

## Cancer Screening — United States, 2010

Each year, approximately 350,000 persons are diagnosed with breast, cervical, or colorectal cancer in the United States, and nearly 100,000 die from these diseases (1). The U.S. Preventive Services Task Force (USPSTF) recommends screening tests for each of these cancers to reduce morbidity and mortality (2). *Healthy People 2020* sets national objectives for use of the recommended cancer screening tests and identifies the National Health Interview Survey (NHIS) as the means to measure progress. Data from the 2010 NHIS were analyzed to assess use of the recommended tests by age, race, ethnicity, education, length of U.S. residence, and source and financing of health care to identify groups not receiving the full benefits of screening and to target specific interventions to increase screening rates. Overall, the breast cancer screening rate was 72.4% (below the *Healthy People 2020* target of 81.1%), cervical cancer screening was 83.0% (below the target of 93.0%), and colorectal cancer screening was 58.6% (below the target of 70.5%). Screening rates for all three cancer screening tests were significantly lower among Asians than among whites and blacks. Hispanics were less likely to be screened for cervical and colorectal cancer. Higher screening rates were positively associated with education, availability and use of health care, and length of U.S. residence. Continued monitoring of screening rates helps to assess progress toward meeting *Healthy People 2020* targets and to develop strategies to reach those targets.

NHIS is a periodic, nationwide, household survey of a representative sample of the U.S. civilian noninstitutionalized population; it includes cancer screening questions on the adult questionnaire. Respondents are asked whether they have been screened with specific tests for cancer, and if they have, when the tests were performed last. For this analysis, because the questionnaire did not distinguish between tests for screening and those performed for other reasons, any report of testing for cancer was categorized as a screening test. Reports of screening were used to determine the portion of the population up-to-date for screenings recommended by USPSTF (2).

Since 2006, NHIS has oversampled Hispanic and Asian populations (3), increasing the ability to examine screening

use among specific racial and ethnic subgroups. Asians were categorized as Chinese, Filipino, or other Asian. Hispanics were categorized as Puerto Rican, Mexican, Mexican-American, Central or South American, or other Hispanic. Sampling weights were applied to account for the probability of selection. Screening percentages and 95% confidence intervals (CIs) were calculated using statistical software to account for complex sample design. Linear trends during 2000–2010 were tested for men and women separately using unadjusted logistic regression models. The conditional response rate for the 2010 NHIS adult sample was 77.3%, and the final response rate was 60.8% (3).

### Breast Cancer Screening

USPSTF recommends that women aged 50–74 years be screened for breast cancer by mammography every 2 years (2). Based on responses to the 2010 NHIS, 72.4% (CI = 70.7%–74.0%) of women overall followed this recommendation, significantly less than the *Healthy People 2020* target of 81.1% (4), with whites and blacks more frequently screened than Asians (Table 1). Considerably lower mammography use was reported by those reporting no usual source of health care (36.2%) or no health insurance (38.2%). Immigrant women who had been in the United States for ≥10 years were almost as likely as U.S.-born women to report having had a mammogram within the past 2 years (70.3% and 73.1%, respectively), whereas only 46.6% of immigrants in the United States for <10 years reported being screened in the past 2 years. Education level also was associated positively with

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screening. Overall, the proportion of women aged 50–74 years who reported having had a mammogram in the past 2 years remained stable during 2000–2010 (Figure).

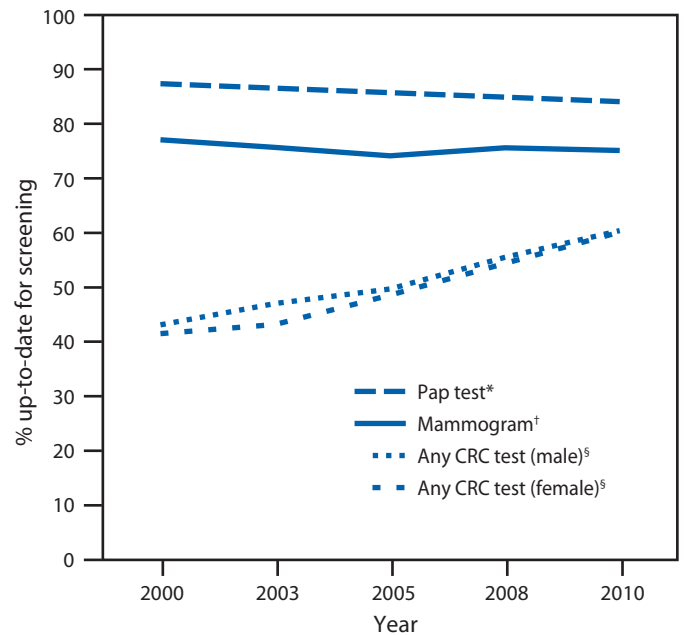
### Cervical Cancer Screening

USPSTF recommends that women aged 21–65 years with a cervix be screened for cervical cancer and precancerous lesions by Papanicolaou (Pap) smear testing every 3 years (2). Overall, 83.0% (CI = 82.0%–84.0%) of women with no hysterectomy reported having a Pap test within the past 3 years (Table 1), significantly less than the *Healthy People 2020* target of 93.0% (4). Rates were significantly lower among Asians (75.4% [CI = 71.1%–79.3%]). Among Asians, Filipinas were more likely to have been screened (86.9% [CI = 80.2%–91.6%]) than other Asians. Those without access to health care were less likely to receive testing; 64.9% of women with no usual source of care and 63.8% of uninsured women were up-to-date. From 2000 to 2010, a small but significant downward trend was observed in the number of women who reported having had a Pap test within the past 3 years.

### Colorectal Cancer Screening

The USPSTF guidelines call for regular screening of both men and women for colorectal cancer, starting at age 50 years and continuing until age 75 years, by any of the following three regimens: 1) annual high-sensitivity fecal occult blood testing, 2) sigmoidoscopy every 5 years combined with

**FIGURE. Percentage of men and women up-to-date on screening for breast, cervical, or colorectal cancer, by type of test, sex, and year — United States, 2000–2010**



**Abbreviations:** CRC = colorectal cancer; Pap = Papanicolaou.

\* Among women aged 21–65 years with no hysterectomy.

† Among women aged 50–74 years.

§ Among persons aged 50–75 years.

high-sensitivity fecal occult blood testing every 3 years, or 3) screening colonoscopy at intervals of 10 years (2). Overall,

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].

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TABLE 1. Breast and cervical cancer screening percentages, by demographic and access to care characteristics — National Health Interview Survey, United States, 2010

Characteristic	Breast cancer			Cervical cancer		
	Mammogram within 2 yrs*			Pap test within 3 yrs*		
	No.	%	(95% CI)	No.	%	(95% CI)
<b>Overall†</b>	<b>4,869</b>	<b>72.4</b>	<b>(70.7–74.0)</b>	<b>8,999</b>	<b>83.0</b>	<b>(82.0–84.0)</b>
<b>Race</b>						
White	3,690	72.8	(70.9–74.6)	6,543	83.4	(82.3–84.5)
Black/African American	852	73.2	(69.7–76.3)	1,626	85.0	(82.8–87.0)
American Indian/Alaska Native	54	69.4	(53.4–81.7)	97	78.7	(65.9–87.5)
Asian	258	64.1	(57.6–70.0)	685	75.4	(71.1–79.3)
Chinese	54	68.1	(53.4–80.0)	144	71.6	(62.2–79.5)
Filipino	72	62.1	(48.9–73.7)	175	86.9	(80.2–91.6)
Other Asian	132	63.5	(53.4–72.5)	366	70.6	(65.1–75.6)
<b>Ethnicity</b>						
Non-Hispanic	4,200	72.7	(70.9–74.4)	7,021	83.8	(82.6–84.9)
Hispanic	669	69.7	(65.5–73.6)	1,978	78.7	(76.3–80.8)
Puerto Rican	86	74.3	(62.7–83.2)	216	85.5	(77.3–91.1)
Mexican	212	66.4	(59.0–73.1)	794	75.0	(70.9–78.6)
Mexican American	144	66.1	(55.1–75.6)	418	80.1	(74.6–84.6)
Central or South American	105	71.4	(60.7–80.2)	327	79.8	(74.4–84.3)
Other Hispanic	122	76.5	(69.5–82.3)	223	81.5	(75.1–86.4)
<b>Age group (yrs)</b>						
21–30				2,392	84.1	(82.2–85.9)
31–40				2,309	84.7	(82.7–86.4)
41–50				2,018	82.5	(80.2–84.6)
51–65				2,280	80.8	(78.8–82.6)
50–64	3,386	72.7	(70.7–74.5)			
65–74	1,483	71.9	(69.0–74.7)			
<b>Length of U.S. residence</b>						
U.S.-born	4,007	73.1	(71.3–74.8)	6,833	85.0	(83.9–86.0)
In United States <10 yrs	61	46.6	(33.5–60.2)	577	67.1	(62.3–71.5)
In United States ≥10 yrs	794	70.3	(66.6–73.8)	1,572	77.8	(74.6–80.7)
<b>Education</b>						
Less than high school	809	58.3	(53.8–62.7)	1,244	69.4	(66.1–72.5)
High school graduate	1,375	69.5	(66.5–72.4)	2,010	77.7	(75.4–79.9)
Some college or associate degree	1,443	73.9	(71.1–76.4)	2,906	85.3	(83.6–86.8)
College graduate	1,229	80.8	(78.0–83.3)	2,818	89.0	(87.5–90.3)
<b>Usual source of care</b>						
None or hospital emergency department	402	36.2	(30.3–42.4)	1,562	64.9	(61.7–67.9)
Has usual source	4,467	75.4	(73.7–77.0)	7,436	86.4	(85.4–87.4)
<b>Health insurance</b>						
Private/Military	3,121	79.8	(77.9–81.5)	5,612	88.7	(87.7–89.7)
Public only	1,192	63.4	(59.8–66.9)	1,422	81.9	(79.1–84.4)
Uninsured	542	38.2	(33.5–43.2)	1,907	63.8	(61.1–66.4)

**Abbreviations:** CI = confidence interval; Pap = Papanicolaou.

\* The U.S. Preventive Services Task Force recommends that women aged 50–74 years be screened for breast cancer by mammography every 2 years and that women aged 21–65 years be screened for cervical cancer and precancerous lesions by Pap smear testing every 3 years.

† Overall percentages were age-standardized to the 2000 U.S. standard population.

58.6% (CI = 57.3%–59.9%) of adults reported being up-to-date with colorectal cancer screening (Table 2). This is significantly lower than the *Healthy People 2020* target of 70.5%. Nearly identical proportions of men (58.5%) and women (58.8%) reported being up-to-date. Whites were significantly more likely to report being up-to-date than blacks or Asians. Hispanics were less likely to report being up-to-date (46.5% [CI = 42.9%–50.2%]) than non-Hispanics. Among respondents who 1) had been in the United States for <10

years; 2) did not have a usual, nonemergency department source of care; or 3) did not have health insurance, less than a quarter reported having been screened within the recommended interval. Respondents aged 65–75 years were more likely to be up-to-date than those aged 50–64 years. Significant upward trends were seen in the proportion of adults up-to-date with colorectal cancer screening from 2000 to 2010 using any colorectal cancer screening regimen (Figure).

**TABLE 2. Colorectal cancer screening percentages, by demographic and access to care characteristics — National Health Interview Survey, United States, 2010**

Characteristic	Colorectal cancer*		
	No.	%	(95% CI)
<b>Overall†</b>	<b>8,914</b>	<b>58.6</b>	<b>(57.3–59.9)</b>
<b>Sex</b>			
Male	3,929	58.5	(56.6–60.4)
Female	4,985	58.8	(57.1–60.5)
<b>Race</b>			
White	6,813	59.8	(58.4–61.2)
Black/African American	1,524	55.0	(51.7–58.2)
American Indian/Alaska Native	82	49.5	(35.3–63.8)
Asian	472	46.9	(41.7–52.2)
Chinese	92	41.3	(28.8–55.0)
Filipino	138	54.5	(44.2–64.3)
Other Asian	242	44.3	(36.5–52.4)
<b>Ethnicity</b>			
Non-Hispanic	7,745	59.9	(58.5–61.3)
Hispanic	1,169	46.5	(42.9–50.2)
Puerto Rican	147	55.3	(45.2–65.0)
Mexican	389	37.8	(31.9–44.1)
Mexican American	242	54.9	(47.2–62.3)
Central or South American	198	47.3	(39.3–55.5)
Other Hispanic	193	46.0	(36.7–55.5)
<b>Age group (yrs)</b>			
50–64	6,091	55.0	(53.4–56.6)
65–75	2,823	67.9	(65.9–69.8)
<b>Length of U.S. residence</b>			
U.S.-born	7,369	60.5	(59.1–61.8)
In United States <10 yrs	111	21.3	(14.0–31.0)
In United States ≥10 yrs	1,424	49.5	(46.2–52.8)
<b>Education</b>			
Less than high school	1,521	44.6	(41.5–47.7)
High school graduate	2,472	53.6	(51.4–55.9)
Some college or associate degree	2,513	62.0	(59.8–64.1)
College graduate	2,376	67.3	(65.0–69.5)
<b>Usual source of care</b>			
None or hospital emergency department	871	20.8	(17.4–24.6)
Has usual source	8,042	62.4	(61.1–63.7)
<b>Health insurance</b>			
Private/Military	8,891	58.7	(57.4–60.0)
Public only	5,780	65.0	(63.4–66.5)
Public only	2,092	55.3	(52.5–58.1)
Uninsured	1,019	20.7	(17.9–23.8)

**Abbreviation:** CI = confidence interval.

\* The U.S. Preventive Services Task Force recommends regular screening for colorectal cancer by men and women aged 50–75 years by 1) annual high-sensitivity fecal occult blood testing, 2) sigmoidoscopy every 5 years combined with high-sensitivity fecal occult blood testing every 3 years, or 3) screening colonoscopy at intervals of 10 years.

