Update: Investigation of Bioterrorism-Related Anthrax—Connecticut, 2001

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CDC and state and local health departments continue investigating cases of bioterrorism-related anthrax. This report revises the number of suspected cases and updates the investigation of a 94-year-old Connecticut (CT) resident who died from inhalational anthrax.

As of December 5, a total of 22 cases of anthrax have been identified; 11 were confirmed as inhalational anthrax, and 11 (seven confirmed and four suspected) were cutaneous. A 54-year-old man who lived in Delaware and who worked at a postal facility in New Jersey (NJ) previously had been classified as having a suspected case of cutaneous anthrax. Additional laboratory findings indicate that the patient’s illness no longer meets the CDC surveillance case definition for anthrax. Initially, he was classified as having a suspected case because of a lesion on his left hand and elevated levels of antibody (IgG) to the protective antigen component of anthrax toxin. Subsequent biopsies of the skin lesion did not reveal Bacillus anthracis in the tissue, and additional confirmatory antibody tests on serum specimens were negative.

The investigation in CT has not identified any additional cases of anthrax through prospective and retrospective surveillance. For prospective surveillance, hospitals, clinicians, postal facilities, and the state medical examiner have been asked to report daily any persons with clinical findings that might be related to anthrax, including sepsis and pneumonia. To date, 50 such patients have been reported. No evidence of anthrax was found in 43 patients and the remaining seven are being evaluated; preliminary investigations of the seven patients have not identified evidence of anthrax. Retrospective surveillance has included a review of all deaths since September 1 involving residents of Oxford and eight surrounding towns (Beacon Falls, Naugatuck, Ansonia, Derby, Woodbury, Shelton, Seymour, and Southbury [total population: 152,481]); 487 death certificates for persons who died during September-November 2001 have been reviewed. Of the 131 deaths attributed to sepsis, pneumonia, sudden death, respiratory arrest, cardiac arrest, or undetermined cause, 66 occurred in hospitals. Of these, 52 had no apparent anthrax disease. For 14 persons who died soon after arrival to the hospital, review of hospital records revealed no evidence of anthrax, but information in the hospital record was insufficient to determine the specific cause of death, and postmortem examinations were not conducted.

The source of exposure for the case of inhalational anthrax in a 94-year-old woman who lived in Oxford, CT, remains unknown. Multiple environmental samples collected from all places (e.g., the patient’s home, church, voting place, restaurants, and cars in which she traveled) the patient was known to have visited during the 60 days preceding illness onset were negative for B. anthracis by culture. Nasal swab specimens were negative from 16 persons epidemiologically linked to the case (e.g., persons who worked in the home and assisted with shopping).

Environmental sampling was performed at the postal processing and distribution center in Wallingford, CT, that serves the towns of Oxford and Seymour and identified B. anthracis spores in three high-speed mail sorters. This facility receives mail from several postal distribution facilities known to have been contaminated by B. anthracis spores, including the postal center in Hamilton, NJ, which was the origination site for envelopes containing B. anthracis powder that were addressed to two U.S. senators. To evaluate potential cross-contamination of envelopes (i.e., an envelope contaminated from another B. anthracis-contaminated envelope or environmental surface), postal sorting records from the Wallingford facility are being examined to determine the timing and pathways of mail delivered to the CT patient and her local relatives and contacts. Sorting records in Hamilton indicated that an envelope addressed to a postal code adjacent to Oxford had been processed using the same automatic canceling machine at Hamilton <1 minute after one of the two B. anthracis powder-containing letters sent to a U.S. senator. This envelope was subsequently sorted at Wallingford and delivered to Seymour. The envelope was received at a residence 4 miles from the home of the CT patient; this envelope was recovered from the recipient and B. anthracis spores were detected on the outside of the envelope; none of the members of this household had clinical evidence of anthrax. No record of mail to the CT case-patient processed at Hamilton was found, and no B. anthracis spores have been recovered from envelopes found at her home.

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CDC Editorial Note: As of December 5, a total of 11 inhalational anthrax cases have been identified; direct exposure to a B. anthracis-containing envelope was likely in the first nine cases.
The source of exposure to *B. anthracis* for the inhalational anthrax cases in CT and New York City (NYC) remain under investigation by public health and law enforcement officials. No direct exposure to *B. anthracis*-containing envelopes has been identified for these cases. Similar to the first nine cases of inhalational anthrax, exposure to *B. anthracis* might have occurred through the mail from exposure to an envelope containing *B. anthracis* powder. No direct exposure to envelopes containing *B. anthracis* powder has been identified for the inhalational cases in CT and NYC.

