

## Launching a National Surveillance System After an Earthquake — Haiti, 2010

On January 12, 2010, Haiti experienced a magnitude-7.0 earthquake; Haitian government officials estimated that 230,000 persons died and 300,000 were injured. At the time, Haiti had no system capable of providing timely surveillance on a wide range of health conditions. Within 2 weeks, Haiti's Ministry of Public Health and Population (MSPP), the Pan-American Health Organization (PAHO), CDC, and other national and international agencies launched the National Sentinel Site Surveillance (NSSS) System. The objectives were to monitor disease trends, detect outbreaks, and characterize the affected population to target relief efforts. Fifty-one hospital and clinic surveillance sites affiliated with the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) were selected to report daily counts by e-mail or telephone for 25 specified reportable conditions. During January 25–April 24, 2010, a total of 42,361 persons had a reportable condition; of these, 54.5% were female, and 32.6% were aged <5 years. Nationally, the three most frequently reported specified conditions were acute respiratory infection (ARI) (16.3%), suspected malaria (10.3%), and fever of unknown cause (10.0%). Injuries accounted for 12.0% of reported conditions. No epidemics or disease clusters were detected. The number of reports decreased over time. NSSS is ongoing and currently transitioning into becoming a long-term national surveillance system for Haiti. NSSS data could assist decision makers in allocation of resources and identifying effective public health interventions. However, data reporting and quality could be improved by additional surveillance education for health-care providers, laboratory confirmation of cases of disease, and Internet-based weekly reporting.

Before the January 12 earthquake, Haiti's national surveillance system focused on the following six immediately notifiable diseases: acute hemorrhagic fever syndrome, suspected meningococcal meningitis, suspected diphtheria, suspected acute flaccid paralysis, suspected measles, and bite by animal suspected of having rabies. Expansion of Haiti's national surveillance capabilities to monitor diseases and conditions of concern after the earthquake was a public health priority. Haiti is divided administratively into 10 departments; surveillance sites were spread across all departments, with

additional sites sampled in Port-au-Prince (Figure 1). The 51 NSSS sites were selected from 99 PEPFAR sites that provided general care, based on their proximity to the earthquake epicenter, size, geographic representativeness, and capacity to submit data electronically after the earthquake. Selecting PEPFAR sites for NSSS enabled rapid establishment of post-earthquake surveillance despite the destruction of most governmental buildings, schools, homes, hospitals, and transportation and communication infrastructure in the West Department, which includes the capital Port-au-Prince, and much of the South-East Department. NSSS provided MSPP and its public health partners with daily information, including patient demographics and condition trends.

A standardized reporting form used by MSPP and PAHO during their summer 2008 response to Hurricane Gustav in the Caribbean was amended for NSSS to include a total of 25 conditions (including symptoms, suspected infectious diseases, acute injuries, and chronic conditions).<sup>\*</sup> PEPFAR surveillance staff members at each site were instructed to report daily counts

<sup>\*</sup>The 25 conditions were as follows: (infectious) fever of unknown cause, suspected malaria, suspected dengue fever, acute hemorrhagic fever syndrome, acute watery diarrhea, acute bloody diarrhea, suspected typhoid fever, acute respiratory infection, suspected measles (fever and rash), tuberculosis, and tetanus; (noninfectious) acute malnutrition, skin disorder, renal failure, pregnancy complications or third trimester without previous care, mental health or psychological health, and chronic diseases not accounted for in other conditions; (injury) trauma, fracture, cerebral concussion from head injury, laceration from weapon or dagger injury, burns, wounds (infected), crush injury syndrome, and amputation.

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of the 25 conditions (as well as other, not specified conditions) with only one condition per new patient, and the total number of new patients examined each day for any condition. Patients were considered new if they had not been examined previously at the site for that condition. No explicit instructions were provided regarding which condition to report if a patient presented with more than one condition. Each patient was classified on the surveillance form by sex, age group (<5 years, ≥5 years, or unknown age), and morbidity and mortality status. Because the MSPP office was destroyed during the earthquake, for temporary data management the surveillance forms were submitted electronically (or if necessary, by telephone) to the CDC-Haiti office and then to the CDC Emergency Operations Center in Atlanta. A CDC epidemiology team entered data from the forms into a database and conducted data analyses. Cumulative daily surveillance reports were e-mailed from CDC-Atlanta to MSPP for immediate review, approval, and dissemination to public health partners working in Haiti. Frequencies of reported conditions were categorized as either from the two departments nearest the earthquake epicenter (West and South-East) or from the eight departments further away from the epicenter (North-West, North, North-East,

Artibonite, Center, Grand Anse, Nippes, and South) (Figure 1).

During January 25–April 24, 2010, a total of 48 of the 51 selected sites reported at least once to NSSS, with an average of 18 sites reporting each weekday (most sites did not report on weekends). The number of sites reporting decreased over time (both those nearest and further away from the epicenter), with an average of 23 sites reporting each weekday during January 25–March 14, 2010, and an average of 11 sites reporting during March 15–April 24, 2010.

Of the 42,361 new patients with reportable conditions, 23,081 (54.5%) were female, and 13,798 (32.6%) were aged <5 years. Nationally, the three most frequently reported specified conditions were ARI, 6,910 (16.3%); suspected malaria, 4,366 (10.3%); and fever of unknown cause, 4,240 (10.0%). Injuries accounted for, 5,065 (12.0%) of reported conditions (Table). Among patients aged <5 years, the three most frequently reported specified conditions nationally were ARI, 3,895 (28.2%); acute watery diarrhea, 2,560 (18.6%); and fever of unknown cause, 1,565 (11.3%).

The two departments nearest the epicenter accounted for 53.6% (22,717) of the reported conditions. The three most frequently reported specified conditions in the departments nearest the epicenter

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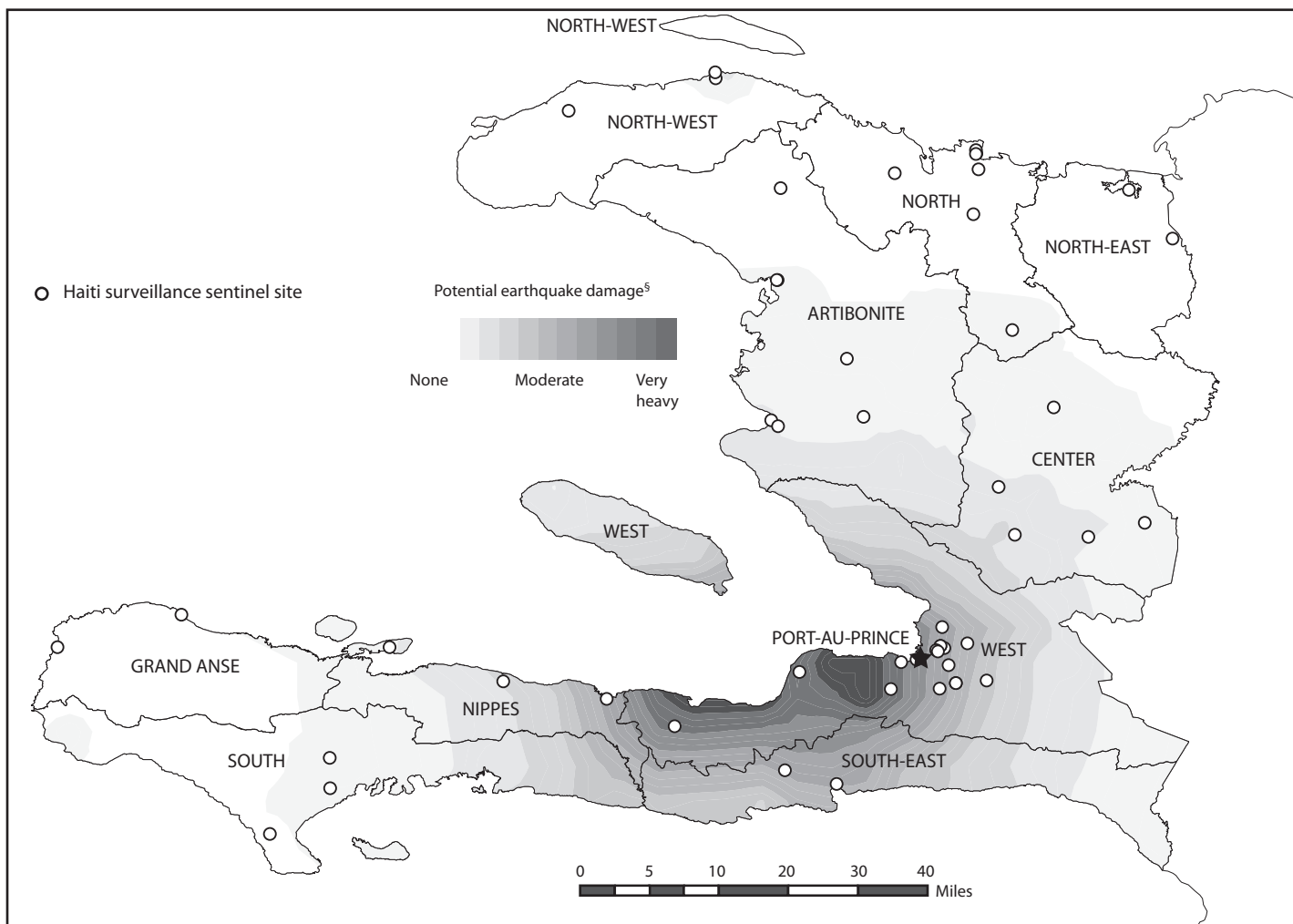
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FIGURE 1. National Sentinel Site Surveillance System sites (N = 51)\* and potential earthquake damage, by department — Haiti, 2010†



\* All were affiliated with the U.S. President's Emergency Plan for AIDS Relief. Some site indicators overlap because of close geographic location.

† As of June 11, 2010.

§ Based on data from the U.S. Geological Survey, available at <http://pubs.usgs.gov/tm/2005/12A01>.

were ARI, 4,027 (17.7%); suspected malaria, 2,437 (10.7%); and fever of unknown cause, 2,238 (9.9%). Injuries accounted for 2,084 (9.2%) of the reported conditions. In the eight departments further from the epicenter, among the 19,644 conditions reported, the three most frequently reported were ARI, 2,858 (14.5%); watery diarrhea, 2,059 (10.5%); and fever of unknown cause, 2002 (10.2%). Injuries accounted for 2,977 (15.2%) of the reported conditions (Figure 2).

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#### Editorial Note

NSSS was instituted to monitor disease trends, detect outbreaks, and characterize the affected population to target post-earthquake relief efforts. NSSS surveillance data and laboratory reports were used to respond to rumors and concerns of disease clusters and outbreaks by providing evidence that no unexpected or abnormal increases in disease had been detected. Although not unexpected in postdisaster settings, underreporting, unclear case definitions, and limited laboratory capacity compromised the data quality and completeness

TABLE. Number and percentage of reported post-earthquake conditions,\* by age group and type of condition — National Sentinel Site Surveillance System, Haiti, January 25–April 24, 2010

| Condition  | Age group (yrs)      |                      |                     | Total<br>No. (%)     |
|--|----------------------|----------------------|---------------------|----------------------|
|  | <5<br>No. (%)        | ≥5<br>No. (%)        | Unknown<br>No. (%)  |                      |
| <b>Overall</b>   | <b>13,798 (32.6)</b> | <b>24,923 (58.8)</b> | <b>3,640 (8.6)</b>  | <b>42,361 (100)</b>  |
| <b>Infectious (total)</b>                                      | <b>9,590 (69.5)</b>  | <b>11,177 (44.8)</b> | <b>1,647 (45.2)</b> | <b>22,414 (52.9)</b> |
| Fever of unknown cause   | 1,565 (11.3)         | 2,279 (9.1)          | 396 (10.9)          | 4,240 (10.0)         |
| Suspected malaria  | 776 (5.6)            | 3,079 (12.4)         | 521 (14.3)          | 4,366 (10.3)         |
| Suspected dengue fever   | 13 (0.1)             | 20 (0.1)             | 7 (0.2)             | 40 (0.1)             |
| Acute hemorrhagic fever syndrome                               | 73 (0.5)             | 103 (0.4)            | 5 (0.1)             | 181 (0.4)            |
| Acute watery diarrhea  | 2,560 (18.6)         | 1,240 (5.0)          | 135 (3.7)           | 3,935 (9.3)          |
| Acute bloody diarrhea  | 304 (2.2)            | 241 (1.0)            | 55 (1.5)            | 600 (1.4)            |
| Suspected typhoid fever  | 268 (1.9)            | 1,183 (4.8)          | 150 (4.1)           | 1,601 (3.8)          |
| Acute respiratory infection                                    | 3,895 (28.2)         | 2,708 (10.9)         | 307 (8.4)           | 6,910 (16.3)         |
| Suspected measles (fever and rash)                             | 10 (0.1)             | 10 (<0.1)            | 0 (—)               | 20 (0.1)             |
| Tuberculosis   | 121 (0.9)            | 307 (1.2)            | 71 (2.0)            | 499 (1.2)            |
| Tetanus  | 15 (0.1)             | 7 (<0.1)             | 0 (—)               | 22 (0.1)             |
| <b>Noninfectious (total)</b>                                   | <b>1,998 (14.5)</b>  | <b>2,857 (11.5)</b>  | <b>809 (22.2)</b>   | <b>5,664 (13.4)</b>  |
| Acute malnutrition   | 935 (6.8)            | 91 (0.4)             | 2 (0.1)             | 1,028 (2.4)          |
| Skin disorder  | 1,005 (7.3)          | 1,566 (6.3)          | 91 (2.5)            | 2,662 (6.3)          |
| Renal failure  | 2 (<0.1)             | 7 (<0.1)             | 2 (0.1)             | 11 (<0.1)            |
| Pregnancy complications or 3rd trimester without previous care | 0 (—)                | 453 (1.8)            | 54 (1.5)            | 507 (1.2)            |
| Mental health or psychological health                          | 46 (0.3)             | 263 (1.1)            | 107 (2.9)           | 416 (1.0)            |
| Chronic diseases not accounted for in other conditions         | 10 (0.1)             | 477 (1.9)            | 553 (15.2)          | 1,040 (2.5)          |
| <b>Injuries (total)</b>  | <b>448 (3.2)</b>     | <b>4,266 (17.1)</b>  | <b>351 (9.6)</b>    | <b>5,065 (12.0)</b>  |
| Trauma   | 141 (1.0)            | 947 (3.8)            | 60 (1.7)            | 1,148 (2.7)          |
| Fracture   | 61 (0.4)             | 321 (1.3)            | 85 (2.3)            | 467 (1.1)            |
| Cerebral concussion from head injury                           | 2 (<0.1)             | 23 (0.1)             | 2 (0.1)             | 27 (0.1)             |
| Laceration from weapon or dagger injury                        | 4 (<0.1)             | 96 (0.4)             | 11 (0.3)            | 111 (0.3)            |
| Burns  | 37 (0.3)             | 99 (0.4)             | 13 (0.4)            | 149 (0.4)            |
| Wounds (infected)  | 195 (1.4)            | 2,691 (10.8)         | 175 (4.8)           | 3,061 (7.2)          |
| Crush injury syndrome  | 5 (<0.1)             | 78 (0.3)             | 5 (0.1)             | 88 (0.2)             |
| Amputation   | 3 (<0.1)             | 11 (<0.1)            | 0 (—)               | 14 (<0.1)            |
| <b>Other, not specified (total)</b>                            | <b>1,762 (12.8)</b>  | <b>6,623 (26.6)</b>  | <b>833 (22.9)</b>   | <b>9,218 (21.8)</b>  |

\* Including symptoms, suspected diseases, acute injuries, and chronic conditions.