† Overall percentages were age-standardized to the 2000 U.S. standard population.

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### Editorial Note

Measuring use of recommended cancer screening regimens and changes in use over time is important to identify groups that might not be receiving the full benefits of screening. The population-based estimates in this report show a slight downward trend in the proportion of women up-to-date with screening for cervical cancer but no change over time in breast cancer screening rates. Screening rates for colorectal cancer increased markedly for men and women, with the rate for women increasing slightly faster, so that rates among men and women were the same in 2010. Breast cancer and colorectal cancer screening rates for persons living in the United States <10 years have declined since 2008 (5,6), and many of those known to face health disparities, such as those without a source of health care and those who are uninsured, continue to be screened less often than recommended. The proportions of women being screened for breast cancer (72.4%) and cervical cancers (83.0%) are below the respective *Healthy People 2020* targets of 81.1% and 93.0%. Screening for colorectal cancer has increased over time, reaching 58.6%, according to the 2010 NHIS data, and 65.4%, according to 2010 Behavioral Risk Factor Surveillance Survey (BRFSS) data (7). Both estimates are considerably lower than the *Healthy People 2020* target of 70.5% (4). Differences between BRFSS and NHIS estimates of cancer screening rates are likely the result of differences in the methods used for the surveys (8).

Financial barriers to screening might explain some of the observed disparities in cancer screening rates. The National Breast and Cervical Cancer Early Detection Program provides free or low-cost screening and diagnostic breast and cervical cancer services to low-income, underinsured, and uninsured women, and access to state Medicaid programs for treatment if breast or cervical cancer are diagnosed.\* The Affordable Care Act is expected to reduce financial barriers to screening by expanding insurance coverage. Breast, cervical, and colorectal cancer screening are now covered free in Medicare and in newly offered private insurance plans. State Medicaid programs that provide these services free will receive an enhanced federal match rate. Other efforts are needed, such as developing systems that identify persons eligible for cancer screening tests, actively encouraging the use of screening tests, and monitoring participation to improve screening rates.

Previous studies have shown that racial and ethnic subgroups differ in cancer screening use (9,10). Large variations were seen between some subgroups. Subgroups that were more likely to receive one type of cancer screening were not necessarily more likely to receive all types. This study further illustrates

\* Additional information is available at <http://www.cdc.gov/cancer/nbcedp>.

**What is already known on this topic?**

Screening at certain ages detects breast, cervical, and colorectal cancer early and reduces morbidity and mortality. The *Healthy People 2020* targets for breast, cervical, and colorectal cancer screening are 81.1%, 93.0%, and 70.5% of the targeted age groups.

**What is added by this report?**

Analysis of data from the 2010 National Health Interview Survey shows that the proportion of the U.S. population screened for cancer according to current recommendations remains below target levels. The proportions screened are 72.4% for breast cancer, 83.0% for cervical cancer, and 58.6% for colorectal cancer. Screening rates for breast cancer have changed little in the past 10 years, whereas rates for cervical cancer have decreased slightly, and rates for colorectal cancer have increased. Screening use varies with age group, race, ethnicity, education, access to health care, and length of U.S. residence.

**What are the implications for public health practice?**

Efforts should be made to improve screening rates in all population groups (including targeting populations with particularly low levels of cancer screening) to increase population screening levels to meet *Healthy People 2020* targets and reduce cancer morbidity and mortality.

the importance of identifying and tracking differences among racial and ethnic subgroups and provides guidance for future targeted interventions.

The age ranges examined in this report correspond to the specifications in *Healthy People 2020* objectives, based on current guidelines from USPSTF (2,3), but some persons younger or older than those ages also might benefit from screening. For cervical cancer screening, USPSTF recommends screening women aged >65 years who previously have not been screened or for whom information about previous screening is not available. For adults aged 75–85 years who previously have not been screened for colorectal cancer, USPSTF recommends that screening decisions be made considering the person's health status and competing risks. For mammography screening, USPSTF states that evidence is insufficient to assess the additional benefits and harms of screening in women aged ≥75 years.

The findings in this report are subject to at least four limitations. First, NHIS data are self-reported, and any report of testing for cancer was classified as a screening test; therefore, these data are subject to inaccuracies. Second, screening recommendations have changed over time. Third, before 2005, the NHIS survey allowed incomplete responses to questions about the date of the test, often requiring assumptions to recode screening measures. To facilitate comparisons over time, this analysis imposed the 2000 method, which allows use of data defined consistently across all years. As a result, the description

of screening rates might be less accurate, so that the percentages shown for 2010 in the trend analysis differ slightly from those reported in the tables (5). Finally, the 2003 NHIS did not include questions on prior hysterectomy; consequently, 2003 data for Pap smears in the trend analysis were excluded to allow for exclusion of women who had undergone hysterectomy.

Although progress toward achieving the *Healthy People 2020* objective for colorectal cancer screening is being made, screening for breast cancer and cervical cancer has not increased over the past decade, and screening use remains low for many groups. This study shows the disparity in subgroup screening rates. Monitoring of these groups is important to assess progress toward reaching *Healthy People 2020* cancer screening targets. Efforts should be made to improve screening rates in all population groups (including targeted efforts for populations with particularly low levels of cancer screening).

**References**

1. Taplin S. Breast cancer screening improvement means considering the entire process. Testimony before the Subcommittee on Health, Committee on Energy and Commerce, US House of Representatives; October 7, 2009. Washington, DC: US Department of Health and Human Services; 2011. Available at <http://www.hhs.gov/asl/testify/2009/10/t20091007a.html>. Accessed January 17, 2012.
2. US Preventive Services Task Force. Recommendations for adults: cancer. Rockville, MD: US Preventive Services Task Force; 2011. Available at <http://www.uspreventiveservicestaskforce.org/adultrec.htm>. Accessed January 17, 2012.
3. National Center for Health Statistics. 2010 National Health Interview Survey (NHIS) public use data release: NHIS survey description. Hyattsville, MD: US Department of Health and Human Services, CDC, National Center for Health Statistics; 2011. Available at [ftp://ftp.cdc.gov/pub/health\\_statistics/nchs/dataset\\_documentation/nhis/2010/srvydesc.pdf](ftp://ftp.cdc.gov/pub/health_statistics/nchs/dataset_documentation/nhis/2010/srvydesc.pdf). Accessed January 19, 2012.
4. US Department of Health and Human Services. Healthy People 2020 topics and objectives: cancer. Washington, DC: US Department of Health and Human Services; 2011. Available at <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=5>. Accessed January 17, 2012.
5. Breen N, Gentleman JF, Schiller JS. Update on mammography trends: comparisons of rates in 2000, 2005, and 2008. *Cancer* 2011;117:2209–18.
6. Klabunde CN, Cronin KA, Breen N, Waldron WR, Ambs AH, Nadel MR. Trends in colorectal cancer test use among vulnerable populations in the United States. *Cancer Epidemiol Biomarkers Prev* 2011;20:1611–21.
7. CDC. Vital signs: colorectal cancer screening, incidence, and mortality—United States, 2002–2010. *MMWR* 2011;60:884–9.
8. Raghunathan T, Xie D, Schenker N, et al. Combining information from two surveys to estimate county-level prevalence rates of cancer risk factors and screening. *J Am Stat Assoc* 2007;102:474–86.
9. Miller BA, Chu KC, Hankey BF, Ries LA. Cancer incidence and mortality patterns among specific Asian and Pacific Islander populations in the U.S. *Cancer Causes Control* 2008;19:227–56.
10. Gorin SS, Heck JE. Cancer screening among Latino subgroups in the United States. *Prev Med* 2005;40:515–26.

## Gang Homicides — Five U.S. Cities, 2003–2008

Gang homicides account for a substantial proportion of homicides among youths in some U.S. cities; however, few surveillance systems collect data with the level of detail necessary to gang homicide prevention strategies. To compare characteristics of gang homicides with nongang homicides, CDC analyzed 2003–2008 data from the National Violent Death Reporting System (NVDRS) for five cities with high levels of gang homicide. This report describes the results of that analysis, which indicated that, consistent with similar previous research, a higher proportion of gang homicides than other homicides involved young adults and adolescents, racial and ethnic minorities, and males. Additionally, the proportion of gang homicides resulting from drug trade/use or with other crimes in progress was consistently low in the five cities, ranging from zero to 25%. Furthermore, this report found that gang homicides were more likely to occur with firearms and in public places, which suggests that gang homicides are quick, retaliatory reactions to ongoing gang-related conflict. These findings provide evidence for the need to prevent gang involvement early in adolescence and to increase youths' capacity to resolve conflict nonviolently.

NVDRS is an active, state-based surveillance system that collects violent death data from multiple sources, such as death certificates, coroner/medical examiner records, and various law enforcement reports (e.g., police reports and supplementary homicide reports [SHRs]). As of 2008, NVDRS has operated in 17 U.S. states.\* This report includes 2003–2008 data from large cities in NVDRS states. Only cities ranked within the 100 largest in the United States were examined because gang problems more frequently occur in large cities (1–2). Cases of gang homicide were defined as homicides reported to have been either precipitated by gang rivalry or activity† or perpetrated by a rival gang member on the victim.

\*Seven states joined in 2003 (Alaska, Maryland, Massachusetts, New Jersey, Oregon, South Carolina, and Virginia); six states joined in 2004 (Colorado, Georgia, North Carolina, Oklahoma, Rhode Island, and Wisconsin), and four states joined in 2005 (California, Kentucky, New Mexico, and Utah). Five California counties are included in NVDRS. The three counties in northern California began data collection in 2004. The two counties in southern California began data collection in 2005.

†Homicides deemed to have been precipitated by gang rivalry and activity were identified based on variables captured in NVDRS or variables captured in SHRs, a data source for NVDRS. The relevant variables for NVDRS include “gang activity” or “gang rivalry” listed as a preceding circumstance. The relevant preceding circumstance variable in SHRs included “juvenile gang killing” and “gangland killing.” Whereas standard NVDRS and SHR variables were used to capture cases, these variables are largely determined by the law enforcement narratives, and law enforcement agencies might have different criteria for listing gang activity on a report.

Because a city might be served by more than one law enforcement agency and each agency might have its own definition of gang-related crime, this analysis used only data from municipal police departments. Municipal police departments often have a jurisdiction congruent with city limits. Geographic areas matching municipal police jurisdictions were identified by geographic codes (either federal information processing standards or zip codes) for location of injury in NVDRS. U.S. Census Bureau 2000 population estimates were determined for each city using the *Law Enforcement Agency Identifiers Crosswalk* (3). For each of the 33 eligible large cities, gang homicide counts were averaged for the period 2003–2008 and divided by the population estimates to calculate an average annual gang-related mortality rate. Cities with gang-related mortality rates equal to or greater than one standard deviation above the average were selected for further analyses.

Five cities met the criterion for having a high prevalence of gang homicides: Los Angeles, California; Oklahoma City, Oklahoma; Long Beach, California; Oakland, California; and Newark, New Jersey. In these cities, a total of 856 gang and 2,077 nongang homicides were identified and included in the analyses. Comparisons of the characteristics of gang and nongang homicides were made using Fisher's exact tests for all the variables except mean age, which required a t-test. The characteristics included basic demographics of the victims, descriptive information on the homicide event, and circumstances precipitating the event.

Gang homicide victims were significantly younger than nongang homicide victims in all five cities (Table 1). Whereas 27%–42% of the gang homicide victims were aged 15–19 years, only 9%–14% of the nongang homicide victims were in this age group. Approximately 80% of all homicide victims were male in each city; however, Los Angeles, Newark, and Oklahoma City still reported significantly higher proportions of male victims in gang homicide incidents compared with nongang homicide incidents. In Los Angeles and Oakland, a significantly higher proportion of gang victims were Hispanic and, in Oklahoma City, a significantly higher proportion of gang victims were non-Hispanic black compared with nongang victims.