In the absence of definitive evidence indicating how transmission occurred, infection from a cross-contaminated envelope is one hypothesis being considered by investigators.

Cross-contamination could explain how *B. anthracis* spores were spread to some postal facilities that did not process the envelopes addressed to the U.S. senators. Approximately 85 million pieces of mail were processed on the days after the implicated envelopes passed through the NJ and the District of Columbia (DC) sorting facilities until they were closed. Both of these facilities had evidence of widespread environmental contamination with *B. anthracis*. Some of the pieces of mail that passed through these facilities could have been cross-contaminated and, in turn, could have contaminated mail processing equipment or other envelopes processed elsewhere. Despite the high volume of mail distributed to metropolitan areas around these facilities, active surveillance has not identified cases of inhalational anthrax among approximately 10.5 million residents in NJ, DC, Pennsylvania, Maryland, and Virginia or in postal workers since the initial cluster of cases associated with the processing of the implicated letters sent to the U.S. senators. The large population, the duration of active surveillance, and the absence of additional cases of inhalational anthrax indicate that if there is a risk for inhalational anthrax associated with exposure to mail crosscontaminated by the letters addressed to the U.S. senators, it is very low.

Despite this very low risk, persons remaining concerned about their risk may want to take additional steps such as not opening suspicious mail; keeping mail away from your face when you open it and not blowing or sniffing mail or mail contents; washing your hands after you handle the mail; avoiding vigorous handling of mail, such as tearing or shredding mail before disposal; and discarding envelopes after opening mail. However, the effectiveness of these steps in reducing any residual risk is not known.

Suspicious persons or situations should be reported to law enforcement authorities. Health-care providers should remain alert for persons with clinical presentations consistent with early anthrax, obtain appropriate diagnostic tests (e.g., blood cultures and chest radiograph), and report suspicious illnesses to local or state public health authorities. Fatalities can be minimized by promptly initiating combination antimicrobial therapy. Recommendations for risk reduction for persons with potential occupational exposure are available. Public health surveillance for anthrax and research efforts to further define the risk associated with exposure to *B. anthracis* in the environment as a result of the bioterrorist attack is ongoing. CDC will continue to provide updates as new information becomes available.

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**Influenza Activity—United States, 2001-2002 Season**

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In collaboration with the World Health Organization (WHO) and its collaborating laboratories, National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories, state and local health departments, and a network of sentinel physicians, CDC conducts surveillance to monitor influenza activity and to detect antigenic changes in circulating strains of influenza viruses. This report summarizes influenza activity in the United States* during September 30—November 24, 2001, when the viruses isolated most frequently were influenza A (H3N2). These viruses were well matched antigenically by the 2001-02 influenza A (H3N2) vaccine. Vaccine supplies are plentiful and influenza vaccine should continue to be offered during December and later.

As of November 24, WHO and NREVSS collaborating laboratories in the United States tested 8,140 specimens for influenza viruses; 73 (0.9%) were positive. The percentage of positive influenza isolates identified each week is an indicator of the level of influenza activity, and for the weeks ending October 6 through November 24, the percentage of respiratory specimens testing positive for influenza viruses ranged from 0.4% to 1.7%. These percentages are low compared with the 24%-33% testing positive at the peak of the 1998-99, 1999-2000, and 2000-01 seasons. Of the 73 influenza isolates reported since September 30, 70 (96%) were influenza A viruses and three (4%) were influenza B viruses. Of the 70 influenza A viruses identified, 45 (64%) have been subtyped; 44 were influenza A (H3N2) viruses and one was an influenza A (H1N1) virus. Influenza A (H3N2) isolates were identified in Alaska, Arizona, Colorado, Florida, New York, North Carolina,
North Dakota, Texas, Utah, and Wisconsin. The influenza A (H1N1) isolate was identified in Washington, and unsubtyped influenza A isolates were identified in Alabama, Alaska, Hawaii, Louisiana, Minnesota, New York, Washington, and Wisconsin. Influenza B isolates were identified in Louisiana, Michigan, and Texas. Thirty-nine (52%) of the 73 influenza viruses isolated were identified in Alaska.

