Climate Change and Older Adults

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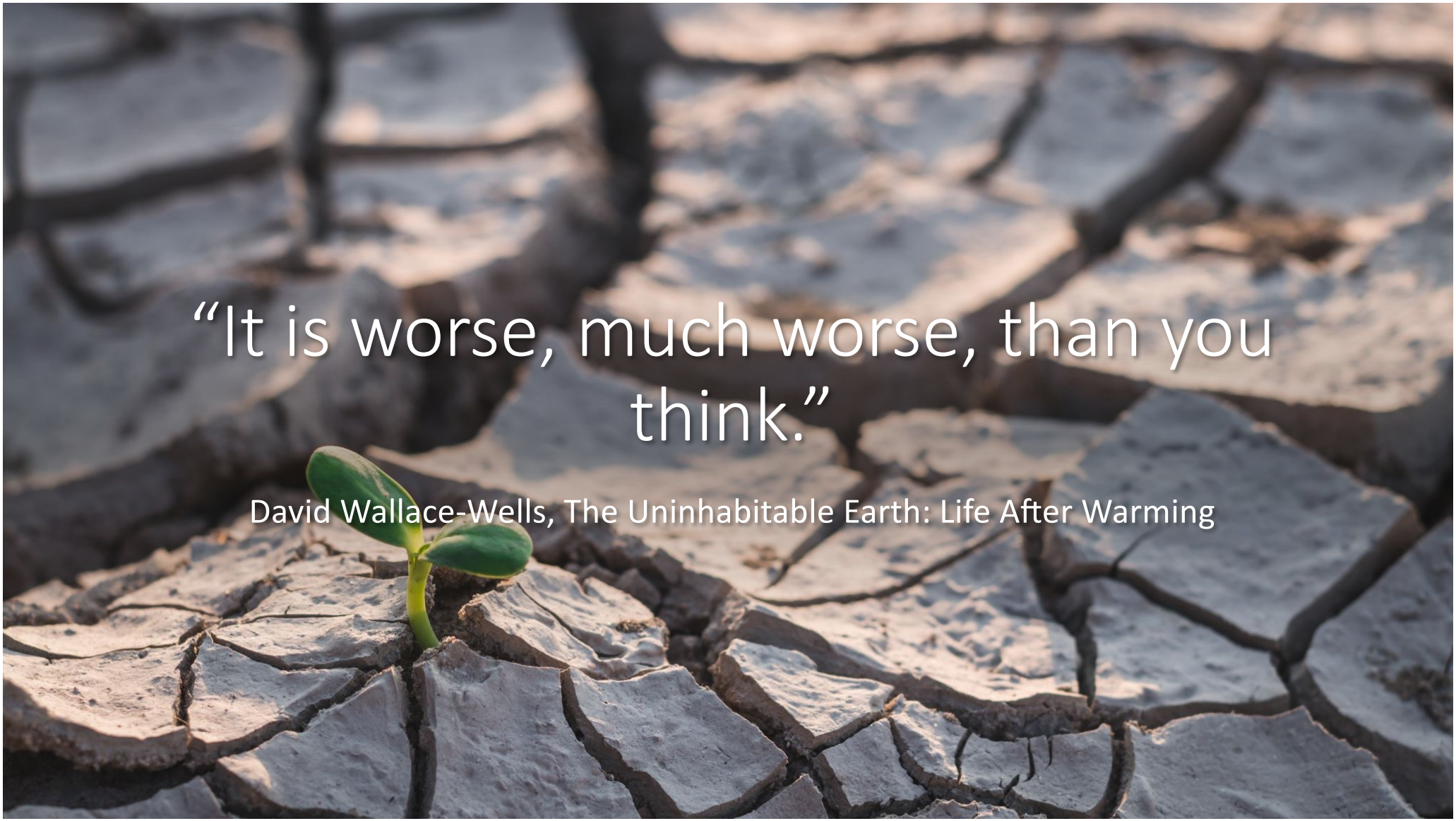
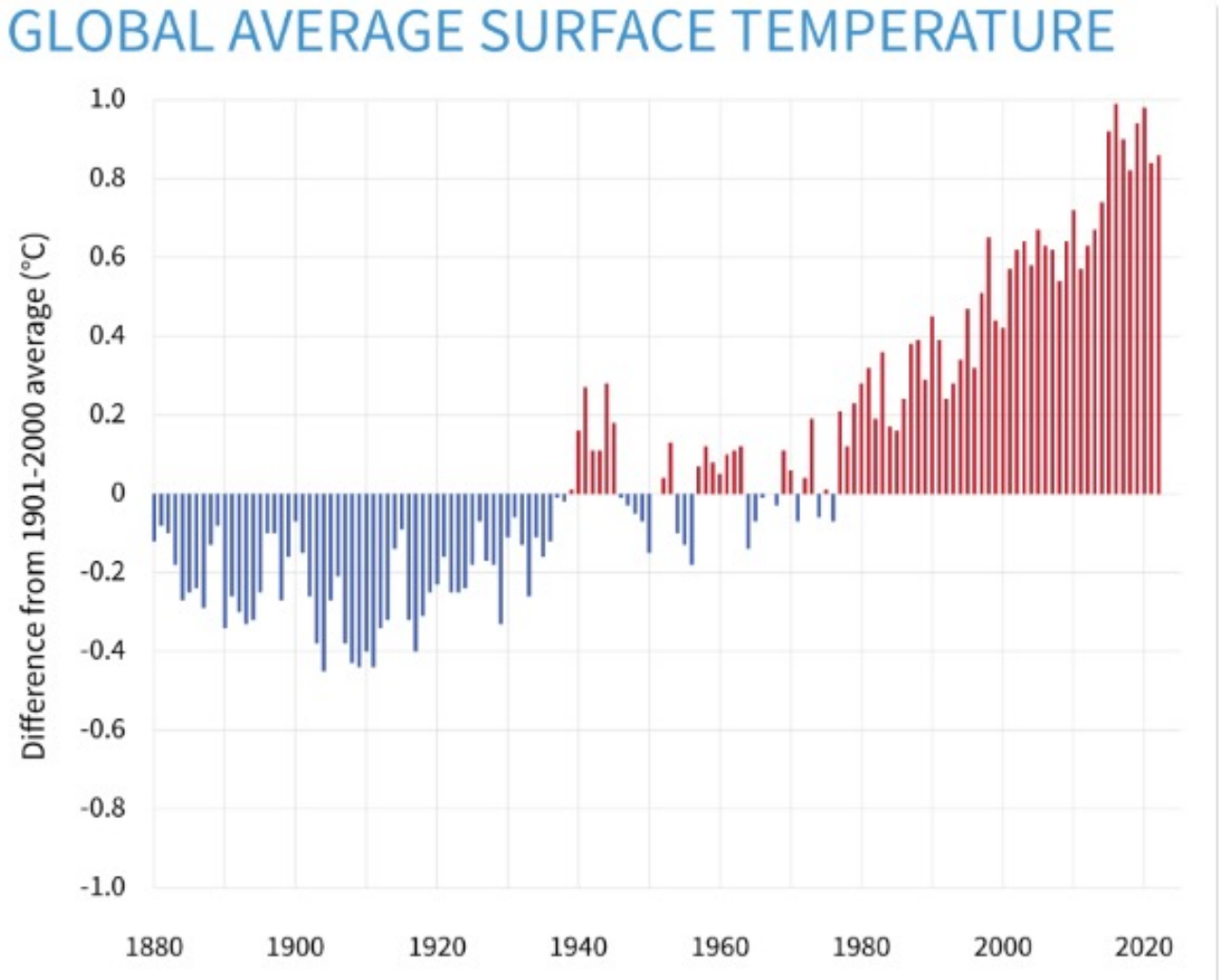
Disclosures

