Exhibit No.: _____
Issue: Hot Weather Safety Program

BEFORE THE PUBLIC SERVICE COMMISSION OF MISSOURI

DIRECT TESTIMONY AND ATTACHMENTS OF JOHN G. HOWAT

ON BEHALF OF AARP

AmerenUE
Case No. ER-2008-0318

Filed: August 28, 2008

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is John Howat, and I am Senior Policy Analyst at the National Consumer Law Center, 7 Winthrop Square, Boston, MA 02110.

Q. FOR WHOM ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am providing comments and testimony in behalf of AARP.

Q. BRIEFLY OUTLINE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. I have been professionally involved with energy program and policy issues since 1981. Prior to joining the Advocacy Staff at National Consumer Law Center, I consulted with a broad range of public and private entities on issues related to utility industry restructuring. Previously, I served as Research Director of The Massachusetts Joint Legislative Committee on Energy, responsible for the development of new energy efficiency programs and low-income energy assistance budgetary matters; economist with the Electric Power Division of the Massachusetts Department of Public Utilities, responsible for analysis of electric industry restructuring proposals; and Director of the Association of Massachusetts Local Energy Officials. I have a Master's Degree from Tufts University's Graduate Department of Urban and Environmental Policy and Bachelor of Arts Degree from The Evergreen State College.

Q. WHAT ARE YOUR PRIMARY RESPONSIBILITIES AS A SENIOR POLICY ANALYST AT THE NATIONAL CONSUMER LAW CENTER?

A. At the National Consumer Law Center over the past seven years, I have managed a range of regulatory, legislative and advocacy projects across the country in support of low-income consumers' access to affordable utility and energy related services. I have been involved with the design and implementation of low-income energy affordability and efficiency programs and outreach efforts, low-income regulatory consumer protection, rate design, issues related to metering and billing, development of load profiles, energy burden analysis and related demographic analysis. In addition to current work in the instant proceeding I work or have worked on behalf of community-based organizations or their associations in Arkansas, Arizona, Louisiana, Massachusetts, Mississippi, New Jersey, Pennsylvania, Rhode Island, Texas, Vermont and Washington State. I also work or have worked on utility-related matters on behalf of the AARP, including in proceedings in Illinois, Louisiana, Kansas, Texas, Utah, and Vermont. I have worked under contract with the U.S. Department of Health and Human Services, Oak Ridge National Laboratories the National Energy Assistance Directors' Association and the Office of the Attorney General in Nevada for work related to the design of universal service programs, metering and regulatory consumer protection issues. I have presented testimony before utility regulatory agencies in Illinois, Louisiana, Massachusetts, Nevada, New Jersey, Pennsylvania, Rhode Island, Texas, and Vermont. I am a regular presenter at conferences of National Community Action Foundation, National Low Income Energy Consortium,

National Energy Assistance Directors Association, National Association of Regulatory Utility Commissions and National Association of State Utility Consumer Advocates. I am co-author of Access to Utility Service, "Home Energy Costs: The New Threat to Independent Living for the Nation's Low-in Income Elderly," and primary author of "Tracking the Need of the Home Energy Needs of Low-Income Households through Trend Data on Arrearages and Disconnections," and "Public Service Commission Consumer Protection Rules and Regulations: A Resource Guide."

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide the Missouri Public Service Commission with a proposal for a limited credit on the summer monthly bills of AmerenUE's low income customers who are particularly susceptible to the health and safety risks posed by exposure to excessive heat. As demonstrated below, Seniors aged 65 and above are especially prone to adverse health effects and death that can result from exposure to high indoor or outdoor temperatures, and that many may be reluctant to use air conditioning equipment in their homes even when available because of concern about the cost of operating the equipment.

Q. PLEASE DESCRIBE YOUR PROPOSAL.

A. AARP's proposed hot weather protection credit was the subject of discussions between the Company and a range of stakeholder groups regarding implementation of a Hot Weather Safety Program. At the core of AARP's

proposal is the provision of a fixed bill credit on the bills of participating customers during the hot weather months of July and August. The amount of the monthly credit would be equal to one half of the product of the floating 30-year historical average number of days that the outdoor temperature exceeded 95°F as reported by the National Weather Service's St. Louis Reporting Station, and five dollars.

1/2 x (30 yr. avg. days >=95°F x $5) = monthly credit

The bill credit would serve as a means of encouraging customers vulnerable to the health effects of excessive heat to use air conditioners in their homes during particularly hot weather to reduce the risk of heat related illness or death that might otherwise occur. AARP envisions that the bill credit will operate in conjunction with a coordinated community outreach campaign alerting the public to the dangers of excessive heat and encouraging the adoption of appropriate measures to prevent those adverse health effects that have been linked to exposure to hot weather conditions.

Q. BASED ON CURRENT DATA FROM THE NATIONAL WEATHER SERVICE'S ST. LOUIS REPORTING STATION, WHAT WOULD THE MONTHLY CREDIT BE IF THE HOT WEATHER SAFETY PROGRAM WAS IN OPERATION NOW?

A. According to the National Weather Service Data provided by the Company in response to Date to Request AARP 010, there were 282 days from 1978 through 2007 when the temperature exceeded 95°F. There was an average of 9.4 days per

year during that period when the temperature exceeded 95°F. Thus, the monthly credit per participating customer during June and July would be $23.50.

1/2 x (9.4 x $5) = $23.50

Q. WHAT DO THE 2 MONTHLY CREDITS REPRESENT IN TERMS OF THE COST TO OPERATE HOME AIR CONDITIONING?

A. An annual credit of $47 represents slightly more than half of the annual operating cost of an Energy Star qualified, 10,000 BTU per hour room air-conditioning unit assuming an electricity cost of 7.5 cents per kilowatt hour, and St. Louis weather conditions. (See Att. AARP-JH-1.) The credit therefore represents a meaningful incentive for participating customers to operate a room air-conditioning unit during the hottest days of the summer.

Q. WHY ARE YOU PROPOSING THAT THE COMPANY IMPLEMENT A BILL CREDIT PROGRAM AS DESCRIBED ABOVE?

A. I am proposing that the company implement a bill credit as part of a broader hot weather safety program because (1) excessive heat poses a major, continuing public health threat in Missouri, (2) use of air-conditioning is an effective preventive measure, and (3) some individuals may be reluctant, absent an incentive, to use air conditioning in their home even when available because of the expense involved in operating an air-conditioning unit.

Extreme heat leads to deaths and illnesses that are preventable when people are able to stay cool indoors. From 1979 through 2003 excessive heat exposure

caused at least 8,000 deaths in the United States, more than those who died in hurricanes, lightning, tornadoes, floods and earthquakes combined. In 2001 alone, 300 deaths in the U.S. were attributed to excessive heat exposure. According to the US Department of Health and Human Services, Centers for Disease Control and Prevention, "air-conditioning is the number one protective factor against heat related illness and death." (See Att. AARP-JH-2.) Further, in 2000 the Missouri Department of Health reported that 92 Missourians died due to heat related causes during the previous year, and that 68 of those deaths were of individuals aged 65 or older. The Missouri Department of Health added that "during periods of high temperatures, air-conditioning is the best preventive measure." The Department of Health further reported that among the elder heat related deaths in 1999, 19 had an air-conditioning unit, but would not use it. (See Att. AARP-JH-3.)

Q. WHY WERE THERE HEAT-RELATED DEATHS IN HOUSEHOLDS WHERE THERE WAS AN OPERATIVE AIR CONDITIONING UNIT?

Current, Missouri-specific information supports the hypothesis that some households that own the air conditioning units are reluctant to use them even during heat waves because of concern over operating costs. The Company collaborated with the Center for Advanced Social Research of University of Missouri-Columbia in June and July 2008 to conduct an elder and heat hazards survey. The survey entailed conducting telephone interviews with 405 respondents aged 60 or above in Missouri. Survey respondents were asked

questions regarding usage of air conditioning during summer months and heat waves. Among owners of air conditioning units, ten percent indicated that during summer months they did not routinely run their air conditioning unit. Of the respondents who reported that they did not routinely run their air conditioning during summer months, 35% cited "high cost" as the main reason. (It should be noted that an additional 42% gave open-ended responses to the question regarding why available air conditioning equipment had not been used during hot weather periods. As of the date of the filing of this testimony, AARP had not been provided with or had the opportunity to examine these open-ended responses.) In addition, Calvin H. Hirsch, M.D., geriatric specialist with UC Davis Health System, reported that many elderly people avoid turning on air-conditioning to save money. (See Att. AARP-JH-4.) Consistent with this report, a national survey of recipients of benefits through the Low-Income Home Energy Assistance Program (LIHEAP) in 2005 indicated that 16% of elder respondents indicated that they had kept their home at an unsafe or unhealthy temperature during the past year because of lack of money to pay for energy bills. (See "NEADA National Energy Assistance Report," p. 35, September 2005.)

Q. WHO SHOULD BE ELIGIBLE TO PARTICIPATE IN THE HOT WEATHER SAFETY BILL CREDIT PROGRAM?

A. At a minimum the program should be available to the Company's residential customers living at or below 175% of the federal poverty level and who live in a dwelling unit with at least one household member who is aged 65 years or older.

According to the Centers for Disease Control, age is a key determinant of vulnerability to heat stroke and heat exhaustion. People aged 65 years and older are the most prone to heat related illness. The elderly do not adjust as well as younger people to sudden changes in temperature, and they are more likely to have a chronic medical condition that upsets normal body responses to heat. In addition, the elderly are more likely to take prescription medicines that impede internal temperature regulatory functions. (See Att. AARP-JH-5.)

According to a June 1995 report entitled "Heat Related Illnesses and Deaths -- United States, 1994-1995" appearing in the Centers for Disease Control and Prevention's Morbidity and Mortality Weekly Report, the average annual rate of heat related deaths in the US among people aged 65 to 74 was nearly 3 times higher than the rate of those aged under 25 years old. The death rate was nearly 6 times higher in the age group of 75 to 84 years, and about 11 times higher than those aged 85 and above. In addition to presenting these national statistics, the report references a 1994 case from St. Louis in which a 68-year-old woman complained of feeling ill at 11 p.m. Paramedics transported the woman to the emergency department, where at 11:38 p.m. she was pronounced dead with a rectal temperature of 108.9°F. Her home air-conditioning unit was in working condition but had not been used. The outdoor temperature and humidity that day had reached 95°F. (See Att. AARP-JH-6.)

There is overwhelming evidence that vulnerability to heat related illness and death increases dramatically in those aged 65 years and above. In addition, as demonstrated in the journal article referenced above, the heat related death rate

infants and very young children is approximately 10 times greater than that of children aged five to 14. I therefore recommend that households with annual incomes of 175% of poverty or less and with one or more children under 2 years of age also be provided with the bill credit as described above.

Q. WHY ARE YOU PROPOSING 175% OF THE FEDERAL POVERTY GUIDELINES AS THE UPPER INCOME-ELIGIBILITY LIMIT FOR THE SUMMER BILL CREDIT PROGRAM?

A. Missourians living at 175% of the federal poverty level struggle to make ends meet and are prone to concerns about paying for necessities such as basic utility service. According to University of Missouri-Columbia Office of Social and Economic Data Analysis, a single person living in St. Louis needs $15,107 per year to pay for food, housing, medical care, transportation, and telephone service. This amount, which is equal to 145% of the federal poverty level and considerably more than the average social security benefit received by a retired worker, includes no allowance for clothing or other goods and services taken for granted by those with higher income. The bare necessities budget also exceeds the upper income eligibility limit for Missouri benefit programs such as the Low Income Home Energy Assistance Program, which is capped at 125% of the federal poverty level.

Q. HOW SHOULD PROGRAM ENROLLMENT BE ADMINISTERED?

A. The bill credit program should wherever possible utilize existing administrative structures and procedures that apply to LIHEAP. While I am recommending that summer bill credit eligibility guidelines be somewhat higher than those that apply to LIHEAP in Missouri, application, income verification, and utility notification procedures are similar and may be efficiently implemented using the Missouri Community Action Agencies that currently manage those program elements for LIHEAP. Community Action Agencies conducting intake will negate the need to establish a new administrative structure to implement the bill credit program while providing applicants with access to information about bill payment assistance, energy efficiency and hot weather safety. I further recommend that, similar to LIHEAP program administration, participating Community Action Agencies receive appropriate administrative fees for services that they deliver.

Q. HAVE YOU PROVIDED AN ESTIMATE OF THE COST OF IMPLEMENTING A BILL CREDIT PROGRAM AS DESCRIBED ABOVE FOR LOW-INCOME SENIORS?

A. Yes. To calculate the cost of providing a bill credit of $23.50 per month for two months annually to households in the Company's service territory with at least one occupant above 65 years of age and household income below 175% of the federal poverty level, I first obtained population and ratio of income to poverty data from the U.S. Census Bureau's 2000 Decennial Census for each of the 56 counties plus the city of St. Louis that comprise the Company’s service territory and calculated a 175% poverty rate for that population for each county. As

indicated in Att. AARP-JH 7, 27.6% of the population 65 years of age and above in the counties that comprise the Company's service territory lived below 175% of the federal poverty level in 1999. I then obtained county-level Census Bureau counts of households with the householder at least 65 years of age and multiplied that count by the 175% elder poverty rate for the corresponding county. Using this methodology I estimate that in 1999 there were 78,208 elder households living below 175% of the federal poverty in level in the counties served by the Company. The resulting household count was then multiplied by the $47 annual credit to obtain an unadjusted annual credit cost for each county.

The unadjusted annual credit for each county was then adjusted by two factors. The first adjustment factor was used to account for the difference between total households as reported in the combined Census Bureau county data and that the actual number of residential customers served by the company. Differences between the Census Bureau data and the number of residential customers as reported by the company are attributable to the fact that the company does not serve all of the households in each of the counties that comprise its service territory and to population changes that may have occurred since release of the 2000 Decennial Census.

The second adjustment factor relates to the rate of customer participation in the bill credit program. While the goal of the program should be to reach 100% of the eligible participants, in reality, considerably less than 100% will participate even after implementation of extensive community outreach. For purposes of estimating the cost of providing bill credits throughout the company's service

territory, I assumed a program participation rate of 50%. Given the considerably lower participation rates in utility payment assistance programs operating throughout the country, I believe that a 50% participation rate provides a high program cost estimate for planning and rate impact analysis purposes.