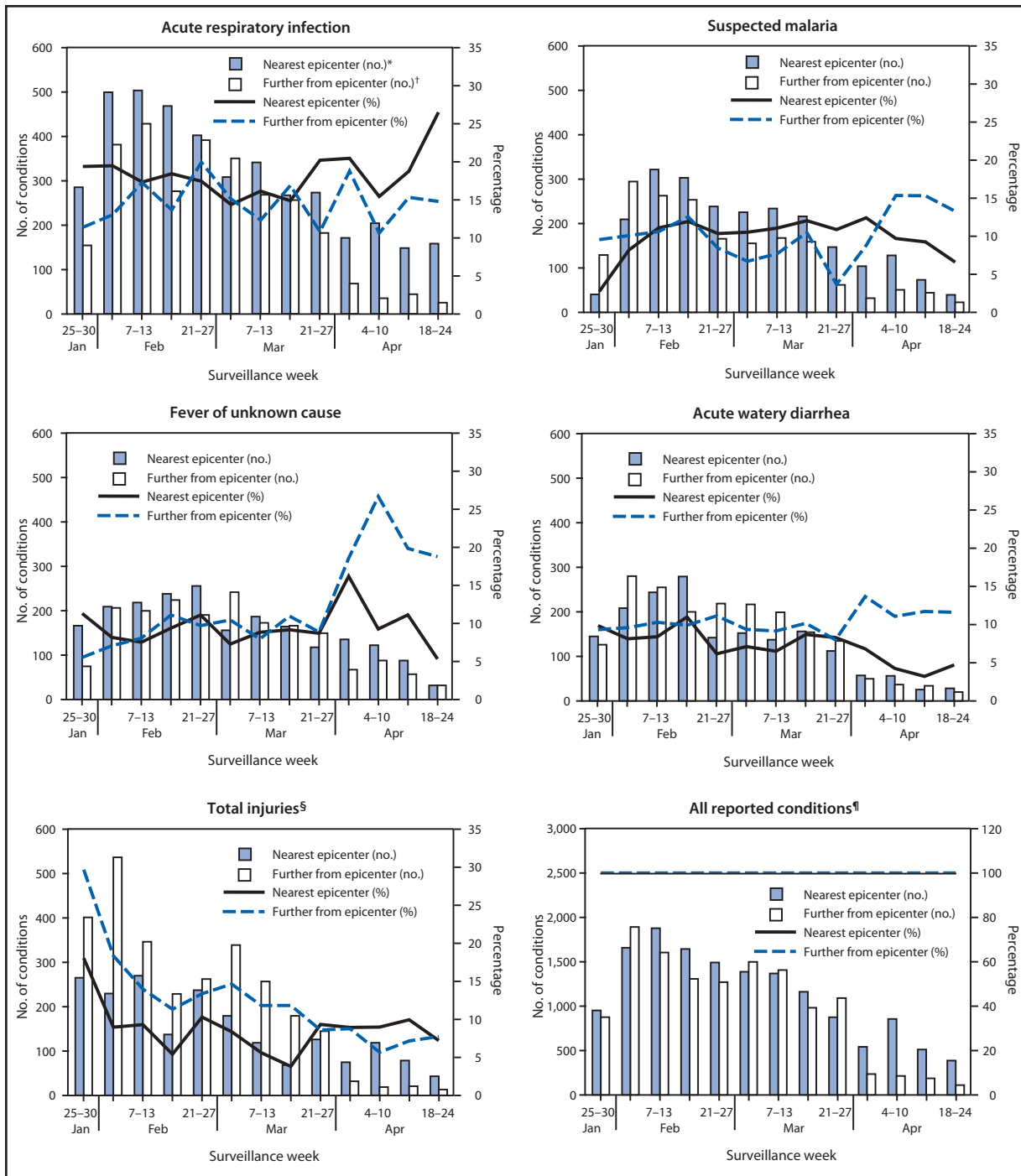
expected of an effective surveillance system (1). Control of NSSS was transferred from CDC-Haiti and CDC in Atlanta to MSPP on April 25; however, collaboration continues between these agencies and PAHO. As Haiti moves from the postearthquake emergency response phase into the recovery phase, efforts to increase reporting, add surveillance sites, improve data quality, and meet long-term surveillance needs by amending the list of reportable conditions are ongoing. These efforts will help ensure that Haiti's MSPP has a sustainable national surveillance system that will better identify unmet health needs in order to set priorities for the allocation of resources for effective interventions for improving public health in Haiti.

Although NSSS was implemented rapidly, the system could not describe the immediate effects of the earthquake. For example, most persons with earthquake-associated injuries were treated or transported immediately after the earthquake, before NSSS began operation, 13 days later. In addition, before

establishment of NSSS and continuing during the first few weeks after the earthquake, hundreds of thousands of persons migrated out of the area nearest the epicenter. By January 31, an estimated 570,000 persons had migrated out of Port-au-Prince alone (2). The migration might explain why both the number and proportion of injuries were higher in those departments further from the epicenter. In addition, as internally displaced persons (IDPs) camps (3) arose in the departments nearest the epicenter, safe water provisions and the availability of health care increased, which might have affected disease trends.

NSSS did not detect any unexpected disease clusters or outbreaks during the reporting period. A few suspected clusters of diarrhea, measles, hemorrhagic fever, and typhoid were reported directly to MSPP. However, using NSSS data and in consultation with the Haiti National Laboratory and surveillance site staff members, investigators determined that no unexpected or abnormal increases in disease had occurred.

FIGURE 2. Number and percentage of most frequently reported conditions, by epicenter proximity and surveillance week — National Sentinel Site Surveillance System, Haiti, January 25–April 24, 2010



\* West and South-East departments.

† North-West, North, North-East, Artibonite, Center, Grand Anse, Nippes, and South departments.

§ Trauma, fracture, cerebral concussion from head injury, laceration from weapon or dagger injury, burns, wounds (infected), crush injury syndrome, amputation.

¶ Scale used differs from the others.

NSSS is limited in surveillance capacity because of incomplete reporting and patients seeking care at non-NSSS sites. Disease surveillance in Haiti could be

improved by investigating unreported cases identified through laboratory data, increasing the capacity of the Haiti National Laboratory to perform diagnostic

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

Little was known about diseases and injuries in Haiti immediately after the January 12, 2010 earthquake.

**What is added by this report?**

Creation of the National Sentinel Site Surveillance (NSSS) System enabled reporting, during January 25–April 24, 2010, of 42,361 reportable conditions. No clusters or outbreaks of disease were detected; the three most frequently reported conditions were acute respiratory infections (16.3%), suspected malaria (10.3%), and fever of unknown cause (10.0%). Injuries accounted for 12.0% of conditions.

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

Continued improvements to NSSS, including Internet-based reporting, improved data quality, and a standardized platform, will allow for long-term sustainability of a system that will provide critical information for decision making, resource allocation, and compliance with the International Health Regulations of the World Health Organization.

testing, and informing health-care providers, including those outside of NSSS surveillance sites, of the need to report immediately notifiable cases to MSPP immediately. Sensitivity and specificity of the surveillance system should be evaluated; plans are being developed to evaluate NSSS systematically.

On April 25, 2010, in an attempt to simplify data entry, increase reporting, and improve availability of data, NSSS began allowing weekly (instead of daily) reporting of daily counts of the 25 conditions and added the ability of NSSS sites to enter their data directly and electronically through the PEPFAR Internet-based system, known as the Monitoring, Evaluation, and Surveillance Interface (MESI).<sup>†</sup> Through MESI, NSSS began transitioning into a weekly, long-term national disease surveillance system for Haiti. In addition, MSPP, PAHO, and CDC have supported development of a complementary surveillance system, the Internally Displaced Persons Surveillance System, to better represent IDPs living in camps and served by nongovernmental organization (NGO) clinics (3).

Many previously documented challenges of post-disaster public health surveillance were experienced in Haiti, including logistical constraints, absence of baseline information, unavailable denominator data, and underreporting of conditions (4). Despite these challenges, NSSS was a valuable element of the public health response, providing daily reports to

public health partners in Haiti during an emergency response and serving as a tool to respond to rumors or concerns of increases in disease. Incorporation of NSSS into PEPFAR's MESI will improve the long-term sustainability of the system by streamlining data entry, improving data quality, providing data on a standardized platform, and complying with International Health Regulations of World Health Organization (5). Through planned improvement to NSSS and ongoing surveillance, MSPP will gain both routine and postdisaster baseline data on diseases to characterize trends that will help identify and support health priorities in Haiti.

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<sup>†</sup> Available at <http://www.mesi.ht>.

## Rapid Establishment of an Internally Displaced Persons Disease Surveillance System After an Earthquake — Haiti, 2010

On January 12, 2010, a 7.0-magnitude earthquake in Haiti disrupted infrastructure and displaced approximately 2 million persons, causing increased risk for communicable diseases from overcrowding and poor living conditions. Hundreds of nongovernmental organizations (NGOs) established health-care clinics in camps of internally displaced persons (IDPs). To monitor conditions of outbreak potential identified at NGO camp clinics, on February 18, the Haiti Ministry of Public Health and Population (MSPP), the Pan-American Health Organization (PAHO), and CDC implemented the IDP Surveillance System (IDPSS). The Inter-Agency Standing Committee (IASC) “cluster approach” (1) was used to coordinate the Haiti humanitarian response. One of 11 clusters, the Global Health Cluster (GHC), builds global capacity, whereas the country-level cluster (in this case, the Haitian Health Cluster [HHC], led by PAHO) responds locally. During the Haiti response, HHC engaged NGOs serving large camps, established IDPSS, followed trends of reportable conditions, undertook epidemiologic and laboratory investigations, and fostered implementation of control measures. This report describes the design and implementation of IDPSS in the post-earthquake period. The primary challenges to implementing IDPSS were communication difficulties with an ever-changing group of NGO partners and limitations to the utility of IDPSS data because of lack of reliable camp population denominator estimates. The IDPSS experience reinforces the need to improve local communication and coordination strategies. Improving future humanitarian response requires advance development and distribution of easily adaptable standard surveillance tools, development of an interdisciplinary strategy for an early and reliable population census, and development of communication strategies using locally available Internet and cellular networks.

### Pre- and post-earthquake capacity

In 2009, before the earthquake, an estimated 55% of Haitians were living in extreme poverty (2). A total of 45% of the population lacked access to safe water, and 83% lacked access to sufficient sanitation (3). The public health-care system had inadequate infrastructure and no emergency medical system. NGOs

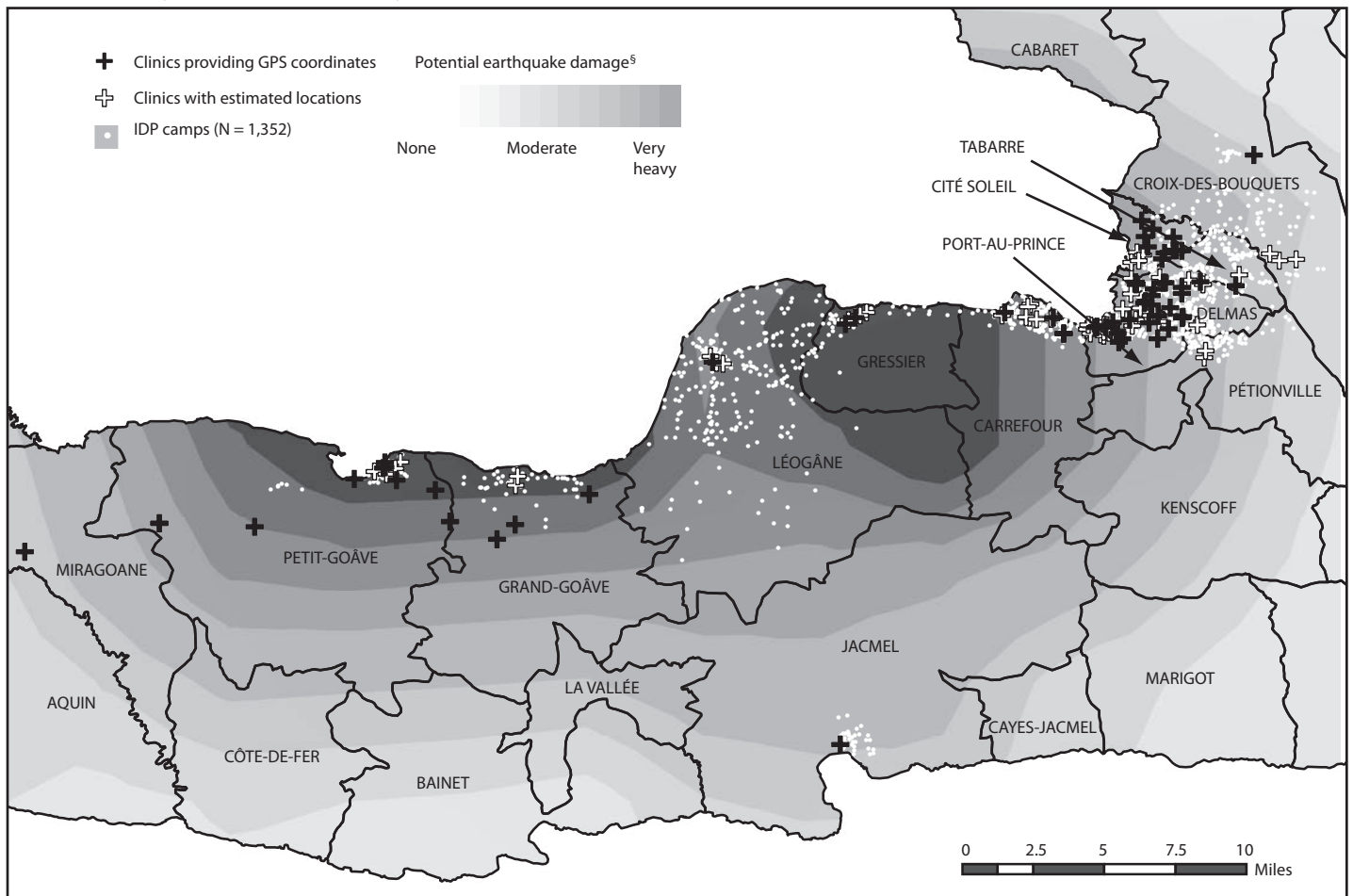
provided much of Haiti’s health services. A January 2010 World Health Organization (WHO) risk assessment of public health services in Haiti estimated that approximately 250 NGOs were operating within the health sector before the earthquake (3).

Before the earthquake, public health surveillance in Haiti was carried out by two independent systems. The Haitian Health Information System was implemented in 749 health facilities serving the general population. The primary purpose of this system was to monitor health service provision and administrative indicators; data flow was too encumbered to provide timely surveillance. The HIV Monitoring, Evaluation, and Surveillance Interface (MESI) is limited to monitoring the health events of human immunodeficiency virus (HIV)-infected patients.

Haitian government officials estimated that the earthquake resulted in approximately 230,000 immediate deaths and caused 1.5 million persons, approximately 15% of the nation’s population, to be displaced to IDP camps. Within days, nearly 900 overcrowded camps were established spontaneously in Port-au-Prince, and an additional 400 further west in Leogane, Jacmel, and Petit-Goâve (Figure 1). Health-care services and humanitarian aid were provided by a huge influx of international and local NGOs. Although approximately 400 health organizations registered officially with the Haitian government, an additional unknown number of organizations also were providing services. Services ranged from general outpatient care to specialized surgical services. Most medical care was provided in temporary tented structures or mobile clinics operating in or around the large camps. The majority of clinics did not possess laboratory capacity, and specimen collection materials were scarce.

The cluster approach was developed by IASC after the 2004 Indian Ocean tsunami to strengthen partnerships among humanitarian organizations and to improve coordination of humanitarian response activities during an emergency (1). The approach has 11 global clusters to be activated locally, as needed, in an emergency: Health, Camp Coordination and Camp Management (CCCM), Water/Sanitation/Hygiene (WASH), Agriculture, Logistics, Early Recovery, Nutrition, Education, Protection, Emergency Shelter,

**FIGURE 1. Distribution of temporary health-care clinics reporting to the Internally Displaced Person Surveillance System (IDPSS)\* and location of IDP camps,† by commune — Haiti, May 2010**



**Sources:** CDC, Haiti Ministry of Public Health and Population, Pan-American Health Organization, Camp Coordination and Camp Management Cluster (CCCM), United Nations Stabilization Mission in Haiti (MINUSTAH), Geocommons, U.S. Geological Survey.

\* Clinics reporting to IDPSS at least once as of May 31, 2010.

† Based on CCCM data, as of May 3, 2010. Available at [http://groups.google.com/group/cccmhaiti/web/mapping-and-gis?\\_done=%2fgroup%2fcccmhaiti%3f](http://groups.google.com/group/cccmhaiti/web/mapping-and-gis?_done=%2fgroup%2fcccmhaiti%3f).

§ Based on data from the U.S. Geological Survey, available at <http://pubs.usgs.gov/tm/2005/12A01>.

and Emergency Telecommunications. WHO is the lead agency for GHC, which includes 31 United Nations agencies and NGOs. In Haiti, all 11 clusters at the local level were activated.

