

US EPA ARCHIVE DOCUMENT



Fact Sheet

Too Darn Hot” – Planning for Excessive Heat Events

Information for Older Adults and Family Caregivers

Did you know that each year more people die from “excessive heat events” than from hurricanes, lightning, tornadoes, floods, and earthquakes combined?² Anyone can be adversely affected by excessive heat, but older adults are particularly vulnerable.

Excessive heat events are prolonged periods when temperatures reach 10 degrees Fahrenheit or more above the average high temperature for a region.³

Excessive heat events are believed to have a disproportionate public health impact in cities. One reason is that roads and buildings absorb the sun’s energy and contribute to the formation of “heat islands.” While rural areas cool off at night, cities retain this absorbed heat. As a result, urban residents get less nighttime relief from high temperatures. Fortunately, there are simple steps that older adults, their caregivers, and community leaders can take to decrease the impact of excessive heat events.

During an average summer, approximately 1,500 people die from excessive heat events in the U.S.¹ A single heat wave in Chicago killed more than 700 people in 1995. In Europe, a record heat wave claimed an estimated 35,000 lives in 2003. In both cases, most of the victims were 65 or older.

“Excessive heat events” are surprisingly deadly. Vulnerable groups like older adults are at particularly high risk.

Who is At Risk from Extreme Heat?

Older adults, as well as young children, are at high risk from excessive heat events. For the growing number of aging Americans, the body's cooling mechanisms may become impaired. Living alone or being confined to a bed and unable to care for one's self further increases risk.

Existing health conditions such as chronic illness, mental impairment, and obesity can also heighten an individual's vulnerability. Persons taking certain medications are likewise susceptible.

In addition, people who live on the top floors of buildings without air-conditioning are more likely to be exposed to excessive heat. Participating in strenuous outdoor activities and consuming alcohol during unusually hot weather likewise exacerbates heat-related health effects.

How Does Excessive Heat Affect the Body?

The body normally cools itself by increasing blood flow to the skin and perspiring. Heat-related illness and mortality occur when the body's temperature control system

becomes overloaded. When this happens, perspiring may not be enough. High levels of humidity can make it even harder for the body to cool itself.

How are Excessive Heat and Heat Stroke Related?

Heat stroke is the most serious health effect of excessive heat events. It is the failure of the body's temperature control system. When the body loses its ability to cool itself, core body temperature rises rapidly. As a result, heat stroke can cause severe and permanent damage to vital organs.

Victims can be identified by skin that appears hot, dry, and red in color. Other warning signs are confusion, hallucinations, and aggression. If not treated immediately, heat stroke can result in permanent disability or death. The good news is that heat stroke can be prevented by taking the easy steps outlined on this page. The good news is that there are simple steps people can take to protect themselves.

How Does Extreme Heat Affect Me?

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How Can I Reduce Exposure to Excessive Heat?

The best defense against excessive heat is prevention. Air-conditioning is one of the best protective factors against heat-related illness and death.⁴ Even a few hours a day in air conditioning can greatly reduce the risk. Electric fans may provide comfort, but when temperatures are in the high 90s fans do not prevent heat-related illness.

During excessive heat events, the following prevention strategies can save lives:

- Visit air-conditioned buildings in your community if your home is not air-conditioned. These may include: senior centers, movie theaters, libraries, shopping malls, or designated "cooling centers."
- Take a cool shower or bath. ⁵
- Drink lots of fluids. Don't wait until you are thirsty to drink. If a doctor limits your fluid intake, make sure to ask how much to drink when it's hot. Avoid beverages containing caffeine, alcohol, or large amounts of sugar. These drinks cause dehydration.
- Ask your doctor or other health care provider if the medications you take could increase your susceptibility to heat-related illness.
- Wear lightweight, light-colored, and loose-fitting clothing.
- Visit at-risk individuals at least twice a day. Watch for signs of heat-related illness such as hot, dry skin, confusion, hallucinations, and aggression.
- Call 9-1-1 if medical attention is needed.

What Can Your Local Government Do to Help?