Finally, to obtain a "bottom line" estimate of providing bill credits as described above throughout the Company's service territory, I summed the total adjusted credits for each of the 56 counties plus the city of St. Louis. The total cost of the credits are estimated to be $1.46 million per year. (See Att. AARP-JH-8.) Please note that community outreach, education and program administration would require additional funding. Further, should the Commission order that vulnerable households, such as those with infants and young children, be protected by a summer bill credit, additional program costs would be incurred.

Q. HOW SHOULD THE HOT WEATHER SAFETY PROGRAM BILL CREDITS BE PAID FOR?

A. I recommend that the cost of the bill credits should be expensed by the company on an annual basis and recovered through monthly billing of all residential class customers as reflected in the bill impacts analysis in Att. AARP-JH-9.

Q. HAVE YOU CALCULATED THE REVENUE IMPACT OF THE COST OF PROVIDING BILL CREDITS AS DESCRIBED IN YOUR TESTIMONY?

A. Yes. A bill credit cost of $1.46 million per year represents about 6/10 of 1% (0.006) of the company's proposed $251 million revenue increase. Further, the bill credit cost represents approximately 7/100 of 1% (0.0007) of total AmerenUE 2007 revenue as reported in the Company's most recent FERC Form 1 filing. Cost of the bill credit, if allocated solely to the residential customer class, would add about 12 cents per month to the average Residential No. 1 customer class bill, assuming usage of 14,200 KWH per year if none of the Company's proposed revenue increase is granted by the Commission. The monthly increase would add about 14 cents per month if the entire 12.1% revenue increase request is granted. (See Att. AARP-JH 9.)

As indicated above, including a bill credit in households with one or more children aged 2 years and below and with incomes below 175% of poverty would add additional cost to the program but protect a population particularly vulnerable to the effects of excessive heat.

If the Company's rate and revenue request is granted by the Commission, average residential revenue per customer will increase by 12.1%, dramatically increasing the need for the hot weather bill credit as proposed here. In contrast, the cost per customer to protect vulnerable customers from the health effects of excessive heat is minimal.

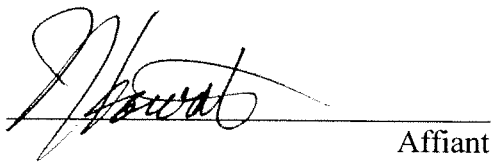
Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

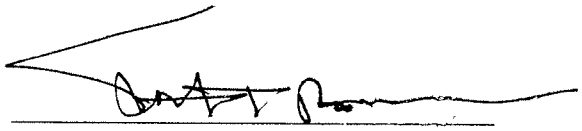
STATE OF Massachusetts)
) ss.
COUNTY OF Suffolk)

I, John Howat, of lawful age and being duly sworn, state that I am presently Senior Policy Analyst of National Consumer Law Center, an entity representing AARP; and further declare under penalties of perjury under the laws of the United States of America and the State of Missouri that the foregoing is true and correct to the best of my knowledge, information and belief, and that this declaration was executed at Boston, Massachusetts this 28th day of August, 2008.



Affiant

Subscribed and sworn to before me this 28th day of August, 2008.



Notary Public

My commission expires:

1/16/15

(S E A L)

Products that earn the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
www.energystar.gov

CHANGE FOR THE BETTER WITH ENERGY STAR

Life Cycle Cost Estimate for 1 ENERGY STAR Qualified Room Air Conditioner(s)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

Enter your own values in the gray boxes or use our default values.

Number of units	1	
Electricity Rate ($/kWh)	$0.075	
Choose your city from the menu at right	MO-St. Louis	
	ENERGY STAR Qualified Unit	**Conventional Unit**
Initial Cost per Unit (estimated retail price)	$300	$270
Energy Efficiency Ratio (EER)	10.8	9.8
Cooling Capacity of Air Conditioner (Btu/hr)	10,000	10,000

Annual and Life Cycle Costs and Savings for 1 Room Air Conditioner(s)

	1 ENERGY STAR Qualified Unit(s)	1 Conventional Unit(s)	Savings with ENERGY STAR
Annual Operating Costs*			
Energy cost	$84	$93	$9
Energy consumption (kWh)	*1,125*	*1,240*	*115*
Maintenance cost	$0	$0	$0
Total	**$84**	**$93**	**$9**
Life Cycle Costs*			
Operating costs (energy and maintenance)	$627	$691	$64
Energy costs	$627	$691	$64
Energy consumption (kWh)	*10,125*	*11,158*	*1,033*
Maintenance costs	$0	$0	$0
Purchase price for 1 unit(s)	$300	$270	-$30
Total	**$927**	**$961**	**$34**
		Simple payback of initial additional cost (years)†	**3.5**

** Annual costs exclude the initial purchase price. All costs, except initial cost, are discounted over the products' lifetime using a real discount rate of 4%. See "Assumptions" to change factors including the discount rate.*

† *A simple payback period of zero years means that the payback is immediate.*

Summary of Benefits for 1 Room Air Conditioner(s)

Initial cost difference	**$30**
Life cycle savings	**$64**
Net life cycle savings (life cycle savings - additional cost)	**$34**
Simple payback of additional cost (years)	**3.5**
Life cycle energy saved (kWh)	**1,033**
Life cycle air pollution reduction (lbs of CO_2)	**1,586**
Air pollution reduction equivalence (number of cars removed from the road for a year)	**0**
Air pollution reduction equivalence (acres of forest)	**0**
Savings as a percent of retail price	**11%**

Extreme Heat: A Prevention Guide to Promote Your Personal Health and Safety

Heat-related deaths and illness are preventable yet annually many people succumb to extreme heat. Historically, from 1979-2003, excessive heat exposure caused 8,015 deaths in the United States. During this period, more people in this country died from extreme heat than from hurricanes, lightning, tornadoes, floods, and earthquakes combined. In 2001, 300 deaths were caused by excessive heat exposure.

People suffer heat-related illness when their bodies are unable to compensate and properly cool themselves. The body normally cools itself by sweating. But under some conditions, sweating just isn't enough. In such cases, a person's body temperature rises rapidly. Very high body temperatures may damage the brain or other vital organs.

Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions related to risk include age, obesity, fever, dehydration, heart disease, mental illness, poor circulation, sunburn, and prescription drug and alcohol use.

Because heat-related deaths are preventable, people need to be aware of who is at greatest risk and what actions can be taken to prevent a heat-related illness or death. The elderly, the very young, and people with mental illness and chronic diseases are at highest risk. However, even young and healthy individuals can succumb to heat if they participate in strenuous physical activities during hot weather. Air-conditioning is the number one protective factor against heat-related illness and death. If a home is not air-conditioned, people can reduce their risk for heat-related illness by spending time in public facilities that are air-conditioned.

Summertime activity, whether on the playing field or the construction site, must be balanced with measures that aid the body's cooling mechanisms and prevent heat-related illness. This pamphlet tells how you can prevent, recognize, and cope with heat-related health problems.

What Is Extreme Heat?

Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility. Droughts occur when a long period passes without substantial rainfall. A heat wave combined with a drought is a very dangerous situation.

During Hot Weather

To protect your health when temperatures are extremely high, remember to keep cool and use common sense. The following tips are important:

Drink Plenty of Fluids

During hot weather you will need to increase your fluid intake, regardless of your activity level. Don't wait until you're thirsty to drink. During heavy exercise in a hot environment, drink two to four glasses (16-32 ounces) of cool fluids each hour.

Warning: If your doctor generally limits the amount of fluid you drink or has you on water pills, ask how much you should drink while the weather is hot.

Don't drink liquids that contain alcohol, or large amounts of sugar—these actually cause you to lose more body fluid. Also avoid very cold drinks, because they can cause stomach cramps.

Replace Salt and Minerals

Heavy sweating removes salt and minerals from the body. These are necessary for your body and must be replaced. If you must exercise, drink two to four glasses of cool, non-alcoholic fluids each hour. A sports beverage can replace the salt and minerals you lose in sweat. However, if you are on a low-salt diet, talk with your doctor before drinking a sports beverage or taking salt tablets.

Wear Appropriate Clothing and Sunscreen

Wear as little clothing as possible when you are at home. Choose lightweight, light-colored, loose-fitting clothing. Sunburn affects your body's ability to cool itself and causes a loss of body fluids. It also causes pain and damages the skin. If you must go outdoors, protect yourself from the sun by wearing a wide-brimmed hat (also keeps you cooler) along with sunglasses, and by putting on sunscreen of SPF 15 or higher (the most effective products say "broad spectrum" or "UVA/UVB protection" on their labels) 30 minutes prior to going out. Continue to reapply it according to the package directions.

Schedule Outdoor Activities Carefully

If you must be outdoors, try to limit your outdoor activity to morning and evening hours. Try to rest often in shady areas so that your body's thermostat will have a chance to recover.

Pace Yourself

If you are not accustomed to working or exercising in a hot environment, start slowly and pick up the pace gradually. If exertion in the heat makes your heart pound and leaves you gasping for breath, STOP all activity. Get into a cool area or at least into the shade, and rest, especially if you become lightheaded, confused, weak, or faint.

Stay Cool Indoors

Stay indoors and, if at all possible, stay in an air-conditioned place. If your home does not have air conditioning, go to the shopping mall or public library—even a few hours spent in air conditioning can help your body stay cooler when you go back into the heat. Call your local health department to see if there are any heat-relief shelters in your area. Electric fans may provide comfort, but when the temperature is in the high 90s, fans will not prevent heat-related illness. Taking a cool shower or bath or moving to an air-conditioned place is a much better way to cool off. Use your stove and oven less to maintain a cooler temperature in your home.

Use a Buddy System

When working in the heat, monitor the condition of your co-workers and have someone do the same for you. Heat-induced illness can cause a person to become confused or lose consciousness. If you are 65 years of age or older, have a friend or relative call to check on you twice a day during a heat wave. If you know someone in this age group, check on them at least twice a day.

Monitor Those at High Risk

Although any one at any time can suffer from heat-related illness, some people are at greater risk than others.

- Infants and children up to four years of age are sensitive to the effects of high temperatures and rely on others to regulate their environments and provide adequate liquids.

- People 65 years of age or older may not compensate for heat stress efficiently and are less likely to sense and respond to change in temperature.

- People who are overweight may be prone to heat sickness because of their tendency to retain more body heat.

- People who overexert during work or exercise may become dehydrated and susceptible to heat sickness.

- People who are physically ill, especially with heart disease or high blood pressure, or who take certain medications, such as for depression, insomnia, or poor circulation, may be affected by extreme heat.

Visit adults at risk at least twice a day and closely watch them for signs of heat exhaustion or heat stroke. Infants and young children, of course, need much more frequent watching.

Adjust to the Environment

Be aware that any sudden change in temperature, such as an early summer heat wave, will be stressful to your body. You will have a greater tolerance for heat if you limit your physical activity until you become accustomed to the heat. If you travel to a hotter climate, allow several days to become acclimated before attempting any vigorous exercise, and work up to it gradually.

Do Not Leave Children in Cars

Even in cool temperatures, cars can heat up to dangerous temperatures very quickly. Even with the windows cracked open, interior temperatures can rise almost 20 degrees Fahrenheit within the first 10 minutes. Anyone left inside is at risk for serious heat-related illnesses or even death. Children who are left unattended in parked cars are at greatest risk for heat stroke, and possibly death. When traveling with children, remember to do the following:

- Never leave infants, children or pets in a parked car, even if the windows are cracked open.
- To remind yourself that a child is in the car, keep a stuffed animal in the car seat. When the child is buckled in, place the stuffed animal in the front with the driver.
- When leaving your car, check to be sure everyone is out of the car. Do not overlook any children who have fallen asleep in the car.

Use Common Sense

Remember to keep cool and use common sense:

- Avoid hot foods and heavy meals—they add heat to your body.
- Drink plenty of fluids and replace salts and minerals in your body. Do not take salt tablets unless under medical supervision.
- Dress infants and children in cool, loose clothing and shade their heads and faces with hats or an umbrella.
- Limit sun exposure during mid-day hours and in places of potential severe exposure such as beaches.
- Do not leave infants, children, or pets in a parked car.
- Provide plenty of fresh water for your pets, and leave the water in a shady area.

Hot Weather Health Emergencies

Even short periods of high temperatures can cause serious health problems. Doing too much on a hot day, spending too much time in the sun or staying too long in an overheated place can cause heat-related illnesses. Know the symptoms of heat disorders and overexposure to the sun, and be ready to give first aid treatment.

Heat Stroke

Heat stroke occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

Recognizing Heat Stroke

Warning signs of heat stroke vary but may include the following:

- An extremely high body temperature (above 103°F, orally)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness

What to Do

If you see any of these signs, you may be dealing with a life-threatening emergency. Have someone call for immediate medical assistance while you begin cooling the victim. Do the following:

- Get the victim to a shady area.
- Cool the victim rapidly using whatever methods you can. For example, immerse the victim in a tub of cool water; place the person in a cool shower; spray the victim with cool water from a garden hose; sponge the person with cool water; or if the humidity is low, wrap the victim in a cool, wet sheet and fan him or her vigorously.
- Monitor body temperature, and continue cooling efforts until the body temperature drops to 101-102°F.
- If emergency medical personnel are delayed, call the hospital emergency room for further instructions.
- Do not give the victim fluids to drink.
- Get medical assistance as soon as possible.

Sometimes a victim's muscles will begin to twitch uncontrollably as a result of heat stroke. If this happens, keep the victim from injuring himself, but do not place any object

in the mouth and do not give fluids. If there is vomiting, make sure the airway remains open by turning the victim on his or her side.

Heat Exhaustion

Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.

Recognizing Heat Exhaustion

Warning signs of heat exhaustion include the following:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting

The skin may be cool and moist. The victim's pulse rate will be fast and weak, and breathing will be fast and shallow. If heat exhaustion is untreated, it may progress to heat stroke. Seek medical attention immediately if any of the following occurs:

- Symptoms are severe
- The victim has heart problems or high blood pressure

Otherwise, help the victim to cool off, and seek medical attention if symptoms worsen or last longer than 1 hour.