### Establishment of IDPSS

Although some NGOs routinely conduct disease surveillance internally during disaster response operations, no system for sharing and tracking illness data among NGOs existed after the Haiti earthquake. MSPP, CDC, and PAHO created IDPSS in response to the need to establish monitoring of communicable diseases identified in temporary clinics serving IDPs. Disease surveillance was one of the activities of HHC, and required interaction with the local CCCM and

WASH clusters. IDPSS is a voluntary passive surveillance system, monitoring 19 priority conditions: six requiring immediate public health notification to MSPP; an additional 10 suspected communicable diseases of outbreak potential; and three programmatic indicators (Table). Total clinic visits per day also were recorded so that surveillance data for each of the 19 priority conditions could be reported as the proportion of all visits in each clinic. Reporting procedures were kept as simple as possible to facilitate voluntary reporting from busy NGO camp clinics, and reportable diagnoses were limited to those posing the greatest public health risk to the displaced population facing overcrowding, poor hygiene and sanitation, malnutrition, exposure to mosquitoes, and



TABLE. Number of reported cases of 19 priority conditions monitored by the Internally Displaced Persons Surveillance System (IDPSS) — Haiti, February 2–April 24, 2010\*

| Priority condition  | Case definition <sup>†</sup>  | No. of reported cases (N = 23,183) | % of total clinic visits (N = 96,472) |
|---|---|------------------------------------|---------------------------------------|
| <b>Requiring immediate notification of the Haiti Ministry of Public Health and Population</b> |   |                                    |                                       |
| Acute hemorrhagic fever syndrome  | Acute onset of fever of less than 3 weeks' duration in a severely ill patient and any two of the following: hemorrhagic or purpuric rash, epistaxis, hematemesis, hemoptysis, blood in stools, other hemorrhagic symptom with no known predisposing host factors for hemorrhagic manifestations   | 183                                | 0.2                                   |
| Suspected measles   | Fever <b>and</b> maculopapular rash (i.e., nonvesicular) <b>and</b> one of the following: cough, coryza, conjunctivitis <b>or</b> any person in whom a clinical health-care worker suspects measles infection   | 42                                 | 0.04                                  |
| Suspected rabies  | A person who has had close contact (usually a bite or a scratch) with a rabies-susceptible animal (e.g., dog, cat, bat, or mongoose) or an animal displaying clinical signs consistent with rabies (e.g., aggression/unprovoked bite, unusual behavior, excessive salivation) at the time of exposure, or within 10 days after exposure   | 14                                 | 0.01                                  |
| Suspected meningococcal meningitis  | Sudden onset fever ( $\geq 100.4^{\circ}\text{F}$ [ $\geq 38.0^{\circ}\text{C}$ ] axillary) and one of the following signs: neck stiffness, altered consciousness, other meningeal signs or petechial/purpurial rash<br><br>In patients aged <1 year, meningitis is suspected when fever is accompanied by bulging of the fontanelle  | 4                                  | 0.004                                 |
| Acute flaccid paralysis   | Acute flaccid paralysis in a child aged <15 years, including Guillain-Barré syndrome or any paralytic illness in a person of any age  | 1                                  | 0.001                                 |
| Suspected diphtheria  | Laryngitis or pharyngitis or tonsillitis and adherent membrane of the tonsils, pharynx, and/or nares  | 1                                  | 0.001                                 |
| <b>Other reportable infectious diseases</b>   |   |                                    |                                       |
| Acute respiratory infection   | Fever $\geq 100.4^{\circ}\text{F}$ ( $\geq 38^{\circ}\text{C}$ ) and at least one of the following: rhinitis, cough, redness or soreness of throat <b>or</b> fever and fast breath and at least one of the following: cough or difficulty breathing<br><br>Respiratory distress in children aged <5 years: breathing 50 or more times per minute for infants aged 2 months–1 year; breathing 40 or more times per minute for children aged 1–5 years; or severe respiratory distress in a child might be signalled by an inability to drink or breastfeed, persistent vomiting, convulsions, lethargy, or chest indrawing or stridor in a calm child                    | 8,878                              | 9.0                                   |
| Suspected malaria   | <i>Uncomplicated malaria</i><br>Fever $\geq 100.4^{\circ}\text{F}$ ( $\geq 38.0^{\circ}\text{C}$ ) or history of fever within the past 48 hours (with or without other symptoms, such as nausea, vomiting and diarrhea, headache, back pain, chills, and myalgia) in persons for whom other obvious causes of fever have been excluded<br><br><i>Severe malaria</i><br>Symptoms as for uncomplicated malaria, plus drowsiness with extreme weakness and associated signs and symptoms related to organ failure, such as disorientation, loss of consciousness, convulsions, severe anaemia, jaundice, haemoglobinuria, spontaneous bleeding, pulmonary edema, and shock | 4,899                              | 5.0                                   |
| Watery diarrhea   | Acute diarrhea (three or more abnormally loose or fluid stools in the past 24 hours) with or without dehydration  | 4,549                              | 5.0                                   |
| Fever of unknown cause  | Person with fever $\geq 100.4^{\circ}\text{F}$ ( $\geq 38^{\circ}\text{C}$ ) in whom all obvious causes of fever have been excluded; this would include suspected cases of dengue fever   | 2,938                              | 3.0                                   |
| Suspected typhoid   | A patient with fever $\geq 100.4^{\circ}\text{F}$ ( $\geq 38^{\circ}\text{C}$ ) that has lasted for at least 3 days <b>and</b> two of the following: headache, anorexia, abdominal pain, constipation, diarrhea, vomiting <b>and</b> other obvious causes of fever have been excluded; for example, malaria should be ruled out (by high clinical suspicion, rapid diagnostic test, or microscopy) before giving a diagnosis of suspected typhoid fever   | 753                                | 0.8                                   |

TABLE. (Continued) Number of reported cases of 19 priority conditions monitored by the Internally Displaced Persons Surveillance System (IDPSS) — Haiti, February 2–April 24, 2010\*

| Priority condition  | Case definition <sup>†</sup>  | No. of reported cases (N = 23,183) | % of total clinic visits (N = 96,472) |
|---|---|------------------------------------|---------------------------------------|
| Bloody diarrhea   | Acute diarrhea with visible blood in the stool  | 497                                | 0.5                                   |
| Acute febrile illness with jaundice   | Acute onset of jaundice <b>and</b> fever $\geq 100.4^{\circ}\text{F}$ ( $\geq 38^{\circ}\text{C}$ ) with the absence of any known precipitating factors   | 110                                | 0.1                                   |
| Tetanus   | In an adult with a wound history or a visible infection entry point: jaw contracture with impossibility to eat and to talk, painful muscular contractions, generalized muscle spasms, rigidity<br><br>In a neonate: any neonate with normal ability to suck and cry during the first 2 days of life who from 3 and 28 days of age cannot suck normally and becomes stiff or has convulsions | 18                                 | 0.02                                  |
| Suspected whooping cough  | Cough for >2 weeks and at least one of the following symptoms: paroxysms (i.e., fits) of coughing, inspiratory whooping, posttussive vomiting (i.e., vomiting immediately after coughing) without other apparent cause  | 13                                 | 0.01                                  |
| Suspected cutaneous anthrax   | Skin lesion evolving over 1–6 days: papular through vesicular stage, to depressed black eschar invariably accompanied by edema that might be mild or extensive  | 0                                  | —                                     |
| <b>Programmatic indicators</b>  |   |                                    |                                       |
| Tuberculosis (TB) patient with interrupted treatment                        | Any patient who has active TB and is currently out of care or experiencing an interruption in TB treatment  | 57                                 | 0.06                                  |
| HIV/AIDS <sup>§</sup> patient with interrupted antiretroviral therapy (ART) | Any HIV-infected patient who states that he or she has experienced an interruption in HIV care or ART   | 16                                 | 0.02                                  |
| Third trimester pregnancy without previous or pregnancy complications       | Pregnant woman in the third trimester without any previous antenatal care and/or a pregnant woman at any trimester with a complication such as premature rupture of membranes, preeclampsia, eclampsia, bleeding, infection, and complicated abortion   | 210                                | 0.2                                   |

\* Although the official launching of the IDPSS was February 18, 2010, several nongovernment organizations were submitting reports before that date.

<sup>†</sup> Haiti Ministry of Public Health and Population and World Health Organization case definitions were adapted to reflect syndromic diagnoses.

<sup>§</sup> Human immunodeficiency virus/acquired immunodeficiency syndrome.

incomplete vaccination coverage. MSPP and WHO case definitions (4) were adapted to reflect syndromic diagnoses. This process of adapting reporting forms and data management tools delayed the system's implementation.

To enroll camp clinics in IDPSS, the CDC team contacted 31 of the government-registered NGOs that were serving the largest camps and planning to provide long-term health services. Through telephone calls, periodic clinic visits, and HHC meetings, MSPP, PAHO, and CDC representatives trained NGO providers about IDPSS reporting procedures. NGO clinics were asked to submit their global positioning system (GPS) coordinates to show their location in relation to IDP camps and other clinics (Figure 1).

NGO camp clinics voluntarily submitted reports on a daily basis, whether or not reportable conditions were observed. Although lack of reporting might have occasionally been attributed to a lack of reportable conditions seen on a given day, the primary reason was

noncompliance. Individual NGOs were contacted or clinics visited to determine reasons for nonreporting and to offer assistance in facilitating improved compliance. As of epidemiologic week 14 (7 weeks after IDPSS implementation), the reporting requirement shifted from daily to weekly to accommodate clinics, many of which were already submitting weekly because of lack of time and resources.

Because the turnover of personnel at the NGOs was high, and because the NGO camp clinics were located across a wide geographic area, the Haiti IDP Surveillance System Google Group was established to improve communication. This type of publicly accessible Internet forum allows members to exchange messages either with the entire group or a specific member. Electronic files can be posted or downloaded by any member. The IDPSS Google Group was effective in encouraging timely and reciprocal communication between IDPSS coordinators and NGOs and also among NGO colleagues interested

in informally comparing observed disease trends and reporting challenges at their respective clinic locations. Each week, feedback reports were available to NGOs on the website and included analysis of trends of proportions of each reportable condition out of total clinic visits (i.e.,  $100 \times [\text{specific condition} / \text{total visits per week}]$ ).

### Surveillance results

IDPSS officially began on February 18, 37 days after the earthquake occurred; however, 33 clinics reported data during February 2–18. By April 24, 91 NGO camp clinics had reported at least one time to IDPSS (mean and median: 35 clinics per week, range: 12–48 clinics per week) (Figure 2). The total number of new clinic visits during February 18–April 24 was 96,472. A total of 23,183 new visits were reported for the 19 reportable conditions, which represents 24% of the total number of clinic visits. Of all clinic visits, the most commonly reported diagnoses were acute respiratory infection (ARI) ( $n = 8,878$  [9%]), suspected malaria ( $n = 4,899$  [5%]), and watery diarrhea ( $n = 4,549$  [5%]) (Table). Although clusters of suspected typhoid fever and malaria were investigated, IDPSS detected no major disease outbreaks through April 24, 2010. Consistent with previous disasters, communicable disease outbreaks were rare (5,6), and ARI was the most commonly reported condition (7).

### Lessons learned

Implementation of IDPSS included logistical and operational challenges similar to those described during other humanitarian emergencies: coordinating multiple, geographically dispersed organizations providing clinical services; rapid health-care provider turnover; inadequate infrastructure; and a dynamic situation. The primary challenge was coordinating the multiple and geographically scattered NGO partners.

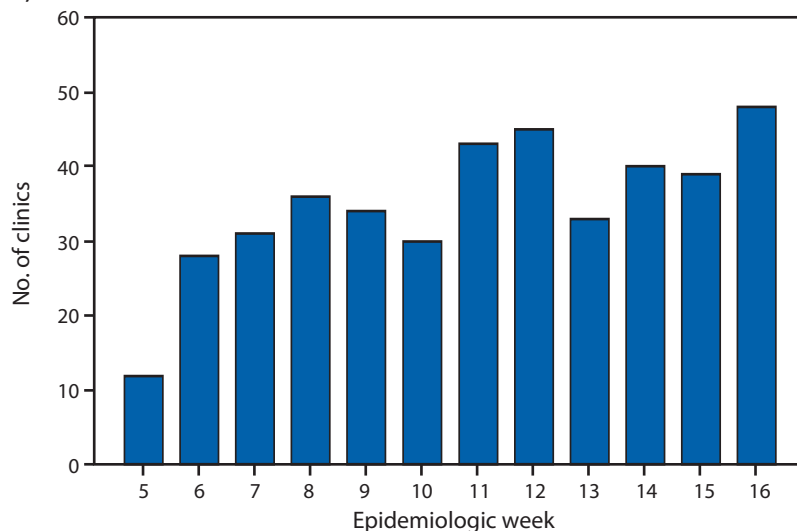
During the first 7 weeks of IDPSS, infrequent reporting was observed, even from the largest, well-established NGOs. The number of daily reports submitted by any given NGO camp clinic during a 54-day period was highly variable, ranging from one to 50 (median: three reports), making it difficult to follow meaningful trends by geographic location. Improving reporting frequency required consistent technical support, frequent communication with reporters, and a shift to weekly reporting.

Analysis of IDPSS data was limited by the lack of denominator information, making calculation of incidence rates (reportable cases per population) impossible. Instead, trends of proportionate clinic-based morbidity (reportable cases per total clinic visits) were followed. Trends in case counts for each condition also were monitored but were not informative because counts varied according to number of reports submitted and, therefore, primarily reflected clinic reporting behavior rather than disease patterns. In addition, the representativeness of these IDPSS data is unknown. Data on the size and distribution of camps and NGO health-care services being provided were incomplete. Reliable estimates of the population served by each NGO camp clinic did not exist because of incomplete camp census data from responsible cluster partners and lack of information on the catchment area of each clinic. Substantial mobility of IDPs between camps and the fact that nondisplaced Haitians were using services intended for IDPs made population census and catchment area estimates difficult.

### Current situation

Six months after the earthquake, frequency of reporting to IDPSS has been increasing. The possibility of disease outbreaks among IDPs remains an active concern for the disaster relief community. Currently, the IDPSS Google Group has 177 members, who represent nearly 60 different NGOs and coordinating

**FIGURE 2.** Number of clinics reporting to the Internally Displaced Persons Surveillance System (IDPSS), by epidemiologic week — Haiti, February 2–April 24, 2010\*



\* Although the official launching of the IDPSS was February 18, 2010, several nongovernmental organizations were submitting reports before that date.

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

After the January 2010 earthquake in Haiti, a huge influx of nongovernmental organizations (NGOs) began providing needed health-care services in camps of internally displaced persons (IDPs), but no common disease surveillance system among NGOs existed.

**What does this report add?**

This report describes how the Haitian Ministry of Public Health and Population, CDC, the Pan-American Health Organization, and NGOs established the IDP Surveillance System and devised strategies to overcome coordination and communication difficulties in gathering, analyzing, and disseminating findings with the many NGO partners involved.

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

Improving future humanitarian response requires advance development and distribution of easily adaptable standard surveillance tools, development of an interdisciplinary strategy for an early and reliable population census to allow analysis of disease incidence, and development of communication strategies using locally available Internet and cellular networks.

agencies. IDPSS continues to function reliably, providing these members weekly reports of baseline trends and news of cluster investigations. IDPSS will become more useful as reporting continues to increase and improved denominator data becomes available from cluster partners responsible for IDP camp census, thus allowing for incidence-based comparisons with national surveillance data.

**Recommendations**

Emergency preparedness activities should involve partnering with NGOs to develop standard operating procedures, forms, and data management tools that are easily modifiable for surveillance activities in potential humanitarian emergency settings. Advance distribution of these tools and their guidelines would speed implementation and improve system performance.

In settings with similar communication challenges, focus should be both on interactive, Internet-based forums (e.g., the IDPSS Google Group) and in-person meetings. Although telephone and Internet access were disrupted in the days after the earthquake, these networks were reestablished quickly and proved essential for coordination of humanitarian response. All NGOs had Internet access in coordinating offices, whereas access on-site at temporary clinics varied

substantially. Cellular telephone access was available throughout earthquake-affected areas, including within camps. These reliable networks should be taken advantage of, and innovative strategies for their use should be formalized for partner communication and surveillance data submission.

The IDPSS experience supports several of IASC recommendations made on the basis of a recent evaluation of the cluster approach in six countries, including Haiti (8). These IASC recommendations address 1) reinforcing the role of international NGOs in clusters; 2) facilitating participation of national and local NGOs to strengthen capacities; and 3) improving mechanisms to deal with multidisciplinary issues and inter-cluster gaps.

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## Any Tobacco Use in 13 States — Behavioral Risk Factor Surveillance System, 2008

Tobacco use is the leading cause of preventable death in the United States, and cigarette smoking, the predominant form of tobacco use in the United States, causes 443,000 deaths annually (1). In 2008, 20.6% of U.S. adults were current smokers (2); however, other tobacco products (e.g., smokeless tobacco, cigars, bidis, and kreteks) also were used by some adults and youths (3). Persons who use cigarettes in combination with other tobacco products (polytobacco use) might have an increased risk for adverse health effects (3). To estimate the prevalence of any tobacco and polytobacco use, CDC analyzed data from the 2008 Behavioral Risk Factor Surveillance System (BRFSS) (the most recent data available) module on use of other tobacco products, which was implemented by 13 states. This analysis found that use of any tobacco product ranged from 18.4% (New Jersey) to 35.0% (West Virginia), cigarette use ranged from 14.6% (New Jersey) to 26.6% (West Virginia), and polytobacco use ranged from 1.0% (New Jersey) to 3.7% (West Virginia). Polytobacco use was more prevalent among men (4.4%), persons aged 18–24 years (5.7%), persons who were single (4.8%), persons with household incomes less than \$35,000 (9.8%), and persons with less than a high school education (3.6%) or with a high school diploma or General Education Development (GED) certificate or diploma (3.6%). Because no form of tobacco is safe to use, prevention and cessation intervention programs need to address all forms of tobacco use to lower tobacco-related morbidity and mortality in the United States. Additionally, counter-marketing messages for tobacco products can be tailored for specific populations, such as young adults and males.