CDC antigenically characterized 10 influenza isolates collected in September and 13 collected in October. They consisted of 20 influenza A (H3N2) viruses, two influenza A (H1N1) viruses, and one influenza B virus. The antigenically characterized influenza A (H3N2), influenza A (H1N1), and influenza B isolates were similar to the vaccine strains A/Panama/2007/99 (H3N2), A/New Caledonia/20/99 (H1N1), and B/Sichuan/379/99, respectively.

During September 30–November 24, the weekly percentage of patient visits for influenza-like illness (ILI)† to approximately 650 U.S. sentinel physicians ranged from 1.0% to 1.4%. For the week ending November 24, the percentage of patient visits for ILI was 1.4%, which is less than the national baseline of 1.9%‡ during the same week, influenza activity, as reported by state epidemiologists, was regional in Alaska and sporadic in 25 states (Alabama, Arizona, California, Colorado, Connecticut, Georgia, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Missouri, Nevada, New Mexico, New York, North Carolina, Ohio, Tennessee, Texas, Utah, Vermont, West Virginia, Wisconsin, and Wyoming), New York City, and District of Columbia; 23 states reported no influenza activity, and one state did not report.

During the week ending November 24, the 122 Cities Mortality Reporting System attributed 6.1% of recorded deaths to pneumonia and influenza (P&I). This percentage was below the epidemic threshold[1] of 7.4% for that week. The percentage of P&I deaths has been below the epidemic threshold for each week since September 30.

In November, two virologically confirmed institutional outbreaks caused by influenza A viruses were reported to CDC. On November 14, an elementary school in Fort Collins, Colorado, reported elevated and increasing absenteeism among its students. Of 675 students, 53 (8%) were absent on November 14, 96 (14%) were absent on November 15, and 110 (16%) were absent on November 16. Baseline absenteeism on November 12–13 was 18–20 students. Two of the three specimens submitted to the state laboratory for viral culture were positive for influenza A (H3N2). The school remained open and a letter was sent to parents describing influenza symptoms and requesting that sick children be kept at home. Use of influenza antiviral agents was left to the discretion of the child’s healthcare provider and family. Nursing homes in the Fort Collins area were advised of influenza activity in the community and a broadcast facsimile outlining antiviral treatments available for influenza was sent to all primary-care providers.

On November 17, an influenza A outbreak was reported in a long-term-care facility with 160 residents located in the Hudson Valley region of New York; 14 residents and eight staff members had an influenza-like illness and four of six ill residents tested positive for influenza A by rapid antigen testing. On November 18, all residents began to receive antiviral medication and since then, no new cases of influenza-like illness in this facility have been reported. The facility received its order of influenza vaccine a week and half before the outbreak and vaccinated residents on November 12–16.

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CDC Editorial Note: The four influenza surveillance system components indicated low levels of influenza activity in the United States during September 30–November 24. The number of influenza viruses isolated this season is relatively low and it is too early to determine which strain(s) will predominate. However, two influenza A outbreaks were detected in November and influenza activity is expected to increase during the next few weeks to months. The viruses isolated most frequently have been influenza A (H3N2) viruses. The 2001-02 influenza vaccine strains are well matched to the influenza isolates that have been characterized antigenically this season.

The best prevention against influenza is vaccination. Vaccine supplies are plentiful and are available for immediate shipment from the three U.S. licensed manufacturers. Manufacturers estimate that approximately 87 million doses of influenza vaccine will be produced this year compared with 76.8 million doses available during the 1999-2000 season and 70.4 million doses available during the 2000-01 season. By the end of November, approximately 74.2 million (85%) of the projected 87 million doses of vaccine will have been distributed. An additional 12.8 million doses are expected to be available in December.

Health-care providers should continue to offer influenza vaccine during December and later because persons who benefit from vaccination after influenza activity has been detected in their community. The most important persons to be vaccinated are those in groups at increased risk for complications from influenza (i.e., persons aged ≤65 years and persons aged 65-64 years with certain underlying medical conditions), and healthcare providers. In addition, household contacts of high-risk persons, healthy persons aged 50-64 years, and anyone who wants to reduce the like-
likelihood of becoming ill with influenza should be vaccinated. CDC collects and reports U.S. influenza surveillance data during October–May. This information is updated weekly and is available through CDC voice information, 888-232-3228, fax information, 888-232-3299 (request document number 361100) or at http://www.cdc.gov/ncidod/diseases/flu/weekly.htm.