In at least three of the five cities, gang homicides were significantly more likely than nongang homicides to occur on a street and involve a firearm (Table 2). More than 90% of gang homicide incidents involved firearms in each city. For nongang homicides, firearms were involved in 57%–86% of the incidents. Gang homicides also were most likely to occur in afternoon/evening hours in the majority of the five cities; however, comparisons were not examined because the data

TABLE 1. Comparison of gang and nongang homicide victim demographics — National Violent Death Reporting System, five U.S. cities

Characteristic*	Los Angeles, CA (2006–2008)				Long Beach, CA (2006–2008)				Oakland, CA (2005–2008)			
	Gang (N = 646)		Nongang (N = 892)		Gang (N = 52)		Nongang (N = 76)		Gang (N = 40)		Nongang (N = 358)	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Mean age (yrs) (SD)	24.7	(9.0) <sup>†</sup>	34.3 <sup>§</sup>	(15.8)	22.4	(7.4) <sup>†</sup>	35.3	(17.1)	23.4	(7.6) <sup>†</sup>	30.8	(12.3)
Age group (yrs)												
0–14	15	(2.3) <sup>†</sup>	43	(4.8)	2	(3.9)	6	(7.9)	2	(5.0)	4	(1.1)
15–19	199	(30.8) <sup>†</sup>	82	(9.2)	22	(42.3) <sup>†</sup>	7	(9.2)	14	(35.0) <sup>†</sup>	48	(13.4)
20–24	185	(28.6) <sup>†</sup>	159	(17.8)	15	(28.9) <sup>†</sup>	10	(13.2)	10	(25.0)	86	(24.0)
25–34	164	(25.4)	215	(24.1)	8	(15.4)	15	(19.7)	10	(25.0)	107	(29.9)
35–64	82	(12.7) <sup>†</sup>	353	(39.6)	5	(9.6) <sup>†</sup>	32	(42.1)	4	(10.0) <sup>†</sup>	109	(30.5)
≥65	1	(0.2) <sup>†</sup>	36	(4.0)	0	—	6	(7.9)	0	—	4	(1.1)
Unknown	0	—	4	(0.5)	0	—	0	—	0	—	0	—
Sex												
Male	615	(95.2) <sup>†</sup>	730	(81.8)	49	(94.2)	66	(86.8)	36	(90.0)	309	(86.3)
Female	31	(4.8) <sup>†</sup>	161	(18.1)	3	(5.8)	10	(13.2)	4	(10.0)	49	(13.7)
Unknown	0	—	1	(0.1)	0	—	0	—	0	—	0	—
Race/Ethnicity												
Hispanic	269	(41.6) <sup>†</sup>	278	(31.2)	19	(36.5)	19	(25.0)	29	(72.5) <sup>†</sup>	53	(14.8)
White, non-Hispanic	131	(20.3) <sup>†</sup>	254	(28.5)	10	(19.2)	21	(27.6)	4	(10.0)	25	(7.0)
Black, non-Hispanic	236	(36.5)	312	(35.0)	17	(32.7)	26	(34.2)	4	(10.0) <sup>†</sup>	262	(73.2)
Other/Unknown	10	(1.6) <sup>†</sup>	48	(5.4)	6	(11.5)	10	(13.2)	3	(7.5)	18	(5.0)

See table footnotes below.

TABLE 1. (Continued) Comparison of gang and nongang homicide victim demographics — National Violent Death Reporting System, five U.S. cities

Characteristic*	Newark, NJ (2003–2008)				Oklahoma City, OK (2004–2008)			
	Gang (N = 55)		Nongang (N = 523)		Gang (N = 63)		Nongang (N = 228)	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Mean age (yrs) (SD)	23.8	(7.1) <sup>†</sup>	29.7	(11.9)	24.1	(8.7) <sup>†</sup>	35.7	(15.7)
Age group (yrs)								
0–14	0	—	15	(2.9)	4	(6.4)	12	(5.3)
15–19	18	(32.7) <sup>†</sup>	73	(14.0)	17	(27.0) <sup>†</sup>	23	(10.1)
20–24	15	(27.3)	96	(18.4)	18	(28.6) <sup>†</sup>	22	(9.7)
25–34	17	(30.9)	204	(39.0)	18	(28.6)	57	(25.0)
35–64	5	(9.1) <sup>†</sup>	127	(24.3)	6	(9.5) <sup>†</sup>	100	(43.9)
≥65	0	—	8	(1.5)	0	— <sup>†</sup>	14	(6.1)
Unknown	0	—	0	—	0	—	0	—
Sex								
Male	55	(100.0) <sup>†</sup>	458	(87.6)	60	(95.2) <sup>†</sup>	173	(75.9)
Female	0	— <sup>†</sup>	65	(12.4)	3	(4.8) <sup>†</sup>	55	(24.1)
Unknown	0	—	0	0	0	—	0	—
Race/Ethnicity								
Hispanic	4	(7.3)	60	(11.5)	14	(22.2)	37	(16.2)
White, non-Hispanic	0	—	30	(5.7)	2	(3.2) <sup>†</sup>	95	(41.7)
Black, non-Hispanic	51	(92.7)	430	(82.2)	44	(69.8) <sup>†</sup>	79	(34.7)
Other/Unknown	0	—	3	(0.6)	3	(4.8)	17	(7.5)

Abbreviation: SD = standard deviation.

\* A t-test was used to compare mean ages. Fisher's exact tests were used to compare all other variables. When a variable had more than two levels, each level was compared with all the remaining levels.

† Denotes statistical difference (p&lt;0.05).

§ Age was unknown for four of the nongang victims.

were missing for 23% of nongang homicide incidents. In Los Angeles, Oakland, and Oklahoma City, gang homicides occurred significantly more frequently on weekends than did nongang homicides.

With regard to the circumstances preceding the homicide, drive-by shootings were significantly more likely to contribute

to gang homicides than other types of homicide in Los Angeles and Oklahoma City (Table 2). Nearly one quarter of gang homicides in these cities were drive-by shootings, compared with 1%–6% of nongang homicides. A significantly smaller proportion of gang versus nongang homicides were precipitated by another crime in progress in the California cities, ranging

TABLE 2. Comparison of gang and nongang incident characteristics — National Violent Death Reporting System, five U.S. cities

Characteristic*	Los Angeles, CA (2006–2008)				Long Beach, CA (2006–2008)				Oakland, CA (2005–2008)			
	Gang (N = 646)		Nongang (N = 892)		Gang (N = 52)		Nongang (N = 76)		Gang (N = 40)		Nongang (N = 358)	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
<b>Weapon</b>												
Firearm	619	(95.8) <sup>†</sup>	553	(62.0)	48	(92.3) <sup>†</sup>	46	(60.5)	38	(95.0)	308	(86.0)
Other	27	(4.2) <sup>†</sup>	277	(31.1)	4	(7.7) <sup>†</sup>	24	(31.6)	2	(5.0)	47	(13.1)
Unknown	0	— <sup>†</sup>	62	(7.0)	0	—	6	(7.9)	0	—	3	(0.8)
<b>Location of injury</b>												
Residence	90	(13.9) <sup>†</sup>	271	(30.4)	12	(23.0)	28	(36.4)	4	(10.0)	58	(16.2)
Street	418	(64.7) <sup>†</sup>	360	(40.4)	32	(61.5) <sup>†</sup>	30	(39.5)	27	(67.5)	219	(61.2)
Other	136	(21.1)	208	(23.3)	8	(15.4)	12	(15.8)	9	(22.5)	73	(20.4)
Unknown	2	(0.3) <sup>†</sup>	53	(5.9)	0	—	6	(7.9)	0	—	8	(2.2)
<b>Time of injury<sup>§</sup></b>												
Day	147	(22.8)	148	(16.6)	5	(9.6)	11	(14.5)	7	(17.5)	68	(19.0)
Afternoon/ Evening	259	(40.1)	239	(26.8)	27	(51.9)	16	(21.1)	18	(45.0)	128	(35.8)
Night	206	(31.9)	273	(30.6)	17	(32.7)	16	(21.1)	15	(37.5)	131	(36.6)
Unknown	34	(5.3)	232	(26.0)	3	(5.8)	33	(43.4)	0	—	31	(8.7)
<b>Day of injury</b>												
Mon/Tues/Wed	235	(36.4)	341	(39.2)	22	(42.3)	28	(36.8)	11	(27.5)	129	(36.0)
Thu/Fri	147	(22.8)	232	(26.0)	12	(23.1)	18	(23.7)	7	(17.5)	102	(28.5)
Sat/Sun	264	(40.9) <sup>†</sup>	319	(35.8)	18	(34.6)	30	(39.5)	22	(55.0) <sup>†</sup>	126	(35.2)
Unknown	0	—	0	—	0	—	0	—	0	—	1	(0.3)
<b>Drive-by shooting</b>	152	(23.5) <sup>†</sup>	57	(6.4)	9	(17.3)	5	(6.6)	9	(22.5)	50	(13.97)
No/Unknown	494	(76.5)	835	(93.6)	43	(82.7)	71	(93.4)	31	(77.5)	308	(86.0)
<b>Any argument</b>	105	(12.3) <sup>†</sup>	345	(16.6)	2	(3.9)	11	(14.5)	9	(22.5)	61	(17.0)
No/Unknown	751	(87.7)	1732	(83.4)	50	(96.2)	65	(85.5)	31	(77.5)	297	(83.0)
<b>Crime in progress</b>	20	(3.1) <sup>†</sup>	94	(10.5)	0	— <sup>†</sup>	7	(9.2)	1	(2.5) <sup>†</sup>	53	(14.8)
No/Unknown	626	(96.9)	798	(89.5)	52	(100.0)	69	(90.8)	39	(97.5)	305	(85.2)
<b>Drug trade/use</b>	5	(0.8)	11	(1.2)	0	—	4	(5.3)	5	(12.5)	59	(16.5)
No/Unknown	641	(99.2)	881	(98.8)	52	(100.0)	72	(94.7)	35	(87.5)	299	(83.5)
<b>Bystander death</b>	5	(0.8)	6	(0.7)	0	—	0	—	1	(2.5)	3	(0.8)
No/Unknown	641	(99.2)	886	(99.3)	52	(100.0)	76	(100.0)	39	(97.5)	355	(99.2)

See table footnotes on page 49.

from zero to 3% of gang homicides, compared with 9% to 15% of nongang homicides. Further, in Los Angeles and Long Beach, less than 5% of all homicides were associated with known drug trade/use. Although data for Newark and Oklahoma City indicated that 20%–25% of gang homicides involved drug trade/use; Newark was the only city that had a significantly higher proportion of gang versus nongang homicides that involved drug trade/use.

#### Reported by

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#### Editorial Note

Homicide is the second leading cause of death among persons aged 15–24 years in the United States (4). In some cities, such as Los Angeles and Long Beach, gang homicides account for the majority of homicides in this age group (61% and 69%, respectively). The differences observed in gang versus nongang homicide incidents with regard to victim demographics, place of injury, and the use of drive-by shootings and firearms are consistent with previous reports (5). The finding that gang homicides commonly were not precipitated by drug trade/use or other crimes in progress also is similar to previous research; however, this finding challenges public perceptions on gang homicides (5). The public often has viewed gangs, drug trade/use, crime, and homicides as interconnected factors; however, studies have shown little connection between gang homicides and drug trade/use and crime (5). Gangs and gang members are involved in a variety of high-risk behaviors that sometimes include drug and crime involvement, but gang-related homicides usually are attributed to other circumstances (6). Newark was an exception by having a higher proportion of gang homicides



TABLE 2. (Continued) Comparison of gang and nongang incident characteristics — National Violent Death Reporting System, five U.S. cities

Characteristic*	Newark, NJ (2003–2008)				Oklahoma City, OK (2004–2008)			
	Gang (N = 55)		Nongang (N = 523)		Gang (N = 63)		Nongang (N = 228)	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
<b>Weapon</b>								
Firearm	53	(96.4) <sup>†</sup>	405	(77.4)	59	(93.7) <sup>†</sup>	130	(57.0)
Other	2	(3.6) <sup>†</sup>	110	(21.0)	4	(6.4) <sup>†</sup>	92	(40.4)
Unknown	0	—	8	(1.5)	0	—	6	(2.6)
<b>Location of injury</b>								
Residence	13	(23.6)	117	(22.4)	25	(39.7) <sup>†</sup>	131	(57.5)
Street	34	(61.8)	281	(53.7)	24	(38.1) <sup>†</sup>	41	(18.0)
Other	6	(10.9)	107	(20.5)	11	(17.5)	47	(20.6)
Unknown	2	(3.6)	18	(3.4)	3	(4.8)	9	(4.0)
<b>Time of injury<sup>§</sup></b>								
Day	8	(14.6)	99	(18.9)	10	(15.9)	42	(18.4)
Afternoon/ Evening	18	(32.7)	144	(27.5)	22	(34.9)	49	(21.5)
Night	23	(41.8)	175	(33.5)	29	(46.0)	63	(27.6)
Unknown	6	(10.9)	105	(20.1)	2	(3.2)	74	(32.5)
<b>Day of injury</b>								
Mon/Tues/Wed	22	(40.0)	208	(39.8)	21	(33.3)	89	(39.0)
Thu/Fri	11	(20.0)	129	(24.7)	15	(23.8)	73	(32.0)
Sat/Sun	22	(40.0)	186	(35.6)	27	(42.9) <sup>†</sup>	65	(28.5)
Unknown	0	—	0	—	0	—	1	(0.4)
<b>Drive-by shooting</b>	5	(9.1)	19	(3.6)	15	(23.8) <sup>†</sup>	3	(1.3)
No/Unknown	50	(90.9)	504	(96.4)	48	(76.2)	225	(98.7)
<b>Any argument</b>	8	(14.6)	49	(9.4)	20	(31.8)	80	(35.1)
No/Unknown	47	(85.5)	474	(90.6)	43	(68.3)	148	(64.9)
<b>Crime in progress</b>	4	(7.3)	49	(9.4)	15	(23.8)	71	(31.1)
No/Unknown	51	(92.7)	474	(90.6)	48	(76.2)	157	(68.9)
<b>Drug trade/use</b>	11	(20.0) <sup>†</sup>	9	(5.5)	16	(25.4)	52	(22.8)
No/Unknown	44	(80.0)	494	(94.5)	47	(74.6)	176	(77.2)
<b>Bystander death</b>	3	(5.5) <sup>†</sup>	6	(1.2)	2	(3.2)	3	(1.3)
No/Unknown	52	(94.6)	517	(98.9)	61	(96.8)	225	(98.7)

\* Fisher's exact tests were conducted. When a variable had more than two levels, each level was compared with all the remaining levels. Because of missing data, statistical tests for time of injury were not conducted.