BRFSS is a state-based, telephone survey of non-institutionalized, civilian adults aged ≥18 years in all 50 states, the District of Columbia (DC), and U.S. territories. In 2008, 13 states\* collected information on the use of tobacco products other than cigarettes through an optional BRFSS module.† Responses to

questions on this module and the core questionnaire were used to measure current use of cigarettes,<sup>§</sup> smokeless tobacco,<sup>¶</sup> and other tobacco products (cigars, pipes, bidis,<sup>\*\*</sup> kreteks,<sup>††</sup> and others).<sup>§§</sup> Any tobacco users were considered respondents who currently used any of the following: cigarette, smokeless tobacco, or other tobacco products. Current polytobacco users were considered respondents who were current cigarette smokers and also current users of another form of tobacco (either smokeless tobacco or other tobacco products). BRFSS uses multistage probability sampling to obtain state-specific estimates of risk behaviors. Estimates weighted by probability of selection and post-stratified by age, sex, and race were calculated, as were 95% confidence intervals for each state and aggregated selected demographic subgroups. Response rates for the 2008 BRFSS survey were calculated using Council American Survey and Research Organizations (CASRO) guidelines,<sup>¶¶</sup> and ranged from 43.4% to 65.5% (median: 55.3%) in the 13 states. Cooperation rates<sup>\*\*\*</sup> in 2008 ranged from 68.4% to 80.7% (median: 76.0%). Data were

<sup>§</sup> Respondents who answered “yes” to the question, “Have you smoked at least 100 cigarettes in your entire life?” and answered “everyday” or “some days” to “Do you now smoke every day, some days, or not at all?” were classified as current cigarette users.

<sup>¶</sup> Respondents who answered “yes” to the question, “Have you ever used or tried any smokeless tobacco products such as chewing tobacco, snuff, or snus?” and “everyday” or “some days” to “Do you currently use chewing tobacco, snuff, or snus every day, some days, or not at all?” were classified as current smokeless tobacco users. (Snus is a small pouch of smokeless tobacco. Unlike traditional or other forms of smokeless tobacco, snus does not require those who use it to dip or spit the tobacco).

<sup>\*\*</sup> Bidis are small, thin, hand-rolled cigarettes imported to the United States primarily from India and Southeast Asian countries. They consist of tobacco wrapped in a tendu or temburni leaf (plants native to Asia); some are secured with a colorful string at one or both ends. Bidis can be flavored (e.g., chocolate, cherry, and mango) or unflavored.

<sup>††</sup> Kreteks, sometimes referred to as clove cigarettes, are imported from Indonesia and typically contain a mixture of tobacco, cloves, and other additives.

<sup>§§</sup> Respondents who answered “yes” to the question, “Do you currently use cigars, pipes, bidis, kreteks, or other tobacco products?” were classified as current users of other tobacco products.

<sup>¶¶</sup> The response rate is the percentage of persons who completed interviews among all eligible persons, including those who were not successfully contacted.

<sup>\*\*\*</sup> The cooperation rate is the percentage of persons who completed interviews among all eligible persons who were contacted.

\*The following 13 states used the 2008 BRFSS “other tobacco products” module: Delaware, Florida, Indiana, Kansas, Louisiana, Nebraska, New Jersey, North Carolina, Tennessee, Texas, West Virginia, Wisconsin, and Wyoming.

† Available at <http://www.cdc.gov/brfss/questionnaires/pdf-ques/2008brfss.pdf>.

combined for the 13 states to examine how tobacco use measures were distributed among demographic groups in those states.<sup>†††</sup> For comparisons of prevalence by sex, race/ethnicity, income, education, and marital status, statistical significance ( $p < 0.05$ ) was determined using a two-sided z-test.

During 2008, the range of prevalence of any tobacco use in the 13 states was 18.4% (New Jersey) to 35.0% (West Virginia) (Table 1). Polyto tobacco use also was highest in West Virginia (3.7%) and lowest in New Jersey (1.0%). Among the 13 states, current use of any tobacco was more prevalent among men than women ( $p < 0.001$ ) and decreased with increasing age (Table 2). Any tobacco use was more prevalent among non-Hispanic whites (26.2%) and non-Hispanic blacks (24.4%) than among Hispanics (19.7%,  $p < 0.001$  and  $p = 0.001$ , respectively). Any tobacco use also was most prevalent among persons who were a member of an unmarried couple (36.3%), single (30.3%), widowed or divorced (29.1%), or who had less than a high school education (33.1%). Any tobacco use decreased with increasing levels of annual income, 32.5% for those earning less than \$15,000 and 19.2% for those earning \$75,000 or more. Polyto tobacco use was most prevalent among men (4.4%), persons aged 18–24 years (5.7%), single adults (4.8%), persons with less than a high school education (3.6%) and high school diploma/GED (3.6%), and persons with incomes less than \$35,000 (9.8%).

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#### Editorial Note

Tobacco control efforts have focused largely on decreasing the prevalence of cigarette smoking; however, other tobacco products also are being used singly or in combination by adults. The prevalence of cigarette smoking ranged from 14.6% to 26.6% in the 13 states in this analysis; however, when any tobacco use (including use of smokeless tobacco, cigars, pipes, bidis, kreteks, and other forms of

tobacco) also is considered, an additional 5% of the adult population in these states would be considered tobacco users (range: 18.4%–35.0%). The findings in this report are similar to those of previous studies, which show that polyto tobacco use is higher among men and young adults than other demographic groups (3,4). Additionally, the findings show that the risk factors for polyto tobacco use mirror those for cigarette smoking (men, persons aged 18–24 years, persons who are single, persons whose household income is less than \$35,000, and persons with no more than a high school education).

Use of multiple tobacco products is associated with higher nicotine addiction, inability to quit using tobacco, and adverse health effects (3). These health effects can lead to increased risks for tobacco-related morbidity and mortality (3). Because youths have higher polyto tobacco use than do adults (5), and among adults, young adults are the most likely to use multiple forms of tobacco concurrently (3,4), prevention programs and policy interventions need to address all forms of tobacco use, as recommended by CDC's *Guide to Community Preventive Services*.<sup>§§§</sup>

*Healthy People 2010* objectives call for the reduction of cigarette smoking to 12.0% and the reduction of spit (smokeless) tobacco use to 0.4% (6). Although cigarette smoking has declined among adults in the United States during the past decade (2), use of smokeless tobacco has remained stable at approximately 3% among adults aged  $\geq 26$  years during 2004–2008 (4). However, from 2003 to 2008, smokeless tobacco use increased from 13.6% to 15.4% among non-Hispanic white men aged 18–25 years, and 1.9% to 3.4% among Hispanic men aged 18–25 years (4). Although women in all 13 states have met the *Healthy People 2010* objective for smokeless tobacco use, no state in this report has met the objective for either current cigarette smoking or current smokeless tobacco use. Public Health Service guidelines suggest that clinicians use the five A's (ask, advise, assess, assist, and arrange) intervention method to help treat tobacco dependence, including polyto tobacco use (7). The guidelines also recommend that clinicians identify smokeless tobacco and other tobacco product users, urge them to quit, and provide

<sup>†††</sup> After excluding surveys with missing data on the five tobacco questions for polyto tobacco use, data on 96% of the survey respondents were available. Only respondents who provided complete information for all five tobacco use questions ( $n = 98,637$ ) were included in the estimates of polyto tobacco use; responses from 3,745 (3.8%) of those persons were excluded because of missing data.

<sup>§§§</sup> CDC's *Guide to Community Preventive Services* reviews the effectiveness of interventions to reduce or prevent tobacco use and is available at <http://www.thecommunityguide.org/tobacco/index.html>.

TABLE 1. State-specific estimates of current use\* of any tobacco products, cigarettes, smokeless tobacco, other tobacco products, and polytobacco use among adults† — Behavioral Risk Factor Surveillance System (BRFSS), 13 states, 2008

| State                    | Current use                  |                         |                                |                                      |                           |                                  |                                       |   |
|--------------------------|------------------------------|-------------------------|--------------------------------|--------------------------------------|---------------------------|----------------------------------|---------------------------------------|---|
|                          | Any tobacco use              | Cigarettes <sup>§</sup> | Smokeless tobacco <sup>¶</sup> | Other tobacco products <sup>**</sup> | Polytobacco <sup>††</sup> | Cigarettes and smokeless tobacco | Cigarettes and other tobacco products | Cigarettes, smokeless tobacco, and other tobacco products |
|                          | %<br>(95% CI <sup>§§</sup> ) | %<br>(95% CI)           | %<br>(95% CI)                  | %<br>(95% CI)                        | %<br>(95% CI)             | %<br>(95% CI)                    | %<br>(95% CI)                         | %<br>(95% CI)   |
| Delaware                 | 23.8<br>(21.7–26.1)          | 17.8<br>(16.1–19.7)     | 1.5<br>(1.0–2.2)               | 6.8<br>(5.4–8.6)                     | 2.1<br>(1.4–3.0)          | 0.2<br>(0.1–0.5)                 | 1.7<br>(1.1–2.6)                      | 0.2<br>(0.0–1.1)  |
| Florida                  | 22.4<br>(20.8–23.9)          | 17.5<br>(16.2–18.9)     | 1.8<br>(1.4–2.3)               | 4.5<br>(3.7–5.3)                     | 2.1<br>(1.6–2.7)          | 0.3<br>(0.2–0.7)                 | 1.7<br>(1.2–2.2)                      | 0.1<br>(0.1–0.3)  |
| Indiana                  | 31.5<br>(29.4–33.7)          | 26.1<br>(24.1–28.2)     | 4.1<br>(3.2–5.2)               | 4.7<br>(3.7–5.9)                     | 3.6<br>(2.6–4.9)          | 1.0<br>(0.5–1.8)                 | 2.2<br>(1.5–3.3)                      | 0.4<br>(0.1–1.1)  |
| Kansas <sup>¶¶</sup>     | 25.7<br>(23.9–27.5)          | 18.6<br>(17.1–20.2)     | 4.7<br>(3.8–5.7)               | 5.1<br>(4.2–6.2)                     | 2.6<br>(1.9–3.4)          | 0.7<br>(0.4–1.2)                 | 1.6<br>(1.1–2.3)                      | 0.3<br>(0.1–0.6)  |
| Louisiana                | 25.3<br>(23.7–26.9)          | 20.5<br>(19.1–21.9)     | 3.1<br>(2.5–3.8)               | 5.0<br>(4.2–6.0)                     | 3.4<br>(2.7–4.2)          | 0.5<br>(0.3–0.8)                 | 2.6<br>(1.9–3.4)                      | 0.4<br>(0.2–0.7)  |
| Nebraska                 | 23.9<br>(22.4–25.5)          | 18.4<br>(17.0–19.8)     | 4.4<br>(3.8–5.1)               | 3.4<br>(2.7–4.2)                     | 2.3<br>(1.8–2.9)          | 0.8<br>(0.6–1.0)                 | 1.3<br>(0.9–1.8)                      | 0.2<br>(0.1–0.6)  |
| New Jersey <sup>¶¶</sup> | 18.4<br>(16.9–19.9)          | 14.6<br>(13.3–16.0)     | 0.5<br>(0.3–1.0)               | 3.1<br>(2.5–3.9)                     | 1.0<br>(0.7–1.7)          | 0.3<br>(0.1–0.8)                 | 0.7<br>(0.4–1.2)                      | 0.0<br>(0.0–0.1)  |
| North Carolina           | 26.4<br>(25.3–27.5)          | 20.9<br>(19.9–22.0)     | 3.9<br>(3.4–4.4)               | 4.0<br>(3.5–4.6)                     | 2.4<br>(2.0–2.9)          | 0.6<br>(0.4–1.0)                 | 1.6<br>(1.3–2.1)                      | 0.1<br>(0.1–0.2)  |
| Tennessee                | 30.0<br>(27.8–32.3)          | 23.2<br>(21.2–25.3)     | 4.6<br>(3.6–5.9)               | 5.2<br>(4.2–6.5)                     | 3.3<br>(2.5–4.3)          | 0.7<br>(0.4–1.2)                 | 2.4<br>(1.7–3.3)                      | 0.3<br>(0.1–0.6)  |
| Texas                    | 23.9<br>(22.4–25.4)          | 18.6<br>(17.3–20.0)     | 3.8<br>(3.1–4.7)               | 4.6<br>(3.7–5.6)                     | 2.8<br>(2.2–3.6)          | 0.7<br>(0.4–1.1)                 | 1.6<br>(1.2–2.2)                      | 0.5<br>(0.2–1.2)  |
| West Virginia            | 35.0<br>(33.1–36.9)          | 26.6<br>(24.9–28.4)     | 8.8<br>(7.7–10.1)              | 3.5<br>(2.8–4.4)                     | 3.7<br>(2.9–4.8)          | 1.8<br>(1.3–2.6)                 | 1.8<br>(1.3–2.6)                      | 0.1<br>(0.1–0.4)  |
| Wisconsin                | 25.8<br>(24.1–27.7)          | 19.9<br>(18.4–21.6)     | 2.9<br>(2.3–3.7)               | 4.3<br>(3.6–5.3)                     | 1.9<br>(1.5–2.5)          | 0.5<br>(0.3–0.9)                 | 1.3<br>(0.9–1.9)                      | 0.1<br>(0.0–0.2)  |
| Wyoming                  | 27.8<br>(26.4–29.2)          | 19.4<br>(18.2–20.7)     | 7.9<br>(7.1–8.9)               | 3.8<br>(3.2–4.4)                     | 3.1<br>(2.5–3.8)          | 1.6<br>(1.2–2.2)                 | 1.3<br>(1.0–1.8)                      | 0.2<br>(0.1–0.4)  |

\* Current tobacco use is defined as the use of any tobacco product, including cigarettes, smokeless tobacco, cigars, pipes, bidis, kreteks, or other tobacco products.

† n = 99,286 for any tobacco use; 99,029 for cigarette use, current other tobacco use, and current smokeless tobacco use; and 98,637 for current polytobacco use, cigarette and smokeless tobacco use, cigarette and other tobacco use, and cigarette, smokeless tobacco, and other tobacco products use.

§ Persons who reported smoking at least 100 cigarettes during their lifetimes and who at the time of interview, reported smoking everyday or some days.

¶ Current smokeless tobacco is defined as persons who reported everyday use of chewing tobacco, snuff, or snus.

\*\* Current use of other tobacco products is defined as persons who reported everyday use of cigars, pipes, bidis, kreteks, or other tobacco products not listed.

†† Polytobacco use is defined as the use of cigarettes in combination with some other form of tobacco, including smokeless tobacco, cigars, pipes, bidis, kreteks, or other tobacco products not listed.

§§ Confidence interval.

¶¶ Only respondents who were asked questions from the BRFSS "other tobacco products" optional module were included in analyses for Kansas and New Jersey.

cessation counseling interventions that are recommended for cigarette smokers (7).

The findings in this report are subject to at least four limitations. First, smoking prevalence might be underestimated because BRFSS does not survey persons in households without telephone service (2.5%) or wireless-only households (17.5%), and adults with wireless-only service are more likely (30.2%) than the rest of the U.S. population to be current smokers (8). Second, estimates for the current use of tobacco products are based on self-report and are not validated by biochemical tests. However, self-reported data on current smoking have high validity and this validity might translate to self-reported use of other tobacco products, such as smokeless tobacco,

cigars, bidis, and kreteks (9). Third, the median response rate for the 13 states was 55.3% (range: 43.4%–65.5%) in 2008. Lower response rates increase the potential for response bias; however, BRFSS aggregated state estimates previously have been shown to be comparable to tobacco use estimates from other surveys with higher response rates (8). Fourth, these findings are not generalizable to other states. Those states that used the other tobacco product module most likely have an interest or concern about other tobacco use issues within their state.

The results in this report highlight the need to increase expenditures to incorporate strategies that address smoking and other tobacco use in state and national tobacco use prevention and cessation efforts.



