
Although hypothermia-related deaths are prevalent during the winter in states that have moderately cold (e.g., Illinois, New York, and Pennsylvania) to severely cold (e.g., Alaska and North Dakota) winters and in states with mountainous or desert terrain (e.g., Arizona, Montana, and New Mexico), hypothermia-related deaths also occur in states with milder climates (e.g., Georgia, Mississippi, and South Carolina), where weather systems can cause rapid changes in temperature. This report summarizes three hypothermia-related deaths in Fulton County, Georgia, representing persons in the highest risk groups for hypothermia; and summarizes hypothermia-related deaths in Georgia during January 1996-December 1997 and in the United States during 1979-1995.

Case Reports

Case 1. In January 1996, a 35-year-old man was found dead in an abandoned apartment building complex. He was dressed in a T-shirt and trousers and was severely emaciated, with gangrene and mummification of both feet. On the day of his death, the minimum temperature recorded by the National Weather Service (NWS) for Atlanta was 18 F (−7.8 C). At autopsy, he was negative for ethanol and drugs but positive for HIV infection. Cause of death was attributed to environmental hypothermia.

Case 2. In February 1996, an 84-year-old woman was found dead outside her home. She was partially dressed and had blood on her face, feet, and hands. According to the medical examiner, the woman had left her home during the night to go next door to a family member’s house when she became disoriented and fell. On the day of her death, the daily minimum temperature recorded by the NWS for Atlanta was 15 F (−9.4 C). At autopsy, gross and histopathologic examination of her brain showed changes consistent with Alzheimer disease. The cause of death was listed as hypothermia.

Case 3. In December 1996, a 38-year-old man was found dead in the parking lot of the building complex in which he lived. The man was fully dressed and was wearing a jacket. On the day of his death, the daily minimum temperature recorded by the NWS for Atlanta was 44 F (6.7 C). When the man was found, his body temperature was 80 F (26.7 C), and the outdoors ambient temperature was 72 F (22.2 C). At autopsy, the decedent was well nourished and had a blunt-trauma injury to his head and abrasions on his face. His blood alcohol concentration was 0.37 g/dL, indicative of acute ethanol intoxication. The medical examiner concluded that the man died from hypothermia after falling and striking his face and head, which resulted in a skull fracture and unconsciousness.

Georgia

From January 1996 through December 1997, 14 deaths attributable to hypothermia were reported to the Georgia Division of Public Health. The average age of the decedents was 61 years (range: 1-84 years; median: 63 years); nine (64%) decedents were men. During 1997, five hypothermia-related deaths occurred in a densely populated urban area of Fulton County, part of the Atlanta metropolitan area.

United States

During 1979-1995 (the most recent year for which data are available), an annual average of 723 deaths in the United States were attributed to hypothermia (range: 551 in 1995 to 1021 in 1983). During this 17-year period, 12,368 deaths were attributable to environmental hypothermia or excessive cold, for a rate of 0.3 deaths per 100,000 population (International Classification of Diseases, Ninth Revision [ICD-9], codes E901.0, E901.8, and E901.9; excludes man-made cold [E901.1]). Approximately half (6036 [49%]) of all hypothermia-related deaths occurred among persons aged ≥65 years; the annual death rate for hypothermia in this age group was 1.2 per 100,000. The age-adjusted death rate for men was almost triple that for women (0.5, compared with 0.2 per 100,000, standardized to the 1980 U.S. population).