<sup>†</sup> Denotes statistical difference ( $p < 0.05$ ).

<sup>§</sup> Day = 7:00 a.m. to 4:59 p.m. Afternoon/Evening = 5:00 p.m. to 11:59 p.m. Night = 12:00 a.m. to 6:59 a.m.

being drug-related. A possible explanation of this divergent finding could be that Newark is experiencing homicides by gangs formed specifically for drug trade. Overall, these findings support a view of gang homicides as retaliatory violence. These incidents most often result when contentious gang members pass each other in public places and a conflict quickly escalates into homicide with the use of firearms and drive-by shootings.

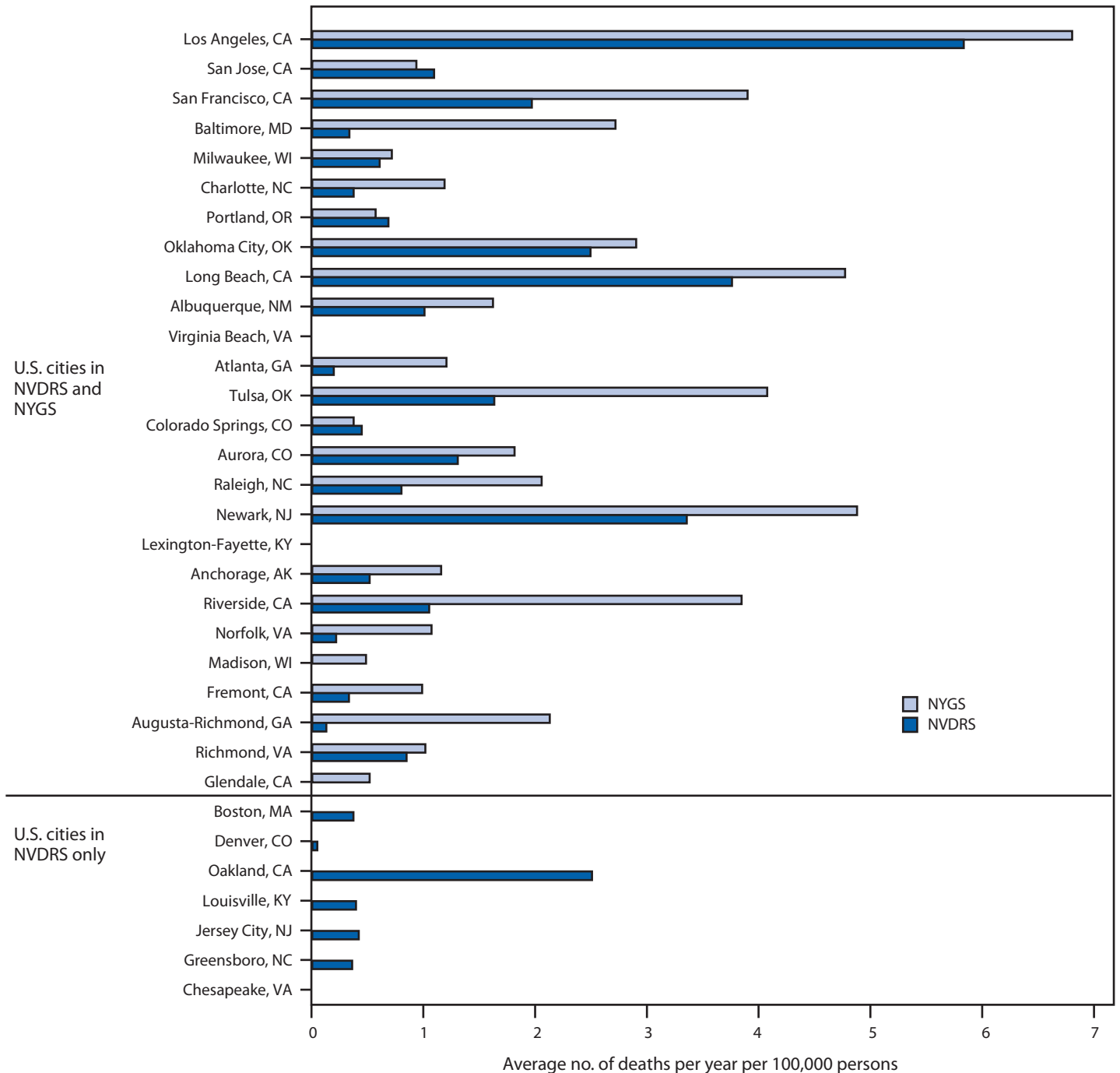
The findings in this report are subject to at least two limitations. First, the accuracy of gang homicide estimates in NVDRS and other surveillance systems is unknown. As a point of reference, CDC compared NVDRS's gang homicide counts to another independent surveillance system, the National Youth Gang Survey (NYGS). NYGS<sup>§</sup> is a nationally representative

<sup>§</sup> NYGS instructs respondents to provide the number of gang-related homicides recorded (not estimated) by each law enforcement agency and to use the following definition for a youth gang: "a group of youths or young adults in your jurisdiction that you or other responsible persons in your agency or community are willing to identify as a gang." This definition excludes motorcycle gangs, hate or ideology groups, prison gangs, and exclusively adult gangs.

annual survey of law enforcement agencies, including all large cities (2). Most cities included in this report also had high gang-related mortality rates in NYGS (Figure). Second, the gang homicide case definition can vary by law enforcement agency, which might introduce a misclassification bias. For instance, organized crime gangs, although distinct from youth street gangs are included in some but not all definitions of gang homicide. In addition, some agencies report according to a gang member–based definition (i.e., homicides involving a gang member) whereas others report according to a gang motive–based definition (i.e., the homicide further the goals of a gang) (7).

In conclusion, gang homicides are unique violent events that require prevention strategies aimed specifically at gang processes. Preventing gang joining and increasing youths' capacity to resolve conflict nonviolently might reduce gang homicides (8). Rigorous evaluation of gang violence prevention programs is limited; however, many promising programs exist

FIGURE. Estimated gang-related mortality rates among 33 U.S. cities included in the National Violence Death Reporting System (NVDRS) and/or the National Youth Gang Survey (NYGS), 2003–2008\*



\* Cities are listed in descending order by population size. City population estimates were determined by 2000 U.S. Census levels. Cities were in the 17 states participating in NVDRS during 2003–2008 and ranked among the 100 largest cities in the United States based on U.S. Census Bureau statistics. Surveillance years for participating cities vary.

(9). In terms of primary prevention, the Prevention Treatment Program, which includes child training in prosocial skills and self-control, has shown reductions in gang affiliation among youths aged 15 years (10). Secondary prevention programs

that intervene when youths have been injured by gang violence, such as hospital emergency department intervention programs, might interrupt the retaliatory nature of gang violence and promote youths leaving gangs. Finally, promising

## References

1. US Census Bureau. Cities with 100,000 or more population in 2000 ranked by population. County and city data book 2000. Washington, DC: US Census Bureau; 2011. Available at <http://www.census.gov/statab/ccdb/cityrank.htm>. Accessed January 17, 2012.
2. Egley A Jr, Howell JC. Highlights of the 2009 National Youth Gang Survey: fact sheet. Washington, DC: US Department of Justice, Office of Juvenile Justice and Delinquency Prevention; 2011. Available at <https://www.ncjrs.gov/pdffiles1/ojjdp/233581.pdf>. Accessed January 17, 2012.
3. Inter-University Consortium for Political and Social Research. Law enforcement agency identifiers crosswalk [United States], 2005. Ann Arbor, MI: Inter-University Consortium for Political and Social Research; 2005. Available at <http://data.nicar.org/files/active/0/04634-0001-Codebook.pdf>. Accessed January 17, 2012.
4. CDC. Web-Based Injury Statistics Query and Reporting System (WISQARS). Atlanta, GA: US Department of Health and Human Services, CDC; 2012. Available at <http://www.cdc.gov/injury/wisqars>. Accessed January 17, 2012.
5. Howell JC. Youth gang homicides: a literature review. *Crime Delinquency* 1999;45:208–41.
6. Bjerregaard B. Gang membership and drug involvement: untangling the complex relationship. *Crime Delinquency* 2010;56:1–32.
7. Klein M, Maxson C. *Street gang patterns and policies*. New York, NY: Oxford University Press; 2006.
8. McDaniel, DD. Risk and protective factors associated with gang affiliation among high-risk youth: a public health approach. *Inj Prev* [Epub ahead of print, January 11, 2012].
9. Howell JC. *Gang prevention: an overview of research and programs*. Washington, DC: US Department of Justice, Office of Juvenile Justice and Delinquency Prevention; 2010. Available at <https://www.ncjrs.gov/pdffiles1/ojjdp/231116.pdf>. Accessed January 17, 2012.
10. Tremblay R, Masse L, Pagani L, Vitaro F. From childhood physical aggression to adolescent maladjustment: the Montreal prevention experiment. In: Peters RD, McMahon RJ, eds. *Preventing childhood disorders, substance abuse, and delinquency*. Thousand Oaks, CA: Sage; 1996:268–98.

## What is already known on this topic?

Gang homicides account for a substantial proportion of homicides among youths in some U.S. cities; however, few surveillance systems collect the level of detail necessary to inform gang homicide prevention strategies.

## What is added by this report?

This report was the first to use city-level data from CDC's National Violent Death Reporting System (NVDRS) to compare gang homicide to other homicide types. Results showed that gang homicides were more likely to occur on the street and involve young, racial/ethnic minority, male victims and firearms than other homicides. Additionally, data showed that gang homicides commonly were not preceded by drug trade and use or with other crimes in progress in Los Angeles, Long Beach, and Oakland, California.

## What are the implications for public health practice?

Whereas many of the existing efforts directed at reducing gang homicide focus on suppression and control of gangs, drug trade, and other crimes, the results of this report indicate a need for complementary prevention efforts. Specifically, prevention programs should target adolescents before they reach the ages of 15–19 years to prevent them from joining gangs and being put at risk for gang violence in the first place. Further, to prevent the retaliation that results from gang conflict, programs might benefit from increasing youths' capacity to resolve conflict nonviolently. Although these prevention strategies seem promising, rigorous evaluation still is needed to support the effectiveness of these programs.

tertiary prevention programs for gang-involved youths might include evidence-based programs for delinquent youths that provide family therapy to increase the youths' capacity to resolve conflict.

## Acknowledgments

The 17 states that collected 2003–2008 violent death data and their partners, including personnel from law enforcement, vital records, medical examiners/coroners, and crime laboratories; the National Gang Center and the law enforcement agencies that voluntarily report to their annual survey; Nimesh Patel, Div of Violence Prevention, National Center for Injury Prevention and Control, CDC.

## Nodding Syndrome — South Sudan, 2011

In November 2010, the Ministry of Health of the proposed nation of South Sudan requested CDC assistance in investigating a recent increase and geographic clustering of an illness resulting in head nodding and seizures. The outbreak was suspected to be nodding syndrome, an unexplained neurologic condition characterized by episodes of repetitive dropping forward of the head, often accompanied by other seizure-like activity, such as convulsions or staring spells. The condition predominantly affects children aged 5–15 years and has been reported in South Sudan from the states of Western and Central Equatoria (1) and in Northern Uganda and southern Tanzania (2,3). Because of visa and security concerns, CDC investigators did not travel to South Sudan until May 2011. On arrival, a case-control study was conducted that included collecting exposure information and biologic specimens to assess the association of nodding syndrome with suspected risk factors. A total of 38 matched case-control pairs were enrolled from two different communities: Maridi and Witto. Overall, current infection with *Onchocerca volvulus* diagnosed by skin snip was more prevalent among the 38 case-patients (76.3%) than the controls (47.4%) (matched odds ratio [mOR] = 3.2). This difference was driven by the 25 pairs in Maridi (88.0% among case-patients, 44.0% among controls, mOR=9.3); among the 13 pairs in Witto, no significant association with onchocerciasis (known as river blindness) was observed. Although onchocerciasis was more prevalent among case-patients, whether infection preceded or followed nodding syndrome onset was unknown. Priorities for nodding syndrome investigations include improving surveillance to monitor the number of cases and their geographic distribution and continued work to determine the etiology of the syndrome.

### Investigation and Results

As part of the outbreak investigation, a descriptive case series and a case-control study to assess for risk factors were conducted in two locations (Witto village and Maridi town) in the state of Western Equatoria, in South Sudan, where cases of nodding syndrome had been reported. Witto village is a rural setting inhabited by internally displaced persons, and Maridi town has a large, semiurban population. To ascertain whether the clinical syndrome was the same as that observed in other East African countries, a clinical case series study, with complete physical and neurologic examinations, clinical and epidemiologic history, assessments of family history, and relevant laboratory investigations, was conducted. A case of nodding syndrome was defined as onset of repetitive dropping

of the head within the preceding 3 years, as reported by a caregiver, in any previously developmentally normal child aged <18 years who had at least one other neurologic or cognitive abnormality or seizure type, based upon investigator observation or caregiver history.