**TABLE 2. Current use\* of any tobacco products, cigarettes, smokeless tobacco, other tobacco products, and polytobacco use among adults,† by demographic characteristics — Behavioral Risk Factor Surveillance System (BRFSS), 13 states, 2008**

| Characteristic                      | Current use                  |                            |                                |                                      |                           |                                  |                                       |   |
|-------------------------------------|------------------------------|----------------------------|--------------------------------|--------------------------------------|---------------------------|----------------------------------|---------------------------------------|---|
|                                     | Any tobacco use              | Cigarettes <sup>§</sup>    | Smokeless tobacco <sup>¶</sup> | Other tobacco products <sup>**</sup> | Polytobacco <sup>††</sup> | Cigarettes and smokeless tobacco | Cigarettes and other tobacco products | Cigarettes, smokeless tobacco, and other tobacco products |
|                                     | %<br>(95% CI <sup>§§</sup> ) | %<br>(95% CI)              | %<br>(95% CI)                  | %<br>(95% CI)                        | %<br>(95% CI)             | %<br>(95% CI)                    | %<br>(95% CI)                         | %<br>(95% CI)   |
| <b>Overall</b>                      | <b>24.8</b><br>(24.2–25.4)   | <b>19.4</b><br>(18.9–19.9) | <b>3.2</b><br>(3.0–3.5)        | <b>4.4</b><br>(4.1–4.8)              | <b>2.5</b><br>(2.3–2.8)   | <b>0.6</b><br>(0.5–0.7)          | <b>1.7</b><br>(1.5–1.9)               | <b>0.2</b><br>(0.1–0.4)                                   |
| <b>Sex<sup>¶¶</sup></b>             |                              |                            |                                |                                      |                           |                                  |                                       |   |
| Men                                 | 31.5<br>(30.5–32.6)          | 21.8<br>(20.9–22.7)        | 6.3<br>(5.8–6.9)               | 8.0<br>(7.3–8.6)                     | 4.4<br>(3.9–4.9)          | 1.2<br>(1.0–1.4)                 | 2.8<br>(2.4–3.2)                      | 0.5<br>(0.3–0.8)  |
| Women                               | 18.3<br>(17.7–19.0)          | 17.1<br>(16.5–17.7)        | 0.3<br>(0.2–0.4)               | 1.1<br>(0.9–1.3)                     | 0.7<br>(0.6–0.9)          | 0.1<br>(0.0–0.1)                 | 0.6<br>(0.5–0.8)                      | 0.0<br>(0.0–0.1)  |
| <b>Race/Ethnicity<sup>***</sup></b> |                              |                            |                                |                                      |                           |                                  |                                       |   |
| White, non-Hispanic                 | 26.2<br>(25.5–26.8)          | 20.1<br>(19.5–20.7)        | 4.1<br>(3.7–4.4)               | 4.5<br>(4.1–4.9)                     | 2.6<br>(2.3–2.9)          | 0.8<br>(0.6–0.9)                 | 1.6<br>(1.4–1.8)                      | 0.3<br>(0.1–0.5)  |
| Black, non-Hispanic                 | 24.4<br>(22.5–26.4)          | 20.1<br>(18.4–21.8)        | 1.2<br>(0.8–1.7)               | 5.2<br>(4.0–6.6)                     | 2.9<br>(2.2–3.9)          | 0.2<br>(0.1–0.5)                 | 2.6<br>(1.9–3.6)                      | 0.1<br>(0.0–0.3)  |
| Hispanic                            | 19.7<br>(17.7–21.9)          | 16.3<br>(14.6–18.3)        | 1.4<br>(0.8–2.4)               | 3.7<br>(2.7–5.0)                     | 2.0<br>(1.4–2.9)          | 0.3<br>(0.2–0.8)                 | 1.3<br>(0.9–2.0)                      | 0.4<br>(0.1–1.3)  |
| Other, non-Hispanic                 | 23.6<br>(20.8–26.6)          | 19.6<br>(17.0–22.4)        | 1.9<br>(1.4–2.5)               | 4.2<br>(3.2–5.6)                     | 2.7<br>(1.9–3.7)          | 0.2<br>(0.1–0.5)                 | 2.3<br>(1.6–3.3)                      | 0.1<br>(0.1–0.4)  |
| <b>Age group (yrs)</b>              |                              |                            |                                |                                      |                           |                                  |                                       |   |
| 18–24                               | 28.8<br>(26.0–31.7)          | 23.5<br>(21.0–26.2)        | 4.6<br>(3.3–6.4)               | 7.0<br>(5.3–9.1)                     | 5.7<br>(4.3–7.4)          | 1.3<br>(0.8–2.1)                 | 3.4<br>(2.5–4.5)                      | 1.0<br>(0.3–2.8)  |
| 25–44                               | 28.4<br>(27.3–29.5)          | 21.9<br>(20.9–22.9)        | 4.4<br>(3.9–4.9)               | 4.8<br>(4.2–5.3)                     | 2.9<br>(2.5–3.3)          | 0.9<br>(0.7–1.1)                 | 1.8<br>(1.5–2.2)                      | 0.2<br>(0.1–0.3)  |
| 45–64                               | 25.4<br>(24.6–26.3)          | 20.6<br>(19.8–21.3)        | 2.3<br>(2.0–2.5)               | 4.2<br>(3.8–4.6)                     | 2.0<br>(1.7–2.3)          | 0.3<br>(0.2–0.4)                 | 1.6<br>(1.3–1.9)                      | 0.1<br>(0.1–0.2)  |
| ≥65                                 | 12.8<br>(12.1–13.4)          | 9.0<br>(8.5–9.6)           | 1.6<br>(1.4–1.8)               | 1.6<br>(2.1–2.8)                     | 2.4<br>(0.5–0.8)          | 0.6<br>(0.1–0.2)                 | 0.5<br>(0.4–0.6)                      | 0.0<br>(0.0–0.1)  |
| <b>Marital status</b>               |                              |                            |                                |                                      |                           |                                  |                                       |   |
| Married                             | 21.2<br>(20.5–21.9)          | 15.4<br>(14.8–16.0)        | 3.2<br>(3.0–3.5)               | 4.1<br>(3.8–4.5)                     | 1.8<br>(1.6–2.1)          | 0.5<br>(0.4–0.6)                 | 1.2<br>(1.1–1.5)                      | 0.1<br>(0.1–0.2)  |
| Widowed/divorced                    | 29.1<br>(28.0–30.3)          | 25.3<br>(24.2–26.4)        | 2.3<br>(1.9–2.7)               | 3.4<br>(2.9–3.9)                     | 2.5<br>(2.0–3.0)          | 0.4<br>(0.3–0.5)                 | 1.9<br>(1.5–2.3)                      | 0.2<br>(0.1–0.5)  |
| Single                              | 30.3<br>(28.4–32.4)          | 24.9<br>(23.1–26.7)        | 4.1<br>(3.2–5.2)               | 6.3<br>(5.1–7.7)                     | 4.8<br>(3.8–5.9)          | 1.2<br>(0.9–1.7)                 | 2.8<br>(2.2–3.6)                      | 0.7<br>(0.3–1.8)  |
| Member of unmarried couple          | 36.3<br>(31.8–41.1)          | 31.5<br>(27.3–36.0)        | 3.8<br>(1.9–7.1)               | 5.3<br>(3.4–8.3)                     | 3.5<br>(2.2–5.6)          | 0.9<br>(0.2–3.2)                 | 2.2<br>(1.3–3.7)                      | 0.5<br>(0.1–1.4)  |
| <b>Education level</b>              |                              |                            |                                |                                      |                           |                                  |                                       |   |
| Less than high school               | 33.1<br>(30.9–35.3)          | 29.1<br>(27.1–31.2)        | 3.8<br>(3.0–4.8)               | 3.3<br>(2.6–4.1)                     | 3.6<br>(2.9–4.6)          | 1.0<br>(0.6–1.6)                 | 2.2<br>(1.7–3.0)                      | 0.3<br>(0.2–0.8)  |
| High school/GED <sup>†††</sup>      | 29.8<br>(28.7–31.0)          | 24.1<br>(23.1–25.2)        | 4.2<br>(3.7–4.8)               | 4.7<br>(4.0–5.5)                     | 3.6<br>(3.0–4.2)          | 1.0<br>(0.7–1.3)                 | 2.2<br>(1.8–2.6)                      | 0.4<br>(0.2–0.9)  |
| Some college or more                | 20.5<br>(19.7–21.2)          | 15.0<br>(14.4–15.7)        | 2.6<br>(2.3–2.9)               | 4.5<br>(4.1–5.0)                     | 1.8<br>(1.5–2.1)          | 0.3<br>(0.3–0.4)                 | 1.3<br>(1.1–1.5)                      | 0.2<br>(0.1–0.3)  |
| <b>Annual income (\$)</b>           |                              |                            |                                |                                      |                           |                                  |                                       |   |
| <15,000                             | 32.5<br>(30.3–34.7)          | 28.8<br>(26.8–31.0)        | 3.2<br>(2.2–4.5)               | 3.8<br>(2.9–4.9)                     | 3.7<br>(2.8–4.9)          | 0.8<br>(0.4–1.4)                 | 2.6<br>(1.9–3.6)                      | 0.4<br>(0.2–0.9)  |
| 15,000–24,999                       | 30.6<br>(29.0–32.3)          | 26.5<br>(25.0–28.1)        | 3.0<br>(2.4–3.7)               | 3.5<br>(2.9–4.2)                     | 3.0<br>(2.4–3.7)          | 0.8<br>(0.5–1.3)                 | 2.0<br>(1.6–2.6)                      | 0.2<br>(0.1–0.3)  |
| 25,000–34,999                       | 28.7<br>(26.7–30.7)          | 23.8<br>(21.9–25.7)        | 3.5<br>(2.8–4.3)               | 3.9<br>(3.1–4.8)                     | 3.1<br>(2.4–4.1)          | 0.8<br>(0.5–1.5)                 | 2.3<br>(1.6–3.1)                      | 0.1<br>(0.0–0.2)  |
| 35,000–49,999                       | 26.9<br>(25.1–28.7)          | 22.3<br>(20.7–24.1)        | 3.2<br>(2.4–4.2)               | 4.2<br>(3.3–5.3)                     | 2.7<br>(2.0–3.7)          | 0.5<br>(0.4–0.8)                 | 1.6<br>(1.2–2.2)                      | 0.5<br>(0.1–2.0)  |
| 50,000–74,999                       | 22.0<br>(20.7–23.5)          | 16.0<br>(14.9–17.2)        | 3.5<br>(2.9–4.1)               | 5.0<br>(4.1–6.0)                     | 2.4<br>(1.9–3.1)          | 0.5<br>(0.4–0.8)                 | 1.7<br>(1.2–2.4)                      | 0.2<br>(0.1–0.4)  |
| ≥75,000                             | 19.2<br>(18.2–20.4)          | 12.0<br>(11.2–12.9)        | 3.8<br>(3.2–4.4)               | 5.8<br>(5.1–6.6)                     | 1.9<br>(1.5–2.4)          | 0.5<br>(0.3–0.8)                 | 1.2<br>(0.9–1.5)                      | 0.3<br>(0.1–0.8)  |

\* Current tobacco use is defined as the use of any tobacco product, including cigarettes, smokeless tobacco, cigars, pipes, bidis, kreteks, or other tobacco products.

† n = 99,286 for any tobacco use; 99,029 for cigarette use, current other tobacco use, and current smokeless tobacco use; and 98,637 for current polytobacco use, cigarette and smokeless tobacco use, cigarette and other tobacco use, and cigarette, smokeless tobacco, and other tobacco products use.

§ Persons who reported smoking at least 100 cigarettes during their lifetimes and who at the time of interview, reported smoking every day or some days.

¶ Current smokeless tobacco is defined as persons who reported everyday use of chewing tobacco, snuff, or snus.

\*\* Current use of other tobacco products is defined as persons who reported everyday use of cigars, pipes, bidis, kreteks, or other tobacco products not listed.

†† Polytobacco use is defined as the use of cigarettes in combination with some other form of tobacco, including smokeless tobacco, cigars, pipes, bidis, kreteks, or other tobacco products not listed.

§§ Confidence interval.

¶¶ p<0.05 for any tobacco use between men and women

\*\*\* p<0.05 for any tobacco use between non-Hispanic whites and non-Hispanic blacks compared with Hispanics.

††† General Educational Development certificate or diploma.

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

Cigarettes are the predominate form of tobacco used in the United States; however, other forms of tobacco also are used by adults and youths, and some persons use more than one form of tobacco (polytobacco use).

**What is added by this report?**

During 2008, polytobacco use was 2.5% among U.S. adults and most prevalent among men, persons aged 18–24 years, single adults, persons with no more than a high school education, and persons with annual incomes less than \$35,000. The most common form of polytobacco use was current use of cigarettes and other tobacco products (cigars, bidis, kreteks, or other tobacco products).

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

Surveillance, prevention, and cessation interventions need to address all forms of tobacco use to lower the public health burden of tobacco use throughout the United States. Clinicians should identify persons who use smokeless tobacco and other tobacco products, urge them to quit, and provide access to cessation counseling.

From 2005 to 2006, expenditures for smokeless tobacco product advertising increased from \$250.8 million to \$354.1 million (10). Additionally, smokeless tobacco use has increased among some population subgroups, especially young adults, non-Hispanic white men, and Hispanic men (4). The increase in advertising expenditures and increased use among subgroups both warrant continued surveillance and monitoring of smokeless tobacco use and use of other tobacco products.

The Family Smoking Prevention and Tobacco Control Act,<sup>11</sup> enacted in 2009, gives the Food and Drug Administration (FDA) authority to regulate the content, sales, and marketing of cigarettes, smokeless tobacco, and roll-your-own tobacco. Under this authority, new tobacco products cannot be introduced in the United States and existing products cannot be changed without FDA approval. The recent increased focus from the tobacco industry on smokeless tobacco products, combined with the unlikelihood of achieving *Healthy People 2010* tobacco objectives, suggests the need for enhanced surveillance and implementation of comprehensive tobacco-control strategies (e.g., increased excise taxes on all tobacco products

and counter-marketing messages) for other tobacco products, in addition to cigarettes.

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<sup>11</sup> Pub. L. No. 111-31, 123 Stat. 1776 (June 22, 2009). Available at <http://www.gpo.gov/fdsys/pkg/PLAW-111publ31/content-detail.html>.

## Vital Signs: State-Specific Obesity Prevalence Among Adults — United States, 2009

On August 3, this report was posted as an MMWR Early Release on the MMWR website (<http://www.cdc.gov/mmwr>).

### ABSTRACT

**Background:** Obesity is a costly condition that can reduce quality of life and increases the risk for many serious chronic diseases and premature death. The U.S. Surgeon General issued the *Call to Action to Prevent and Decrease Overweight and Obesity* in 2001, and in 2007, no state had met the *Healthy People 2010* objective to reduce obesity prevalence among adults to 15%.

**Methods:** CDC used 2009 Behavioral Risk Factor Surveillance System survey data to update estimates of national and state-specific obesity prevalence. Obesity was calculated based on self-reported weight and height and defined as body mass index (weight [kg] / height [m]<sup>2</sup>) ≥30.

**Results:** Overall self-reported obesity prevalence in the United States was 26.7%. Non-Hispanic blacks (36.8%), Hispanics (30.7%), those who did not graduate from high school (32.9%), and persons aged 50–59 years (31.1%) and 60–69 years (30.9%) were disproportionately affected. By state, obesity prevalence ranged from 18.6% in Colorado to 34.4% in Mississippi; only Colorado and the District of Columbia (19.7%) had prevalences of <20%; nine states had prevalences of ≥30%.

**Conclusions:** In 2009, no state met the *Healthy People 2010* obesity target of 15%, and the self-reported overall prevalence of obesity among U.S. adults had increased 1.1 percentage points from 2007.

**Implications for Public Health Practice:** Obesity should be addressed through a comprehensive approach across multiple settings and sectors that can change individual nutrition and physical activity behaviors and the environments and policies that affect these behaviors. New and continued national, state, and community-level surveillance of obesity, its behavioral risk factors, and the environments and policies that affect these behaviors is critical to monitor progress in obesity prevention and to target interventions.

Over the past decade, obesity has become recognized as a national health threat and a major public health challenge. In 2007–2008, based on measured weights and heights (1), approximately 72.5 million adults in the United States were obese (CDC, unpublished data, 2010). Obese adults are at increased risk for many serious health conditions, including coronary heart disease, hypertension, stroke, type 2 diabetes, certain types of cancer, and premature death (2,3). Adult obesity also is associated with reduced quality of life, social stigmatization, and discrimination (2,3). From 1987 to 2001, diseases associated with obesity accounted for 27% of the increases in U.S. medical costs (4). For 2006, medical costs associated with obesity were estimated at as much as \$147 billion (2008 dollars); among all payers, obese

persons had estimated medical costs that were \$1,429 higher than persons of normal weight (5). In 2001, the Surgeon General called for strong public health action to prevent and decrease overweight and obesity (3).

The Behavioral Risk Factor Surveillance System (BRFSS) measures height and weight through self-report in state-based surveys; data are released every year. In 2000, a *Healthy People 2010* objective was established to reduce the prevalence of obesity among adults in the United States to 15%.\* This objective is based on obesity prevalence from measured height and weight among participants in the National Health and Nutrition Examination Survey (NHANES). Because NHANES provides only national and not state-specific estimates, CDC uses the state-based

\*Objective 19-2. Available at <http://www.healthypeople.gov/data>.

BRFSS data and applies the 15% prevalence figure as a reasonable target for self-reported obesity prevalence in the states. As of 2007 (6), no state had met the *Healthy People 2010* objective to reduce the prevalence of obesity among U.S. adults to 15%. To characterize the most recent trends, CDC used data from the 2009 BRFSS survey to estimate the national and state-specific prevalence of obesity among adults aged  $\geq 18$  years.