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3 available

*As of November 29, 2001.†Temperature of >100° F (>37.8° C) and either cough or sore throat in the absence of a known cause.

The national baseline was calculated as the mean percentage of visits for ILI during noninfluenza weeks plus two standard deviations. Because of wide variability in regional level data, to calculate region-specific baseline using the regression procedure employed before the 2000-01 season.

Levels of activity: (1) no activity, (2) sporadically occurring ILI or laboratory-confirmed influenza with no outbreaks detected, (3) regional—outbreaks of ILI or laboratory-confirmed influenza in counties with a combined population of <50% of the state’s population, and (4) widespread—outbreaks of ILI or laboratory-confirmed influenza in counties with a combined population of ≥50% of the state’s population.

The expected baseline proportion of P&I deaths reported by the 122 Cities Mortality Reporting System is projected using a robust regression procedure in which a periodic regression model is applied to the observed percentage of deaths from P&I since 1983. The epidemic threshold is 1.645 standard deviations above the seasonal baseline. Before the 1999-2000 season, a new case definition for a P&I death was introduced. During the summer of 2000, the baseline and epidemic thresholds were adjusted manually to account for these changes in case definition. For the 2001-02 season, sufficient data have been collected using the new case definition to allow projection of the baseline using the regression procedure employed before the 2000-01 season.

**Shigella sonnei**

Outbreak Among Men Who Have Sex With Men—San Francisco, California, 2000–2001

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1 figure omitted

SHIGELLA SONNEI CAUSES APPROXIMATELY 10,000 CASES OF GASTROENTERITIS EACH YEAR IN THE UNITED STATES. These infections occur predominately among young children and usually are associated with poor hygienic conditions in child-care settings. Outbreaks of shigellosis among men who have sex with men (MSM) have occurred because of direct or indirect oral-anal contact but usually are caused by *Shigella flexneri.* This report describes an investigation of *S. sonnei* cases that occurred among MSM in San Francisco during May–December 2000. Following efforts to heighten awareness, the number of cases has declined, but new cases continue to occur at low levels in this risk group. The increased incidence of sexually transmitted *Shigella* and other sexually transmitted diseases (STDs) in MSM require renewed and innovative prevention efforts.

During June–December 2000, 230 cases of culture-confirmed *S. sonnei* infection were reported to the San Francisco Department of Public Health; an average of 21 cases (range: 13-29 cases) occurred during the same period from 1996 to 1999. Based on data obtained from 230 reported cases, the median age was 39 years (range: 16–77 years) and 211 (92%) patients were males. Of 199 males for whom information was available, 141 (71%) were non-Hispanic whites, 159 (80%) were residents of predominantly gay neighborhoods, and 121 (61%) were self-reported MSM. Sexual behavior was unknown for 62 (31%) patients, and 16 (8%) were self-reported heterosexuals. On the basis of the denominator data obtained from the annual San Francisco HIV/AIDS epidemiology report, the rate of *S. sonnei* infection among MSM was 259 per 100,000 population. The rate among all other groups, including women and heterosexual men, was 16.³

Among persons aged ≥18 years with *S. sonnei* and symptom onset during May–December 2000, 106 were selected randomly for telephone interview; 35 (33%) could not be contacted and four (4%) refused to participate. Of the 67 (63%) who agreed to participate, 64 (96%) were male. Among the 64 male respondents, 62 (97%) were MSM, 42 (66%) were college graduates, and 29 (46%) had an annual income >$45,000. Of the respondents, 49 (78%) had health insurance coverage, 45 (70%) thought they became ill from a sexual partner, and 35 (55%) reported concurrent infection with human immunodeficiency virus (HIV).

The median duration of symptoms for male respondents was 7 days (range: 2-90 days); 62 (97%) reported diarrhea, 50 (78%) abdominal cramps, 49 (77%) fever, 47 (73%) weight loss, and 20 (31%) blood in stool.

In the week before illness, 50 (78%) of the 64 males reported being sexually active, including 34 (53%) who had multiple sex partners; 32 (50%) answered “yes” to, “The week before your illness did you put your tongue in a partner’s anus?” Forty-seven (73%) answered “yes” to, “The week before your illness did you have a penis in your mouth?”