Ten case-patients from the case-control study were included in the case series study by selecting every third case. Additionally, 14 case-patients were enrolled in the case series with the same criteria as the case-control study enrollment except for the age at head nodding onset. To gain an understanding of the natural history and progression of the illness, these 14 children were selected to represent affected children who displayed earlier onset of head nodding and therefore longer duration of illness.

The mean age of patients in the case series was 13.1 years, with 91.7% reporting onset of disease at ages 5–15 years. Clinical findings included reports by caregivers of typical nodding episodes, other seizure-like activity, and apparent cognitive defects, but a relative lack of focal neurologic deficits. In-depth analysis of these clinical features and comparison with other nodding syndrome reports is under way.

To identify possible risk factors, a case-control study compared those who met the case definition to controls matched by age and location. Based on power calculations from previous investigations in Uganda, 38 matched pairs were enrolled in the case-control study from the two separate locations. Case finding was done through community mobilization. Persons with suspected cases of nodding syndrome were then brought to the study site by caregivers, along with potential neighbor controls, and after screening by investigators, the first 38 pairs that fulfilled the case definition were enrolled in the study. Eighteen (47.4%) of the 38 case-patients and 20 (52.6%) of the controls were female. The mean age of the case-patients was 11.1 years (range: 7–16 years), and the mean age of the controls was 10.6 years (range: 6–17 years).

Overall, prevalence of current onchocerciasis as diagnosed by skin snip was found to be significantly greater among case-patients (76.3%) than among controls (47.4%). Onchocerciasis was more prevalent among case-patients for the 25 pairs in Maridi (88.0% among case-patients and 44.0% among controls); among the 13 pairs in Witto, no significant association with onchocerciasis was observed (Table). In preliminary analyses, no association with nodding syndrome was found with other risk factors, including exposure to munitions, parents' occupations and demographic characteristics. Additional analyses of case-series data and additional exposures related to nutrition are under way.

TABLE. Comparison between nodding syndrome case-patients and control subjects, by study location and onchocerciasis status — South Sudan, 2011

Characteristic	Case-patients (n = 38)		Control subjects (n = 38)		Matched odds ratio*	(95% CI)	p-value
	No.	(%)	No.	(%)			
<b>Study location</b>							
Maridi	25	(100.0)	25	(100.0)	—		—
Witto	13	(100.0)	13	(100.0)	—		—
<b>Total</b>	<b>38</b>	<b>(100.0)</b>	<b>38</b>	<b>(100.0)</b>	—		—
<b>Positive for onchocerciasis by skin snip</b>							
Maridi	22	(88.0)	11	(44.0)	9.3	(1.9–52.3)	0.001
Witto	7	(53.8)	7	(53.8)	1.0	(0.2–6.2)	—
<b>Total</b>	<b>29</b>	<b>(76.3)</b>	<b>18</b>	<b>(47.4)</b>	<b>3.2</b>	<b>(1.2–8.7)</b>	<b>0.02</b>

Abbreviation: CI = confidence interval.

\* Result of matched analysis using conditional logistic regression.

Results of laboratory testing (e.g., for vitamins A, B6, and B12; *Onchocerca* antibodies; heavy metals [urine analysis]; and genetic markers) are pending.

## Public Health Response

Although the cause of nodding syndrome remains unknown, based on these preliminary findings, reinforcing mass ivermectin treatment for onchocerciasis and conducting seizure management using antiepileptic medications were recommended by CDC to the South Sudan Ministry of Health. Enhancing surveillance to identify new cases as they occur, their location, and the age of patients at onset will enable identification of epidemiologic patterns. Exploring the association of nodding syndrome with onchocerciasis and evaluating the role of malnutrition are important future priorities.

### Reported by

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### Editorial Note

The clinical presentation, neurologic findings, and patient age distribution of cases, along with other features of the South Sudan nodding syndrome outbreak described in this report are consistent with previous descriptions of the disease from

neighboring Uganda. Nodding syndrome might be a new seizure disorder (2). Often accompanied by other seizure-like activity such as convulsions or staring spells, the nodding is reported by some caregivers to be precipitated by food or cold weather. During the episodes, the child stops feeding and appears nonresponsive, with or without loss of consciousness (2). Reports of nodding syndrome from Uganda and Tanzania, in addition to South Sudan, describe progressively worsening head nodding, along with cognitive decline and malnutrition (2,3); however, documented natural history studies are lacking.

A published report on 12 nodding syndrome patients studied with magnetic resonance imaging of the brain found normal results or non-specific changes, and electroencephalography performed on 10 patients between nodding episodes showed abnormal background in six patients and electrographic seizures in two patients (2). No child is known to have recovered from nodding syndrome, and the long-term outcomes of illness are not known. Reports from caregivers indicate that affected children sometimes suffer serious injuries or death resulting from falls during seizure episodes.

An illness descriptively similar to nodding syndrome has been reported from Tanzania for decades; however, nodding syndrome has only recently been reported from South Sudan and Uganda in geographically localized areas (1,2,4). This temporal and geographic clustering of an unusual and unexplained syndrome, consistent with epilepsy but with a stereotypic presentation, has drawn attention of international public health agencies (5,6). CDC is assisting the South Sudan Ministry of Health with its ongoing investigations.

Several etiologic factors have been proposed, including infectious, nutritional, environmental, and psychogenic causes. Specific exposures evaluated in previous studies include munitions, measles, monkey meat, relief seeds, or relief food (e.g., lentils and sorghum). However, despite previous investigations, the cause of the syndrome and the pathophysiology remain unknown (1,2,4). Previous studies also have found an association

**What is already known on this topic?**

Nodding syndrome is an unexplained disorder characterized by stereotypic head nodding that affects primarily children aged 5–15 years. The condition has been reported from Tanzania and Uganda, but its cause and natural history are unclear.

**What is added by this report?**

Two clusters of nodding syndrome cases reported in South Sudan in 2010 were investigated. Multiple features of the disease (e.g., clinical presentation, neurologic findings, and patient age distribution) are consistent with those investigated previously in Uganda. As noted in previous cases, a positive association was observed between onchocerciasis and nodding syndrome, but whether the relationship is causative remains unknown.

**What are the implications for public health practice?**

Collaboration among investigators in South Sudan and other countries where nodding syndrome has been reported will be important for future investigations in identifying the cause of this debilitating condition.

with onchocerciasis, but the causal pathophysiologic mechanism by which infection with the nematode *O. volvulus* might lead to neurologic illness is not clear, and some have concluded that the association is spurious (1,2,4). Additionally, onchocerciasis has been endemic in large parts of West and Central Africa, as well as parts of Central and South America; however, nodding syndrome has only been reported in three small localized regions.

A series of investigations by the World Health Organization and South Sudan Ministry of Health in 2001, 2002, and 2010 in Western Equatoria could not identify the cause for nodding

syndrome (1,4,7,8). Nodding syndrome in South Sudan appears to be the same clinical entity as described previously in other parts of East Africa, but the etiology remains unknown. Further collaborative investigations into nodding syndrome are needed to identify the cause, preventive measures, and treatments.

**Acknowledgments**

Robert Breiman, Eric Gogstad, John Neatherlin, CDC Kenya; Christi Murray, CDC South Sudan; Michael Leju, US Agency for International Development (USAID) South Sudan; Kenya Medical Research Institute; Romanos Mkerenga, United Nations Children's Fund (UNICEF) South Sudan.

**References**

1. Nyungura JL, Akim T, Lako A, Gordon A, Lejeng L, William G. Investigation into nodding syndrome in Witto Payam, Western Equatoria State, 2010. *Southern Sudan Medical Journal* 2010;4:3–6.
2. Winkler AS, Friedrich K, Konig R, et al. The head nodding syndrome—clinical classification and possible causes. *Epilepsia* 2008;49:2008–15.
3. Winkler AS, Friedrich K, Meindl M, et al. Clinical characteristics of people with head nodding in southern Tanzania. *Trop Doct* 2010;40:173–5.
4. Lacey M. Nodding disease: mystery of southern Sudan. *Lancet Neurol* 2003;2:714.
5. CDC. CDC responds to nodding disease in Uganda [Video]. Available at <http://www.cdc.gov/globalhealth/video/nodding/nodding.htm>. Accessed January 20, 2012.
6. Wadman M. African outbreak stumps experts. *Nature* 2011;475:148–9.
7. Kaiser C. Head nodding syndrome and river blindness: a parasitologic perspective [Letter]. *Epilepsia* 2009;50:2325.
8. Ministry of Health, Government of Southern Sudan. Nodding disease/syndrome. In: *Neglected tropical disease in Southern Sudan*. Ministry of Health, Government of Southern Sudan; 2008:45.

## Notes from the Field

### Use of Tetanus, Diphtheria, and Pertussis Vaccine (Tdap) in an Emergency Department — Arizona, 2009–2010

Because of an increasing incidence of reported pertussis cases attributed to waning immunity among adults and adolescents, the Advisory Committee on Immunization Practices (ACIP) in 2005 recommended administration of a new, combined tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) for adolescents and adults aged 11–64 years (1). ACIP recommended that they receive a single dose of Tdap to replace tetanus and diphtheria toxoid vaccine (Td) for booster immunization against tetanus and diphtheria if they had not previously received Tdap. Adults aged  $\geq 65$  years were to receive Td according to ACIP recommendations (1). To learn whether these age-specific recommendations were being followed in an emergency department (ED), the charts of a sample of patients receiving tetanus vaccines at a large ED were reviewed.

The ED is part of an urban, academic center and has an annual volume of approximately 70,000 patient visits. Patients who received a tetanus booster during September 1, 2009–August 31, 2010, were identified through an inpatient pharmacy database. Orders placed through the computerized physician order entry system were used to determine which form of tetanus vaccine the physician ordered. Nursing documentation was reviewed to determine what vaccine was actually administered because, during the study period, the automated medication dispensary allowed access to both vaccine types when “tetanus” was entered. Records were stratified by month, assigned a random number, randomized by sorting, and then sampled proportional to monthly totals. The proportion of patients receiving the correct vaccine according to ACIP recommendations (Tdap for those aged  $< 65$  years and Td for those aged  $\geq 65$  years) was calculated.

Of 2,085 tetanus vaccinations administered during the study period, 231 were sampled for study to detect a compliance of 95% ( $\pm 5\%$ ). Of 231 charts reviewed, 19 were excluded because of various deficiencies (mainly missing data). The remaining 212 patients had a median age of 38 years (interquartile range: 24–54 years). Of those 212 patients, 184 (86.8%) were aged  $< 65$  years, 145 (68.4%) were male, 75 (35.4%) were trauma patients, and 151 (71.2%) were discharged home from the ED, whereas the remaining 61 (28.8%) were admitted. An emergency physician ordered 185 (87.3%) of the boosters, 170 (80.2%) were given for laceration or abrasion, 22 (10.4%) for a skin infection, and 20 (9.4%) for another indication.

Overall, 75.0% (95% confidence interval [CI] = 69.1%–80.8%) of the patients were managed in accordance with

ACIP recommendations (Tdap for patients aged  $< 65$  years and Td for patients aged  $\geq 65$  years). Among patients aged  $< 65$  years, adherence to the ACIP recommendation was 76.1% (CI = 69.9%–82.3%), whereas for those aged  $\geq 65$  years, adherence was 67.9% (CI = 49.4%–86.3%). For the 181 patients with both physician orders and nursing documentation, adherence to ACIP guidelines based on nursing documentation was 86.7% (CI = 81.8%–91.7%). For 30 (16.6%) patients, the physician order differed from the vaccine dispensed. Of these, 25 (83.3%) were changed by nursing staff such that the appropriate vaccine (Tdap for those aged  $< 65$  years and Td for those aged  $\geq 65$  years) was dispensed despite an inappropriate vaccine being ordered. Based on nursing documentation alone, adherence to ACIP guidelines differed significantly by age. Those aged  $< 65$  years were appropriately vaccinated with Tdap 89.9% (CI = 85.1%–94.6%) of the time compared with those aged  $\geq 65$  years, who were appropriately vaccinated with Td 65.2% (CI = 44.2%–86.3%) of the time.

Overall adherence to ACIP guidelines for proper Tdap and Td administration was 75%. In this study, only patients who received tetanus boosters were studied; thus, data on the number of patients that failed to receive either Tdap or Td when it was indicated for wound management are not available. For patients aged 11–64 years, 76.1% received the ACIP-recommended Tdap vaccine. For adults aged  $\geq 65$  years, no licensed Tdap vaccine was available in the United States before 2010. Thus, all patients aged  $\geq 65$  years who were given a tetanus booster during the study period should have received Td; however, 32.1% received Tdap in place of the recommended Td. ACIP changed its recommendations in 2010 to recommend that adults aged  $\geq 65$  years receive Tdap in place of Td if they are health-care professionals or have close contact with an infant (2). The new guidelines also removed the recommended 2-year interval between tetanus vaccinations; no interval is now required between Td and Tdap vaccination. This study is of a single institution and might not be representative of all EDs. An electronic medical record reminder system for health-care providers might increase adherence to the ACIP guidelines.

#### Reported by

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## References

1. CDC. Preventing tetanus, diphtheria, and pertussis among adults: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP) and recommendation of ACIP, supported by the Healthcare Infection Control Practices Advisory Committee (HICPAC), for use of Tdap among health-care personnel. MMWR 2006;55(No. RR-17).
2. CDC. Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) vaccine from the Advisory Committee on Immunization Practices, 2010. MMWR 2011;60:13–5.