## Methods

BRFSS is an ongoing annual, state-based, random-digit-dialed landline telephone survey of the U.S. civilian, noninstitutionalized adult population. States use BRFSS data to identify and monitor the prevalence of behaviors and health conditions and to develop and evaluate risk prevention initiatives. BRFSS data are weighted for probability of selection to match the age-, race-, and sex-specific populations of participating states and the District of Columbia (DC). Since 1984, BRFSS has asked survey respondents to report their weight and height. All 50 states and DC have contributed these data since 1996. The body mass index (BMI) (weight [kg] / height [m]<sup>2</sup>) is calculated for each participant, based on self-reported weight and height. Obesity is defined as BMI  $\geq 30$ . For consistency with previous analyses, respondents reporting weight  $\geq 500$  pounds or height  $\geq 7$  feet or  $< 3$  feet were excluded, and unadjusted prevalence estimates were reported for each state and by selected sociodemographic characteristics. In the 2009 BRFSS survey, Council of American Survey and Research Organizations (CASRO) response rates ranged from 37.9 to 66.9% (median: 52.9%), and cooperation rates ranged from 55.5% to 88.0% (median: 75.0%).<sup>†</sup> A total of 405,102 persons participated. Prevalence estimates were compared with previously published estimates from the 2000, 2005, and 2007 surveys (6,7). T-tests were used to assess statistical differences in the total prevalence estimates.

## Results

The overall estimated prevalence of obesity was 26.7% (95% confidence interval [CI] = 26.4%–27.0%). Obesity prevalence varied substantially by selected characteristics (Table), with the greatest prevalences found among adults aged 50–59 and 60–69 years

<sup>†</sup> Information available at [http://www.cdc.gov/brfss/technical\\_infodata/quality.htm](http://www.cdc.gov/brfss/technical_infodata/quality.htm).

### Key Points for the Public

- Obesity is common, serious, and costly. Approximately 72.5 million U.S. adults are obese. Obesity is a factor contributing to several leading causes of death, including heart disease, stroke, diabetes, and some types of cancer.
- Recent estimates of the annual medical costs of obesity are as high as \$147 billion. On average, persons who are obese have medical costs that are \$1,429 more than persons of normal weight.
- States vary widely in the percentage of their adults who are obese. In 2009, at least 30% of adults were obese in nine states, compared with no states in 2000.
- Past efforts and investments to prevent and control obesity have not been adequate.
- The federal government is intensifying efforts to address the problem through new initiatives such as the Let's Move! campaign, the Communities Putting Prevention to Work program, and the Patient Protection and Affordable Care Act.
- Additional information is available at <http://www.cdc.gov/vitalsigns>.

(31.1% and 30.9%, respectively), non-Hispanic blacks overall (36.8%), non-Hispanic black women (41.9%), Hispanics (30.7%), and residents of the Midwest (28.2%) and South (28.4%). For both men (22.9%) and women (18.6%), obesity prevalence was smallest among those with a college education; overall, prevalence was greatest among those who did not graduate from high school (32.9%), with prevalences of 29.6% among men and 36.4% among women.

The overall prevalence of 26.7% for 2009 is 1.1 percentage points (CI = 0.7–1.5) greater than the 25.6% (CI = 25.3%–25.9%) estimate for 2007 (6) ( $p < 0.001$ ). The 2009 prevalence is 2.8 percentage points greater than the 23.9% (CI = 23.6%–24.1%) estimate for 2005 ( $p < 0.001$ ) and 6.9 percentage points greater than the 19.8% (CI = 19.5%–20.1%) estimate for 2000 (7) ( $p < 0.001$ ).

Among states, the prevalence of adult obesity ranged from 18.6% in Colorado to 34.4% in Mississippi. Only Colorado and DC (19.7%) had prevalences of  $< 20\%$ . A total of 33 states had obesity prevalences of  $\geq 25\%$ ; nine of those states (Alabama,

TABLE. Self-reported prevalence of obesity\* among adults, by sex and selected characteristics — Behavioral Risk Factor Surveillance System, United States, 2009

| Characteristic                   | Overall<br>(N = 405,102) |                    | Men<br>(n = 158,455) |                    | Women<br>(n = 246,647) |                    |
|----------------------------------|--------------------------|--------------------|----------------------|--------------------|------------------------|--------------------|
|                                  | %                        | (95% CI†)          | %                    | (95% CI)           | %                      | (95% CI)           |
| <b>Total</b>                     | <b>26.7</b>              | <b>(26.4–27.0)</b> | <b>27.4</b>          | <b>(26.9–27.8)</b> | <b>26.0</b>            | <b>(25.7–26.4)</b> |
| <b>Age group (yrs)</b>           |                          |                    |                      |                    |                        |                    |
| 18–29                            | 20.3                     | (19.5–21.2)        | 20.1                 | (18.8–21.4)        | 20.6                   | (19.5–21.7)        |
| 30–39                            | 27.8                     | (27.1–28.6)        | 29.4                 | (28.2–30.7)        | 26.2                   | (25.3–27.1)        |
| 40–49                            | 29.4                     | (28.8–30.1)        | 31.0                 | (30.0–32.0)        | 27.8                   | (27.0–28.6)        |
| 50–59                            | 31.1                     | (30.6–31.7)        | 31.9                 | (31.1–32.8)        | 30.3                   | (29.6–31.0)        |
| 60–69                            | 30.9                     | (30.3–31.5)        | 30.4                 | (29.6–31.3)        | 31.3                   | (30.6–32.1)        |
| ≥70                              | 20.5                     | (20.0–21.0)        | 19.8                 | (19.0–20.5)        | 21.0                   | (20.4–21.6)        |
| <b>Race/Ethnicity</b>            |                          |                    |                      |                    |                        |                    |
| White, non-Hispanic              | 25.2                     | (24.9–25.5)        | 27.1                 | (26.6–27.6)        | 23.3                   | (23.0–23.7)        |
| Black, non-Hispanic              | 36.8                     | (35.7–37.9)        | 30.9                 | (29.2–32.8)        | 41.9                   | (40.5–43.2)        |
| Hispanic                         | 30.7                     | (29.5–31.9)        | 30.6                 | (28.7–32.5)        | 30.8                   | (29.4–32.2)        |
| Other race                       | 16.7                     | (15.5–18.0)        | 16.9                 | (15.2–18.8)        | 16.5                   | (15.0–18.1)        |
| <b>Educational level</b>         |                          |                    |                      |                    |                        |                    |
| Less than high school graduate   | 32.9                     | (31.8–34.0)        | 29.6                 | (27.9–31.4)        | 36.4                   | (35.1–37.8)        |
| High school graduate             | 29.5                     | (29.0–30.1)        | 29.5                 | (28.6–30.4)        | 29.5                   | (28.9–30.2)        |
| Some college                     | 29.1                     | (28.6–29.7)        | 30.6                 | (29.6–31.5)        | 27.9                   | (27.2–28.5)        |
| College graduate                 | 20.8                     | (20.4–21.2)        | 22.9                 | (22.2–23.5)        | 18.6                   | (18.2–19.1)        |
| <b>Census region<sup>§</sup></b> |                          |                    |                      |                    |                        |                    |
| Northeast                        | 24.3                     | (23.6–24.9)        | 25.2                 | (24.2–26.2)        | 23.4                   | (22.6–24.2)        |
| Midwest                          | 28.2                     | (27.7–28.7)        | 29.2                 | (28.4–30.1)        | 27.2                   | (26.5–27.9)        |
| South                            | 28.4                     | (27.9–29.0)        | 28.8                 | (28.0–29.7)        | 28.1                   | (27.5–28.7)        |
| West                             | 24.4                     | (23.8–25.0)        | 25.1                 | (24.2–26.0)        | 23.7                   | (22.9–24.4)        |

\* Body mass index (BMI)  $\geq 30.0$ ; BMI was calculated from self-reported weight and height (weight [kg] / height [m]<sup>2</sup>).

† Confidence interval.

§ Additional information available at <http://www.census.gov>.

Arkansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, and West Virginia) had prevalences of  $\geq 30\%$  (Figure). In contrast, in 2000, 28 states had prevalences of  $< 20\%$ , and no state had a prevalence of  $\geq 30\%$ . In 2005, four states had prevalences of  $< 20\%$ , and three states had prevalences of  $\geq 30\%$ . In 2007, only one state had a prevalence of  $< 20\%$ , and three states had prevalences of  $\geq 30\%$ .

## Conclusions and Comment

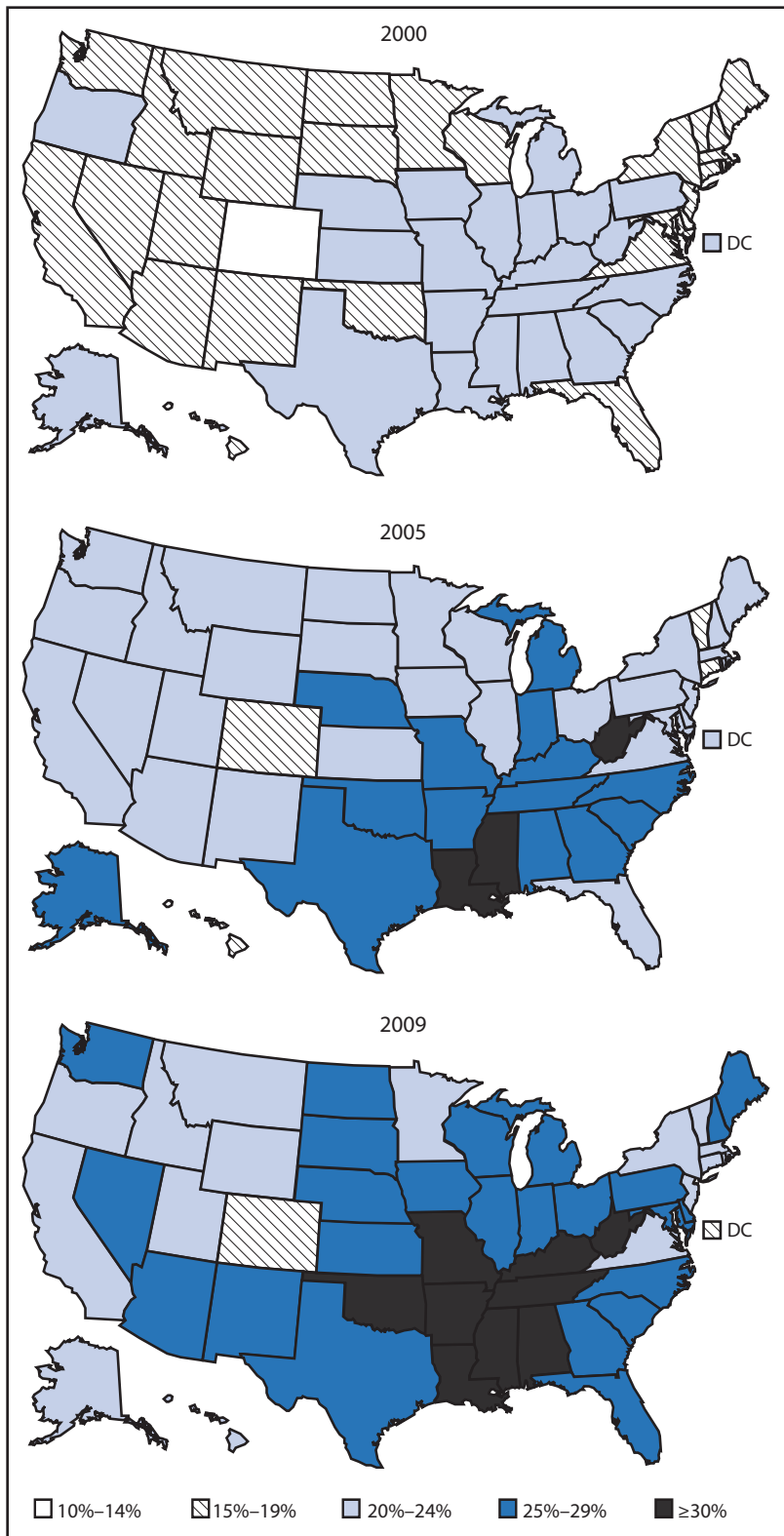
In 2009, all states continued to have high prevalences of obesity among adults, although the prevalences varied geographically. No state met the *Healthy People 2010* target of 15%, and the number of states with obesity prevalence of  $\geq 30\%$  increased from none in 2000 to nine in 2009. The results of this report also indicate that the prevalence of adult obesity in the United States, as measured by BRFSS, continued to increase. Using 2007 population data for both years, the increase of 1.1 percentage points from 2007 to 2009 corresponds to approximately 2.4 million additional adults whose self-reported heights and weights yielded a BMI of  $\geq 30$ . Previously documented disparities in obesity prevalence continued by

age, education, and race/ethnicity (6,7). Of particular concern are the high prevalences among non-Hispanic black women and persons with less education.

BRFSS estimates of obesity prevalence rely on self-reported height and weight, which likely produces underestimates because both men and women tend to overestimate their height and women tend to underestimate their weight (8). The overall 2009 BRFSS obesity prevalence estimate of 26.7% is 7.2 percentage points lower than the national 2007–2008 estimate of 33.9% from NHANES, for which height and weight were measured rather than self-reported (1).

In the BRFSS survey, the prevalence of obesity varied from 18.6% to 34.4% among states, with greater prevalences observed in the South and Midwest. Differences in demographic characteristics associated with obesity, dietary and physical activity behaviors, or environments and policies that affect these behaviors might contribute to the variability. However, the finding that no state met the *Healthy People 2010* goal of 15% prevalence, despite the likelihood that state prevalences are underestimated, suggests that past efforts and investments to address the problem have not been sufficient. Thus, efforts need to be intensified.

FIGURE. Self-reported prevalence of obesity\* among adults — Behavioral Risk Factor Surveillance System, United States, 2000, 2005, and 2009



\* Body mass index (BMI)  $\geq 30.0$ ; BMI was calculated from self-reported weight and height (weight [kg] / height [m]<sup>2</sup>).

The problem of obesity is inherently complex, and no single strategy has been determined most effective. As such, the need for a comprehensive approach was stressed recently in *The Surgeon General's Vision for a Healthy and Fit Nation 2010*<sup>§</sup> and the 2010 report of the White House Task Force on Childhood Obesity.<sup>¶</sup> These reports highlight the need to 1) address both nutrition and physical activity, 2) work across multiple settings (e.g., medical-care sites, worksites, and communities) and multiple sectors (e.g., industry and government), and 3) change individual behaviors as well as the environments and policies that affect those behaviors. For example, research indicates that environmental and policy supports for physical activity (e.g., access and community design)\*\* and for nutrition (e.g., access to supermarkets) (9) are associated with increased physical activity and improved diet, including greater consumption of fruits and vegetables. A comprehensive approach also should use the best available evidence and should evaluate new strategies.

Based on the best available evidence, persons can support their personal weight goals by following the recommendations of the 2005 *Dietary Guidelines for Americans*<sup>††</sup> and the 2008 *Physical Activity Guidelines for Americans*.<sup>§§</sup> Health-care providers also can help their adult patients address obesity by following recommendations of the U.S. Preventive Services Task Force to screen for obesity and provide intensive counseling to those in need of weight loss.<sup>¶¶</sup> BMI measurement is increasingly included in clinical quality measurement and also has been included as a core objective to demonstrate “meaningful use” of electronic medical records, according to the Health Information Technology for Economic and Clinical Health Act.<sup>\*\*\*</sup> Worksites can follow recommendations of the Task Force on Community Preventive Services to implement programs intended to improve diet and physical activity to reduce weight in employees<sup>†††</sup> and can be supported in their efforts by toolkits

<sup>§</sup> Available at <http://www.surgeongeneral.gov/library/obesityvision/obesityvision2010.pdf>.

<sup>¶</sup> Available at [http://www.letsmove.gov/pdf/TFCO\\_Table\\_of\\_Contents.pdf](http://www.letsmove.gov/pdf/TFCO_Table_of_Contents.pdf).

\*\* Information available at <http://www.thecommunityguide.org/pa/index.html>.

†† Available at <http://www.health.gov/dietaryguidelines>.

§§ Available at <http://www.health.gov/paguidelines>.

¶¶ Information available at <http://www.ahrq.gov/clinic/pocketgd09/gcp09s2d.htm#obesity>.

\*\*\* Available at <http://edocket.access.gpo.gov/2010/pdf/2010-17207.pdf>.

††† Information available at <http://www.thecommunityguide.org/obesity/workprograms.html>.

such as CDC's LEAN *Works*.<sup>§§§</sup> Communities can address obesity by implementing recommended strategies such as those that increase the availability of affordable healthier food and beverages or create community infrastructures that support physical activity (10). States can help reduce obesity with statewide policies that address nutrition (e.g., increased fruit and vegetable consumption; breastfeeding initiation, duration, and exclusivity; and decreased consumption of high energy-dense foods and sugar-sweetened drinks), physical activity, or clinical services, or by supporting local groups in their efforts.