- None

Objectives

Review	Recognize	Consider
Review major categories of how our climate is changing	Recognize the health impacts particular to older populations	Consider ways you can address climate change for older adults in your clinical settings

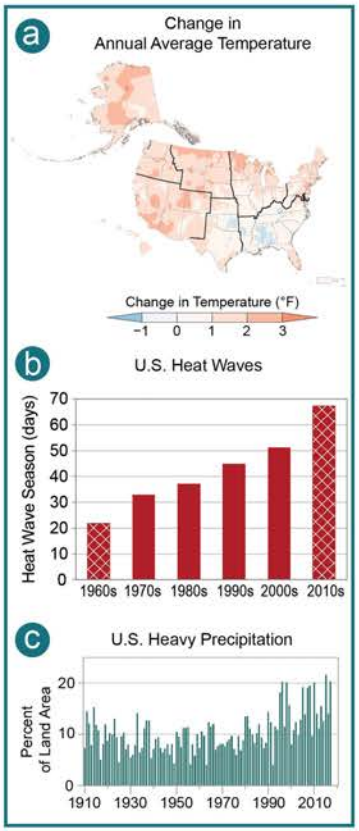

“It is worse, much worse, than you think.”
David Wallace-Wells, The Uninhabitable Earth: Life After Warming

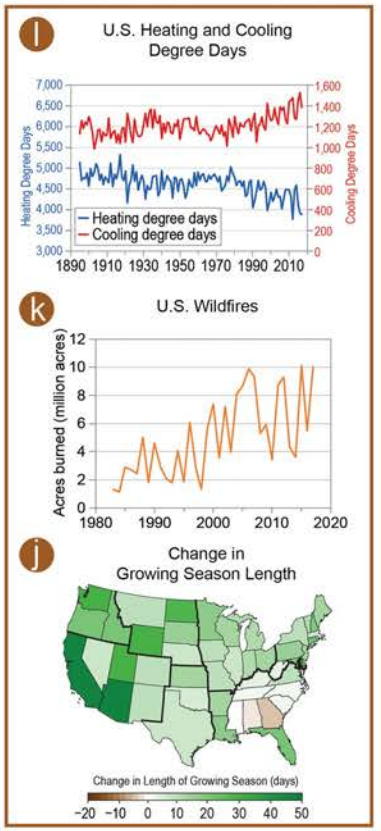


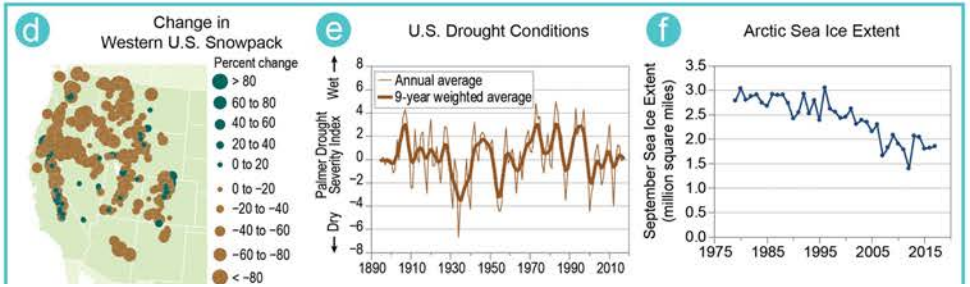
The Earth is Warming

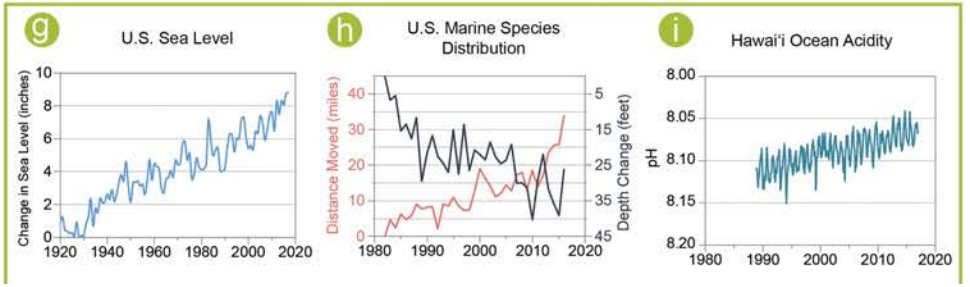
- www.climateaging.bctr.cornell.edu/learn/climate-change-101
- Climate Change 101