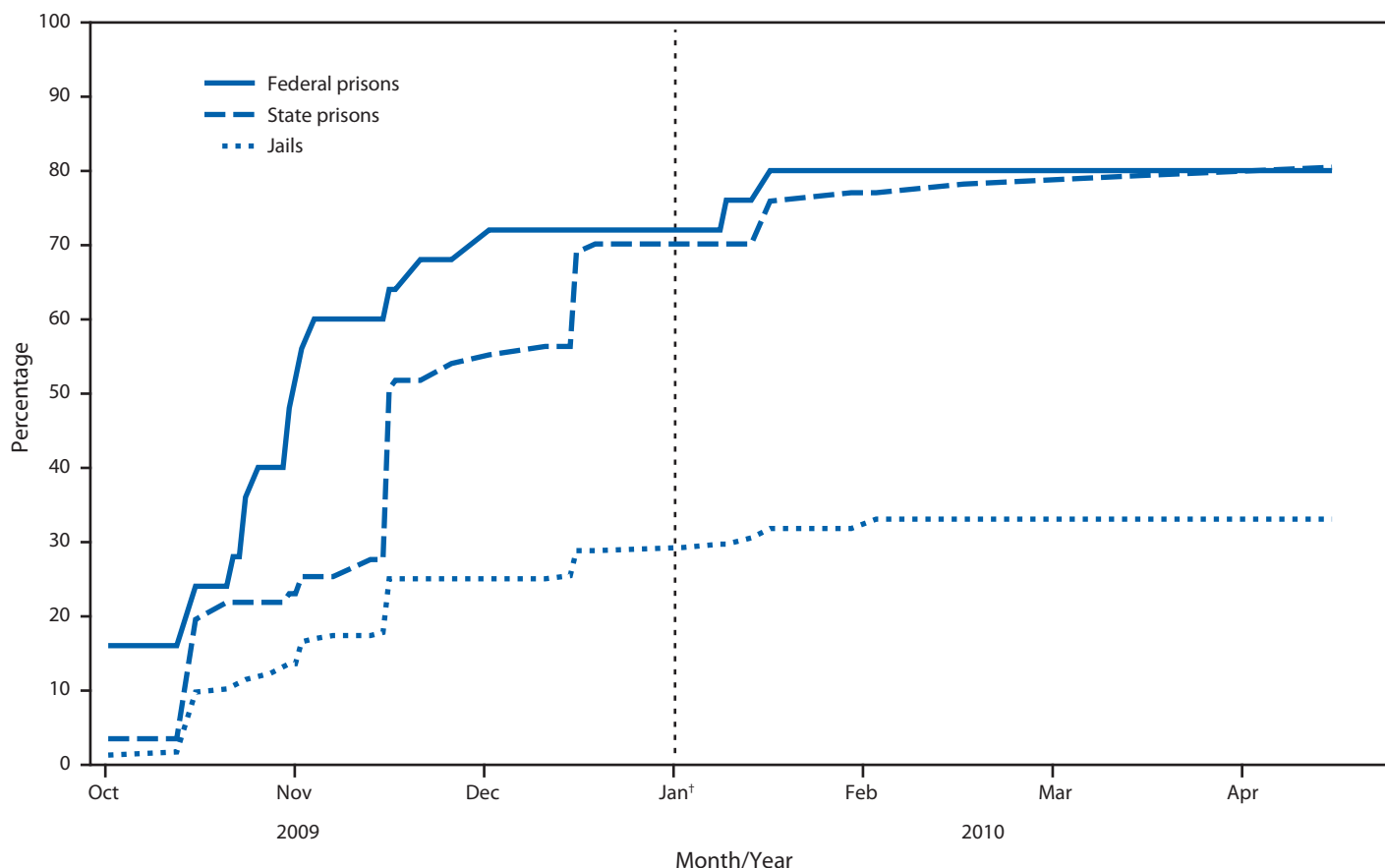
## Errata

### Vol. 60, Nos. 51 & 52

In the report, “Receipt of A(H1N1)pdm09 Vaccine by Prisons and Jails — United States, 2009–10 Influenza Season,” errors occurred in the data presented in Figure 2. The corrected Figure 2 is below. In addition, errors occurred in the

last sentence of the last paragraph on page 1737. That sentence should read as follows: “When facilities that reported receipt of vaccine but did not report a receipt date were excluded, the proportions receiving vaccine by April 2010 were **80.0%** for federal prisons, **80.5%** for state prisons, and **33.1%** for jails.”

**FIGURE 2. Percentage of correctional facilities receiving A(H1N1)pdm09 vaccine, by date and facility type, among facilities that provided receipt dates in their response — United States, 2009–10 influenza season\***



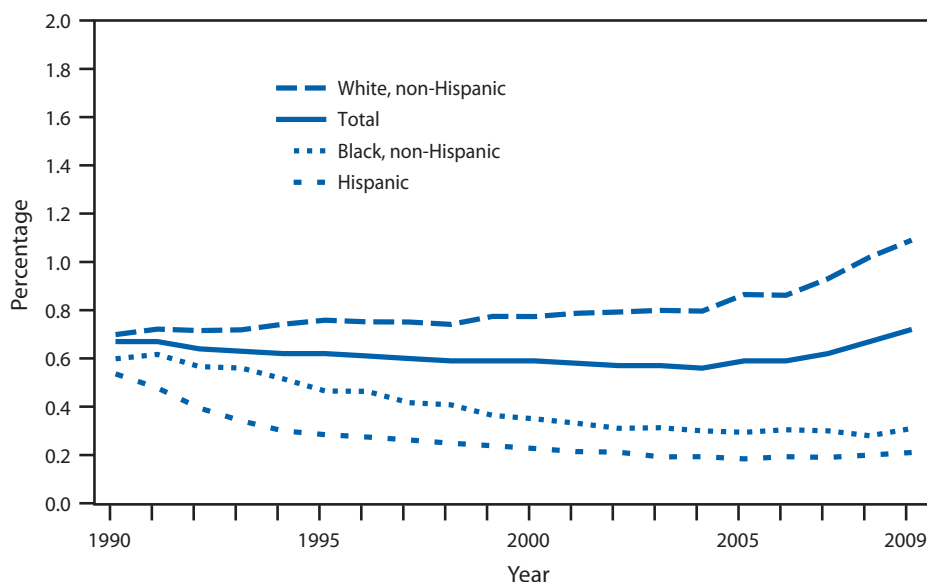
\* In total, 265 facilities indicated that they received the vaccine, 171 indicated that they did not receive the vaccine, and 11 did not indicate either way. Of the 265 that indicated they received the vaccine, 177 provided the date received. Curves reflect those that provided a receipt date or reported that they did not receive vaccine. Those that reported that they received vaccine but did not report a receipt date are not included.

† All A(H1N1)pdm09 vaccine had entered the marketplace by January 2010.

## QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

### Percentage of Births That Were Home Births, by Maternal Race/Ethnicity — United States, 1990–2009\*



\* Race/ethnicity data exclude data from New Hampshire during 1990–1992 and Oklahoma in 1990 because these states did not report Hispanic ethnicity on birth certificates for those years.

In 2009, a total of 29,650 home births occurred in the United States, accounting for <1% of all U.S. births. After a gradual decline during 1990–2004, the percentage of home births increased by 29%, from 0.56% of births in 2004 to 0.72% in 2009. Nearly all of the total increase in home births from 2004 to 2009 was attributed to a 36% increase in home births among non-Hispanic white women. In 2009, approximately one out of every 140 births in the United States overall was a home birth; for non-Hispanic white women, approximately one out of every 90 births was a home birth.

**Source:** MacDorman MF, Mathews TJ, Declercq E. Home births in the United States, 1990–2009. NCHS data brief no. 84. Hyattsville, MD: US Department of Health and Human Services, CDC, National Center for Health Statistics; 2012.

## 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 21, 2012 (3rd week)\*

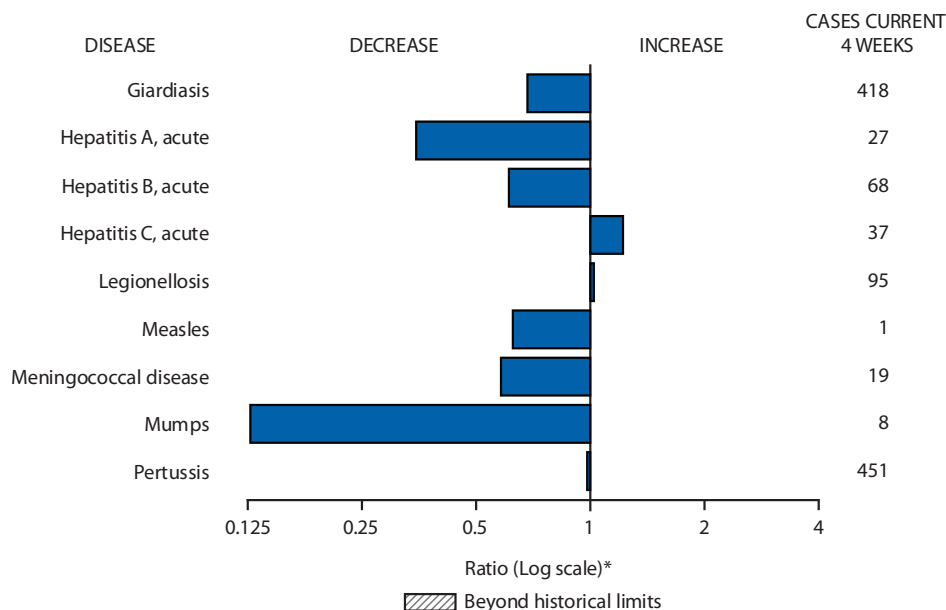
Disease	Current week	Cum 2012	5-year weekly average <sup>†</sup>	Total cases reported for previous years					States reporting cases during current week (No.)
				2011	2010	2009	2008	2007	
Anthrax	—	—	—	1	—	1	—	1	
Arboviral diseases <sup>§, ¶</sup> :									
California serogroup virus disease	—	—	—	130	75	55	62	55	
Eastern equine encephalitis virus disease	—	—	—	4	10	4	4	4	
Powassan virus disease	—	—	0	16	8	6	2	7	
St. Louis encephalitis virus disease	—	—	—	5	10	12	13	9	
Western equine encephalitis virus disease	—	—	—	—	—	—	—	—	
Babesiosis	1	1	0	644	NN	NN	NN	NN	NY (1)
Botulism, total	1	2	2	117	112	118	145	144	
foodborne	—	—	0	10	7	10	17	32	
infant	—	1	1	77	80	83	109	85	
other (wound and unspecified)	1	1	0	30	25	25	19	27	CA (1)
Brucellosis	—	1	1	79	115	115	80	131	
Chancroid	—	1	1	27	24	28	25	23	
Cholera	—	—	1	31	13	10	5	7	
Cyclosporiasis <sup>§</sup>	—	1	3	145	179	141	139	93	
Diphtheria	—	—	—	—	—	—	—	—	
<i>Haemophilus influenzae</i> ,** invasive disease (age <5 yrs):									
serotype b	—	—	0	8	23	35	30	22	
nonsensory b	1	4	5	111	200	236	244	199	OH (1)
unknown serotype	2	11	5	246	223	178	163	180	OH (1), NC (1)
Hansen disease <sup>§</sup>	—	2	2	50	98	103	80	101	
Hantavirus pulmonary syndrome <sup>§</sup>	—	—	0	20	20	20	18	32	
Hemolytic uremic syndrome, postdiarrheal <sup>§</sup>	1	2	2	202	266	242	330	292	NE (1)
Influenza-associated pediatric mortality <sup>§, ††</sup>	1	1	3	118	61	358	90	77	CA (1)
Listeriosis	1	17	13	773	821	851	759	808	FL (1)
Measles <sup>§§</sup>	1	3	1	216	63	71	140	43	DE (1)
Meningococcal disease, invasive <sup>¶¶</sup> :									
A, C, Y, and W-135	—	3	5	184	280	301	330	325	
serogroup B	—	—	3	113	135	174	188	167	
other serogroup	1	1	0	16	12	23	38	35	OH (1)
unknown serogroup	5	13	11	381	406	482	616	550	MO (1), FL (1), CA (3)
Novel influenza A virus infections <sup>***</sup>	—	—	0	8	4	43,774	2	4	
Plague	—	—	0	2	2	8	3	7	
Poliomyelitis, paralytic	—	—	—	—	—	1	—	—	
Polio virus Infection, nonparalytic <sup>§</sup>	—	—	—	—	—	—	—	—	
Psittacosis <sup>§</sup>	—	—	0	2	4	9	8	12	
Q fever, total <sup>§</sup>	—	—	1	119	131	113	120	171	
acute	—	—	1	90	106	93	106	—	
chronic	—	—	0	29	25	20	14	—	
Rabies, human	—	—	—	2	2	4	2	1	
Rubella <sup>†††</sup>	—	—	0	4	5	3	16	12	
Rubella, congenital syndrome	—	—	0	—	—	2	—	—	
SARS-CoV <sup>§</sup>	—	—	—	—	—	—	—	—	
Smallpox <sup>§</sup>	—	—	—	—	—	—	—	—	
Streptococcal toxic-shock syndrome <sup>§</sup>	1	2	2	121	142	161	157	132	KY (1)
Syphilis, congenital (age <1 yr) <sup>§§§</sup>	—	—	8	257	377	423	431	430	
Tetanus	—	—	0	9	26	18	19	28	
Toxic-shock syndrome (staphylococcal) <sup>§</sup>	—	—	1	74	82	74	71	92	
Trichinellosis	—	—	0	10	7	13	39	5	
Tularemia	—	—	0	140	124	93	123	137	
Typhoid fever	4	9	8	326	467	397	449	434	NY (1), OH (2), AZ (1)
Vancomycin-intermediate <i>Staphylococcus aureus</i> <sup>§</sup>	—	—	1	68	91	78	63	37	
Vancomycin-resistant <i>Staphylococcus aureus</i> <sup>§</sup>	—	—	—	—	2	1	—	2	
Vibriosis (noncholera <i>Vibrio</i> species infections) <sup>§</sup>	2	12	6	725	846	789	588	549	FL (2)
Viral hemorrhagic fever <sup>¶¶¶</sup>	—	—	0	—	1	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 21, 2012 (3rd week)\***