CDC Editorial Note: Hypothermia is a medical emergency.1 It is clinically defined as unintentional lowering of the core body temperature to ≤95 F (≤35 C).2 Environmental hypothermia results from a combination of heat loss by convection (degree of wind exposure), conduction, and radiation to the surrounding ambient air. The severity of hypothermia is indicated by the degree to which core body temperature is lowered: mild (93 F-95 F [34 C-35 C]), moderate (86 F-93 F [30 C-34 C]), and severe (<86 F [<30 C]).3 Risk for death from hypothermia is related to age, pre-existing disease, nutritional status, and alcohol and drug intoxication. Socioeconomic factors such as social isolation or homelessness (especially in combination with chronic disease such as immunosuppression) also may increase risk. Alcohol abuse results in vasodilation and interferes with peripheral vasoconstriction, an important physiologic mechanism of defense against cold. Neuroleptic drugs also predispose a person to hypothermia by...
inducing vasodilation and suppressing the shivering response; lower ambient temperatures amplify the hypothermic effects of these drugs. Other risk factors associated with hypothermia include hypothyroidism, mental illness, starvation, poverty, dehydration, immobilizing illnesses, and sustained contact with materials that promote conductive heat loss (e.g., water). Hypothermia death rates increase with age, with the elderly at the highest risk for mortality because of physiologic changes (e.g., lack of appropriate vasoconstriction in response to cold environments, decreased basal metabolic rate, and impaired shivering mechanism) and underlying disease.

The onset of hypothermia is insidious. Early manifestations of exposure include shivering, numbness, fatigue, poor coordination, slurred speech, impaired mental state, blueness or puffiness, poor coordination, slurred speech, and irrationality. Other clinical problems may include hemato logic, respiratory, renal, and endocrinologic abnormalities. Coma, hypotension, apnea, and/or cardiac arrhythmia characterize severe hypothermia.

Hypothermia-related morbidity and mortality can be prevented by early recognition of symptoms and prompt medical attention. Persons who are outdoors for extended periods during cold weather should wear insulated or layered clothing, including headgear, that does not retain moisture; maintain their fluid and calorie intake; abstain from drinking alcoholic beverages; and avoid overexertion and excessive sweating. Public health strategies to reduce hypothermia-related deaths should be targeted toward high-risk populations (e.g., elderly and homeless persons). Preventive measures include educating the public and health-care providers about heat-preservation strategies and providing outreach programs that identify and shelter persons at risk, especially in large urban communities where there are larger groups of homeless persons.

### REFERENCES


10. These data were obtained from the Compressed Mortality File (CMF), maintained by CDC’s National Center for Health Statistics, and have been prepared in accordance with the external cause-of-death codes from the ICD-9. The CMF contains information from death certificates filed in the 50 states and the District of Columbia.

### Outbreak of Primary and Secondary Syphilis—Guilford County, North Carolina, 1996-1997

In 1996 and 1997, 153 cases of primary and secondary (P&S) syphilis were reported each year in Guilford County, North Carolina, a 147% increase from the 62 cases reported in 1994. The incidence of P&S syphilis in Guilford County during 1996-1997 was 40.5 cases per 100,000 persons, substantially higher than the national health objective for 2000 of four cases per 100,000 (objective 19.3.).

In comparison, the number of P&S syphilis cases in North Carolina declined 57% from 1994 to 1997, to a rate of 10.9 per 100,000 in 1997. This report summarizes the results of an investigation conducted by the Guilford County Health Department (GCHD), the North Carolina Division of Epidemiology, and CDC, which suggest this ongoing outbreak has been associated with missed opportunities for syphilis screening and treatment in high-risk settings, increased exchange of sex for money or drugs, and substantial rates of coinfection with syphilis and human immunodeficiency virus (HIV) among those tested.

To assess factors associated with the epidemic, interviews were conducted with P&S syphilis patients, state and local health department staff members, clinicians, and community residents. Demographic data for all residents of Guilford County with reported cases of syphilis from January 1993 (when the present data registry system was initiated) through August 1997 were analyzed to assess trends in factors that might influence syphilis rates (e.g., access to medical care and adequacy of screening and treatment). Additionally, we reviewed the contact index (the number of sex partners for whom information was sufficient to initiate efforts to locate the person divided by the number of persons with syphilis interviewed) and the treatment index (the number of persons treated as a result of partner notification divided by the number of persons interviewed). The roles of illicit-drug use and sex worker activity during the epidemic were assessed. HIV screening and prevalence data were used to assess the extent of HIV coinfection among P&S syphilis patients. Syphilis registry data were used to compare risk factors among P&S syphilis patients reported during the pre-epidemic period (January 1993-December 1995) with P&S syphilis patients reported during the epidemic period (January 1996-August 1997).