Of the 14 patients who reported sexual activity during the week of or the week following illness, three (21%) answered “yes” to, “During [or after] your illness did you have a tongue in your anus?” All 14 persons who were sexually active during and after illness reported diarrhea (duration: 3-23 days) for which they were prescribed antibiotics.

Local response to the outbreak included a press release, development of an Internet web site, and a media campaign with newspaper and Internet articles for the gay community. Approximately 2,000 notices were mailed to community agencies and providers, 10 presentations were conducted for community agencies, and 4,000 health alerts were distributed through a mass mailing to 40 acquired immunodeficiency syndrome-related agencies and their clients, several large gay and lesbian fairs, bars, sex clubs, and the city STD clinic.

**Free Shigella** screening was offered for 1 month at the city STD clinic. Of 119 patients screened, five reported having diarrhea at presentation to the STD clinic. Two of the five had *S. sonnei* isolated from their rectal swab samples; no *Shigella* species were isolated from the 114 remaining clients.
A convenience sample of *S. sonnei* from outbreak-related patients and controls (women and children with *S. sonnei* infection in the outbreak period and region) was subtyped by pulsed-field gel electrophoresis (PFGE). Of 26 outbreak-related isolates, 23 (88%) shared one of two closely related patterns, and only one (12%) of eight isolates from controls had a similar PFGE pattern.

Of 20 randomly selected isolates from outbreak-related patients, 19 were resistant to trimethoprim-sulfamethoxazole, tetracycline, ampicillin, sulfisoxazole, and streptomycin. All isolates were susceptible to ciprofloxacin, nalidixic acid, and ceftriaxone.

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*Defined as culture-confirmed *S. sonnei* infection in residents of San Francisco County aged ≥15 years.

**CDC Editorial Note:** This report indicates that *S. sonnei* can cause large community outbreaks through sexual transmission among MSM. The strains circulating among MSM were different from those circulating in the rest of the community, indicating unique transmission. The recent increases in STDs and enteric infections in MSM follow a 10-year decline. The rate of *S. sonnei* remained low in MSM until the summer of 2000 in San Francisco. These trends paralleled changes in sexual behavior that increased the risk for HIV and other STDs.

Approximately half of the patients in this report were infected with HIV compared with an estimated prevalence of 20% among MSM in San Francisco, suggesting that MSM with HIV infection are more likely to participate in sexual behaviors that place them at risk for shigellosis. Standard HIV management includes stool bacteria cultures of persons with diarrhea. However, HIV-infected persons with shigellosis might have more severe illness leading to more frequent diagnosis and reporting.

The findings in this report are subject to at least two limitations. First, approximately a third of the selected cases could not be contacted, and those who were might have had difficulty accurately recalling events that occurred up to 6 months preceding the interview. Second, the magnitude of this outbreak probably was underestimated because reporting shigellosis in California is required of physicians but not of laboratories, and many cases probably were undiagnosed and unreported.

Because most patients in this outbreak were sexually active with multiple partners, the potential for ongoing transmission is high. In San Francisco and other communities with high rates of shigellosis in adult men, clinicians should obtain stool cultures and sexual orientation data from men with diarrhea and report suspected cases of shigellosis to the health department. Appropriate antimicrobial therapy will decrease the duration, transmission, and severity of symptoms and should be prescribed based on the severity of illness or the need to protect close contacts. Patients in certain occupations (i.e., foodhandlers, child-care providers, and health-care workers) and children who attend child care often are required to have a negative stool culture documented following treatment. The incubation period of shigellosis is 1-4 days, and shigellae are shed in stool from several days to several weeks after illness. Persons who receive appropriate antimicrobial therapy will be culture negative at 72 hours.

Patients with shigellosis should be counseled to abstain from sexual behavior that is likely to transmit infection for at least 3 days after starting an appropriate course of antimicrobial therapy. Because antimicrobial resistance is common, in cases in which antimicrobial susceptibility data are not available, patients should be counseled on abstaining from high-risk sexual behavior until at least one negative posttreatment stool culture is obtained. Patients also should be counseled on methods to avoid or reduce the risk for sexual transmission of enteric infections such as *Shigella* and hepatitis A, should be educated to avoid sexual practices that might result in fecal-oral transmission, and should be advised to wash with soap and water the perianal/perineal area, other body parts, and sex toys before and after sexual activity.