—: No reported cases. N: Not reportable. NN: Not Nationally Notifiable. Cum: Cumulative year-to-date counts.  
 \* Case counts for reporting year 2011 and 2012 are provisional and subject to change. For further information on interpretation of these data, see [http://www.cdc.gov/osels/ph\\_surveillance/nndss/phs/files/ProvisionalNationa%20NotifiableDiseasesSurveillanceData20100927.pdf](http://www.cdc.gov/osels/ph_surveillance/nndss/phs/files/ProvisionalNationa%20NotifiableDiseasesSurveillanceData20100927.pdf).  
 † Calculated by summing the incidence counts for the current week, the 2 weeks preceding the current week, the 2 weeks following the current week, for a total of 5 preceding years. Additional information is available at [http://www.cdc.gov/osels/ph\\_surveillance/nndss/phs/files/5yearweeklyaverage.pdf](http://www.cdc.gov/osels/ph_surveillance/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/osels/ph\\_surveillance/nndss/phs/infdis.htm](http://www.cdc.gov/osels/ph_surveillance/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 2, 2011, one influenza-associated pediatric death occurring during the 2011-12 influenza season has been reported.  
 ‡‡ The one measles case reported for the current week was imported.  
 ¶¶ 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, and the eight cases reported during 2011, were identified as swine influenza A (H3N2) virus and are unrelated to the 2009 pandemic influenza A (H1N1) virus. Total case counts are 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 were no cases of viral hemorrhagic fever reported during the current week. See Table II for dengue hemorrhagic fever.

**FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals January 21, 2012, with historical data**



\* 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.

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Morbidity and Mortality Weekly Report

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending January 21, 2012, and January 22, 2011 (3rd week)\*

Reporting area	Dengue Virus Infection									
	Dengue Fever <sup>†</sup>					Dengue Hemorrhagic Fever <sup>§</sup>				
	Current week	Previous 52 weeks		Cum 2012	Cum 2011	Current week	Previous 52 weeks		Cum 2012	Cum 2011
	Med	Max				Med	Max			
<b>United States</b>	—	3	16	—	13	—	0	1	—	—
<b>New England</b>	—	0	1	—	—	—	0	0	—	—
Connecticut	—	0	0	—	—	—	0	0	—	—
Maine	—	0	0	—	—	—	0	0	—	—
Massachusetts	—	0	0	—	—	—	0	0	—	—
New Hampshire	—	0	0	—	—	—	0	0	—	—
Rhode Island	—	0	0	—	—	—	0	0	—	—
Vermont	—	0	1	—	—	—	0	0	—	—
<b>Mid. Atlantic</b>	—	1	6	—	3	—	0	0	—	—
New Jersey	—	0	0	—	—	—	0	0	—	—
New York (Upstate)	—	0	0	—	—	—	0	0	—	—
New York City	—	0	4	—	2	—	0	0	—	—
Pennsylvania	—	0	2	—	1	—	0	0	—	—
<b>E.N. Central</b>	—	0	2	—	3	—	0	1	—	—
Illinois	—	0	1	—	—	—	0	1	—	—
Indiana	—	0	1	—	1	—	0	0	—	—
Michigan	—	0	1	—	—	—	0	0	—	—
Ohio	—	0	1	—	—	—	0	0	—	—
Wisconsin	—	0	2	—	2	—	0	0	—	—
<b>W.N. Central</b>	—	0	2	—	—	—	0	0	—	—
Iowa	—	0	1	—	—	—	0	0	—	—
Kansas	—	0	1	—	—	—	0	0	—	—
Minnesota	—	0	1	—	—	—	0	0	—	—
Missouri	—	0	1	—	—	—	0	0	—	—
Nebraska	—	0	0	—	—	—	0	0	—	—
North Dakota	—	0	1	—	—	—	0	0	—	—
South Dakota	—	0	0	—	—	—	0	0	—	—
<b>S. Atlantic</b>	—	1	8	—	4	—	0	1	—	—
Delaware	—	0	2	—	—	—	0	0	—	—
District of Columbia	—	0	0	—	—	—	0	0	—	—
Florida	—	1	7	—	3	—	0	0	—	—
Georgia	—	0	1	—	—	—	0	0	—	—
Maryland	—	0	2	—	—	—	0	0	—	—
North Carolina	—	0	1	—	—	—	0	0	—	—
South Carolina	—	0	1	—	—	—	0	0	—	—
Virginia	—	0	1	—	1	—	0	1	—	—
West Virginia	—	0	0	—	—	—	0	0	—	—
<b>E.S. Central</b>	—	0	3	—	—	—	0	0	—	—
Alabama	—	0	1	—	—	—	0	0	—	—
Kentucky	—	0	1	—	—	—	0	0	—	—
Mississippi	—	0	0	—	—	—	0	0	—	—
Tennessee	—	0	2	—	—	—	0	0	—	—
<b>W.S. Central</b>	—	0	2	—	—	—	0	0	—	—
Arkansas	—	0	0	—	—	—	0	0	—	—
Louisiana	—	0	1	—	—	—	0	0	—	—
Oklahoma	—	0	0	—	—	—	0	0	—	—
Texas	—	0	1	—	—	—	0	0	—	—
<b>Mountain</b>	—	0	1	—	1	—	0	0	—	—
Arizona	—	0	1	—	1	—	0	0	—	—
Colorado	—	0	0	—	—	—	0	0	—	—
Idaho	—	0	0	—	—	—	0	0	—	—
Montana	—	0	0	—	—	—	0	0	—	—
Nevada	—	0	1	—	—	—	0	0	—	—
New Mexico	—	0	1	—	—	—	0	0	—	—
Utah	—	0	1	—	—	—	0	0	—	—
Wyoming	—	0	0	—	—	—	0	0	—	—
<b>Pacific</b>	—	0	4	—	2	—	0	0	—	—
Alaska	—	0	0	—	—	—	0	0	—	—
California	—	0	2	—	1	—	0	0	—	—
Hawaii	—	0	4	—	—	—	0	0	—	—
Oregon	—	0	0	—	—	—	0	0	—	—
Washington	—	0	1	—	1	—	0	0	—	—
<b>Territories</b>										
American Samoa	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	18	83	—	79	—	0	3	—	1
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 2011 and 2012 are provisional and subject to change. For further information on interpretation of these data, see [http://www.cdc.gov/osels/ph\\_surveillance/nndss/phs/files/ProvisionalNationa%20NotifiableDiseasesSurveillanceData20100927.pdf](http://www.cdc.gov/osels/ph_surveillance/nndss/phs/files/ProvisionalNationa%20NotifiableDiseasesSurveillanceData20100927.pdf). Data for TB are displayed in Table IV, which appears quarterly.

<sup>†</sup> Dengue Fever includes cases that meet criteria for Dengue Fever with hemorrhage, other clinical and unknown case classifications.

<sup>§</sup> DHF includes cases that meet criteria for dengue shock syndrome (DSS), a more severe form of DHF.



## Morbidity and Mortality Weekly Report

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending January 21, 2012, and January 22, 2011 (3rd week)\*

Reporting area	Giardiasis					Gonorrhea					<i>Haemophilus influenzae</i> , invasive† All ages, all serotypes				
	Current week	Previous 52 weeks		Cum 2012	Cum 2011	Current week	Previous 52 weeks		Cum 2012	Cum 2011	Current week	Previous 52 weeks		Cum 2012	Cum 2011
		Med	Max				Med	Max				Med	Max		
<b>United States</b>	111	282	441	355	700	2,693	5,973	6,719	10,749	17,756	31	64	87	141	235
<b>New England</b>	1	27	64	6	63	45	108	178	91	198	—	4	9	4	18
Connecticut	—	4	10	—	13	—	45	101	—	49	—	1	4	1	5
Maine	—	3	10	3	4	—	5	18	—	7	—	0	2	2	3
Massachusetts	—	12	29	—	36	41	47	80	61	133	—	2	4	—	8
New Hampshire	1	2	8	1	5	—	2	7	—	5	—	0	2	1	1
Rhode Island	—	0	10	—	1	4	7	35	30	2	—	0	1	—	—
Vermont	—	3	19	2	4	—	0	6	—	2	—	0	2	—	1
<b>Mid. Atlantic</b>	16	54	91	52	120	405	744	916	1,690	2,014	11	15	25	49	43
New Jersey	—	0	0	—	—	23	151	232	296	366	—	2	6	—	8
New York (Upstate)	12	22	51	22	25	94	115	288	220	207	5	3	12	8	3
New York City	3	16	29	14	50	39	241	315	426	719	2	3	10	12	5
Pennsylvania	1	16	30	16	45	249	258	416	748	722	4	5	13	29	27
<b>E.N. Central</b>	21	47	84	71	147	244	1,055	1,263	1,490	3,996	5	11	22	20	44
Illinois	—	10	19	1	29	11	288	383	182	965	—	3	11	1	10
Indiana	—	6	13	2	15	50	133	169	203	704	—	2	6	1	5
Michigan	3	10	21	16	30	124	237	371	544	1,020	—	1	4	2	5
Ohio	18	15	31	41	44	48	310	398	387	1,019	5	4	7	15	15
Wisconsin	—	8	19	11	29	11	88	118	174	288	—	1	4	1	9
<b>W.N. Central</b>	11	20	52	44	56	14	311	378	175	862	1	2	10	3	6
Iowa	3	4	15	15	13	1	37	79	104	120	—	0	1	—	—
Kansas	—	2	9	—	5	—	42	65	13	101	—	0	2	—	—
Minnesota	—	0	0	—	—	—	44	61	—	119	—	0	0	—	—
Missouri	6	8	23	18	20	—	150	204	—	416	1	1	5	1	4
Nebraska	2	3	11	10	11	13	27	52	51	57	—	0	2	2	2
North Dakota	—	0	12	—	—	—	4	9	—	14	—	0	6	—	—
South Dakota	—	1	8	1	7	—	11	20	7	35	—	0	1	—	—
<b>S. Atlantic</b>	26	50	103	78	122	965	1,490	1,947	3,548	4,186	6	14	31	36	53
Delaware	—	0	3	—	—	15	15	35	38	48	—	0	2	—	—
District of Columbia	—	1	5	—	1	8	38	105	131	126	—	0	1	—	—
Florida	19	23	69	46	82	220	376	472	905	1,183	—	5	12	11	20
Georgia	—	10	51	10	12	221	312	461	683	765	1	2	6	5	13
Maryland	7	6	13	13	8	53	117	176	84	283	2	2	5	8	3
North Carolina	N	0	0	N	N	274	334	548	1,208	975	3	1	7	4	3
South Carolina	—	2	8	5	6	—	162	420	—	360	—	1	5	4	3
Virginia	—	5	12	4	13	160	121	352	471	387	—	2	8	2	11
West Virginia	—	0	8	—	—	14	14	29	28	59	—	0	5	2	—
<b>E.S. Central</b>	1	3	9	5	5	78	515	789	410	1,204	4	3	12	10	19
Alabama	1	3	9	5	5	—	165	408	—	479	—	1	3	—	7
Kentucky	N	0	0	N	N	61	76	151	163	39	1	1	4	4	3
Mississippi	N	0	0	N	N	—	103	191	—	249	—	0	3	—	2
Tennessee	N	0	0	N	N	17	145	222	247	437	3	2	8	6	7
<b>W.S. Central</b>	2	5	15	2	13	625	878	1,176	1,779	2,628	3	2	10	6	9
Arkansas	2	2	8	2	3	—	85	138	—	254	—	0	3	1	1
Louisiana	—	2	10	—	10	184	120	255	231	290	—	0	4	—	4
Oklahoma	—	0	0	—	—	40	33	196	60	212	3	1	9	5	4
Texas	N	0	0	N	N	401	590	834	1,488	1,872	—	0	1	—	—
<b>Mountain</b>	2	25	45	20	66	131	202	322	414	617	—	5	10	7	26
Arizona	—	2	6	1	6	84	84	130	299	202	—	1	6	3	10
Colorado	—	11	25	10	22	43	39	89	95	158	—	1	5	—	7
Idaho	1	3	9	3	11	—	3	13	—	9	—	0	2	—	2
Montana	1	2	5	2	2	—	1	4	2	6	—	0	1	—	1
Nevada	—	1	7	3	4	3	38	103	12	125	—	0	2	2	1
New Mexico	—	1	6	—	7	—	34	73	—	102	—	1	3	2	5
Utah	—	3	9	1	13	1	5	10	6	12	—	0	3	—	—
Wyoming	—	0	5	—	1	—	0	3	—	3	—	0	1	—	—
<b>Pacific</b>	31	47	124	77	108	186	631	755	1,152	2,051	1	3	9	6	17
Alaska	—	2	7	4	4	8	20	31	40	55	—	0	3	—	2
California	29	32	51	62	75	146	516	608	954	1,721	1	1	5	2	3
Hawaii	—	0	3	—	—	—	12	24	—	39	—	0	3	1	3
Oregon	2	7	20	10	26	12	27	60	52	86	—	1	6	3	9
Washington	—	6	95	1	3	20	50	79	106	150	—	0	1	—	—
<b>Territories</b>															
American Samoa	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	5	—	—	—	0	0	—	—
Puerto Rico	—	0	4	—	3	—	6	14	2	15	—	0	0	—	—
U.S. Virgin Islands	—	0	0	—	—	—	2	10	—	9	—	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.