Screening and prevalence data from the local jails were reviewed.

Seventy-three percent of Guilford County residents reside in two major cities: Greensboro (1990 population: 222,000) and High Point (1990 population: 74,000). Most (96%) reported P&S syphilis patients in Guilford County reside in these two cities. Of patients in Guilford County who had infectious syphilis from January 1996 through August 1997, 55% were men. The mean age of men with P&S syphilis was 34.5 years in 1993 and 37.2 years during January-August 1997 (p=0.2). The mean age of women with P&S syphilis increased sig-
Patients during the epidemic period were more likely to have used illicit drugs at some time since 1978 (odds ratio [OR] = 1.9; 95% confidence interval [CI] = 1.1-3.3) and to have exchanged sex for drugs or money during the preceding year (OR = 2.1; 95% CI = 1.4-3.3) and were less likely to have been tested for HIV (18.6%) than patients before the epidemic period (27.8%; OR = 0.6; 95% CI = 0.4-0.9). Of P&S syphilis patients tested for HIV infection before and during the epidemic, 16% and 13%, respectively, were HIV infected. On the basis of local police records, prostitution arrests did not increase during 1993-1996, but crack cocaine–related arrests increased 69%.

Public sexually transmitted diseases clinical care appeared to meet the needs of persons seeking care during the epidemic in Greensboro. The contact index was 2.0 in 1993 and 1.7 in 1996, indicating fewer sex partners named per patient interviewed in 1996. However, the treatment index was 0.9 in 1993 and 1.0 in 1996, indicating more patients and contacts were treated for syphilis or preventively treated in 1996.

At the Guilford County jail, full health assessments were offered after 10-14 days of detainment. However, because of a rapid turnover and a high refusal rate, most detainees were not screened. In 1996, 9.6% of those detained in the jail system were screened for syphilis and <1% were screened for HIV infection; 7.5% of syphilis tests and 3.3% of HIV tests were positive. During January-August 1997, 8.0% of detained inmates had a history, physical examination, and syphilis serology, of whom 13.3% had reactive syphilis serologic tests.

To control the increase in syphilis cases in Guilford County, the North Carolina HIV/STD Prevention and Care Section and GCHD, in collaboration with local community organizations, conducted a community intervention effort from July through September 1997. This intervention combined sex partner notification strategies, community outreach, and extended local clinical services to find and treat more patients with P&S syphilis and to educate the community about syphilis. Other prevention measures included alerting the local medical community; obtaining help from community-based organizations in identifying locations where at-risk persons are commonly found and increasing education, outreach, and screening at these locations; and increasing screening and treatment for syphilis at local settings where persons at high risk may have been encountered (e.g., jails). Based on reported cases of P&S syphilis in Guilford County through August 1998, P&S syphilis is expected to decrease 38% in 1998 compared with 1997.

CDC Editorial Note: This investigation identified epidemiologic factors frequently associated with syphilis outbreaks in other urban areas of the United States: increased illicit-drug use and exchange of money or drugs for sex. This investigation also identified missed opportunities for rapid syphilis screening and treatment at the local jails. Previous studies have identified emergency departments (EDs) and jails as sites of high syphilis prevalence during epidemics.2,6 Many arrested persons lack medical insurance or have used hospital EDs at their last medical visit.3 Therefore, jails and EDs are potentially high-impact settings for rapid screening and treatment of patients at high risk for syphilis in areas with endemic or epidemic syphilis.2,6

Increased cocaine arrests corroborated community perceptions of increased crack cocaine use in Guilford County before the onset of the P&S syphilis epidemic. Also, data on P&S syphilis patients during 1996-1997 document increased exchange of sex for drugs or money and an increase in injecting or other drug use, compared with patients during 1993-1995. The link between crack cocaine and injecting-drug use and high-risk sex behaviors has been reported previously.7 The sequelae of syphilis are substantial, including facilitation of HIV transmission, congenital syphilis, and advanced syphilis lesions affecting the cardiovascular and central nervous systems. The high frequency of HIV infection among persons tested who also have P&S syphilis underscores the need to make HIV counseling, testing, and prevention a priority for patients with syphilis.