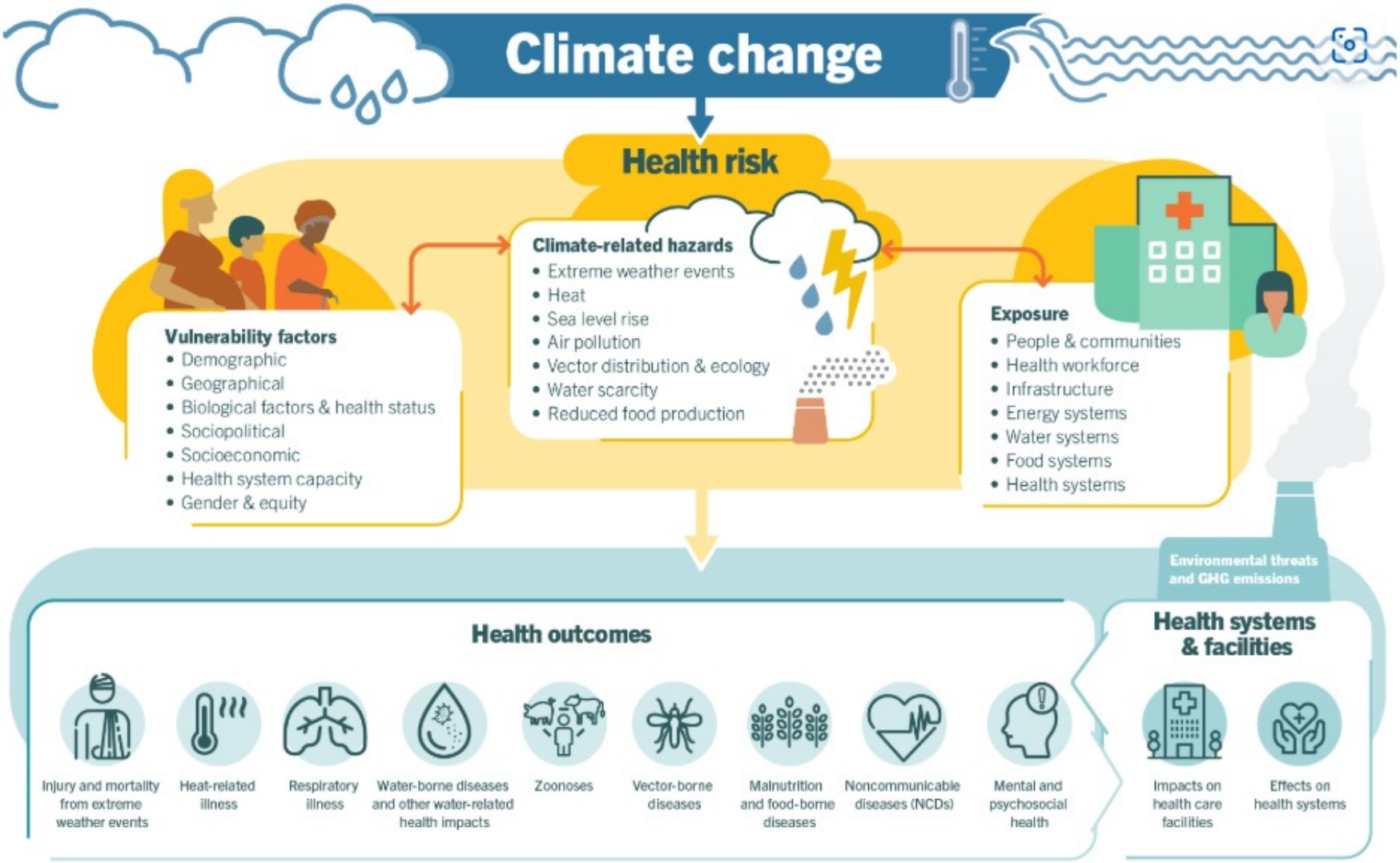
Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.201