What to Do

Cooling measures that may be effective include the following:

- Cool, nonalcoholic beverages
- Rest
- Cool shower, bath, or sponge bath
- An air-conditioned environment
- Lightweight clothing

Heat Cramps

Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles may be the cause of heat cramps. Heat cramps may also be a symptom of heat exhaustion.

Recognizing Heat Cramps

Heat cramps are muscle pains or spasms—usually in the abdomen, arms, or legs—that may occur in association with strenuous activity. If you have heart problems or are on a low-sodium diet, get medical attention for heat cramps.

What to Do

If medical attention is not necessary, take these steps:

- Stop all activity, and sit quietly in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous activity for a few hours after the cramps subside, because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention for heat cramps if they do not subside in 1 hour.

Sunburn

Sunburn should be avoided because it damages the skin. Although the discomfort is usually minor and healing often occurs in about a week, a more severe sunburn may require medical attention.

Recognizing Sunburn

Symptoms of sunburn are well known: the skin becomes red, painful, and abnormally warm after sun exposure.

What to Do

Consult a doctor if the sunburn affects an infant younger than 1 year of age or if these symptoms are present:

- Fever
- Fluid-filled blisters
- Severe pain

Also, remember these tips when treating sunburn:

- Avoid repeated sun exposure.
- Apply cold compresses or immerse the sunburned area in cool water.
- Apply moisturizing lotion to affected areas. Do not use salve, butter, or ointment.
- Do not break blisters.

http://www.bt.cdc.gov/disasters/extremeheat/heat_guide.asp

Heat Rash

Heat rash is a skin irritation caused by excessive sweating during hot, humid weather. It can occur at any age but is most common in young children.

Recognizing Heat Rash

Heat rash looks like a red cluster of pimples or small blisters. It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases.

What to Do

The best treatment for heat rash is to provide a cooler, less humid environment. Keep the affected area dry. Dusting powder may be used to increase comfort.

Treating heat rash is simple and usually does not require medical assistance. Other heat-related problems can be much more severe.

This information provided by NCEH's Health Studies Branch.

Heat-Related News and Information from Missouri Dept. of Health

MO Department of Health Warns Missourians to Take Precautions to Prevent Heat-Related Illness and Death

Read the State of Missouri Heat Alert Policy

The Missouri Department of Health, the National Weather Service, and the State Emergency Management Agency have joined together to sponsor a Hot Weather Safety Day on June 8, 2000. The day is used to make Missourians more aware of the health effects of hot weather and the precautions to take during the upcoming summer months.

Last year 92 Missourians died due to heat-related causes; 68 of these were individuals aged 65 or older. During prolonged periods of high temperatures, air conditioning is the best preventive measure. Of the 68 elderly deaths in 1999, 24 had no air conditioning, 19 had an air conditioner but would not use it and 11 had an air conditioner that was not working properly. Most of the elderly were found in homes with fans blowing and windows closed. For some, even encouragement from relatives and friends could not convince them to use their air conditioner. Many did not want to or could not pay the high electric bill associated with air conditioning, while others stated they had made it through other hot summers without air conditioning or that the cold bothered their arthritis.

"Missourians need to be aware that exposure to high temperatures and humidity can cause heat-related illness and even death," said Dr. Maureen Dempsey, director of the Department of Health.

The elderly and the chronically ill are more vulnerable to the effects of high temperatures. They perspire less and are more likely to have health problems requiring medications that can impair the body's response to heat. Many prescription medications make individuals more sensitive to the heat.

"People should check with their doctor or pharmacist to find out if their medications fall into this category," Dempsey said. Some of these medications include antipsychotics, major tranquilizers, antihistamines, over-the-counter sleeping pills, antidepressants, heart drugs and some antiparkinsonian agents.

During the past ten summers, 225 Missourians have died due to heat-related causes. In 1999, 968 heat-related illnesses were reported to the Missouri Department of Health. "This summer we urge all Missourians to take extra precautions to prevent heat-related illness and death," Dempsey added. "Check on elderly family members and neighbors regularly to be sure they are not suffering from the effects of high temperatures. Do not leave infants and children unattended in hot environments."

"Missourians should be especially cautious during the first periods of high temperatures because they are not acclimated to the effects of higher temperatures and humidity," Dempsey said. Any sudden change in temperature, such as an early heat wave, will be stressful on your body. You will have a greater tolerance for the heat if you limit your physical activity until you become accustomed to the heat. If traveling to a hotter climate, allow several days to become acclimated before attempting any vigorous exercise, and work up to it gradually.

Heat-related illness occurs when the body's temperature control system is overloaded. The body normally cools itself by sweating, but when the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions that can limit the ability to regulate body temperature include old age, obesity, infection or fever, diarrhea or dehydration, certain medications, heart disease, poor circulation, diabetes, sunburn and drug or alcohol use. Very high body temperatures may damage the brain or other vital organs.

The most efficient way to beat the heat is to spend time in an air-conditioned area. If you do not have air conditioning in your home, consider spending some time in a shopping mall, public library or other air-conditioned location. Electric fans may be useful to increase comfort or to draw cool air into your home at night, but do not rely on a fan as your primary cooling device during a heat wave. As the air temperature rises, air flow is increasingly ineffective in cooling the body until finally, at temperatures above about 100° F (the exact number varies with the humidity) increasing air movement actually increases heat stress. More specifically, when the temperature of the air rises to about 100° F, the fan may be delivering overheated air to the skin at a rate that exceeds the capacity of the body to get rid of this heat, even with sweating, and the net effect is to add heat rather than to cool the body.

Dr. Dempsey urges Missourians to use the state's toll-free adult abuse hotline, 1-800-392-0210 , to report any elderly persons suffering from the heat and needing assistance.

In order to warn Missourians of dangerous heat conditions, the department actively monitors heat indexes across the state on a daily basis during the summer and issues appropriate advisories and warnings. The department also monitors the incidence of heat-related illness and death, especially during heat waves. A statewide **Hot Weather Health Advisory** will be issued by the Department of Health when a heat index of 105° is first reached (or predicted) in a large proportion of the state. The Department of Health will issue a statewide **Hot Weather Health Warning** when the afternoon heat index has been at least 105° for two days and when weather forecasts call for continued high-stress conditions for at least 48 hours over a large proportion of the state.

For additional information on preventing heat-related illness and the state's heat alert policy, see the attached material. Information is also available through the Department of Health web site at http://www.health.state.mo.us/ColdAndHeat/CAndH.html.

Elderly need special care in hot weather

An elderly person may not even be aware of feeling hot or thirsty, so it's important to pay close attention to health and well-being of loved ones and friends during a heat wave.

Hot weather can be a big concern for older people says Calvin Hirsch, a geriatrics specialist with UC Davis Health System.

"No one is comfortable when the temperature soars," said Hirsch, who is a professor of internal medicine, "but seniors account for a disproportionate number of heat-related hospitalizations and deaths."

Hirsch noted there are many factors involved in why seniors are so vulnerable in hot weather. Some individuals have health problems, such as heart disease, that make it more difficult for the body to circulate blood properly and dissipate heat. Others are on medications, like diuretics (water pills), that cause water loss and worsen the dehydrating effects of high temperatures. Obese individuals have an especially hard time keeping cool.

In addition, many seniors who live on their own will not or cannot venture far from their homes or apartments. For security reasons, they also are less inclined to keep windows open to help with the cooling power of air circulation. If the power goes out and air conditioning or fans don't work, elderly residents are much more vulnerable to rising indoor temperatures and may be unable to easily leave for a cooler environment.

Preventing heat-related illness depends mostly on making efforts to stay comfortable: drinking fluids when thirsty, sponging off with a cool towel, and escaping unrelenting heat in a location with more comfortable and safer temperatures.

"An elderly person may not even be aware of being thirsty or feeling too hot, especially if suffering from dementia or diabetes, which diminishes sensation," said Hirsch. "Many medications, such as tranquilizers, can blunt an individual's awareness of discomfort, as can alcohol."

Hirsch offers several of steps to help keep a house or apartment as cool as possible:

- Vacuum or change the filters in air conditioners. A clean filtration system offers both efficiency and more sustained cooling capabilities.
- Keep the sunshine out. Use shades or draperies on sunny windows. Outdoor awnings also can make big difference in keeping heat out of the house.

- Reflect light and heat away from the house by covering pieces of cardboard with aluminum foil on one side and placing it in the windows (preferably on the outside) facing out during hot days.

- Use portable fans for rooms that are used the most, such as the living room and bedroom.

With high temperatures, it's especially important for the elderly to follow heat-wave precautions:

- Stay in the coolest place as much as possible, and avoid too much activity. Usually the coolest part of a house is on the first floor. Outdoors, in the shade, may be cooler than indoors, especially if a breeze comes up.

- Use the air conditioner! Many elderly people avoid turning it on to save money. If there is no air conditioner or the power has gone out, seniors should try to spend at least a few hours in an air-conditioned public place, such as a library, shopping mall, movie theater or restaurant.

- Eat lightly and drink plenty of fluids. Avoid alcohol and drinks with caffeine. Don't take salt tablets unless advised to do so by a doctor.

- Make use of hand-held, battery-operated fans and misters. These inexpensive gadgets usually can be found in many stores. They can be life-savers during hot weather, especially if the power goes out.

- Rub wet washcloths over your wrists, face, and back of neck. For a quicker cool-down, wrap ice cubes in a washcloth or use packs of frozen vegetables or blue cooler packs.

“It also crucial that we all stay in frequent touch with elderly relatives and neighbors during this heat wave,” added Hirsch. “Keep in mind that heat stroke may begin with flu-like symptoms such as a loss of appetite, nausea, light-headedness or muscle cramping. But such symptoms can develop rapidly or slowly over a period of days. A person may not even be aware of feeling hot or thirsty, so it's important for the rest of us to pay close attention to health and well-being of our loved ones and friends during this heat wave.”

Hirsch says that if chilled liquids and other cooling-off measures don't seem to be working, a trip to the emergency room could be in order. Heat stroke can be fatal if not recognized and treated in time.

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EXTREME HEAT

Fact Sheet

Heat Stress in the Elderly

Elderly people (that is, people aged 65 years and older) are more prone to heat stress than younger people for several reasons:

- Elderly people do not adjust as well as young people to sudden changes in temperature.
- They are more likely to have a chronic medical condition that upsets normal body responses to heat.
- They are more likely to take prescription medicines that impair the body's ability to regulate its temperature or that inhibit perspiration.

Heat Stroke

Heat stroke is the most serious heat-related illness. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the body loses its ability to sweat, and it is unable to cool down. Body temperatures rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

Signs and Symptoms of Heat Stroke

Warning signs vary but may include the following:

- An extremely high body temperature (above 103°F)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea

Heat Exhaustion

Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids.

Signs and Symptoms of Heat Exhaustion

Warning signs vary but may include the following:

- Heavy sweating
- Paleness
- Muscle Cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting
- Skin: may be cool and moist
- Pulse rate: fast and weak
- Breathing: fast and shallow

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Heat Stress in the Elderly
(continued from previous page)

What You Can Do to Protect Yourself
You can follow these prevention tips to protect yourself from heat-related stress:

- Drink cool, nonalcoholic, noncaffeinated beverages. (If your doctor generally limits the amount of fluid you drink or has you on water pills, ask him how much you should drink when the weather is hot. Also, avoid extremely cold liquids because they can cause cramps.)
- Rest.
- Take a cool shower, bath, or sponge bath.
- If possible, seek an air-conditioned environment. (If you don't have air conditioning, consider visiting an air-conditioned shopping mall or public library to cool off.)
- Wear lightweight clothing.
- If possible, remain indoors in the heat of the day.
- Do not engage in strenuous activities.

What You Can Do to Help Protect Elderly Relatives and Neighbors
If you have elderly relatives or neighbors, you can help them protect themselves from heat-related stress:

- Visit older adults at risk at least twice a day and watch them for signs of heat exhaustion or heat stroke.
- Take them to air-conditioned locations if they have transportation problems.
- Make sure older adults have access to an electric fan whenever possible.

What You Can Do for Someone With Heat Stress
If you see any signs of severe heat stress, you may be dealing with a life-threatening emergency. Have someone call for immediate medical assistance while you begin cooling the affected person. Do the following:

- Get the person to a shady area.
- Cool the person rapidly, using whatever methods you can. For example, immerse the person in a tub of cool water; place the person in a cool shower; spray the person with cool water from a garden hose; sponge the person with cool water; or if the humidity is low, wrap the person in a cool, wet sheet and fan him or her vigorously.
- Monitor body temperature and continue cooling efforts until the body temperature drops to 101°–102°F
- If emergency medical personnel are delayed, call the hospital emergency room for further instructions.
- Do not give the person alcohol to drink.
- Get medical assistance as soon as possible.

For more information, visit www.bt.cdc.gov/disasters/extremeheat, or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (español), or (866) 874-2646 (TTY).

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June 30, 1995 / Vol. 44 / No. 25

MMWR™

MORBIDITY AND MORTALITY WEEKLY REPORT

Heat-Related Illnesses and Deaths — United States, 1994–1995

Although heat-related illness and death are readily preventable, exposure to extreme temperatures causes at least 240 deaths* during years with no heat wave. A heat wave is defined by the National Weather Service as ≥3 consecutive days of temperatures ≥90.0 F (≥32.2 C). In 1980, 1983, and 1988 (recent years with prolonged heat waves), 1700, 556, and 454 deaths, respectively, were attributed to heat. This report describes four instances of heat-related illness and death that occurred in the United States during 1994 and 1995 and summarizes risk factors for heat-related illness and death.

Case 1. On June 13, 1994, in Houston, Texas, a 29-year-old mentally impaired women was found lying on the floor of her garage. She was unresponsive when admitted to a local hospital and had a rectal temperature of 107.9 F (41.9 C). She died within 2 days of arrival at the hospital. The outdoor temperature and humidity had reached 92.0 F (33.3 C) and 91%, respectively. Her underlying cause of death was listed as hyperthermia†.

