Hypothermia is the unintentional lowering of core body temperature to <95°F (<35°C).1 Core body temperature normally is maintained at 97.7°F (36.5°C).2 Most hypothermia-related deaths occur during the winter in states that have moderate to severe cold temperatures (e.g., Alaska, Illinois, New York, and Pennsylvania).3 During 1979-1998, New York had the second highest number of hypothermia-related deaths in the United States. This report presents case reports of four hypothermia-related deaths during January-February 2000 in Suffolk County (1999 population: 1,383,847), the largest county in New York excluding New York City, and summarizes hypothermia-related deaths in the United States during 1979-1998. Such deaths can be prevented by educating health-care providers and the public to identify persons at risk for hypothermia.

**Case Reports**

**Case 1.** On December 15, 1998, an 89-year-old woman with a history of wandering was noticed missing from the adult home facility where she resided and was found shivering in 1 foot of water at the edge of a pond on the property. The temperature that day ranged from 23°F-54°F (−5°C-12.2°C). On admission to a hospital, her rectal temperature was 95°F (35°C). Her medical history included dementia, multiple transient ischemic attacks (TIAs), hypertension, and chronic atrial fibrillation. Her medications included digoxin, furosemide, aspirin, colchicine, and sertraline hydrochloride. On December 21, she developed adult respiratory distress syndrome; she died on January 10, 1999. The death certificate listed the cause of death as complications of environmental exposure with aspiration. Hypertension, arteriosclerotic cardiovascular disease, and dementia were contributory.

**Case 2.** In January 2000, a 51-year-old man wearing a rain-soaked sweater, pants, and work boots was found dead behind a dumpster. On the day he was found, the temperature ranged from 25°F-49°F (−3.9°C-9.4°C); the day before, it had been raining with temperatures in the 50s. Drug paraphernalia was found in his pockets and needle track marks were observed on his arms. According to the police report, the decedent had a history of illegal drug use. Toxicology showed 0.10% ethanol, morphine, codeine, and methadone in his body. The death certificate listed the cause of death as complications of acute and chronic drug abuse and environmental hypothermia.

**Case 3.** In January 2000, a 79-year-old woman who resided in an adult home facility had been missing for 40 minutes. She was found outside, unresponsive, wearing a blouse, sweatshirt, and sweatpants. The temperature that day ranged from 26°F-32°F (−3.3°C-0°C). At a hospital, her rectal temperature was 81°F (27°C). She was treated with hypothermic blankets but died 1 hour later. The decedent had a history of senile dementia, syncope, and TIAs. Her medications included iron sulfate and aspirin. The cause of death was hypothermia with senile dementia and arteriosclerotic cardiovascular disease.

**Case 4.** In March 2000, a 45-year-old homeless man was found dead next to a makeshift bed in a wooded campsite with his shirt partly covered with snow. The temperature that day ranged from 24°F-41°F (−4.4°C-4°C). He was fully clothed, including hat and gloves, and was lying partially in a sleeping bag on top of a canvas pool cover. The decedent had a history of alcohol and drug abuse, but no drugs or alcohol were found in his blood. He had been living in the woods for several years and was last seen several weeks before his death. The death certificate listed the cause of death as probable hypothermia attributed to environmental exposure with chronic alcoholism contributing.

**New York**

During 1979-1998, the age-adjusted death rate for hypothermia was 0.2 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]),3 compared with the median of 0.4 for the United States. Suffolk County ranked fifth among New York’s 62 counties in number of hypothermia-related deaths for persons of all ages. Age-specific death rates in Suffolk County and New York increased with age. Of all hypothermia-related deaths in New York and Suffolk County, 386 (53%; 95% confidence interval [CI] = ±3.6%) and 25 (58%; 95% CI = ±14.8%), respectively, occurred among persons aged ≥65 years. In Suffolk County, age-adjusted death rates were three times higher for men than women.

**United States**

During 1979-1998, 13,970 persons died from hypothermia, an average of 699 deaths per year (range: 420-1024 deaths), and the age-adjusted death rates for hypothermia decreased significantly (p<0.001). Of all hypothermia-related deaths, 6857 (49%; 95% CI = ±0.83%) occurred among persons aged ≥65 years. The age-
adjusted rate for hypothermia was approximately 2.5 times higher for men (0.5 per 100,000 population) than women (0.2) during the same period.

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CDC Editorial Note: The findings in this report indicate that hypothermia-related deaths in the United States decreased during 1979-1998. In addition, in New York and Suffolk County, hypothermia-related death rates increased by age category and were higher among men, similar to trends observed in the United States. All four case-patients in this report had one or more risk factors for hypothermia-related death (e.g., older age ≥65 years, lack of adequate housing, homelessness, mental impairment, drug overdose, and alcohol ingestion).

Contributing factors include malnutrition, lack of fitness, severe illness, and drug use or abuse.

Data in this report are limited by the underreporting of hypothermia in medical records and death certificates. Hypothermia-related deaths may be underreported because (1) physical signs of hypothermia may not be recognized; (2) hospitals may not use low-temperature thermometers; (3) medical personnel may be unaware of hypothermia’s significance; and (4) an autopsy cannot prove hypothermia as an underlying cause of death. In addition, vital record data on hypothermia may not code hypothermia as the underlying cause of death.