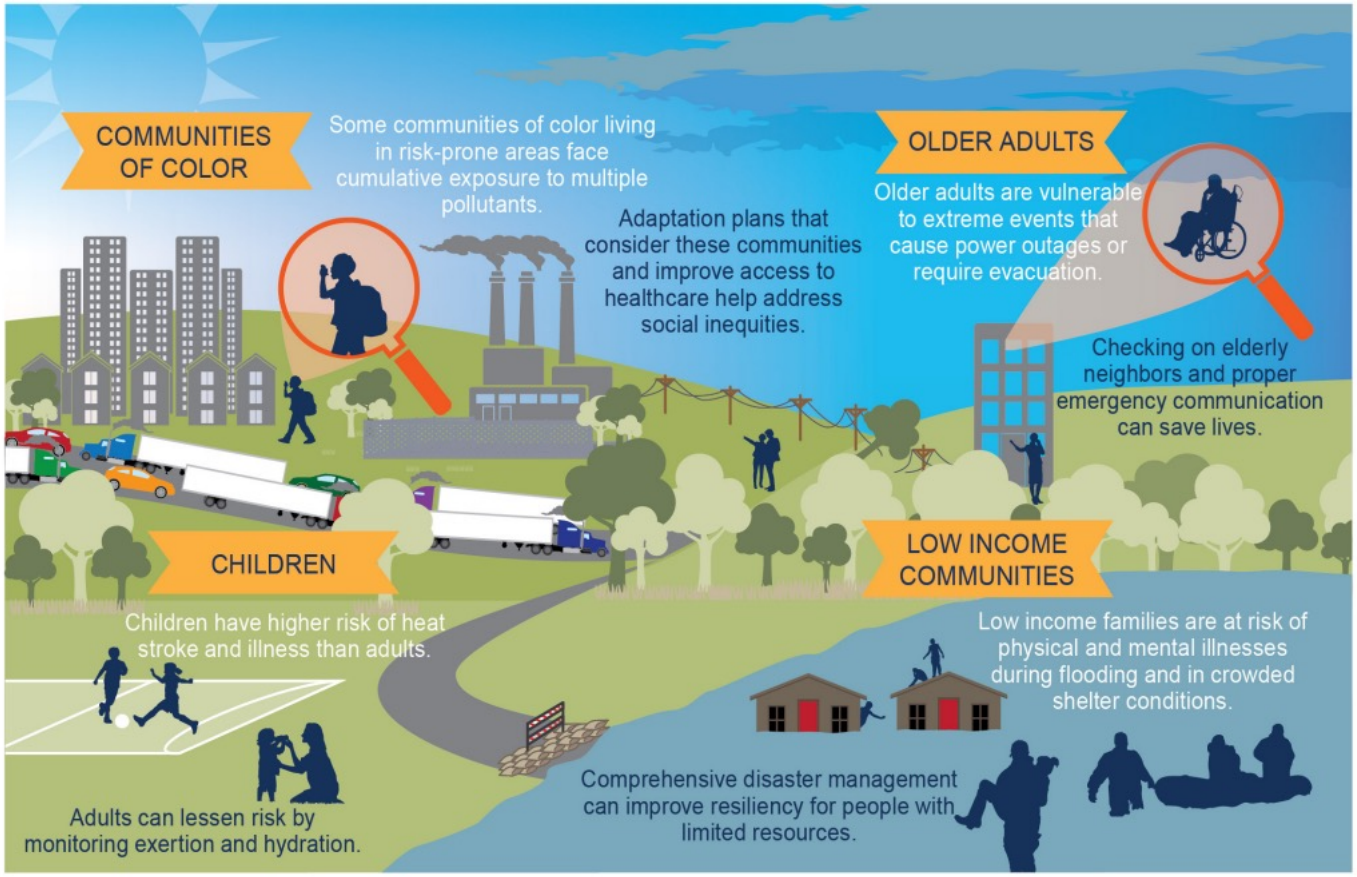






From World Health Organization

Vulnerable Populations



Examples of populations at higher risk of exposure to adverse climate-related health threats are shown along with adaptation measures that can help address disproportionate impacts. When considering the full range of threats from climate change as well as other environmental exposures, these groups are among the most exposed, most sensitive, and have the least individual and community resources to prepare for and respond to health threats. White text indicates the risks faced by those communities, while dark text indicates actions that can be taken to reduce those risks. *From Figure 14.2 (Source: EPA).*

What contributes to particular vulnerabilities in older adults?