Case 2. On June 18, 1994, in St. Louis, Missouri, a 68-year-old woman who weighed approximately 350 pounds complained of "feeling ill" at 11 p.m. Her spouse phoned paramedics, who found her unresponsive; cardiac rhythm was undetectable after she was placed in the ambulance. At 11:38 p.m., she was pronounced dead on arrival at the emergency department with a rectal temperature of 108.9 F (42.7 C). Her home air conditioning system was operational but had not been used. The outdoor temperature and humidity that day had reached 95.0 F (35.6 C) and 45%, respectively. Her cause of death was listed as hyperthermia, with morbid obesity listed as an "other condition."

Case 3. On July 1, 1994, in Tucson, Arizona, a 44-year-old woman, her 53-year-old brother (both mentally retarded), and their 72-year-old mother were found dead in

*During 1979–1992, a total of 5379 deaths in the United States were attributed to excessive heat, classified according to the *International Classification of Diseases, Ninth Revision* (ICD-9), as E900.0, "due to weather conditions"; E900.1, "of man-made origin"; or E900.9, "of unspecified origin." These data were obtained from CDC's Compressed Mortality File (CMF), which contains information from death certificates filed in the 50 states and the District of Columbia that have been prepared in accordance with external cause codes. CDC's Wide-ranging ONline Data for Epidemiologic Research computerized information system was used to access CMF data.

†Hyperthermia is the diagnostic term used for deaths resulting from core body temperature ≥105 F (≥40.6 C).

Heat-Related Deaths — Continued

their home by neighbors after they had not been seen for several days. The coroner's report indicated that the mother died first, and the children had remained in the house until they also died. There was no air conditioner in the house, and all windows were closed. The outdoor temperature and humidity had reached 106.0 F (41.1 C) and 36%, respectively. The cause of death for all three was listed as hyperthermia due to heat exposure.

Case 4. On June 26, 1995, in College Park, Georgia, a grocery store customer found a 6-year-old boy, a 4-year-old girl, and a 2-year-old boy in a locked car with the windows closed in the store parking lot. After unsuccessfully attempting to attract the children's attention, the customer called 911. Police and paramedics were able to get the 6-year-old to unlock the car door. Paramedics reported the children were unresponsive, disoriented, flushed, and profusely sweating and had delayed reflexes. The children were placed in the shade under a tree and given juice and water for rehydration; they regained alertness and began talking within 30 minutes. The children had been in the car for approximately 10–20 minutes. The outdoor temperature and humidity were 84.0 F (28.9 C) and 60%, respectively, and the estimated temperature inside the car was ≥110.0 F (≥43.3 C). Paramedics reported that the children had classic signs of the onset of heatstroke that would have been life-threatening within 5–10 minutes.

Reported by: C Anders, JA Jachimczyk, Forensic Center, Harris County Medical Examiner, Houston, Texas. R Green, Medical Examiner's Office, St. Louis, Missouri. B Parks, Forensic Science Center, Tucson, Arizona. D Miller, Western Regional Climate Center, Reno, Nevada. LB Harper, College Park Police Dept, CT Dillard, ER Evans, College Park Fire Dept, College Park, Georgia. Health Studies Br and Surveillance and Programs Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC.

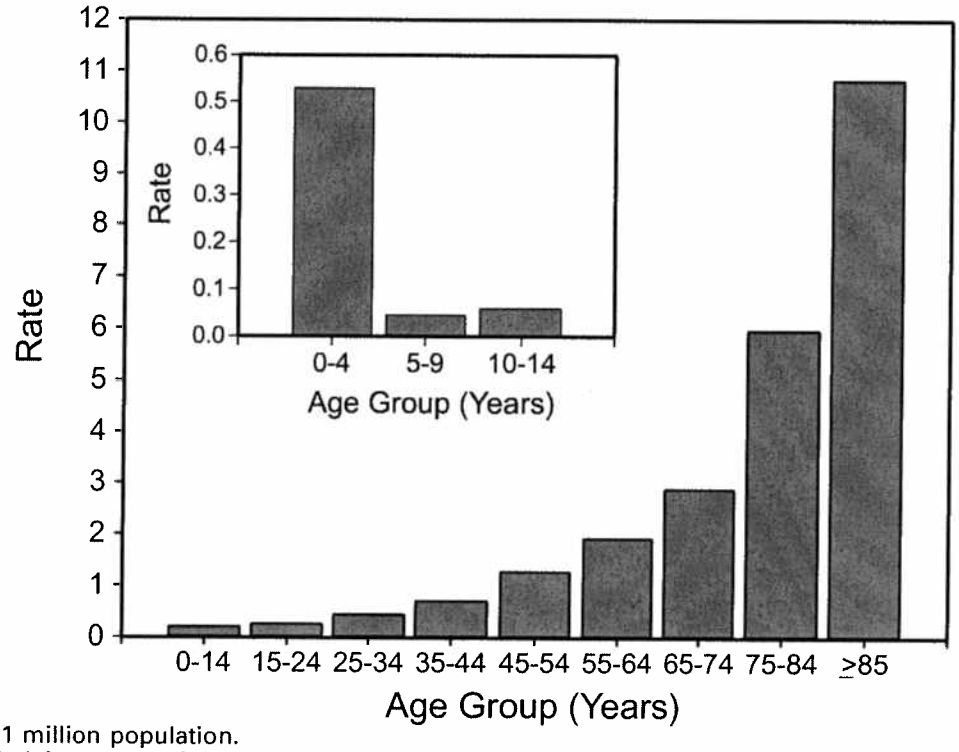
Editorial Note: Each year 148–1700 persons die in the United States because of excessive exposure to high temperatures. The highest age-adjusted death rates for heat-related illness have occurred in Alabama, Arkansas, Arizona, Georgia, Kansas, Mississippi, Missouri, Oklahoma, and South Carolina (from one to six per 1 million persons per year during 1979–1992). However, deaths listed with an underlying cause of hyperthermia represent only a portion of heat-related excess mortality because increased mortality from cardiovascular, cerebrovascular, and respiratory causes also occurs during heat waves (*1–4*).

Heatstroke, the most serious heat-related illness, is a medical emergency characterized by a body temperature ≥105.0 F (≥40.6 C) and may include symptoms such as disorientation, delirium, and coma. Onset of heatstroke can be rapid with progression to life-threatening illness within minutes. Heat exhaustion is a milder form of heat-related illness that can develop following exposure for several days to high ambient temperatures and inadequate or unbalanced replacement of fluids and electrolytes. Heat exhaustion is characterized by dizziness, weakness, and fatigue and may be sufficiently severe to require hospitalization.

The cases described in this report underscore the increased risk for heat-related illness and death among the very young (particularly infants), the elderly (i.e., persons aged ≥65 years) (Figure 1), and persons with impaired mobility (*5*). In addition, persons with chronic illness (e.g., cardiovascular disease) are at increased risk. Persons in these groups may be unable to obtain adequate fluids or to remove themselves from hot environments (e.g., closed automobiles). In extremely hot environments, the body is unable to cool itself through sweating.

Heat-Related Deaths — Continued

FIGURE 1. Average annual rate* of heat-related deaths†, by age group — United States, 1979–1992



*Per 1 million population.
† Underlying cause of death attributed to excess heat exposure, code E900.0, "due to weather conditions," *International Classification of Diseases, Ninth Revision.*

The risk for heat-related illness and death also may be higher among persons who use certain drugs (*1*), including neuroleptics (e.g., haloperidol or chlorpromazine), which impair thermoregulatory function; medications with anticholinergic effects (e.g., medication for Parkinson disease), which inhibit perspiration; and major tranquilizers (e.g., phenothiazines, butyrophenones, and thiozanthenes). In addition, excessive alcohol consumption can cause dehydration and may be a predisposing factor in heat-related illness (*5*). Salt tablets are not recommended and are potentially dangerous (*1*). Persons whose fluid consumption is restricted for medical reasons or who use diuretic medications should not alter their fluid intake patterns without the advice of their physicians. The risk for illness and death also may be increased in persons who are unacclimatized to the heat and who work or exercise vigorously outdoors, fail to rest frequently, or do not drink sufficient quantities of fluids; acclimatization to warm environments may require gradual exposure to high temperatures for 10–14 days (*6*).

The use of an artificially cooled environment (e.g., air-conditioning or evaporative cooling units), even for a few hours each day, will reduce the risk for heat-related illness (*5*). Fans can be a source of relief in areas with low humidity. However, because increased air movement (e.g., fans) has been associated with increased heat stress when the ambient temperature exceeds approximately 100 F (37.8 C) and because fans are not protective at temperatures >90 F (>32.2 C) with humidity > 35% (the exact

Heat-Related Deaths — Continued

temperature varies with the humidity), fans should not be used for preventing heat-related illness in areas of high humidity (*5,7*). Persons without home air conditioners should be assisted in taking advantage of such environments in private or in public places, such as shopping malls. Immersion in cool water (59.0 F– 61.0 F [15.0 C–16.1 C]) also can be used for maintaining acceptable body temperature.

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Update: Outbreak of Ebola Viral Hemorrhagic Fever — Zaire, 1995

As of June 25, public health authorities have identified 296 persons with viral hemorrhagic fever (VHF) attributable to documented or suspected Ebola virus infection in an outbreak in the city of Kikwit and the surrounding Bandundu region of Zaire (*1,2*); 79% of the cases have been fatal, and 90 (32%) of 283 cases in persons for whom occupation was known occurred in health-care workers. This report summarizes characteristics of persons with VHF from an initial description of cases and preliminary findings of an assessment of risk factors for transmission.

A case was defined as confirmed or suspected VHF in a resident of Kikwit or the surrounding Bandundu region identified since January 1. The median age of persons with VHF was 37 years (range: 1 month–71 years); 52% were female. Based on preliminary analysis of 66 cases for which data were available, the most frequent symptoms at onset were fever (94%), diarrhea (80%), and severe weakness (74%); other symptoms included dysphagia (41%) and hiccups (15%). Clinical signs of bleeding occurred in 38% of cases.

Potential risk factors for intrafamilial transmission were evaluated for secondary cases within households of 27 primary household cases identified through May 10. A primary household case was defined as the first case of VHF in a household; household was defined as persons who shared a cooking fire at the onset of illness in the primary household case. Among 173 household members of the 27 primary household cases, there were 28 (16%) secondary case-patients. The risk for developing VHF was higher for spouses of the primary household case-patients than for other household members (10 [45%] of 22 compared with 18 [14%] of 151; rate ratio [RR]=3.8;

Update: Ebola Virus — Continued

95% confidence interval [CI]=2.0–7.2) and for adults (aged ≥18 years) than for children (24 [30%] of 81 compared with four [4%] of 92; RR=6.7; 95% CI=2.4–18.4).

Needle sticks or surgical procedures during the 2 weeks before illness were reported for two of the 27 primary household case-patients and none of 28 secondary case-patients. Of the 28 secondary case-patients, 12 had direct contact with blood, vomitus, or stool of the ill person during hospitalization (i.e., later stages of illness), and 17 simultaneously shared the same hospital bed. Of 78 household members who had no direct physical contact with the person with the primary household case-patient during their clinical illness, none developed VHF (95% CI=0–4).

Reported by: M Musong, MD, Minister of Health, Kinshasa; T Muyembe, MD, Univ of Kinshasa; Technical and Scientific International Coordinating Committee for Viral Hemorrhagic Fever, Kikwit, Zaire. World Health Organization Kinshasa, Zaire. World Health Organization, Brazzaville, Congo. World Health Organization, Geneva, Switzerland. Médecins Sans Frontières, Belgium. Epicentre, Paris, France. Prince Leopold Institute of Tropical Medicine and Hygiene, Antwerp, Belgium. Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; International Health Program Office; Epidemiology Program Office, CDC.

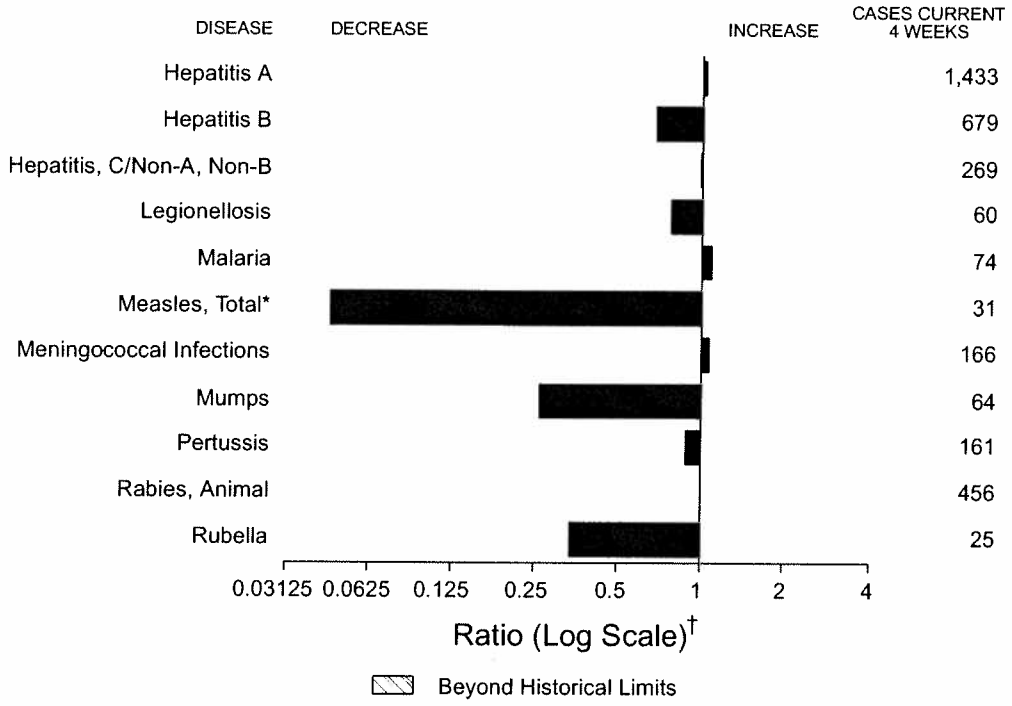
Editorial Note: The incidence of VHF related to Ebola virus in Kikwit has diminished following the institution of interventions including 1) training of medical and relief personnel on the proper use of protective equipment, 2) initiation of aggressive case-finding; and 3) educational measures in the community (e.g., pamphlets and public announcements) (*1,2*). However, cases continue to occur, and each case has the potential to be a source for additional infections. Therefore, ongoing measures including continued intensive surveillance, training activities, and public education are necessary to contain the epidemic.