Mortality estimates are 75%-90% for persons with hypothermia and underlying disease, compared with ≤10% for those with hypothermia alone. Diseases such as hypoglycemia, hypothyroidism, sepsis, and cirrhosis, or drug use (e.g., alcohol, phenothiazines, opiates, clonidine, lithium, barbiturates, and benzodiazepenes) can result in decreased heat production. Alcohol use results in central nervous system depression, vasodilation, and blunting behavioral responses to cold. Signs of hypothermia include uncontrollable shivering, confusion, memory loss, drowsiness, exhaustion, fumbling hands, and slurred speech. Severe hypothermia can result in loss of consciousness, apparent apnea, or undetectable pulse. In infants, warning signs of hypothermia include cold, bright red skin and lethargy.

Preventive measures include wearing several layers of loosely fitting clothing with a tightly woven, wind-resistant outer layer and wool, silk, or polypropylene inner layers to hold body heat. In cold and windy climates, persons should maintain dry clothing; eat well-balanced meals; drink warm, sweet, nonalcoholic beverages; and avoid exertion because excess perspiration can cause chilblains.

Persons who participate in outdoor recreation should take appropriate precautions, such as wearing wet suits while participating in water-related activities or carrying emergency shelters and heat-generating devices for unexpected weather changes while hiking or camping. During winter months or in areas with low nighttime temperatures, blankets or extra clothing should be kept in vehicles when driving. Measures to prevent hypothermia-related deaths include educating the public and health-care providers (e.g., emergency department, adult home facility, and social services staff) to identify persons at risk and establishing outreach programs that provide warm shelter and adequate clothing.

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*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 Ebola Hemorrhagic Fever—Uganda, August 2000-January 2001**

**MMWR. 2000;50:73-77**

2 figures omitted

ON OCTOBER 8, 2000, AN OUTBREAK OF an unusual febrile illness with occasional hemorrhage and significant mortality was reported to the Ministry of Health (MoH) in Kampala by the superintendent of St. Mary’s Hospital in Lacor, and the District Director of Health Services in the Gulu District. A preliminary assessment conducted by MoH found additional cases in Gulu District and in Gulu Hospital, the regional referral hospital. On October 15, suspicion of Ebola hemorrhagic fever (EHF) was confirmed when the National Institute of Virology (NIV), Johannesburg, South Africa, identified Ebola virus infection among specimens from patients, including health-care workers at St. Mary’s Hospital. This report describes surveillance and control activities related to the EHF outbreak and presents preliminary clinical and epidemiologic findings.

Control activities were organized around surveillance and epidemiology, clinical case management, social education and mobilization, and coordination and logistic support. An active EHF surveillance system was initiated to determine the extent and magnitude of the outbreak, identify loci of disease activity, and detect cases early. Ill persons were encouraged to be assessed at a hospital and, if indicated, 

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to be hospitalized to reduce further community transmission. Targeted prevention activities included follow-up of contacts of identified cases for 21 days; establishment of trained burial teams for all potential and confirmed EHF deaths; community education; cessation of traditional healing and burial practices; cessation of large public gatherings; and updates of hospital infection-control measures, including isolation wards. Laboratory testing was performed at a field laboratory established at St. Mary's Hospital by CDC and supplemented by additional testing at CDC and NIV. Sequence analysis revealed that the virus associated with this outbreak was Ebola-Sudan and differed at the nucleotide sequence level from earlier Ebola-Sudan isolates by 3.3% and 4.2% in the polymerase (362 nucleotides sequenced) and nucleocapsid (146 nucleotides sequenced) protein encoding genes, respectively.

During the third week of October, active surveillance was established and included three case notification categories: alert, suspect, and probable. The alert category comprised persons with sudden onset of high fever, sudden death, or hemorrhage, and was used by community members to alert health-care personnel. The suspect category comprised persons with fever and contact with a potential case-patient; persons with unexplained bleeding; persons with fever and three or more specified symptoms (i.e., headache, vomiting, anorexia, diarrhea, weakness or severe fatigue, abdominal pain, body aches or joint pains, difficulty swallowing, difficulty breathing, and hiccups), and all unexplained deaths. The suspect category was used by mobile surveillance teams to determine whether a patient required transport to an isolation ward. The probable category included persons who met these criteria and were assessed and reported by a physician. Laboratory tests included virus antigen detection and antibody ELISA tests and reverse transcriptase polymerase chain reaction. Laboratory-confirmed case-patients were defined as patients who met the surveillance case definitions and were either positive for Ebola virus antigen or Ebola IgG antibody.

During October 5–November 27, among 62 persons with laboratory-confirmed EHF admitted to Gulu Hospital, symptoms included diarrhea (66%), asthenia (64%), anorexia (61%), headache (63%), nausea and vomiting (60%), abdominal pain (55%), and chest pain (48%). Patients presented for care a mean of 8 days (range: 2–20 days) after symptom onset. Bleeding occurred in 12 (20%) patients and primarily involved the gastrointestinal tract. Among the 62 confirmed case-patients, 36 (58%) died; among patients aged <15 years, four of five died (case fatality: 80%). Spontaneous abortions were reported among pregnant women infected with EHF. Patients who died usually exhibited a rapid progression of shock, increasing coagulopathy, and loss of consciousness.