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## Morbidity and Mortality Weekly Report

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending January 21, 2012, and January 22, 2011 (3rd week)\*

Reporting area	Hepatitis (viral, acute), by type														
	A				B				C						
	Current week	Previous 52 weeks		Cum 2012	Cum 2011	Current week	Previous 52 weeks		Cum 2012	Cum 2011	Current week	Previous 52 weeks		Cum 2012	Cum 2011
	Med	Max				Med	Max				Med	Max			
<b>United States</b>	4	21	39	22	60	30	47	95	74	125	8	19	36	32	49
<b>New England</b>	—	1	5	—	4	—	1	8	—	6	—	1	5	—	1
Connecticut	—	0	3	—	2	—	0	4	—	—	—	0	5	—	1
Maine	—	0	2	—	—	—	0	2	—	—	—	0	3	—	—
Massachusetts	—	0	3	—	1	—	1	6	—	5	—	0	2	—	—
New Hampshire	—	0	0	—	—	—	0	1	—	1	N	0	0	N	N
Rhode Island	—	0	1	—	—	U	0	0	U	U	U	0	0	U	U
Vermont	—	0	2	—	1	—	0	0	—	—	—	0	1	—	—
<b>Mid. Atlantic</b>	—	3	7	1	11	1	5	8	3	12	1	1	5	2	4
New Jersey	—	0	0	—	—	—	0	1	—	—	—	0	1	—	—
New York (Upstate)	—	1	4	—	1	—	1	4	—	3	—	1	4	—	4
New York City	—	1	5	—	7	—	1	5	1	3	—	0	1	—	—
Pennsylvania	—	1	4	1	3	1	2	4	2	6	1	1	3	2	—
<b>E.N. Central</b>	—	4	8	3	12	3	6	37	8	20	—	2	8	1	14
Illinois	—	1	4	—	3	—	1	6	—	6	—	0	2	—	1
Indiana	—	0	3	—	1	—	1	4	2	1	—	0	5	—	9
Michigan	—	1	6	3	4	—	1	6	1	8	—	1	4	1	3
Ohio	—	1	3	—	3	3	1	30	5	3	—	0	1	—	—
Wisconsin	—	0	1	—	1	—	0	3	—	2	—	0	1	—	1
<b>W.N. Central</b>	—	1	7	1	1	—	2	9	2	11	—	0	4	—	—
Iowa	—	0	1	—	1	—	0	1	—	—	—	0	0	—	—
Kansas	—	0	1	—	—	—	0	2	—	2	—	0	1	—	—
Minnesota	—	0	7	—	—	—	0	7	—	—	—	0	2	—	—
Missouri	—	0	1	1	—	—	1	5	1	5	—	0	0	—	—
Nebraska	—	0	1	—	—	—	0	2	1	3	—	0	1	—	—
North Dakota	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
South Dakota	—	0	2	—	—	—	0	0	—	1	—	0	0	—	—
<b>S. Atlantic</b>	3	4	11	3	12	13	12	57	25	30	5	5	13	12	12
Delaware	—	0	1	—	1	—	0	2	—	—	U	0	0	U	U
District of Columbia	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
Florida	2	1	8	2	3	4	4	7	9	12	1	1	3	2	5
Georgia	—	1	5	—	3	3	2	7	4	4	—	1	3	—	3
Maryland	—	0	4	—	2	2	1	4	4	2	—	0	3	1	2
North Carolina	—	0	3	—	—	2	2	9	3	5	—	1	7	3	2
South Carolina	—	0	2	—	1	—	1	3	—	3	—	0	1	—	—
Virginia	—	0	3	—	2	2	1	4	5	4	—	0	3	—	—
West Virginia	1	0	2	1	—	—	0	43	—	—	4	0	7	6	—
<b>E.S. Central</b>	—	1	6	1	1	8	10	15	24	18	1	5	10	12	5
Alabama	—	0	2	—	—	—	2	6	3	3	—	0	3	1	—
Kentucky	—	0	2	—	1	3	3	7	8	7	1	2	8	7	2
Mississippi	—	0	1	—	—	—	1	4	2	—	U	0	0	U	U
Tennessee	—	0	5	1	—	5	4	8	11	8	—	1	5	4	3
<b>W.S. Central</b>	1	3	7	4	3	2	6	15	5	7	—	1	5	2	7
Arkansas	—	0	2	—	—	—	1	4	—	—	—	0	0	—	—
Louisiana	—	0	2	—	1	—	0	4	—	3	—	0	1	—	4
Oklahoma	—	0	2	—	—	—	1	9	—	1	—	1	4	—	1
Texas	1	2	7	4	2	2	3	8	5	3	—	0	3	2	2
<b>Mountain</b>	—	1	5	4	7	3	1	4	5	10	—	1	5	2	3
Arizona	—	0	2	1	2	—	0	3	1	1	U	0	0	U	U
Colorado	—	0	2	2	3	—	0	2	—	2	—	0	2	—	1
Idaho	—	0	1	—	—	—	0	1	—	1	—	0	2	—	2
Montana	—	0	1	—	1	—	0	0	—	—	—	0	1	—	—
Nevada	—	0	3	1	—	3	0	2	4	5	—	0	2	2	—
New Mexico	—	0	1	—	1	—	0	2	—	—	—	0	2	—	—
Utah	—	0	1	—	—	—	0	1	—	1	—	0	2	—	—
Wyoming	—	0	1	—	—	—	0	0	—	—	—	0	1	—	—
<b>Pacific</b>	—	3	11	5	9	—	3	8	2	11	1	2	8	1	3
Alaska	—	0	1	—	—	—	0	1	—	—	U	0	0	U	U
California	—	3	7	5	8	—	2	7	—	10	1	1	4	1	1
Hawaii	—	0	2	—	—	—	0	1	1	—	U	0	0	U	U
Oregon	—	0	2	—	1	—	0	4	1	1	—	0	2	—	1
Washington	—	0	4	—	—	—	0	3	—	—	—	0	4	—	1
<b>Territories</b>															
American Samoa	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	5	—	—	—	2	8	—	—	—	0	3	—	1
Puerto Rico	—	0	1	—	—	—	0	2	—	—	N	0	0	N	N
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 21, 2012, and January 22, 2011 (3rd week)\*

Reporting area	Varicella (chickenpox)					West Nile virus disease <sup>†</sup>									
	Current week	Previous 52 weeks		Cum 2012	Cum 2011	Neuroinvasive					Nonneuroinvasive <sup>§</sup>				
		Med	Max			Current week	Previous 52 weeks	Cum 2012	Cum 2011	Current week	Previous 52 weeks	Cum 2012	Cum 2011		
<b>United States</b>	108	257	342	416	784	—	0	60	—	—	—	0	31	—	—
<b>New England</b>	3	21	50	11	84	—	0	3	—	—	—	0	1	—	—
Connecticut	—	5	16	—	15	—	0	2	—	—	—	0	1	—	—
Maine	2	4	11	2	18	—	0	0	—	—	—	0	0	—	—
Massachusetts	—	9	18	—	28	—	0	2	—	—	—	0	1	—	—
New Hampshire	—	1	7	—	8	—	0	0	—	—	—	0	0	—	—
Rhode Island	—	0	6	—	1	—	0	1	—	—	—	0	0	—	—
Vermont	1	1	9	9	14	—	0	1	—	—	—	0	0	—	—
<b>Mid. Atlantic</b>	19	19	51	108	56	—	0	11	—	—	—	0	6	—	—
New Jersey	10	0	41	73	—	—	0	1	—	—	—	0	2	—	—
New York (Upstate)	N	0	0	N	N	—	0	5	—	—	—	0	4	—	—
New York City	—	0	0	—	—	—	0	4	—	—	—	0	1	—	—
Pennsylvania	9	19	39	35	56	—	0	2	—	—	—	0	1	—	—
<b>E.N. Central</b>	23	65	114	141	244	—	0	13	—	—	—	0	6	—	—
Illinois	5	18	38	35	47	—	0	6	—	—	—	0	5	—	—
Indiana	—	5	20	14	11	—	0	2	—	—	—	0	1	—	—
Michigan	6	18	44	28	78	—	0	7	—	—	—	0	1	—	—
Ohio	12	21	47	64	108	—	0	3	—	—	—	0	3	—	—
Wisconsin	—	0	1	—	—	—	0	1	—	—	—	0	1	—	—
<b>W.N. Central</b>	—	11	32	2	61	—	0	9	—	—	—	0	7	—	—
Iowa	N	0	0	N	N	—	0	2	—	—	—	0	2	—	—
Kansas	—	7	21	—	29	—	0	1	—	—	—	0	0	—	—
Minnesota	—	0	1	—	—	—	0	1	—	—	—	0	1	—	—
Missouri	—	3	14	1	30	—	0	2	—	—	—	0	2	—	—
Nebraska	—	0	2	—	—	—	0	4	—	—	—	0	3	—	—
North Dakota	—	0	7	—	1	—	0	1	—	—	—	0	1	—	—
South Dakota	—	1	6	1	1	—	0	0	—	—	—	0	1	—	—
<b>S. Atlantic</b>	19	36	65	57	77	—	0	10	—	—	—	0	5	—	—
Delaware	—	0	2	—	1	—	0	1	—	—	—	0	0	—	—
District of Columbia	—	0	2	—	2	—	0	3	—	—	—	0	3	—	—
Florida	17	17	38	45	42	—	0	5	—	—	—	0	2	—	—
Georgia	N	0	0	N	N	—	0	2	—	—	—	0	1	—	—
Maryland	N	0	0	N	N	—	0	5	—	—	—	0	3	—	—
North Carolina	N	0	0	N	N	—	0	1	—	—	—	0	0	—	—
South Carolina	—	0	9	—	—	—	0	0	—	—	—	0	0	—	—
Virginia	2	9	26	12	16	—	0	2	—	—	—	0	0	—	—
West Virginia	—	6	32	—	16	—	0	1	—	—	—	0	0	—	—
<b>E.S. Central</b>	1	5	15	11	20	—	0	11	—	—	—	0	5	—	—
Alabama	1	5	14	9	17	—	0	2	—	—	—	0	0	—	—
Kentucky	N	0	0	N	N	—	0	2	—	—	—	0	1	—	—
Mississippi	—	0	2	2	3	—	0	5	—	—	—	0	4	—	—
Tennessee	N	0	0	N	N	—	0	3	—	—	—	0	1	—	—
<b>W.S. Central</b>	30	53	136	53	70	—	0	4	—	—	—	0	3	—	—
Arkansas	—	5	26	1	6	—	0	1	—	—	—	0	0	—	—
Louisiana	—	2	6	—	4	—	0	1	—	—	—	0	2	—	—
Oklahoma	N	0	0	N	N	—	0	1	—	—	—	0	0	—	—
Texas	30	46	131	52	60	—	0	3	—	—	—	0	3	—	—
<b>Mountain</b>	13	23	68	33	153	—	0	11	—	—	—	0	5	—	—
Arizona	1	4	50	2	49	—	0	7	—	—	—	0	4	—	—
Colorado	9	7	32	22	40	—	0	2	—	—	—	0	2	—	—
Idaho	N	0	0	N	N	—	0	1	—	—	—	0	1	—	—
Montana	—	2	15	—	41	—	0	1	—	—	—	0	0	—	—
Nevada	N	0	0	N	N	—	0	4	—	—	—	0	2	—	—
New Mexico	3	1	4	4	4	—	0	1	—	—	—	0	0	—	—
Utah	—	3	26	4	19	—	0	1	—	—	—	0	1	—	—
Wyoming	—	0	1	1	—	—	0	1	—	—	—	0	1	—	—
<b>Pacific</b>	—	2	9	—	19	—	0	18	—	—	—	0	7	—	—
Alaska	—	1	4	—	6	—	0	0	—	—	—	0	0	—	—
California	—	0	4	—	6	—	0	18	—	—	—	0	7	—	—
Hawaii	—	1	4	—	7	—	0	0	—	—	—	0	0	—	—
Oregon	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
Washington	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
<b>Territories</b>															
American Samoa	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	2	4	—	1	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	3	10	—	12	—	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 2011 and 2012 are provisional and subject to change. For further information on interpretation of these data, see [http://www.cdc.gov/osels/ph\\_surveillance/nndss/phs/files/ProvisionalNationalNotifiableDiseasesSurveillanceData20100927.pdf](http://www.cdc.gov/osels/ph_surveillance/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>.







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U.S. Government Printing Office: 2012-523-043/21101 Region IV ISSN: 0149-2195