To maximize prevention and control measures, prompt laboratory diagnosis is an important component of surveillance. An enzyme-linked immunosorbent assay (ELISA) detected Ebola antigen in specimens initially submitted to CDC from 11 of 13 acutely infected persons (*1*). Ongoing testing of additional specimens will assess the utility of this ELISA as a rapid diagnostic test that could be used locally. In addition, Ebola antigen was detected in multiple formalin-fixed tissue samples (liver, lung, and skin) of seven case-patients by immunohistochemical (IHC) staining using a specific polyclonal antibody. These findings suggest that IHC staining of fixed tissue may assist in surveillance for hemorrhagic fevers in Africa and other countries. Other activities include ecologic studies to identify the natural reservoir of the virus; these studies are focusing especially on mammals, nonmammalian vertebrates, and arthropods.

Transmission associated with health-care providers and caregivers has been a prominent feature of the current and previous VHF outbreaks in Africa attributable to Lassa, Marburg, Ebola, or Crimean-Congo hemorrhagic fever viruses (*3*). In some outbreaks, transmission from patient to patient within hospitals has been associated with the reuse of unsterile needles and syringes. As in previous outbreaks, high rates of transmission in this outbreak have occurred from patients to health-care workers and to family members who provided nursing care without appropriate barrier precautions to prevent exposure to blood, other body fluids, vomitus, urine, and stool. Based on findings in this report, the risk for transmitting infection from patients appears to be highest during the later stages of illness, which is characterized by vomiting, diarrhea, shock, and often hemorrhage. However, a small number of cases of VHF in Zaire

(Continued on page 475)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending June 24, 1995, with historical data — United States



*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.

†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.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending June 24, 1995 (25th Week)

	Cum. 1995		Cum. 1995
Anthrax	-	Psittacosis	31
Brucellosis	44	Rabies, human	1
Cholera	7	Rocky Mountain Spotted Fever	119
Congenital rubella syndrome	4	Syphilis, congenital, age < 1 year§	-
Diphtheria*	-	Tetanus	12
Haemophilus influenzae†	610	Toxic shock syndrome	98
Hansen Disease	66	Trichinosis	21
Plague	2	Typhoid fever	145
Poliomyelitis, Paralytic	-		

*The case previously reported in 1995 had onset of illness in October 1994. It will now be included in 1994 data.
†Of 596 cases of known age, 147 (25%) were reported among children less than 5 years of age.
§Updated quarterly from reports to the Division of Sexually Transmitted Diseases and HIV Prevention, National Center for Prevention Services. First quarter data not yet available.
-: no reported cases

TABLE II. Cases of selected notifiable diseases, United States, weeks ending June 24, 1995, and June 25, 1994 (25th Week)

Reporting Area	AIDS*	Gonorrhea		Hepatitis (Viral), by type						Legionellosis	
				A		B		C/NA,NB			
	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	29,887	167,147	183,830	11,801	10,640	4,611	5,502	2,072	2,005	612	665
NEW ENGLAND	1,471	2,274	3,925	118	158	88	199	53	75	12	12
Maine	26	36	48	16	14	6	9	-	-	3	-
N.H.	49	60	36	5	8	11	16	7	5	1	-
Vt.	14	21	12	3	2	1	6	1	6	-	-
Mass.	652	1,332	1,382	45	68	36	122	44	52	7	6
R.I.	122	245	226	14	13	8	3	1	12	1	6
Conn.	608	580	2,221	35	53	26	43	-	-	N	N
MID. ATLANTIC	7,605	17,229	20,475	717	751	559	714	193	249	69	87
Upstate N.Y.	836	2,612	4,450	191	269	181	192	102	111	22	19
N.Y. City	3,952	6,128	7,812	348	252	154	152	1	1	1	-
N.J.	1,794	1,704	2,605	96	153	135	197	75	112	14	17
Pa.	1,023	6,785	5,608	82	77	89	173	15	25	32	51
E.N. CENTRAL	2,492	36,756	37,344	1,504	1,020	481	590	142	182	172	190
Ohio	544	11,941	11,074	941	322	62	92	5	13	81	85
Ind.	200	3,667	3,799	77	171	115	108	-	4	41	23
Ill.	1,105	9,732	11,111	217	292	94	158	33	49	13	20
Mich.	502	8,820	8,003	184	130	187	192	104	116	19	38
Wis.	141	2,596	3,357	85	105	23	40	-	-	18	24
W.N. CENTRAL	697	8,852	9,937	745	511	246	307	52	43	61	48
Minn.	148	1,383	1,583	88	103	26	38	2	9	-	-
Iowa	40	697	631	38	27	19	16	3	7	12	21
Mo.	280	5,323	5,238	511	222	162	220	33	8	35	15
N. Dak.	2	13	20	14	1	3	-	3	1	3	4
S. Dak.	7	78	94	18	17	2	-	1	-	-	-
Nebr.	61	-	671	25	77	16	16	5	8	7	6
Kans.	159	1,358	1,700	51	64	18	17	5	10	4	2
S. ATLANTIC	7,773	49,907	48,398	581	542	672	1,099	150	266	100	167
Del.	154	961	872	7	14	2	8	1	1	-	-
Md.	1,133	5,971	9,221	93	82	111	172	5	15	18	39
D.C.	464	2,240	3,504	8	10	12	17	-	-	3	5
Va.	552	5,133	5,977	95	72	46	60	5	18	7	4
W. Va.	36	373	340	11	6	29	13	25	19	3	1
N.C.	405	11,665	11,527	58	57	153	129	27	34	18	12
S.C.	398	5,795	5,859	20	20	27	22	11	3	20	9
Ga.	935	7,928	U	47	23	58	466	15	148	11	75
Fla.	3,696	9,841	11,098	242	258	234	212	61	28	20	22
E.S. CENTRAL	961	20,684	21,348	537	228	439	549	577	419	16	58
Ky.	116	2,174	2,130	24	94	35	54	11	15	2	5
Tenn.	380	6,096	6,745	432	76	342	459	564	396	9	31
Ala.	263	8,769	7,569	50	34	62	36	2	8	4	7
Miss.	202	3,645	4,904	31	24	-	-	-	-	1	15
W.S. CENTRAL	2,513	15,120	21,840	1,435	1,345	679	501	290	123	7	16
Ark.	108	1,821	3,350	131	28	23	11	2	4	-	4
La.	366	5,724	5,790	43	70	97	83	78	62	2	1
Okla.	131	1,303	2,137	316	119	222	59	195	27	3	8
Tex.	1,908	6,272	10,563	945	1,128	337	348	15	30	2	3
MOUNTAIN	975	3,693	4,615	1,922	2,044	405	292	240	220	104	50
Mont.	8	38	38	39	14	10	10	9	4	4	14
Idaho	24	61	41	189	166	45	45	29	48	1	1
Wyo.	5	25	37	73	13	12	12	108	66	5	3
Colo.	339	1,456	1,574	246	243	60	52	32	39	30	11
N. Mex.	81	421	499	368	521	149	97	28	33	3	1
Ariz.	268	1,377	1,464	554	761	71	27	21	11	44	3
Utah	58	83	154	397	194	43	23	5	9	4	3
Nev.	192	232	808	56	132	15	26	8	10	13	14
PACIFIC	5,400	12,632	15,948	4,242	4,041	1,042	1,251	375	428	71	37
Wash.	463	1,190	1,435	345	541	86	111	108	126	7	8
Oreg.	184	202	446	772	431	43	77	23	21	-	-
Calif.	4,587	10,634	13,278	3,014	2,925	898	1,033	234	277	59	27
Alaska	45	351	424	19	113	5	7	1	-	-	-
Hawaii	121	255	365	92	31	10	23	9	4	5	2
Guam	-	42	67	2	12	-	4	-	-	-	1
P.R.	1,099	267	260	52	32	351	157	201	74	-	-
V.I.	19	4	11	-	2	2	4	-	1	-	-
Amer. Samoa	-	8	18	5	5	-	-	-	-	-	-
C.N.M.I.	-	13	25	15	3	7	-	-	-	-	-

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly to the Division of HIV/AIDS Prevention, National Center for Prevention Services, last update May 25, 1995.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 24, 1995, and June 25, 1994 (25th Week)

Reporting Area	Lyme Disease		Malaria		Measles (Rubeola)						Meningococcal Infections		Mumps	
					Indigenous		Imported*		Total					
	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	1995	Cum. 1995	1995	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	2,134	2,817	468	450	3	197	-	8	205	744	1,660	1,569	438	704
NEW ENGLAND	312	366	19	28	-	4	-	-	4	22	85	64	7	14
Maine	3	2	1	2	-	-	-	-	-	4	6	13	4	3
N.H.	12	10	1	3	-	-	-	-	-	1	17	6	-	4
Vt.	5	3	-	1	-	-	-	-	-	2	6	2	-	-
Mass.	53	43	6	11	-	2	-	-	2	6	29	27	1	-
R.I.	64	40	2	5	-	2	-	-	2	6	-	-	-	1
Conn.	175	268	9	6	-	-	-	-	-	3	27	16	2	6
MID. ATLANTIC	1,464	1,836	111	73	-	3	-	2	5	202	210	162	64	68
Upstate N.Y.	876	1,433	23	20	-	-	-	-	-	15	70	53	16	18
N.Y. City	47	3	51	24	-	1	-	2	3	12	22	22	5	-
N.J.	147	239	25	17	-	2	-	-	2	168	60	36	6	13
Pa.	394	161	12	12	-	-	-	-	-	7	58	51	37	37
E.N. CENTRAL	32	218	58	49	-	6	-	1	7	95	228	216	72	134
Ohio	23	13	4	7	-	1	-	-	1	15	70	62	22	39
Ind.	5	8	9	9	-	-	-	-	-	1	35	24	1	6
Ill.	3	10	31	19	-	-	-	-	-	56	70	78	23	55
Mich.	1	1	9	12	-	3	-	1	4	20	44	28	26	29
Wis.	-	186	5	2	-	2	-	-	2	3	9	24	-	5
W.N. CENTRAL	28	42	9	24	-	1	-	-	1	168	96	105	29	39
Minn.	-	-	3	7	-	-	-	-	-	-	16	9	2	3
Iowa	1	1	1	4	-	-	-	-	-	7	16	13	8	10
Mo.	10	36	3	9	-	1	-	-	1	159	36	51	15	23
N. Dak.	-	-	-	1	-	-	-	-	-	-	1	1	-	2
S. Dak.	-	-	-	-	-	-	-	-	-	-	4	6	-	-
Nebr.	1	2	2	2	-	-	-	-	-	1	9	8	4	1
Kans.	16	3	-	1	-	-	-	-	-	1	14	17	-	-
S. ATLANTIC	204	258	103	90	1	6	-	-	6	12	287	233	46	107
Del.	7	34	1	3	-	-	-	-	-	-	3	2	-	-
Md.	134	83	24	39	-	-	-	-	-	2	20	16	-	28
D.C.	-	2	9	8	-	-	-	-	-	-	1	2	-	-
Va.	16	28	21	9	-	-	-	-	-	2	33	42	14	24
W. Va.	12	9	1	-	-	-	-	-	-	1	5	10	-	3
N.C.	20	33	8	2	-	-	-	-	-	-	49	39	16	24
S.C.	7	4	-	2	-	-	-	-	-	-	36	11	7	6
Ga.	5	59	11	14	1	3	-	-	3	2	60	53	-	7
Fla.	3	6	28	13	-	3	-	-	3	5	80	58	9	15
E.S. CENTRAL	11	19	9	13	-	-	-	-	-	28	100	123	15	15
Ky.	1	12	-	4	-	-	-	-	-	-	32	25	-	-
Tenn.	7	5	3	6	-	-	-	-	-	28	27	24	4	5
Ala.	1	2	5	2	-	-	-	-	-	-	25	48	4	3
Miss.	2	-	1	1	-	-	-	-	-	-	16	26	7	7
W.S. CENTRAL	45	38	9	19	2	19	-	-	19	12	195	185	30	153
Ark.	2	3	2	1	-	2	-	-	2	1	19	31	2	4
La.	1	-	1	3	2	17	-	-	17	1	30	23	7	18
Okla.	18	19	-	2	-	-	-	-	-	-	21	18	-	22
Tex.	24	16	6	13	-	-	-	-	-	10	125	113	21	109
MOUNTAIN	4	2	29	20	-	47	-	1	48	154	129	116	27	23
Mont.	-	-	2	-	-	-	-	-	-	-	2	3	1	-
Idaho	-	1	1	2	-	-	-	-	-	-	5	14	2	5
Wyo.	2	1	-	1	-	-	-	-	-	-	5	5	-	1
Colo.	1	-	15	8	-	8	-	-	8	19	33	22	1	2
N. Mex.	-	-	3	3	-	28	-	-	28	-	28	11	N	N
Ariz.	-	-	5	1	-	10	-	-	10	-	42	40	6	2
Utah	-	-	2	4	-	-	-	1	1	126	7	15	10	7
Nev.	1	-	1	1	-	1	-	-	1	9	7	6	6	6
PACIFIC	34	38	121	134	-	111	-	4	115	51	330	365	148	151
Wash.	2	-	11	14	-	13	-	2	15	3	57	55	10	8
Oreg.	2	5	4	10	-	1	-	-	1	-	54	80	N	N
Calif.	30	33	98	102	-	97	-	1	98	46	211	224	125	132
Alaska	-	-	1	-	-	-	-	-	-	-	6	2	9	2
Hawaii	-	-	7	8	-	-	-	1	1	2	2	4	4	9
Guam	-	-	-	-	U	-	U	-	-	227	3	-	3	4
P.R.	-	-	1	2	-	9	-	-	9	11	12	5	-	2
V.I.	-	-	-	-	U	-	U	-	-	-	-	-	2	3
Amer. Samoa	-	-	-	-	U	-	U	-	-	-	-	-	-	2
C.N.M.I.	-	-	1	1	U	-	U	-	-	29	-	-	-	2