As of January 23, 2001, 425 presumptive* case-patients with 224 (53%) deaths attributed to EHF were recorded from three districts in Uganda: 393 (93%) from Gulu, 27 (6%) from Masindi, and five (1%) from Mbarara. The combined area comprises approximately 11,700 square miles (31,000 square kilometers; 2000 combined population: 1.8 million). Although the cluster of cases in early October triggered identification of the outbreak and response measures, investigations (i.e., case-record review and interviews with surviving patients or their surrogates) identified cases occurring in the community and patients hospitalized several weeks earlier. The onset of illness of the earliest presumptive case was August 30, 2000, and onset of the last presumptive case was January 9, 2001. The ages of presumptive case-patients ranged from 3 days–72 years (median: 28 years); 269 (63%) were women. Mean time from symptom onset to death was 8 days (95% confidence interval=±5 days); 218 (51%) presumptive cases were laboratory confirmed.

Epidemiologic investigations identified the three most important means of transmission as attending funerals of presumptive EHF case-patients where ritual contact with the deceased occurred, and intrafamilial or nosocomial transmission. Fourteen (64%) of 22 health-care workers in Gulu were infected after establishing the isolation wards; these incidences led to the reenforcement of infection-control measures. Two distant focal outbreaks were initiated by movement of infected contacts of EHF cases from Gulu to Mbarara and Masindi districts. National notification and surveillance efforts led to the rapid identification of these foci and effective containment.

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dissemination by person-to-person transmission, often within medical facilities. This is the largest reported EHF outbreak and the third known Ebola-Sudan virus-associated outbreak. The first occurred in 1976 in the southern Sudan towns of Nzara and Maridi and was concurrent with an Ebola-Zaire outbreak in Zaire (Democratic Republic of the Congo). The second Ebola-Sudan outbreak occurred in 1979 in the same locations. Similar to the 1976 and 1979 outbreaks, the 2000 outbreak had a case fatality of approximately 50%. Also similar to the earlier outbreaks, the 2000 outbreak seemed to have begun with the introduction of the virus into Gulu District followed by transmission into the community and health-care facilities. However, the first cases associated with this EHF outbreak remain obscure, which has limited the ability to investigate possible reservoirs of the virus.

Community transmission was eliminated by recognition of the outbreak, initiation of case finding, case isolation and other infection-control practices, and hospitalization of identified case-patients in medical facilities where barrier nursing (e.g., wearing personal protective clothing) and other infection-control procedures were implemented. Decreased transmission also was the result of community education about the dangers of contact with symptomatic and deceased EHF patients, the establishment of specialized burial teams, and heightened awareness of the disease among health-care staff. Although transmission to health-care workers occurred during this outbreak, the use of isolation facilities remains the most effective means of controlling EHF outbreaks. During the 4-month outbreak and response period, approximately 5600 contacts in Gulu District were under surveillance for 21 days by approximately 150 trained volunteers. The goal of ongoing prevention efforts is to identify specific risk factors for disease acquisition in the community and hospitals, examine virologic and clinical parameters of infection, and increase the reporting of potentially epidemic diseases into a national surveillance system.

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*Persons initially identified by the mobile teams or assessed by a health-care worker (suspect and probable cases using the notification scheme) who were not laboratory negative and met the following case definition: (a) unexplained bleeding; or (b) fever and three or more specified symptoms (i.e., headache, vomiting, anorexia, diarrhea, weakness or severe fatigue, abdominal pain, body aches or joint pains, difficulty in swallowing, difficulty in breathing, and hiccups); or (c) unexplained deaths. All laboratory-confirmed cases also were included.

Publication of Report on Validation and Use of Measures of Health-Related Quality of Life

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CDC recently published “Measuring Healthy Days: Population Assessment of Health-Related Quality of Life,” the first comprehensive report to describe the validity and use of a set of survey measures developed by CDC and partners to track population health status and health-related quality of life (HRQOL) in states and communities. The report is intended for public health professionals involved or interested in HRQOL surveillance or measurement. The report identifies the policy and conceptual origins of a brief set of healthy days HRQOL measures developed for use as public health outcome measures and summarizes the results of studies to test the measures’ accuracy and consistency.

During January 1993–December 2000, approximately 1 million U.S. adults were asked Behavioral Risk Factor Surveillance System questions on self-rated health, recent physical and mental health, and activity limitations. State and local health officials can use the measures and data to help achieve the two major goals of the national health objectives for 2010: improve the quality and years of healthy life and eliminate health disparities. States and communities are encouraged to use the measures to identify subgroups of persons with poor perceived health and to use that information to identify population health trends and disparities, define disease burden, allocate resources based on unmet needs, and evaluate disease prevention efforts. The report is available on the World-Wide Web, http://www.cdc.gov/nccdphp/hrqol.

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