Changes in physiology with aging

- Homeostenosis

More co-morbidities

- Less able to tolerate, increase morbidity

More medications

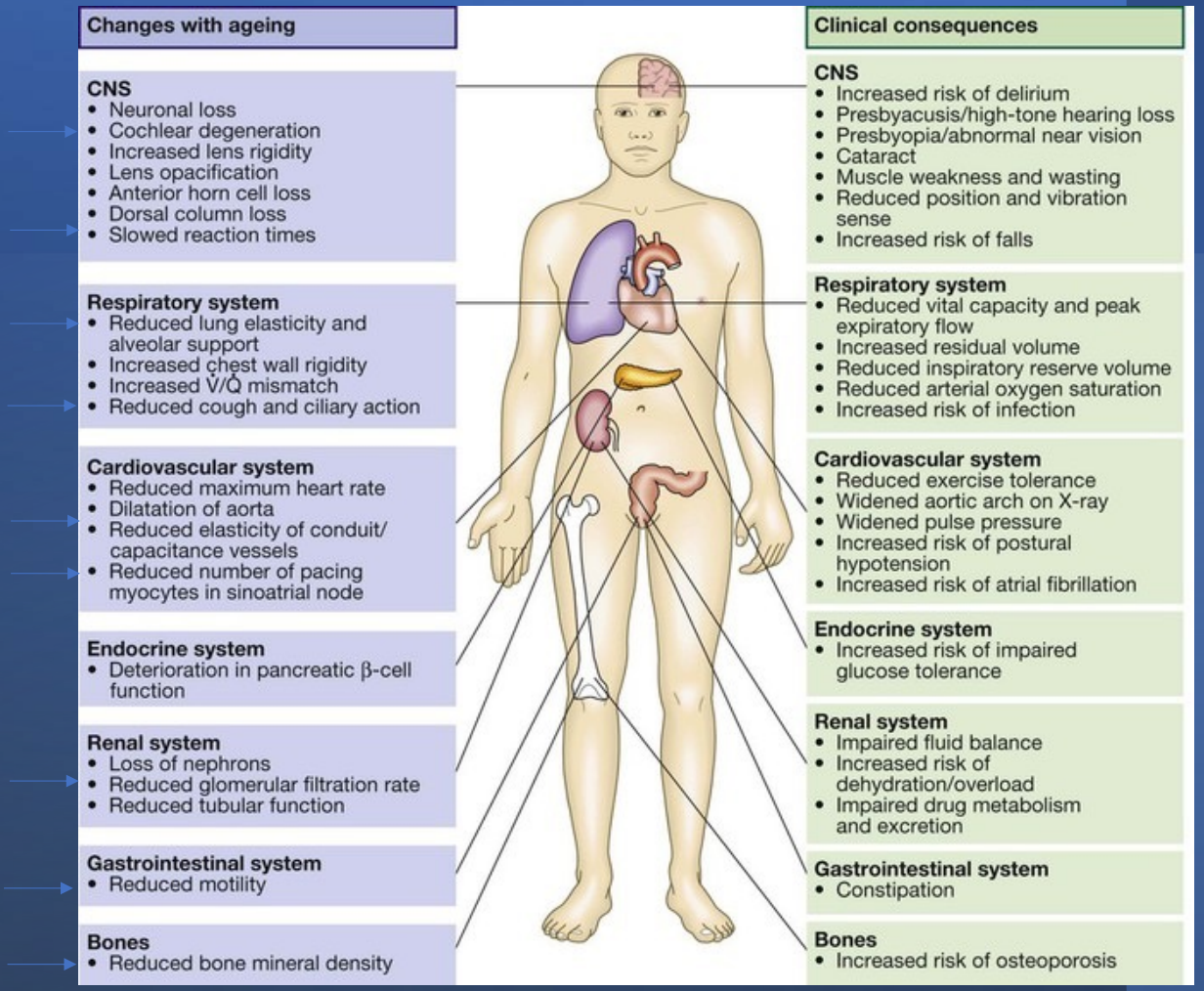
- Issue with access to meds, heat stability of meds, increased sensitivity to the environment (eg diuretics)