*For imported measles, cases include only those resulting from importation from other countries.
N: Not notifiable U: Unavailable -: no reported cases

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 24, 1995, and June 25, 1994 (25th Week)

Reporting Area	Pertussis			Rubella			Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	1995	Cum. 1995	Cum. 1994	1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	50	1,386	1,690	2	62	171	7,215	10,343	8,553	10,018	3,064	3,385
NEW ENGLAND	6	175	177	-	14	119	87	107	171	195	811	884
Maine	2	20	2	-	1	-	2	4	-	-	-	-
N.H.	1	15	39	-	1	-	1	1	5	10	93	96
Vt.	-	5	27	-	-	-	-	-	2	3	109	78
Mass.	3	125	89	-	2	118	34	42	95	92	288	339
R.I.	-	-	3	-	-	1	1	9	18	18	137	5
Conn.	-	10	17	-	10	-	49	51	51	72	184	366
MID. ATLANTIC	3	124	300	2	6	6	434	636	1,812	1,946	691	824
Upstate N.Y.	3	65	114	1	3	5	24	86	185	259	261	587
N.Y. City	-	22	62	1	3	-	217	295	990	1,184	-	-
N.J.	-	5	9	-	-	1	87	108	333	346	183	147
Pa.	-	32	115	-	-	-	106	147	304	157	247	90
E.N. CENTRAL	3	135	263	-	-	6	1,230	1,464	885	955	20	20
Ohio	1	46	70	-	-	-	430	526	141	149	2	-
Ind.	-	13	35	-	-	-	118	116	21	86	3	3
Ill.	2	24	54	-	-	1	471	515	503	472	3	4
Mich.	-	40	23	-	-	5	130	149	190	217	11	7
Wis.	-	12	81	-	-	-	81	158	30	31	1	6
W.N. CENTRAL	-	63	73	-	-	2	378	611	274	255	157	104
Minn.	-	28	39	-	-	-	22	25	58	52	6	13
Iowa	-	2	6	-	-	-	28	25	38	17	54	41
Mo.	-	5	15	-	-	2	319	521	109	122	17	10
N. Dak.	-	6	3	-	-	-	-	1	1	4	18	6
S. Dak.	-	7	-	-	-	-	-	1	10	14	35	14
Nebr.	-	4	4	-	-	-	-	8	10	8	-	-
Kans.	-	11	6	-	-	-	9	30	48	38	27	20
S. ATLANTIC	16	134	171	-	16	10	1,738	2,670	1,613	1,908	1,034	906
Del.	1	6	-	-	-	-	8	14	12	18	33	21
Md.	-	15	54	-	-	-	42	114	205	152	213	296
D.C.	-	2	4	-	-	-	60	124	51	52	10	2
Va.	-	8	15	-	-	-	305	372	105	176	199	191
W. Va.	-	-	2	-	-	-	2	8	47	41	51	37
N.C.	5	55	44	-	-	-	564	860	180	230	211	88
S.C.	2	14	10	-	-	-	306	343	160	197	67	85
Ga.	-	1	13	-	-	-	257	422	271	365	143	184
Fla.	8	33	29	-	16	10	194	413	582	677	107	2
E.S. CENTRAL	3	32	91	-	-	-	1,979	1,816	465	694	86	98
Ky.	-	-	53	-	-	-	103	106	53	156	9	6
Tenn.	3	7	16	-	-	-	411	485	162	215	11	34
Ala.	-	25	14	-	-	-	313	343	185	209	66	58
Miss.	-	-	8	-	-	-	1,152	882	65	114	-	-
W.S. CENTRAL	-	67	51	-	2	7	1,002	2,407	1,087	1,146	61	363
Ark.	-	-	10	-	-	-	173	257	90	105	16	15
La.	-	4	5	-	-	-	524	881	-	7	23	43
Okla.	-	14	20	-	-	4	42	84	103	120	22	19
Tex.	-	49	16	-	2	3	263	1,185	894	914	-	286
MOUNTAIN	1	444	204	-	5	3	111	156	298	251	64	40
Mont.	-	3	3	-	-	-	3	1	3	9	23	8
Idaho	-	74	23	-	-	-	-	1	6	6	-	-
Wyo.	-	1	-	-	-	-	2	-	2	2	18	11
Colo.	1	14	112	-	-	-	70	76	22	26	-	6
N. Mex.	-	32	9	-	-	-	7	9	44	37	3	2
Ariz.	-	305	43	-	4	-	19	36	147	95	18	11
Utah	-	10	12	-	1	2	3	7	19	16	1	-
Nev.	-	5	2	-	-	1	7	26	55	60	1	2
PACIFIC	18	212	360	-	19	18	256	476	1,948	2,668	140	146
Wash.	4	41	46	-	1	-	7	21	133	126	-	4
Oreg.	-	8	43	-	1	-	6	18	23	67	-	-
Calif.	12	144	265	-	15	16	242	434	1,671	2,314	136	111
Alaska	-	-	-	-	-	-	1	2	42	33	4	31
Hawaii	2	19	6	-	2	2	-	1	79	128	-	-
Guam	U	-	2	U	-	1	1	3	5	37	-	-
P.R.	-	6	2	-	-	-	138	165	89	62	19	45
V.I.	U	-	-	U	-	-	1	22	-	-	-	-
Amer. Samoa	U	-	-	U	-	-	-	1	3	3	-	-
C.N.M.I.	U	-	-	U	-	-	3	-	13	16	-	-

U: Unavailable -: no reported cases

TABLE III. Deaths in 121 U.S. cities,* week ending June 24, 1995 (25th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	609	421	106	59	16	7	35
Boston, Mass.	155	97	33	19	3	3	3
Bridgeport, Conn.	47	33	10	2	1	1	-
Cambridge, Mass.	16	12	2	2	-	-	-
Fall River, Mass.	30	24	4	2	-	-	2
Hartford, Conn.	58	33	12	9	3	1	2
Lowell, Mass.	25	19	5	1	-	-	2
Lynn, Mass.	11	10	1	-	-	-	2
New Bedford, Mass.	29	27	2	-	-	-	3
New Haven, Conn.	55	37	8	4	4	2	2
Providence, R.I.	38	31	5	2	-	-	-
Somerville, Mass.	5	1	2	2	-	-	-
Springfield, Mass.	52	38	7	6	1	-	5
Waterbury, Conn.	24	16	4	2	2	-	3
Worcester, Mass.	64	43	11	8	2	-	11
MID. ATLANTIC	2,367	1,545	420	296	58	48	110
Albany, N.Y.	45	36	6	3	-	-	4
Allentown, Pa.	28	21	6	1	-	-	-
Buffalo, N.Y.	97	70	12	11	3	1	3
Camden, N.J.	34	18	7	4	3	2	2
Elizabeth, N.J.	17	14	1	2	-	-	3
Erie, Pa.§	28	21	3	4	-	-	1
Jersey City, N.J.	32	18	5	5	1	3	-
New York City, N.Y.	1,266	796	245	163	38	24	35
Newark, N.J.	93	38	21	25	2	7	8
Paterson, N.J.	26	19	-	6	1	-	-
Philadelphia, Pa.	289	201	54	34	-	-	28
Pittsburgh, Pa.§	54	32	10	6	-	6	3
Reading, Pa.	9	7	-	2	-	-	1
Rochester, N.Y.	123	90	15	14	2	2	10
Schenectady, N.Y.	28	22	3	1	1	1	-
Scranton, Pa.§	28	22	4	1	1	-	2
Syracuse, N.Y.	95	63	19	7	4	2	6
Trenton, N.J.	34	24	5	4	1	-	1
Utica, N.Y.	14	11	3	-	-	-	1
Yonkers, N.Y.	27	22	1	3	1	-	2
E.N. CENTRAL	2,063	1,331	414	185	79	54	127
Akron, Ohio	54	38	12	4	-	-	-
Canton, Ohio	34	22	8	3	-	1	3
Chicago, Ill.	389	228	90	46	14	11	30
Cincinnati, Ohio	110	66	26	8	3	7	3
Cleveland, Ohio	156	83	36	25	7	5	4
Columbus, Ohio	164	101	39	14	7	3	11
Dayton, Ohio	109	74	24	4	3	4	5
Detroit, Mich.	186	110	39	20	13	4	3
Evansville, Ind.	68	53	12	3	-	-	5
Fort Wayne, Ind.	66	52	11	2	1	-	5
Gary, Ind.	26	15	2	4	5	-	-
Grand Rapids, Mich.	66	50	4	5	4	3	12
Indianapolis, Ind.	198	126	46	17	5	4	14
Madison, Wis.	42	29	6	3	4	-	4
Milwaukee, Wis.	112	80	16	6	2	8	5
Peoria, Ill.	43	30	9	1	2	1	7
Rockford, Ill.	48	33	9	5	1	-	6
South Bend, Ind.	34	26	6	1	1	-	1
Toledo, Ohio	97	70	12	9	4	2	8
Youngstown, Ohio	61	45	7	5	3	1	1
W.N. CENTRAL	677	467	117	40	18	26	37
Des Moines, Iowa	62	44	13	1	1	3	10
Duluth, Minn.	25	20	5	-	-	-	1
Kansas City, Kans.	U	U	U	U	U	U	U
Kansas City, Mo.	107	67	22	8	-	1	5
Lincoln, Nebr.	43	35	7	1	-	-	1
Minneapolis, Minn.	151	99	29	9	9	5	9
Omaha, Nebr.	88	64	16	3	2	3	7
St. Louis, Mo.	126	81	19	12	5	9	-
St. Paul, Minn.	75	57	6	6	1	5	4
Wichita, Kans.	U	U	U	U	U	U	U
S. ATLANTIC	1,185	734	249	143	40	18	82
Atlanta, Ga.	163	89	39	27	4	4	5
Baltimore, Md.	161	100	32	22	2	5	23
Charlotte, N.C.	124	78	28	13	4	1	7
Jacksonville, Fla.	126	81	22	17	3	3	10
Miami, Fla.	102	66	19	15	1	1	-
Norfolk, Va.	40	22	9	4	4	1	3
Richmond, Va.	61	33	24	2	2	-	3
Savannah, Ga.	29	20	5	3	1	-	2
St. Petersburg, Fla.	69	54	7	6	1	1	3
Tampa, Fla.	195	136	35	16	7	-	23
Washington, D.C.	108	50	29	16	11	2	3
Wilmington, Del.	7	5	-	2	-	-	-
E.S. CENTRAL	813	496	191	80	29	17	81
Birmingham, Ala.	112	69	26	13	3	1	4
Chattanooga, Tenn.	53	39	9	1	3	1	2
Knoxville, Tenn.	79	47	17	9	5	1	9
Lexington, Ky.	71	49	15	5	2	-	6
Memphis, Tenn.	233	134	58	25	9	7	27
Mobile, Ala.	67	43	11	9	1	3	2
Montgomery, Ala.	66	38	22	4	1	1	11
Nashville, Tenn.	132	77	33	14	5	3	20
W.S. CENTRAL	1,402	890	274	155	42	41	64
Austin, Tex.	70	40	15	11	4	-	6
Baton Rouge, La.	34	16	6	9	-	3	-
Corpus Christi, Tex.	59	40	14	4	-	1	2
Dallas, Tex.	191	108	38	31	8	6	5
El Paso, Tex.	56	44	8	2	1	1	5
Ft. Worth, Tex.	98	63	11	13	4	7	1
Houston, Tex.	334	217	71	35	4	7	20
Little Rock, Ark.	65	51	10	3	-	1	3
New Orleans, La.	141	81	24	23	8	5	-
San Antonio, Tex.	173	99	47	14	5	8	10
Shreveport, La.	69	49	7	5	6	2	6
Tulsa, Okla.	112	82	23	5	2	-	6
MOUNTAIN	927	641	152	94	23	17	60
Albuquerque, N.M.	103	64	21	9	4	5	4
Colo. Springs, Colo.	36	26	5	3	1	1	6
Denver, Colo.	133	78	23	24	3	5	8
Las Vegas, Nev.	181	136	28	16	1	-	9
Ogden, Utah	28	19	6	3	-	-	1
Phoenix, Ariz.	180	117	30	21	11	1	13
Pueblo, Colo.	31	19	6	6	-	-	2
Salt Lake City, Utah	98	75	16	5	1	1	9
Tucson, Ariz.	137	107	17	7	2	4	8
PACIFIC	1,816	1,224	291	183	48	43	142
Berkeley, Calif.	15	12	-	3	-	-	4
Fresno, Calif.	103	67	18	10	3	5	8
Glendale, Calif.	25	21	2	2	-	-	3
Honolulu, Hawaii	53	36	10	2	3	2	5
Long Beach, Calif.	72	48	12	9	1	2	9
Los Angeles, Calif.	525	350	90	50	22	9	26
Pasadena, Calif.	26	19	2	1	-	4	1
Portland, Oreg.	98	70	13	9	2	4	2
Sacramento, Calif.	166	115	26	18	5	2	22
San Diego, Calif.	129	85	24	15	2	3	17
San Francisco, Calif.	128	65	19	17	2	3	15
San Jose, Calif.	179	130	27	18	2	2	13
Santa Cruz, Calif.	36	25	7	4	-	-	6
Seattle, Wash.	129	87	19	15	3	5	4
Spokane, Wash.	53	39	8	3	1	1	4
Tacoma, Wash.	79	55	14	7	2	1	3
TOTAL	11,859¶	7,749	2,214	1,235	353	271	738

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

†Pneumonia and influenza.

§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

U: Unavailable -: no reported cases

Update: Ebola Virus — Continued

have been reported in family members whose only contact with an infected person was in the domestic setting within a few days after onset of illness.

Updated recommendations for the management of VHFs attributable to these viruses in the United States are presented in a Notice to Readers in this issue (*4*).

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Notice to Readers

Update: Management of Patients with Suspected Viral Hemorrhagic Fever — United States

In 1988, CDC published guidelines for managing patients with suspected viral hemorrhagic fever (VHF) (*1*). Pending a comprehensive review of the 1988 guidelines, this notice provides interim recommendations that update the 1988 guidelines for healthcare settings in the United States. This update applies to four viruses that cause syndromes of VHF: Lassa, Marburg, Ebola, and Congo-Crimean hemorrhagic fever viruses; although the risk and/or mode of nosocomial transmission differs for each of these viruses, the limited data do not permit clear distinctions.