Local governments can play an important role in predicting and responding to excessive heat events. Two increasingly common strategies are heat alert systems and heat reduction measures.

Heat Alert Systems

Heat Health Watch-Warning Systems identify when a heat-related public health threat is likely. These systems use computer programs that analyze National Weather Service forecasts and other local data to predict dangerous conditions. Heat Health Watch-Warning Systems have been established in Philadelphia, Seattle, Chicago, St. Louis, and other cities in the U.S. and Europe.



After a warning has been called, city health authorities communicate this information to older adults, their care-givers, and other at-risk groups.

Assist the Homeless and Those With Mental Health Illness

The following steps are “best-practices” that city officials can take to alert residents and provide direct assistance:

- Distribute media advisories
- Activate telephone hotlines
- Alert neighborhood volunteers, family members, and friends
- Provide air-conditioned buildings and offer transportation to these facilities
- Assist the homeless
- Work with local “area agencies on aging” to educate at-risk individuals

Cities may also coordinate with local utilities to ensure that no customer’s electricity is turned off during a heat wave.

What Cost-Effective Steps Can Communities Take to Cool the Air?

Two steps that communities can take include using construction

material that reflect the sun's rays, and planting trees and vegetation to provide shade and natural cooling. Both strategies reduce the urban heat island effect – urban temperatures 2-10 degrees Fahrenheit hotter than surrounding rural areas – and may limit the frequency, duration, and magnitude of excessive heat events.

Heat reduction strategies such as using reflective “cool roofs” and light-colored pavements, and planting shade trees, have numerous benefits. These measures:

- Lower ambient temperatures
- Slow heat-driven reaction that forms ozone air pollution
- Decrease energy consumption
- Improve comfort and livability

Learn More

The EPA Aging Initiative is working to protect the environmental health of older adults through the coordination of research, prevention strategies, and public education. For more information or to join the listserve visit: www.epa.gov/aging

Other References

Environmental Protection Agency,
Heat Island Reduction Initiative
<http://www.epa.gov/heatisland>

Center for Disease Control and
Prevention
<http://www.cdc.gov/aging/>

[http://www.cdc.gov/nceh/hsb/
extremeheat](http://www.cdc.gov/nceh/hsb/extremeheat)

<http://www.cdc.gov/MMWR>

Environmental Health Perspectives
<http://www.ehp.niehs.nih.gov>

American Medical Association,
Heat-Related Illness During
Extreme Emergencies
<http://www.ama-assn.org/>

National Weather Service,
Heat Wave and Heat Index
[http://www.nws.noaa.gov/pa/
secnews/heat/](http://www.nws.noaa.gov/pa/secnews/heat/)

Medline Plus, Heat Illness
[www.niapublications.org/
agepages/hyperther.asp](http://www.niapublications.org/agepages/hyperther.asp)

National Weather Service
<http://www.nws.noaa.gov/om/hazstats.shtml>

Heat Wave Awareness Project
<http://www.esig.ucar.edu/heat/literate.html>

FOOTNOTES

1 Kalkstein, L.S. and J.S. Greene, 1997. An Evaluation of Climate/Mortality Relationships in Large U.S. Cities and the Possible Impact of a Climate Change. *Environmental Health Perspectives*, 105(1):84-93.

2 Centers for Disease Control and Prevention, 2003. Extreme Heat. Available online:
<http://www.cdc.gov/nceh/hsb/extremeheat/default.htm>

3 Federal Emergency Management Administration, Backgrounder on Extreme Heat, Feb. 2003

4 Naughton MP, Henderson A, Mirabelli MC, Kaiser R, Wilhelm JL, Kieszak SM, Rubin CH, McGeehin MA. Heat-related mortality during a 1999 heat wave in Chicago. *Am J Prev Med*. 2002 May;22(4):328-9.

5 McMichael, A.J., L.S. Kalkstein and other lead authors, 1996. *Climate Change and Human Health*, (eds. A.J. McMichael, A. Haines, R. Slooff, S. Kovats). World Health Organization, and United Nations Environment Programme (Who/WMO/UNEP), Geneva, 297 pp.