Syphilis elimination is a feasible goal in the United States as syphilis rates continue to decline nationally, but outbreaks of P&S syphilis and persisting endemic foci are major obstacles.8 Outbreaks, such as the one in Guilford County, emphasize the prevention strategies and activities needed to maintain national and local progress toward elimination of syphilis, including innovative public health responses tailored to meet the challenge of shifting community patterns of high-risk behaviors and associated new outbreaks of communicable diseases. In addition, findings from this outbreak suggest that strengthening and maintaining screening in jails may be a useful component of syphilis surveillance and early outbreak detection, even in areas with little or no recognized syphilis transmission.

**REFERENCES**

RESPIRATORY SYNCYTIAL VIRUS (RSV) IS THE single most important cause of serious lower respiratory tract disease in infants and young children worldwide.\(^1\) In temperate climates, infections primarily occur during yearly outbreaks that usually peak during the winter months.\(^2\) RSV activity in the United States is monitored by the National Respiratory and Enteric Virus Surveillance System (NREVSS), a voluntary, laboratory-based system. This report summarizes trends for RSV reported to NREVSS from July 1997 to June 1998 and presents preliminary surveillance data from July 1 to November 18, 1998.

Since July 1, 1990, 107 clinical and public health laboratories in 47 states and the District of Columbia have contributed data to NREVSS. Laboratories report weekly to CDC the number of positive results. RSV activity is considered widespread by NREVSS when at least half of laboratories report any RSV detections for at least 2 consecutive weeks and when >10% of all specimens tested by antigen detection for RSV are positive.

From July 1990 through June 1998, widespread RSV activity began each November and continued for a mean of 22 weeks (range: 20-26 weeks), until April to mid-May. Peak activity for most laboratories occurred in January or February. For the 1997-98 season, 141,444 specimens tested for RSV by antigen detection and/or virus-isolation methods and the number of positive results. RSV activity is considered widespread by NREVSS when at least half of laboratories report any RSV detections for at least 2 consecutive weeks and when >10% of all specimens tested by antigen detection for RSV are positive.

From July 1990 through June 1998, widespread RSV activity began each November and continued for a mean of 22 weeks (range: 20-26 weeks), until April to mid-May. Peak activity for most laboratories occurred in January or February. For the 1997-98 season, 141,444 tests were performed, and 19,591 were positive for RSV. Median peak activity was observed in late December with peak activity occurring slightly earlier in southern sites (November-December) than in northern sites (January-February). Since the week ending November 13, 1998, 60% of the 59 laboratories reporting RSV test results have identified specimens positive for RSV, and 20% of reporting laboratories had >10% of all tests positive for RSV, indicating the onset of widespread RSV activity for the 1998-99 season.

**Reported by:** National Respiratory and Enteric Virus Surveillance System collaborating laboratories. Respiratory and Enteric Viruses Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases, CDC.

**CDC Editorial Note:** The 1997-98 RSV season featured a longer period of widespread activity (26 weeks) than usual. The total specimens positive for RSV, months of peak activity, and south-to-north trend were consistent with data reported during previous years. Although not a population-based system, NREVSS consists of a large number of widely distributed laboratories and is an important tool for characterizing the spatio-temporal trends of RSV infections in the United States and can alert public health officials and physicians to seasonal RSV activity.