Background

In Africa, transmission of VHF has been associated with reuse of unsterile needles and syringes and with provision of patient care without appropriate barrier precautions to prevent exposure to virus-containing blood and other body fluids (including vomitus, urine, and stool). The risks associated with various body fluids have not been well defined as most caregivers who acquired infection had multiple contacts with multiple fluids. Epidemiologic studies of VHF in humans indicate that infection is not readily transmitted from person to person by the airborne route (*1,2*). Airborne transmission involving humans has never been documented and is considered a possibility only in rare instances from persons with advanced stages of disease (e.g., one patient with Lassa fever who had extensive pulmonary involvement may have transmitted infection by the airborne route) (*3*). In contrast, investigation of VHF in nonhuman primates (i.e., monkeys) has suggested possible airborne spread among these species (*4–7*). Despite uncertainties regarding the applicability to humans of data regarding airborne transmission in nonhuman primates, such information must be considered in the development of infection-control precautions because information regarding exposure and transmission in humans is limited.

The risk for person-to-person transmission of hemorrhagic fever viruses is highest during the latter stages of illness, which are characterized by vomiting, diarrhea, shock, and often hemorrhage. VHF infection has not been reported in persons whose contact with an infected patient occurred only during the incubation period (i.e., be-

Notice to Readers — Continued

fore the patient became febrile; the incubation period ranges from 2 days to 3 weeks, depending on the etiology of the VHF [*1*]). In the 1995 Zaire outbreak, some instances of Ebola virus transmission within a few days after onset of fever were reported; however, other symptoms in the source patients and the level of exposure to body fluids among these secondary cases were unknown (CDC, unpublished data, 1995). In studies involving three monkeys experimentally infected with Ebola virus (Reston strain), fever and other systemic signs of illness preceded detection of infectious virus in the pharynx by 2–4 days, in the nares by 5–10 days, in the conjunctivae by 5–6 days, and on anal swabs by 5–6 days (P. Jahrling, U.S. Army Medical Research Institute of Infectious Diseases, unpublished data, 1995).

Reporting

All suspected cases of infection with Ebola virus and other hemorrhagic fever viruses should be reported immediately to local and state health departments and to CDC (telephone [404] 639-1511; from 4:30 p.m. to 8 a.m., telephone [404] 639-2888). Specimens for virus-specific diagnostic tests should be sent to CDC as rapidly as possible according to instructions provided when contact is made. General information regarding Ebola virus infection is available through the CDC Ebola Hotline (telephone [800] 900-0681).

Recommendations

The following recommendations apply to patients who, within 3 weeks before onset of fever, have either 1) traveled in the specific local area of a country where VHF has recently occurred; 2) had direct contact with blood, other body fluids, secretions, or excretions of a person or animal with VHF; or 3) worked in a laboratory or animal facility that handles hemorrhagic fever viruses. **The likelihood of acquiring VHF is considered extremely low in persons who do not meet any of these criteria.** The cause of fever in persons who have traveled in areas where VHF is endemic is more likely to be a different infectious disease (e.g., malaria or typhoid fever); evaluation for and treatment of these other potentially serious infections should not be delayed.

1. Because most ill persons undergoing prehospital evaluation and transport are in the early stages of disease and would not be expected to have symptoms that increase the likelihood of contact with infectious body fluids (e.g., vomiting, diarrhea, or hemorrhage), universal precautions are generally sufficient (*8*). If a patient has respiratory symptoms (e.g., cough or rhinitis), face shields or surgical masks and eye protection (e.g., goggles or eyeglasses with side shields) should be worn by caregivers to prevent droplet contact (*8*). Blood, urine, feces, or vomitus, if present, should be handled as described in the following recommendations for hospitalized patients.
2. Patients in a hospital outpatient or inpatient setting should be placed in a private room. A negative pressure room is not required during the early stages of illness, but should be considered at the time of hospitalization to avoid the need for subsequent transfer of the patient. Nonessential staff and visitors should be restricted from entering the room. Caretakers should use barrier precautions to prevent skin or mucous membrane exposure to blood and other body fluids, secretions, and excretions. All persons entering the patient's room should wear gloves and gowns to prevent contact with items or environmental surfaces that may be soiled. In addition, face shields or surgical masks and eye protection

Notice to Readers — Continued

(e.g., goggles or eyeglasses with side shields) should be worn by persons coming within approximately 3 feet of the patient to prevent contact with blood, other body fluids, secretions (including respiratory droplets), or excretions. The need for additional barriers depends on the potential for fluid contact, as determined by the procedure performed and the presence of clinical symptoms that increase the likelihood of contact with body fluids from the patient (*8*). For example, if copious amounts of blood, other body fluids, vomit, or feces are present in the environment, leg and shoe coverings also may be needed. Before entering the hallway, all protective barriers should be removed and shoes that are soiled with body fluids should be cleaned and disinfected as described below (see recommendation 6). An anteroom for putting on and removing protective barriers and for storing supplies would be useful, if available (*1*).

3. For patients with suspected VHF who have a prominent cough, vomiting, diarrhea, or hemorrhage, additional precautions are indicated to prevent possible exposure to airborne particles that may contain virus. Patients with these symptoms should be placed in a negative-pressure room (*9*). Persons entering the room should wear personal protective respirators as recommended for care of patients with active tuberculosis (high efficiency particulate air [HEPA] respirators or more protective respirators) (*9*).
4. Measures to prevent percutaneous injuries associated with the use and disposal of needles and other sharp instruments should be undertaken as outlined in recommendations for universal precautions (*8*). If surgical or obstetric procedures are necessary, the state health department and CDC's National Center for Infectious Diseases, Hospital Infections Program (telephone [404] 639-6425) and Division of Viral and Rickettsial Diseases (telephone [404] 639-1511; from 4:30 p.m. to 8 a.m., telephone [404] 639-2888) should be consulted regarding appropriate precautions for these procedures.
5. Because of the potential risks associated with handling infectious materials, laboratory testing should be the minimum necessary for diagnostic evaluation and patient care. Clinical laboratory specimens should be obtained using precautions outlined above (see recommendations 1–4 above), placed in plastic bags that are sealed, then transported in clearly labeled, durable, leakproof containers directly to the specimen handling area of the laboratory. Care should be taken not to contaminate the external surfaces of the container. Laboratory staff should be alerted to the nature of the specimens, which should remain in the custody of a designated person until testing is done. Specimens in clinical laboratories should be handled in a class II biological safety cabinet following biosafety level 3 practices (*10*). Serum used in laboratory tests should be pretreated with polyethylene glycol p-tert-octylphenyl ether (Triton® X-100)*; treatment with 10 µL of 10% Triton® X-100 per 1 mL of serum for 1 hour reduces the titer of hemorrhagic fever viruses in serum, although 100% efficacy in inactivating these viruses should not be assumed. Blood smears (e.g., for malaria) are not infectious after fixation in solvents. Routine procedures can be used for automated analyzers; analyzers should be disinfected as recommended by the

*Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Notice to Readers — Continued

manufacturer or with a 500 parts per million solution of sodium hypochlorite (1:100 dilution of household bleach: ¼ cup to 1 gallon water) after use. Virus isolation or cultivation must be done at biosafety level 4 (*10*). The CDC mobile isolation laboratory is no longer available (*1*).

6. Environmental surfaces or inanimate objects contaminated with blood, other body fluids, secretions, or excretions should be cleaned and disinfected using standard procedures (*8*). Disinfection can be accomplished using a U.S. Environmental Protection Agency (EPA)-registered hospital disinfectant or a 1:100 dilution of household bleach.
7. Soiled linens should be placed in clearly labeled leak-proof bags at the site of use and transported directly to the decontamination area. Linens can be decontaminated in a gravity displacement autoclave or incinerated. Alternatively, linens can be laundered using a normal hot water cycle with bleach if universal precautions to prevent exposures are precisely followed (*8*) and linens are placed directly into washing machines without sorting.
8. There is no evidence for transmission of hemorrhagic fever viruses to humans or animals through exposure to contaminated sewage; the risk of such transmission would be expected to be extremely low with sewage treatment procedures in use in the United States. As an added precaution, however, measures should be taken to eliminate or reduce the infectivity of bulk blood, suctioned fluids, secretions, and excretions before disposal. These fluids should be either autoclaved, processed in a chemical toilet, or treated with several ounces of household bleach for ≥5 minutes (e.g., in a bedpan or commode) before flushing or disposal in a drain connected to a sanitary sewer. Care should be taken to avoid splashing when disposing of these materials. Potentially infectious solid medical waste (e.g., contaminated needles, syringes, and tubing) should either be incinerated or be decontaminated by autoclaving or immersion in a suitable chemical germicide (i.e., an EPA-registered hospital disinfectant or a 1:100 dilution of household bleach), then handled according to existing local and state regulations for waste management.
9. If the patient dies, handling of the body should be minimal. The corpse should be wrapped in sealed leakproof material, not embalmed, and cremated or buried promptly in a sealed casket. If an autopsy is necessary, the state health department and CDC should be consulted regarding appropriate precautions (*1*).
10. Persons with percutaneous or mucocutaneous exposures to blood, body fluids, secretions, or excretions from a patient with suspected VHF should immediately wash the affected skin surfaces with soap and water. Application of an antiseptic solution or handwashing product may be considered also, although the efficacy of this supplemental measure is unknown. Mucous membranes (e.g., conjunctiva) should be irrigated with copious amounts of water or eyewash solution. Exposed persons should receive medical evaluation and follow-up management (*1*).

Reported by: Hospital Infections Program, Div of Viral and Rickettsial Diseases, and Div of Quarantine, National Center for Infectious Diseases; Office of the Director, National Institute for Occupational Safety and Health; Office of Health and Safety, CDC.

Notice to Readers — Continued

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Notice to Readers

Prevention 96 Conference: Prevention for All — Challenges, Opportunities, and Strategies

Prevention 96, the 13th annual national preventive medicine meeting, will be sponsored by the American College of Preventive Medicine and the Association of Teachers of Preventive Medicine in collaboration with CDC and other national health agencies in Dallas, Texas, March 23–26, 1996. The conference will explore challenges, opportunities, and strategies for preventive medicine in the health-care system. Information on registration and submission of abstracts is available from the Meetings Manager, Prevention 96, 1660 L Street, N.W., Suite 206, Washington, DC, 20036-5603; telephone (202) 466-2569.

Erratum: Vol. 44, No. SS-2

In the *CDC Surveillance Summaries*, on page 29 of the report titled "Abortion Surveillance—United States, 1991," the ninth footnote to Table 3 should read: ***>100 abortions per 1,000 women 15–44 years of age.

Erratum: Vol. 44, No. 23

In the article "Implementation of Health Initiatives During a Cease Fire—Sudan, 1995" one of the areas in Figures 1 (page 434) and 2 (page 435) was mislabeled. In Figure 1, the area labeled "Red Sea" should have been labeled Red Sea state. In Figure 2, the area labeled "Red Sea" should not have been labeled.

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AmerenUE Service Territory Counties - Ratio of Income to Poverty in Population 65+

MO County	Population - All Ages	Population - 65+	Ratio of Income in 1999 to Poverty - Population 65+										<175% Poverty Rate 65+
			Under .50	.50 to .74	.75 to .99	1.00 to 1.24	1.25 to 1.29	1.30 to 1.49	1.50 to 1.74	1.75 to 1.84	1.85 to 1.99	2.00 and over	
Adair	22,186	2,783	111	98	126	211	82	154	172	50	108	1,671	36.1%
Audrain	23,891	4,005	103	109	181	192	74	216	248	81	156	2,645	30.1%
Boone	126,458	10,922	184	181	283	403	88	356	450	141	352	8,484	19.1%
Butler	40,039	6,325	185	365	517	614	132	510	440	150	197	3,215	46.1%
Caldwell	8,831	1,397	40	55	85	112	36	64	110	39	62	794	38.7%
Callaway	36,763	4,147	56	83	206	224	60	119	285	115	177	2,822	27.7%
Camden	36,505	6,854	144	100	285	412	50	305	345	132	221	4,860	25.9%
Cape Girardeau	65,333	8,548	176	213	473	382	96	434	640	138	307	5,689	29.9%
Chariton	8,230	1,730	84	44	114	147	32	104	145	36	78	946	40.8%
Clark	7,266	1,141	54	17	74	94	30	44	69	38	65	656	36.8%
Clay	181,335	18,771	320	208	500	650	162	541	802	297	604	14,687	18.5%
Clinton	18,557	2,370	76	73	151	129	38	76	188	36	92	1,511	32.4%
Cole	65,737	7,644	120	95	345	236	77	231	323	143	291	5,783	20.5%
Cooper	14,648	2,314	27	69	96	114	68	93	156	29	89	1,573	28.2%
Daviess	7,932	1,360	32	49	99	60	11	50	76	18	67	898	29.0%
DeKalb	8,755	1,437	48	73	98	64	47	79	148	34	44	802	41.1%
Dunklin	32,324	5,021	217	225	628	503	75	258	406	109	144	2,456	48.2%
Franklin	92,466	10,628	326	196	409	469	199	381	740	306	415	7,187	28.5%
Gasconade	14,992	2,624	48	69	146	186	26	136	178	102	82	1,651	34.0%
Gentry	6,706	1,373	30	26	86	131	35	83	87	33	44	818	37.2%
Howard	9,537	1,565	88	37	100	73	9	117	140	63	72	866	40.1%
Iron	10,376	1,603	27	45	139	126	24	134	135	54	56	863	42.7%
Jefferson	195,583	17,158	301	256	527	885	244	716	1,260	473	579	11,917	27.2%
Knox	4,284	874	26	30	88	92	13	24	49	19	26	507	39.0%
Lewis	9,714	1,507	38	65	74	77	30	114	48	66	75	920	34.0%
Lincoln	38,288	3,933	56	135	164	239	52	135	289	101	139	2,623	29.8%
Linn	13,468	2,601	65	111	191	230	72	170	217	38	125	1,382	42.1%
Livingston	13,592	2,400	42	54	175	199	42	106	178	72	144	1,388	36.2%
Maries	8,781	1,360	30	31	119	92	22	72	152	51	43	748	41.8%