Intensified nationwide efforts to address obesity will be supported by recent federal initiatives such as the Let's Move! campaign,<sup>¶¶¶</sup> Communities Putting Prevention to Work program,<sup>\*\*\*\*</sup> and the Patient Protection and Affordable Care Act.<sup>††††</sup> For example, the Let's Move! campaign facilitates work across multiple sectors to solve the problem of childhood obesity in a generation. Together, these initiatives mobilize public and private resources and partnerships, provide guidance and funding to states and communities to change state and local environments and policies related to diet and physical activity, and help reduce financial barriers to screening.

The findings in this report are subject to at least three limitations. First, BRFSS excludes persons who do not have landline telephones. Adults who live in wireless-only households are more likely to be younger, to be black or Hispanic, and to have lower incomes and no health insurance coverage.<sup>§§§§</sup> These differences might affect obesity prevalence estimates. Second, the median CASRO response rate in BRFSS for 2009 was 52.9% and varied by state. The level of nonresponse might lead to bias in the results if respondents overall or by state have different characteristics related to obesity status than nonrespondents. Finally, it is unknown whether the extent of overestimation of height and underestimation of weight has changed over time, which could impact the self-reported trend data in this report.

New and continued national, state, and community-level surveillance of obesity, its behavioral risk factors (e.g., physical inactivity and consumption of sugar-

sweetened drinks or high energy-dense foods), and the environments and policies that affect these behaviors is needed to monitor progress in obesity prevention and to target and assess the impact of interventions.

### Reported by

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§§§ Available at <http://www.cdc.gov/leanworks>.

¶¶¶ Available at <http://www.letsmove.gov>.

\*\*\*\* Available at <http://www.cdc.gov/chronicdisease/recovery/community.htm>.

†††† Available at [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111\\_cong\\_public\\_laws&docid=f:publ148.111](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_public_laws&docid=f:publ148.111).

§§§§ Information available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201005.pdf>.

## Errata: Vol. 58, No. SS-10

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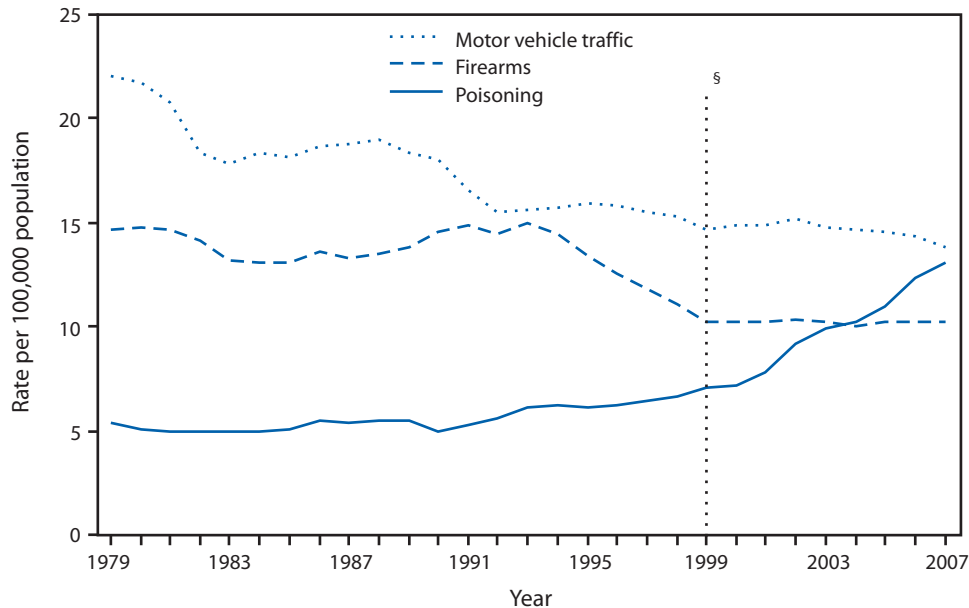
In the *MMWR Surveillance Summary* “Prevalence of Autism Spectrum Disorders—Autism and Developmental Disabilities Monitoring Network, United States, 2006,” three errors occurred. On page 1, the first sentence of the “Results” section should read, “For the 2006 surveillance year, 2,757 (0.9%) of **308,038** children aged 8 years residing in the 11 ADDM sites were identified as having an ASD, indicating an overall average prevalence of 9.0 per 1,000 population (95% confidence interval [CI] = 8.6–9.3).” On page 2, the first sentence of the third paragraph should read, “Before the 1980s, the term “autism” was used primarily to refer to autistic disorder and was thought to be rare, affecting approximately one in every 2,000 (**0.05%**) children (2,3).” On page 13, the y-axis for Figure 4 should be labeled “**Prevalence.**”



## QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

## Death Rates\* for the Three Leading Causes of Injury Death† — United States, 1979–2007



\* Per 100,000 population. Age-adjusted to the 2000 U.S. standard population.

† Injuries are from all manners, including unintentional, suicide, homicide, undetermined intent, legal intervention, and operations of war. Poisoning deaths include those resulting from drug overdose, those resulting from other misuse of drugs, and those associated with solid or liquid biologic substances, gases or vapors, or other substances such as pesticides or unspecified chemicals.

§ In 1999, *International Classification of Diseases, 10th Revision (ICD-10)* replaced the previous revision of the ICD (ICD-9). This resulted in approximately 5% fewer deaths being classified as motor vehicle traffic-related and 2% more deaths being classified as poisoning-related. Therefore, death rates for 1998 and earlier are not directly comparable with those computed after 1998. Little change was observed in the classification of firearm-related deaths from ICD-9 to ICD-10.

In 2007, the three leading causes of injury deaths in the United States were motor vehicle traffic, poisoning, and firearms. The age-adjusted death rate for poisoning more than doubled from 1979 to 2007, in contrast to the age-adjusted death rates for motor vehicle traffic and firearms, which decreased during this period. From 2006 to 2007, the age-adjusted poisoning death rate increased 6%, whereas the motor vehicle traffic death rate decreased 4%, and the firearm death rate did not change.

Sources: National Vital Statistics System, mortality data, available at <http://www.cdc.gov/nchs/deaths.htm>.

CDC WONDER, compressed mortality file, underlying cause-of-death, available at <http://wonder.cdc.gov/mortsql.html>.

## 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 July 31, 2010 (30th week)\*

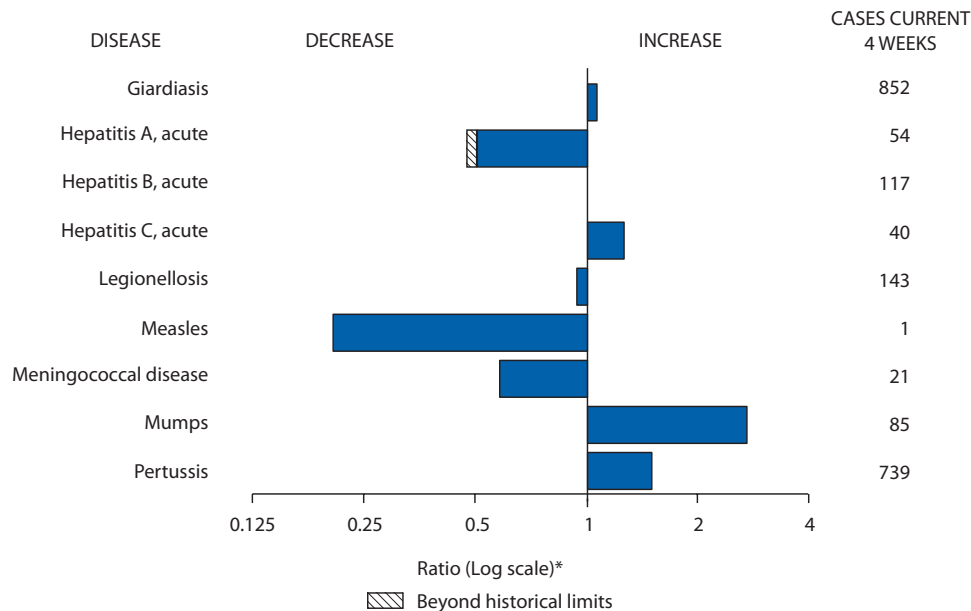
| Disease  | Current week | Cum 2010 | 5-year weekly average <sup>†</sup> | Total cases reported for previous years |      |      |       |      | States reporting cases during current week (No.) |
|--|--------------|----------|------------------------------------|---|------|------|-------|------|--|
|  |              |          |                                    | 2009                                    | 2008 | 2007 | 2006  | 2005 |  |
| Anthrax  | —            | —        | —                                  | 1                                       | —    | 1    | 1     | —    |  |
| Botulism, total  | —            | 44       | 3                                  | 118                                     | 145  | 144  | 165   | 135  |  |
| foodborne  | —            | 5        | 0                                  | 10                                      | 17   | 32   | 20    | 19   |  |
| infant   | —            | 31       | 2                                  | 83                                      | 109  | 85   | 97    | 85   |  |
| other (wound and unspecified)  | —            | 8        | 1                                  | 25                                      | 19   | 27   | 48    | 31   |  |
| Brucellosis  | 3            | 68       | 3                                  | 115                                     | 80   | 131  | 121   | 120  | GA (1), OR (1), CA (1)                           |
| Chancroid  | —            | 29       | 0                                  | 28                                      | 25   | 23   | 33    | 17   |  |
| Cholera  | —            | 2        | 0                                  | 10                                      | 5    | 7    | 9     | 8    |  |
| Cyclosporiasis <sup>§</sup>  | 4            | 104      | 6                                  | 141                                     | 139  | 93   | 137   | 543  | FL (3), TX (1)                                   |
| Diphtheria   | —            | —        | —                                  | —                                       | —    | —    | —     | —    |  |
| Domestic arboviral diseases <sup>§,¶</sup> :                         |              |          |                                    |   |      |      |       |      |  |
| California serogroup virus disease                                   | —            | 5        | 4                                  | 55                                      | 62   | 55   | 67    | 80   |  |
| Eastern equine encephalitis virus disease                            | —            | 2        | 0                                  | 4                                       | 4    | 4    | 8     | 21   |  |
| Powassan virus disease   | —            | 1        | 0                                  | 6                                       | 2    | 7    | 1     | 1    |  |
| St. Louis encephalitis virus disease                                 | —            | 2        | 0                                  | 12                                      | 13   | 9    | 10    | 13   |  |
| Western equine encephalitis virus disease                            | —            | —        | —                                  | —                                       | —    | —    | —     | —    |  |
| <i>Haemophilus influenzae</i> ,** invasive disease (age <5 yrs):     |              |          |                                    |   |      |      |       |      |  |
| serotype b   | —            | 6        | 0                                  | 35                                      | 30   | 22   | 29    | 9    |  |
| nonsertotype b   | —            | 118      | 3                                  | 236                                     | 244  | 199  | 175   | 135  |  |
| unknown serotype   | 2            | 129      | 3                                  | 178                                     | 163  | 180  | 179   | 217  | NY (1), NE (1)                                   |
| Hansen disease <sup>§</sup>  | 3            | 24       | 1                                  | 103                                     | 80   | 101  | 66    | 87   | FL (3)   |
| Hantavirus pulmonary syndrome <sup>§</sup>                           | —            | 10       | 1                                  | 20                                      | 18   | 32   | 40    | 26   |  |
| Hemolytic uremic syndrome, postdiarrheal <sup>§</sup>                | 1            | 87       | 7                                  | 242                                     | 330  | 292  | 288   | 221  | TN (1)   |
| HIV infection, pediatric (age <13 yrs) <sup>††</sup>                 | —            | —        | 1                                  | —                                       | —    | —    | —     | 380  |  |
| Influenza-associated pediatric mortality <sup>§,§§</sup>             | —            | 54       | 1                                  | 358                                     | 90   | 77   | 43    | 45   |  |
| Listeriosis  | 7            | 378      | 21                                 | 851                                     | 759  | 808  | 884   | 896  | NY (2), OH (1), FL (1), TX (1), CO (1), WA (1)   |
| Measles <sup>¶¶</sup>  | —            | 32       | 1                                  | 71                                      | 140  | 43   | 55    | 66   |  |
| Meningococcal disease, invasive <sup>***</sup> :                     |              |          |                                    |   |      |      |       |      |  |
| A, C, Y, and W-135   | 3            | 154      | 4                                  | 301                                     | 330  | 325  | 318   | 297  | MI (1), VA (1), WA (1)                           |
| serogroup B  | —            | 67       | 3                                  | 174                                     | 188  | 167  | 193   | 156  |  |
| other serogroup  | —            | 7        | 0                                  | 23                                      | 38   | 35   | 32    | 27   |  |
| unknown serogroup  | 4            | 232      | 9                                  | 482                                     | 616  | 550  | 651   | 765  | OH (2), MI (1), CA (1)                           |
| Mumps  | 7            | 2,238    | 14                                 | 1,991                                   | 454  | 800  | 6,584 | 314  | NYC (5), OH (1), MN (1)                          |
| Novel influenza A virus infections <sup>†††</sup>                    | —            | 1        | 0                                  | 43,774                                  | 2    | 4    | NN    | NN   |  |
| Plague   | —            | 1        | 0                                  | 8                                       | 3    | 7    | 17    | 8    |  |
| Poliomyelitis, paralytic   | —            | —        | —                                  | 1                                       | —    | —    | —     | 1    |  |
| Polio virus Infection, nonparalytic <sup>§</sup>                     | —            | —        | —                                  | —                                       | —    | —    | NN    | NN   |  |
| Psittacosis <sup>§</sup>   | —            | 4        | 0                                  | 9                                       | 8    | 12   | 21    | 16   |  |
| Q fever, total <sup>§,§§§</sup>                                      | —            | 61       | 3                                  | 114                                     | 120  | 171  | 169   | 136  |  |
| acute  | —            | 48       | 1                                  | 94                                      | 106  | —    | —     | —    |  |
| chronic  | —            | 13       | 0                                  | 20                                      | 14   | —    | —     | —    |  |
| Rabies, human  | —            | —        | —                                  | 4                                       | 2    | 1    | 3     | 2    |  |
| Rubella <sup>¶¶¶</sup>   | —            | 6        | 0                                  | 3                                       | 16   | 12   | 11    | 11   |  |
| Rubella, congenital syndrome   | —            | —        | —                                  | 2                                       | —    | —    | 1     | 1    |  |
| SARS-CoV <sup>§,****</sup>   | —            | —        | —                                  | —                                       | —    | —    | —     | —    |  |
| Smallpox <sup>§</sup>  | —            | —        | —                                  | —                                       | —    | —    | —     | —    |  |
| Streptococcal toxic-shock syndrome <sup>§</sup>                      | 1            | 107      | 2                                  | 161                                     | 157  | 132  | 125   | 129  | NY (1)   |
| Syphilis, congenital (age <1 yr) <sup>††††</sup>                     | —            | 102      | 8                                  | 423                                     | 431  | 430  | 349   | 329  |  |
| Tetanus  | —            | 2        | 0                                  | 18                                      | 19   | 28   | 41    | 27   |  |
| Toxic-shock syndrome (staphylococcal) <sup>§</sup>                   | 1            | 43       | 2                                  | 74                                      | 71   | 92   | 101   | 90   | MI (1)   |
| Trichinellosis   | —            | 1        | 0                                  | 13                                      | 39   | 5    | 15    | 16   |  |
| Tularemia  | —            | 42       | 5                                  | 93                                      | 123  | 137  | 95    | 154  |  |
| Typhoid fever  | 5            | 201      | 8                                  | 397                                     | 449  | 434  | 353   | 324  | FL (1), CA (4)                                   |
| Vancomycin-intermediate <i>Staphylococcus aureus</i> <sup>§</sup>    | 1            | 56       | 1                                  | 78                                      | 63   | 37   | 6     | 2    | NY (1)   |
| Vancomycin-resistant <i>Staphylococcus aureus</i> <sup>§</sup>       | —            | 1        | —                                  | 1                                       | —    | 2    | 1     | 3    |  |
| Vibriosis (noncholera <i>Vibrio</i> species infections) <sup>§</sup> | 18           | 253      | 15                                 | 789                                     | 588  | 549  | NN    | NN   | OH (3), MD (1), GA (1), FL (8), WA (5)           |
| Viral hemorrhagic fever <sup>§§§§</sup>                              | —            | 1        | —                                  | NN                                      | NN   | NN   | NN    | NN   |  |
| Yellow fever   | —            | —        | —                                  | —                                       | —    | —    | —     | —    |  |

See Table I 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 July 31, 2010 (30th week)\***

—: No reported cases. N: Not reportable. NN: Not Nationally Notifiable Cum: Cumulative year-to-date counts.  
 \* Incidence data for reporting years 2009 and 2010 are provisional, whereas data for 2005 through 2008 are finalized.  
 † Calculated by summing the incidence counts for the current week, the 2 weeks preceding the current week, and the 2 weeks following the current week, for a total of 5 preceding years. Additional information is available at <http://www.cdc.gov/ncphi/diss/nndss/phs/files/5yearweeklyaverage.pdf>.  
 ‡ Not reportable in all states. Data from states where the condition is not reportable are excluded from this table except starting in 2007 for the domestic arboviral diseases, STD data, TB data, and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at <http://www.cdc.gov/ncphi/diss/nndss/phs/infdis.htm>.  
 ¶ Includes both neuroinvasive and nonneuroinvasive. Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ArboNET Surveillance). Data for West Nile virus are available in Table II.  
 \*\* Data for *H. influenzae* (all ages, all serotypes) are available in Table II.  
 †† Updated monthly from reports to the Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Implementation of HIV reporting influences the number of cases reported. Updates of pediatric HIV data have been temporarily suspended until upgrading of the national HIV/AIDS surveillance data management system is completed. Data for HIV/AIDS, when available, are displayed in Table IV, which appears quarterly.  
 ††† Updated weekly from reports to the Influenza Division, National Center for Immunization and Respiratory Diseases. Since April 26, 2009, a total of 286 influenza-associated pediatric deaths associated with 2009 influenza A (H1N1) virus infection have been reported. Since August 30, 2009, a total of 279 influenza-associated pediatric deaths occurring during the 2009–10 influenza season have been reported. A total of 133 influenza-associated pediatric deaths occurring during the 2008–09 influenza season have been reported.  
 ¶¶ No measles cases were reported for the current week.  
 \*\*\* Data for meningococcal disease (all serogroups) are available in Table II.  
 †††† CDC discontinued reporting of individual confirmed and probable cases of 2009 pandemic influenza A (H1N1) virus infections on July 24, 2009. During 2009, three cases of novel influenza A virus infections, unrelated to the 2009 pandemic influenza A (H1N1) virus, were reported to CDC. The one case of novel influenza A virus infection reported to CDC during 2010 was identified as swine influenza A (H3N2) virus and is unrelated to pandemic influenza A (H1N1) virus.  
 ††††† In 2009, Q fever acute and chronic reporting categories were recognized as a result of revisions to the Q fever case definition. Prior to that time, case counts were not differentiated with respect to acute and chronic Q fever cases.  
 ¶¶¶ No rubella cases were reported for the current week.  
 \*\*\*\* Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases.  
 ††††† Updated weekly from reports to the Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention.  
 †††††† There was one case of viral hemorrhagic fever reported during week 12. The one case report was confirmed as lassa fever. See Table II for dengue hemorrhagic fever.

**FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals July 31, 2010, 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.

**Notifiable Disease Data Team and 122 Cities Mortality Data Team**  
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TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending July 31, 2010, and August 1, 2009 (30th week)\*

| Reporting area       | <i>Chlamydia trachomatis</i> infection |                   |        |          |          | Cryptosporidiosis |                   |     |          |          |
|----------------------|--|-------------------|--------|----------|----------|-------------------|-------------------|-----|----------|----------|
|                      | Current week                           | Previous 52 weeks |        | Cum 2010 | Cum 2009 | Current week      | Previous 52 weeks |     | Cum 2010 | Cum 2009 |
|                      |  | Med               | Max    |          |          |                   | Med               | Max |          |          |
| <b>United States</b> | 11,017                                 | 23,403            | 26,098 | 654,299  | 723,850  | 121               | 121               | 284 | 3,377    | 3,523    |
| <b>New England</b>   | 568                                    | 759               | 1,396  | 22,427   | 23,080   | 1                 | 7                 | 50  | 219      | 216      |
| Connecticut          | —                                      | 216               | 736    | 5,469    | 6,739    | —                 | 0                 | 44  | 44       | 38       |
| Maine†               | 61                                     | 48                | 75     | 1,431    | 1,413    | 1                 | 1                 | 4   | 36       | 20       |
| Massachusetts        | 407                                    | 396               | 638    | 11,543   | 10,987   | —                 | 3                 | 15  | 59       | 76       |
| New Hampshire        | 47                                     | 39                | 116    | 1,269    | 1,194    | —                 | 1                 | 6   | 35       | 37       |
| Rhode Island†        | 40                                     | 70                | 130    | 1,995    | 2,070    | —                 | 0                 | 8   | 8        | 4        |
| Vermont†             | 13                                     | 24                | 63     | 720      | 677      | —                 | 1                 | 9   | 37       | 41       |
| <b>Mid. Atlantic</b> | 2,924                                  | 3,179             | 4,619  | 96,454   | 90,038   | 25                | 15                | 38  | 391      | 406      |
| New Jersey           | 387                                    | 462               | 718    | 14,955   | 14,355   | —                 | 0                 | 5   | —        | 29       |
| New York (Upstate)   | 807                                    | 664               | 2,530  | 19,056   | 16,578   | 8                 | 3                 | 16  | 83       | 91       |
| New York City        | 1,184                                  | 1,178             | 2,144  | 35,927   | 33,895   | —                 | 1                 | 5   | 35       | 48       |
| Pennsylvania         | 546                                    | 865               | 1,092  | 26,516   | 25,210   | 17                | 9                 | 19  | 273      | 238      |
| <b>E.N. Central</b>  | 1,049                                  | 3,568             | 4,413  | 97,539   | 117,354  | 34                | 29                | 73  | 817      | 855      |
| Illinois             | 19                                     | 880               | 1,322  | 20,808   | 35,859   | —                 | 3                 | 7   | 86       | 82       |
| Indiana              | —                                      | 345               | 774    | 9,941    | 13,780   | —                 | 4                 | 11  | 102      | 155      |
| Michigan             | 668                                    | 889               | 1,417  | 27,743   | 27,083   | 2                 | 6                 | 12  | 168      | 147      |
| Ohio                 | 103                                    | 962               | 1,077  | 27,162   | 28,302   | 19                | 7                 | 13  | 220      | 226      |
| Wisconsin            | 259                                    | 407               | 495    | 11,885   | 12,330   | 13                | 10                | 39  | 241      | 245      |
| <b>W.N. Central</b>  | 54                                     | 1,354             | 1,651  | 37,623   | 40,955   | 12                | 22                | 59  | 572      | 524      |
| Iowa                 | 24                                     | 181               | 294    | 5,621    | 5,617    | 1                 | 4                 | 13  | 139      | 124      |
| Kansas               | 6                                      | 191               | 381    | 5,320    | 5,954    | 2                 | 2                 | 6   | 67       | 49       |
| Minnesota            | —                                      | 270               | 337    | 7,415    | 8,394    | —                 | 3                 | 31  | 98       | 131      |
| Missouri             | —                                      | 489               | 606    | 13,711   | 15,201   | 6                 | 3                 | 18  | 127      | 101      |
| Nebraska†            | —                                      | 96                | 237    | 2,792    | 3,097    | 2                 | 2                 | 9   | 72       | 50       |
| North Dakota         | 6                                      | 35                | 93     | 1,083    | 959      | 1                 | 0                 | 18  | 13       | 6        |
| South Dakota         | 18                                     | 60                | 82     | 1,681    | 1,733    | —                 | 2                 | 10  | 56       | 63       |
| <b>S. Atlantic</b>   | 2,134                                  | 4,541             | 5,681  | 128,997  | 148,807  | 17                | 18                | 51  | 521      | 547      |
| Delaware             | 79                                     | 87                | 156    | 2,450    | 2,747    | —                 | 0                 | 2   | 3        | 2        |
| District of Columbia | —                                      | 102               | 178    | 2,798    | 4,205    | —                 | 0                 | 1   | 2        | 5        |
| Florida              | 698                                    | 1,402             | 1,669  | 41,926   | 43,108   | 6                 | 8                 | 24  | 204      | 173      |
| Georgia              | —                                      | 366               | 1,323  | 7,656    | 24,097   | 5                 | 5                 | 31  | 179      | 215      |
| Maryland†            | —                                      | 452               | 1,031  | 12,652   | 13,045   | —                 | 1                 | 3   | 17       | 25       |
| North Carolina       | —                                      | 802               | 1,562  | 26,021   | 25,216   | —                 | 1                 | 6   | 11       | 59       |
| South Carolina†      | 529                                    | 524               | 720    | 15,684   | 16,185   | —                 | 1                 | 7   | 37       | 28       |
| Virginia†            | 783                                    | 595               | 902    | 17,747   | 18,020   | 5                 | 2                 | 8   | 60       | 33       |
| West Virginia        | 45                                     | 67                | 137    | 2,063    | 2,184    | 1                 | 0                 | 2   | 8        | 7        |
| <b>E.S. Central</b>  | 1,323                                  | 1,716             | 2,407  | 49,864   | 54,426   | —                 | 4                 | 10  | 113      | 109      |
| Alabama†             | 443                                    | 473               | 656    | 14,279   | 16,117   | —                 | 1                 | 5   | 41       | 39       |
| Kentucky             | 299                                    | 312               | 642    | 9,146    | 7,107    | —                 | 1                 | 6   | 39       | 28       |
| Mississippi          | 362                                    | 409               | 784    | 10,515   | 14,013   | —                 | 0                 | 3   | 6        | 8        |
| Tennessee†           | 219                                    | 587               | 734    | 15,924   | 17,189   | —                 | 1                 | 5   | 27       | 34       |
| <b>W.S. Central</b>  | 344                                    | 2,870             | 4,578  | 83,369   | 95,459   | 6                 | 8                 | 40  | 171      | 214      |
| Arkansas†            | 324                                    | 238               | 402    | 5,548    | 8,287    | 3                 | 1                 | 4   | 20       | 23       |
| Louisiana            | —                                      | 245               | 1,055  | 2,922    | 17,175   | —                 | 1                 | 4   | 18       | 24       |
| Oklahoma             | 20                                     | 262               | 1,338  | 8,346    | 8,636    | 2                 | 2                 | 9   | 43       | 48       |
| Texas†               | —                                      | 2,143             | 3,208  | 66,553   | 61,361   | 1                 | 5                 | 30  | 90       | 119      |
| <b>Mountain</b>      | 649                                    | 1,516             | 2,118  | 41,115   | 43,215   | 6                 | 9                 | 25  | 258      | 287      |
| Arizona              | 122                                    | 488               | 713    | 12,516   | 14,907   | —                 | 0                 | 3   | 15       | 23       |
| Colorado             | 297                                    | 405               | 709    | 11,061   | 9,057    | 4                 | 2                 | 10  | 76       | 70       |
| Idaho†               | 1                                      | 66                | 192    | 1,710    | 2,001    | 1                 | 2                 | 6   | 48       | 46       |
| Montana†             | 47                                     | 57                | 74     | 1,689    | 1,757    | —                 | 1                 | 4   | 29       | 25       |
| Nevada†              | —                                      | 175               | 478    | 5,463    | 5,771    | —                 | 0                 | 2   | 8        | 11       |
| New Mexico†          | 105                                    | 168               | 453    | 4,098    | 4,995    | —                 | 2                 | 8   | 40       | 78       |
| Utah                 | 68                                     | 117               | 175    | 3,507    | 3,613    | 1                 | 1                 | 4   | 32       | 19       |
| Wyoming†             | 9                                      | 35                | 70     | 1,071    | 1,114    | —                 | 0                 | 2   | 10       | 15       |
| <b>Pacific</b>       | 1,972                                  | 3,483             | 5,350  | 96,911   | 110,516  | 20                | 12                | 27  | 315      | 365      |
| Alaska               | —                                      | 105               | 146    | 3,244    | 3,083    | —                 | 0                 | 1   | 2        | 3        |
| California           | 1,698                                  | 2,742             | 4,406  | 78,765   | 84,837   | 12                | 8                 | 20  | 194      | 200      |
| Hawaii               | —                                      | 113               | 159    | 2,942    | 3,585    | —                 | 0                 | 0   | —        | 1        |
| Oregon               | —                                      | 136               | 468    | 1,367    | 6,266    | 2                 | 2                 | 10  | 74       | 116      |
| Washington           | 274                                    | 385               | 638    | 10,593   | 12,745   | 6                 | 1                 | 8   | 45       | 45       |
| American Samoa       | —                                      | 0                 | 0      | —        | —        | N                 | 0                 | 0   | N        | N        |
| C.N.M.I.             | —                                      | —                 | —      | —        | —        | —                 | —                 | —   | —        | —        |
| Guam                 | —                                      | 4                 | 31     | 157      | 230      | —                 | 0                 | 0   | —        | —        |
| Puerto Rico          | —                                      | 93                | 266    | 2,694    | 4,710    | N                 | 0                 | 0   | N        | N        |
| U.S. Virgin Islands  | —                                      | 8                 | 15     | 132      | 335      | —                 | 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.

\* Incidence data for reporting years 2009 and 2010 are provisional. Data for HIV/AIDS, AIDS, and TB, when available, are displayed in Table IV, which appears quarterly.

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

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending July 31, 2010, and August 1, 2009 (30th week)\*

| Reporting area              | Dengue Virus Infection    |                   |    |          |          |                                       |                   |   |          |          |
|-----------------------------|---------------------------|-------------------|----|----------|----------|---------------------------------------|-------------------|---|----------|----------|
|                             | Dengue Fever <sup>†</sup> |                   |    |          |          | Dengue Hemorrhagic Fever <sup>‡</sup> |                   |   |          |          |
|                             | Current week              | Previous 52 weeks |    | Cum 2010 | Cum 2009 | Current week                          | Previous 52 weeks |   | Cum 2010 | Cum 2009 |
|                             | Med                       | Max               |    |          |          | Med                                   | Max               |   |          |          |
| <b>United States</b>        | —                         | 1                 | 10 | 121      | NN       | —                                     | 0                 | 1 | 1        | NN       |
| <b>New England</b>          | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Connecticut                 | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Maine <sup>¶</sup>          | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Massachusetts               | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| New Hampshire               | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Rhode Island <sup>¶</sup>   | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Vermont <sup>¶</sup>        | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>Mid. Atlantic</b>        | —                         | 0                 | 4  | 27       | NN       | —                                     | 0                 | 0 | —        | NN       |
| New Jersey                  | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| New York (Upstate)          | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| New York City               | —                         | 0                 | 4  | 23       | NN       | —                                     | 0                 | 0 | —        | NN       |
| Pennsylvania                | —                         | 0                 | 2  | 4        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>E.N. Central</b>         | —                         | 0                 | 2  | 5        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Illinois                    | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Indiana                     | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Michigan                    | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Ohio                        | —                         | 0                 | 2  | 5        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Wisconsin                   | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>W.N. Central</b>         | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Iowa                        | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Kansas                      | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Minnesota                   | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Missouri                    | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Nebraska <sup>¶</sup>       | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| North Dakota                | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| South Dakota                | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>S. Atlantic</b>          | —                         | 0                 | 10 | 76       | NN       | —                                     | 0                 | 1 | 1        | NN       |
| Delaware                    | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| District of Columbia        | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Florida                     | —                         | 0                 | 9  | 66       | NN       | —                                     | 0                 | 1 | 1        | NN       |
| Georgia                     | —                         | 0                 | 2  | 5        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Maryland <sup>¶</sup>       | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| North Carolina              | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| South Carolina <sup>¶</sup> | —                         | 0                 | 1  | 4        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Virginia <sup>¶</sup>       | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| West Virginia               | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>E.S. Central</b>         | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Alabama <sup>¶</sup>        | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Kentucky                    | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Mississippi                 | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Tennessee <sup>¶</sup>      | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>W.S. Central</b>         | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Arkansas <sup>¶</sup>       | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Louisiana                   | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Oklahoma                    | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Texas <sup>¶</sup>          | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>Mountain</b>             | —                         | 0                 | 1  | 3        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Arizona                     | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Colorado                    | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Idaho <sup>¶</sup>          | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Montana <sup>¶</sup>        | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Nevada <sup>¶</sup>         | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| New Mexico <sup>¶</sup>     | —                         | 0                 | 1  | 1        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Utah                        | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Wyoming <sup>¶</sup>        | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| <b>Pacific</b>              | —                         | 0                 | 2  | 7        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Alaska                      | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| California                  | —                         | 0                 | 1  | 4        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Hawaii                      | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Oregon                      | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Washington                  | —                         | 0                 | 2  | 3        | NN       | —                                     | 0                 | 0 | —        | NN       |
| American Samoa              | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| C.N.M.I.                    | —                         | —                 | —  | —        | NN       | —                                     | —                 | — | —        | NN       |
| Guam                        | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |
| Puerto Rico                 | —                         | 12                | 83 | 1,054    | NN       | —                                     | 0                 | 3 | 25       | NN       |
| U.S. Virgin Islands         | —                         | 0                 | 0  | —        | NN       | —                                     | 0                 | 0 | —        | NN       |

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.

\* Incidence data for reporting years 2009 and 2010 are provisional.

† Dengue Fever includes cases that meet criteria for Dengue Fever with hemorrhage.

‡ DHF includes cases that meet criteria for dengue shock syndrome (DSS), a more severe form of DHF.

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























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