During the RSV season (November-May), health-care providers should consider RSV as a cause of acute respiratory disease in both children and adults. RSV causes repeated symptomatic infections throughout life because of limited protective immunity induced by natural infection. Severe manifestations of RSV infection (e.g., pneumonia and bronchiolitis) most commonly occur in infants aged 2-6 months. In addition, RSV infection also can result in serious complications in older children and adults, especially those who have underlying cardiac or pulmonary disease or who are immunocompromised or elderly.\(^3\) Infection in immunocompromised persons can result in high death rates.\(^3\)

RSV is a common but preventable cause of nosocomially acquired infection; the risk for nosocomial transmission increases during community outbreaks.\(^4\) Nosocomial infection may be acquired from infected patients, staff, visitors, or contaminated items in the patient’s environment. Nosocomial outbreaks or transmission of RSV can be controlled with strict attention to contact-isolation procedures.\(^6\) Although vaccines are under development, none have been demonstrated to be safe and effective in preventing RSV-associated disease. RSV intravenous immune globulin and a recently licensed, humanized murine anti-RSV monoclonal antibody are available as prophylaxis for serious RSV infections in some high-risk infants and young children (e.g., those born prematurely or with chronic lung disease).\(^7\) Ribavirin is the only available antiviral agent for treating RSV infection and may be considered for some patients.\(^8\)

**REFERENCES**

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Cases of reported gonorrhea in the District of Columbia decreased 26%, from 6935 cases before the clinic closure to 5166 cases after the closure. The decline in reported gonorrhea cases was seen in all wards.

The numbers of P&S syphilis cases reported for NW residents at the SE STD clinic did not change substantially following the NW STD clinic closure. However, the number of gonorrhea cases reported among NW residents increased at the SE STD clinic from 22 cases to 153 cases.

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CDC Editorial Note: Although in the United States syphilis has declined to historically low levels, it remains a problem in the District of Columbia. In 1996, the city's syphilis rate was 13th highest for U.S. cities of >200,000 population. Data from this investigation suggest that the closing of the NW STD clinic resulted in unreported syphilis cases. Reporting of syphilis cases is essential if health departments are to ensure that patients and their sex partners are treated and counseled properly, that trends in disease are monitored effectively, and that outbreaks are identified and addressed promptly.

The substantial increase in syphilis among women residing in the SE ward following the clinic closure suggests that a simultaneous increase in the NW ward might not have been detected. Cases in the NW ward may have been missed because of limited access to STD care after the NW STD clinic closure. The number of cases reported among women residing in the NW ward did not decrease as it did for men, possibly because a higher proportion of women than men are tested for syphilis in health-care settings other than STD clinics (e.g., family planning and antenatal care).

The elimination of STD care can result in substantial decreases in STD clinic visits, laboratory testing, and chlamydia and gonorrhea case reports. In the District of Columbia, gonorrhea case reports declined, but decreases in all wards were similar. Differences between the specific behaviors of syphilis patients and gonorrhea patients may help to explain the differential impact on reporting. Syphilis patients are more likely than gonorrhea patients to have a greater number of unnamed sex partners and to engage in illicit-drug use and exchange of sex for drugs or money. Syphilis patients and their partners may have particular difficulty accessing the health-care system. The signs and symptoms of early syphilis in men are often transient and painless compared with the often persistent urethral discharge and dysuria of gonorrhea; thus, persons with syphilis may not seek health care as readily as persons with gonorrhea. The loss of a public STD clinic may have had a greater impact on the likelihood of identifying, locating, and treating syphilis patients than gonorrhea patients.

The findings in this report are subject to at least two limitations. First, patients who would have been served by the NW STD clinic may have sought STD services from other health-care facilities; however, if such cases were not reported to the health department their sex partners probably did not receive adequate follow-up. Second, although the clinic closure appears to be the most likely explanation for the sharp decline in reporting of syphilis cases among NW residents, other unmeasured factors might have affected the syphilis and gonorrhea rates in the NW ward and elsewhere in the city.

When considering closing any public facility providing health-care services, health departments should evaluate the potential impact on populations with high rates of disease. Specifically, they should assess the extent to which these patients can access the remaining health-care facilities and the capacity of these facilities to handle an increase in patient volume. In settings such as the District of Columbia, measures to increase syphilis case finding should be implemented by expanding routine syphilis serologic screening, strengthening partner notification activities, and improving patient education.

REFERENCES 4 available