Source: U.S. Census Bureau, Census 2000 - PCT50. AGE BY RATIO OF INCOME IN 1999 TO POVERTY LEVEL

AmerenUE Service Territory Counties - Ratio of Income to Poverty in Population 65+

MO County	Population - All Ages	Population - 65+	Ratio of Income in 1999 to Poverty - Population 65+ Under .50	.50 to .74	.75 to .99	1.00 to 1.24	1.25 to 1.29	1.30 to 1.49	1.50 to 1.74	1.75 to 1.84	1.85 to 1.99	2.00 and over	<175% Poverty Rate 65+
Miller	23,110	3,464	119	123	268	303	63	212	203	68	113	1,992	39.2%
Mississippi	13,056	1,974	46	148	235	254	56	146	85	80	70	854	53.2%
Moniteau	13,465	1,908	42	39	90	167	25	101	119	23	63	1,239	31.8%
Monroe	9,128	1,530	27	27	104	166	29	101	95	45	55	881	38.8%
Montgomery	11,712	1,866	14	44	139	162	30	83	173	37	79	1,105	36.5%
Morgan	19,066	3,656	165	56	132	275	56	186	264	81	121	2,320	33.2%
New Madrid	19,304	2,773	125	131	277	294	65	168	150	93	140	1,330	47.0%
Osage	12,829	1,772	22	50	113	131	34	115	161	29	66	1,051	37.0%
Pemiscot	19,739	2,832	153	108	396	313	68	181	194	82	72	1,265	52.8%
Pettis	38,670	5,739	214	126	264	338	56	215	453	109	254	3,710	30.9%
Pike	16,086	2,427	87	100	181	120	66	193	143	79	52	1,406	39.9%
Ralls	9,511	1,299	44	26	69	96	11	79	68	34	53	819	32.9%
Randolph	22,178	3,351	117	81	243	212	71	251	267	74	117	1,918	39.3%
Ray	22,956	2,823	82	41	96	153	25	137	166	50	93	1,980	26.6%
Reynolds	6,537	1,063	23	57	85	119	15	80	94	34	37	519	47.7%
St. Charles	279,670	23,846	409	208	598	683	213	696	914	481	645	18,999	17.6%
Ste. Genevieve	17,455	2,469	56	69	69	189	42	110	171	76	92	1,595	31.7%
St. Francois	51,834	7,655	232	159	492	517	134	466	621	206	247	4,581	36.9%
St. Louis	997,284	135,766	2,409	1,747	3,103	4,225	1,077	3,975	5,113	2,444	3,503	108,170	17.7%
Saline	22,045	3,539	92	65	147	224	23	233	260	79	103	2,313	31.7%
Schuyler	4,103	771	6	17	113	62	8	45	40	33	52	395	42.0%
Scotland	4,823	840	13	45	55	106	11	40	66	34	18	452	44.0%
Scott	39,715	5,173	155	103	448	455	87	347	293	130	229	2,926	39.0%
Stoddard	29,236	4,831	209	125	516	540	103	339	434	133	224	2,208	49.7%
Sullivan	7,092	1,234	57	62	139	126	25	94	134	34	32	531	54.4%
Warren	24,272	3,110	91	84	148	146	41	148	174	89	97	2,092	29.6%
Washington	22,098	2,565	125	63	144	208	27	174	229	130	159	1,306	42.9%
St. Louis city	339,323	45,357	2,030	1,714	4,141	3,265	669	2,324	3,050	1,228	1,688	25,248	40.6%
TOTAL	3,218,874	410,028	10,218	8,730	19,284	21,195	5,056	17,061	22,610	8,979	13,328	283,567	27.6%

Source: U.S. Census Bureau, Census 2000 - PCT50. AGE BY RATIO OF INCOME IN 1999 TO POVERTY LEVEL

MO PSC Case No. ER-2008-0318
Hot Weather Safety Program Annual Bill Credit Cost

Daily Credit	$5	AmerenUE Residential Customers (2007 FF1)	1,027,668
Average days 95+	9.4	Total Households in AmerenUE Counties 2000 Census	1,293,098
Annual Credit per Participating Customer	$47	Customer Adjustment Factor	0.795
Total Annual Credit	$1,460,624	Assumed Participation Rate	50%

MO County	Total Households:	Households by Householder 65 years and over:	<175% Poverty Rate 65+	Households by Householder 65 years and over and below 175% Poverty:	Annual Credit per Participating Customer	Total Annual Credit (unadjusted)	Customer Adjustment Factor	Assumed Participation Rate	Total Annual Credit (unadjusted)
Adair	9,645	1,950	36.1%	703	$47	$33,064	0.795	50%	$13,138
Audrain	9,872	2,803	30.1%	843	$47	$39,605	0.795	50%	$15,738
Boone	53,106	7,297	19.1%	1,394	$47	$65,502	0.795	50%	$26,028
Butler	16,737	4,549	46.1%	2,095	$47	$98,468	0.795	50%	$39,128
Caldwell	3,522	973	38.7%	377	$47	$17,710	0.795	50%	$7,037
Callaway	14,449	2,969	27.7%	822	$47	$38,629	0.795	50%	$15,350
Camden	15,740	4,548	25.9%	1,176	$47	$55,295	0.795	50%	$21,972
Cape Girardeau	27,031	5,907	29.9%	1,764	$47	$82,886	0.795	50%	$32,936
Chariton	3,462	1,222	40.8%	499	$47	$23,438	0.795	50%	$9,314
Clark	2,967	823	36.8%	303	$47	$14,238	0.795	50%	$5,658
Clay	72,613	12,273	18.5%	2,275	$47	$106,940	0.795	50%	$42,494
Clinton	7,170	1,697	32.4%	549	$47	$25,812	0.795	50%	$10,257
Cole	27,064	5,220	20.5%	1,072	$47	$50,390	0.795	50%	$20,023
Cooper	5,943	1,610	28.2%	454	$47	$21,321	0.795	50%	$8,472
Daviess	3,184	969	29.0%	281	$47	$13,228	0.795	50%	$5,256
DeKalb	3,553	1,043	41.1%	429	$47	$20,161	0.795	50%	$8,011
Dunklin	13,414	3,648	48.2%	1,759	$47	$82,672	0.795	50%	$32,851
Franklin	35,081	7,305	28.5%	2,080	$47	$97,754	0.795	50%	$38,844
Gasconade	6,188	1,914	34.0%	650	$47	$30,546	0.795	50%	$12,138
Gentry	2,745	959	37.2%	357	$47	$16,775	0.795	50%	$6,666
Howard	3,838	1,041	40.1%	417	$47	$19,602	0.795	50%	$7,789
Iron	4,209	1,131	42.7%	483	$47	$22,682	0.795	50%	$9,013
Jefferson	71,567	11,171	27.2%	3,035	$47	$142,658	0.795	50%	$56,687
Knox	1,794	602	39.0%	235	$47	$11,039	0.795	50%	$4,387
Lewis	3,965	1,102	34.0%	374	$47	$17,597	0.795	50%	$6,992
Lincoln	13,882	2,641	29.8%	786	$47	$36,957	0.795	50%	$14,686
Linn	5,741	1,913	42.1%	805	$47	$37,817	0.795	50%	$15,027
Livingston	5,796	1,715	36.2%	620	$47	$29,152	0.795	50%	$11,584
Maries	3,536	923	41.8%	386	$47	$18,150	0.795	50%	$7,212
Miller	9,288	2,461	39.2%	966	$47	$45,379	0.795	50%	$18,032
Mississippi	5,379	1,516	53.2%	806	$47	$37,900	0.795	50%	$15,060
Moniteau	5,264	1,332	31.8%	423	$47	$19,884	0.795	50%	$7,901

Source: U.S. Census Bureau, Census 2000 - P12. HOUSEHOLDS BY AGE OF HOUSEHOLDER BY HOUSEHOLD TYPE (INCLUDING LIVING ALONE) BY PRESENCE OF OWN CHILDREN UNDER 18 YEARS

MO PSC Case No. ER-2008-0318
Hot Weather Safety Program Annual Bill Credit Cost

Daily Credit	$5	AmerenUE Residential Customers (2007 FF1)	1,027,668
Average days 95+	9.4	Total Households in AmerenUE Counties 2000 Census	1,293,098
Annual Credit per Participating Customer	$47	Customer Adjustment Factor	0.795
Total Annual Credit	$1,460,624	Assumed Participation Rate	50%

MO County	Total Households:	Households by Householder 65 years and over:	<175% Poverty Rate 65+	Households by Householder 65 years and over and below 175% Poverty:	Annual Credit per Participating Customer	Total Annual Credit (unadjusted)	Customer Adjustment Factor	Assumed Participation Rate	Total Annual Credit (unadjusted)
Monroe	3,640	1,071	38.8%	416	$47	$19,543	0.795	50%	$7,766
Montgomery	4,782	1,408	36.5%	515	$47	$24,187	0.795	50%	$9,611
Morgan	7,847	2,369	33.2%	787	$47	$37,003	0.795	50%	$14,704
New Madrid	7,831	1,993	47.0%	936	$47	$44,015	0.795	50%	$17,490
Osage	4,956	1,214	37.0%	449	$47	$21,091	0.795	50%	$8,381
Pemiscot	7,906	2,078	52.8%	1,097	$47	$51,557	0.795	50%	$20,487
Pettis	15,616	3,983	30.9%	1,232	$47	$57,899	0.795	50%	$23,007
Pike	6,417	1,761	39.9%	703	$47	$33,045	0.795	50%	$13,131
Ralls	3,725	882	32.9%	290	$47	$13,627	0.795	50%	$5,415
Randolph	9,217	2,447	39.3%	961	$47	$45,166	0.795	50%	$17,948
Ray	8,725	1,950	26.6%	518	$47	$24,349	0.795	50%	$9,676
Reynolds	2,735	761	47.7%	363	$47	$17,059	0.795	50%	$6,779
St. Charles	101,826	15,425	17.6%	2,718	$47	$127,751	0.795	50%	$50,764
Ste. Genevieve	6,602	1,672	31.7%	530	$47	$24,890	0.795	50%	$9,890
St. Francois	20,788	5,226	36.9%	1,930	$47	$90,708	0.795	50%	$36,045
St. Louis	404,607	92,323	17.7%	16,384	$47	$770,030	0.795	50%	$305,984
Saline	8,984	2,500	31.7%	793	$47	$37,285	0.795	50%	$14,816
Schuyler	1,725	554	42.0%	233	$47	$10,942	0.795	50%	$4,348
Scotland	1,895	584	44.0%	257	$47	$12,090	0.795	50%	$4,804
Scott	15,689	3,724	39.0%	1,453	$47	$68,279	0.795	50%	$27,132
Stoddard	12,047	3,378	49.7%	1,677	$47	$78,841	0.795	50%	$31,329
Sullivan	2,921	893	54.4%	486	$47	$22,822	0.795	50%	$9,069
Warren	9,210	2,044	29.6%	605	$47	$28,450	0.795	50%	$11,305
Washington	8,376	1,758	42.9%	754	$47	$35,434	0.795	50%	$14,080
St. Louis city	147,286	34,223	40.6%	13,899	$47	$653,258	0.795	50%	$259,583
TOTAL	1,293,098	283,448	27.6%	78,208	$47	$3,675,759	0.795	50%	$1,460,624

Source: U.S. Census Bureau, Census 2000 - P12. HOUSEHOLDS BY AGE OF HOUSEHOLDER BY HOUSEHOLD TYPE (INCLUDING LIVING ALONE) BY PRESENCE OF OWN CHILDREN UNDER 18 YEARS

MO PSC Case No. ER-2008-0318
Hot Weather Safety Program Credits - Bill Impacts

2007 FERC Form 1

Total Annual Credit	$1,460,624
Revenue Without Charge for Summer Bill Credit Program	$971,945,809
Revenue With Charge for Summer Bill Credit Program	$973,406,433
Credit as Percentage of 2007 Revenues	0.150%

				Without Summer Bill Credit Program			*With Summer Bill Credit Program*			
Rate Schedule	**MWH Sold**	**Average Number of Customers**	**KWH Sales per Customer**	**Total Revenue**	**Revenue per KWH**	**Monthly Revenue per Customer**	**Total Revenue**	**Revenue per KWH**	**Monthly Revenue per Customer**	**Difference in Monthly Revenue per Customer**
Residential Sales										
Residential No. 1	14,100,232	992,968	14,200	$964,368,537	$0.0684	$80.93	$965,817,774	$0.0685	$81.05	$0.12
Residential T-O-D	35,156	34,700	1,013	$7,577,272	$0.2155	$18.20	$7,588,659	$0.2159	$18.22	$0.03
Total Residential Sales	14,135,388	1,027,668	13,755	$971,945,809	$0.0688	$78.81	$973,406,433	$0.0689	$78.93	$0.12

2007 FERC Form 1 + 12.1% Revenue Increase

Total Annual Credit	$1,460,624
Revenue Without Charge for Summer Bill Credit Program	$1,088,579,306
Revenue With Charge for Summer Bill Credit Program	$1,090,039,930
Credit as Percentage of 2007 Revenues	0.134%

				Without Summer Bill Credit Program			*With Summer Bill Credit Program*			
Rate Schedule	**MWH Sold**	**Average Number of Customers**	**KWH Sales per Customer**	**Total Revenue**	**Revenue per KWH**	**Monthly Revenue per Customer**	**Total Revenue**	**Revenue per KWH**	**Monthly Revenue per Customer**	**Difference in Monthly Revenue per Customer**
Residential Sales										
Residential No. 1	14,100,232	992,968	14,200	$1,080,092,761	$0.0766	$90.65	$1,081,715,907	$0.0767	$90.78	$0.14
Residential T-O-D	35,156	34,700	1,013	$8,486,545	$0.2414	$20.38	$8,499,298	$0.2418	$20.41	$0.03
Total Residential Sales	14,135,388	1,027,668	13,755	$1,088,579,306	$0.0770	$88.27	$1,090,215,205	$0.0771	$88.41	$0.13

Source: Union Electric Company 2007 FERC Form 1, page 304