Frequent sensory impairment, ambulatory dysfunction, cognitive impairment

- Can make escaping or adjusting difficult

Social vulnerability

- Isolation, fixed income, ageism
- 50% of people over 85 need help with ADLs



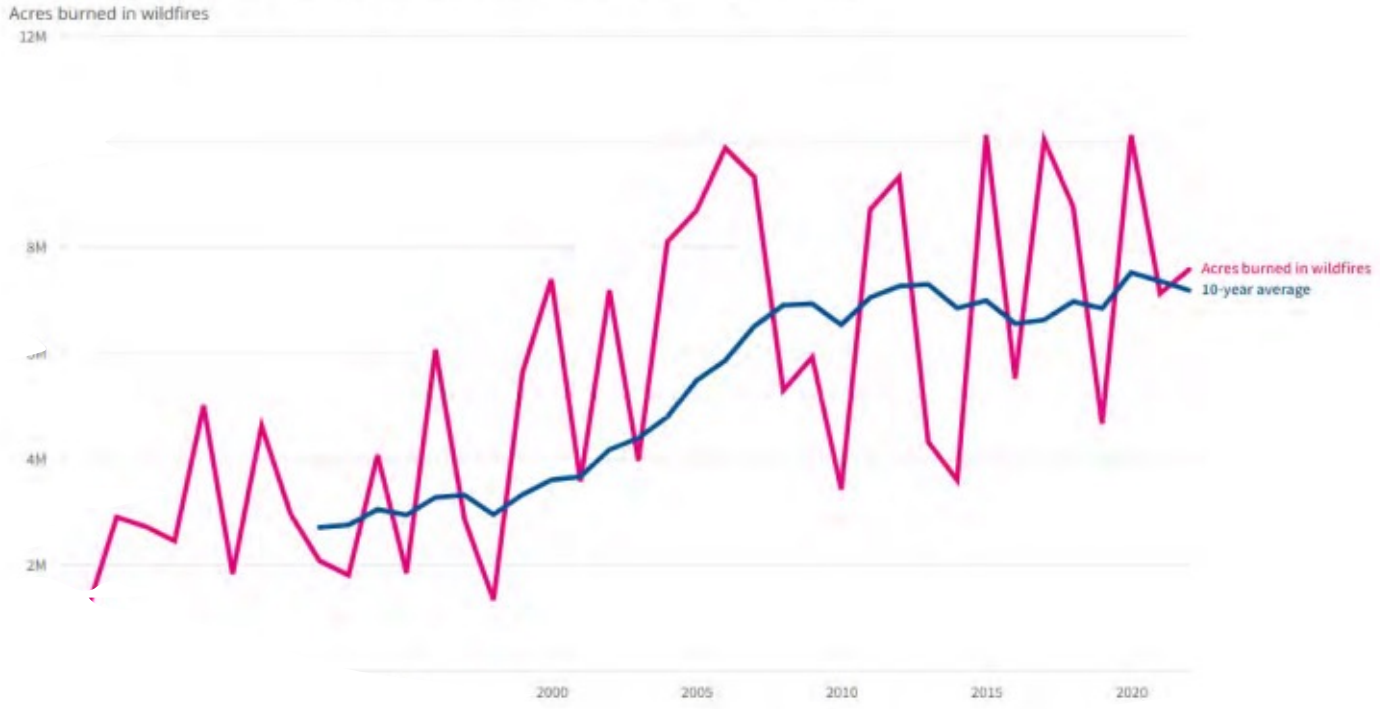
Ageing and disease | Basicmedical Key

Air Quality

- Draughts contribute to more dust; Fires to particulate matter
- Small particle pollutions impairs cognitive performance and mental health
- Impairs heart and lung function, increases lung infections, BP, stroke, asthma, hospitalization, death
- Globally 1 in 6 deaths attributable to air pollution
- For every single unit of additional air pollution the relative risk of Alzheimer's disease is doubled
- 95% of the world is breathing dangerously polluted air

As of 2021, there were 58,985 wildfires that burned 7.1 million acres — an area about the size of Massachusetts, according to data compiled by the National Interagency Fire Center (NIFC).

The average number of acres burned has been increasing since 1983.



90% of deaths were in people over 65 y

LA wildfires bring another health hazard: smoke

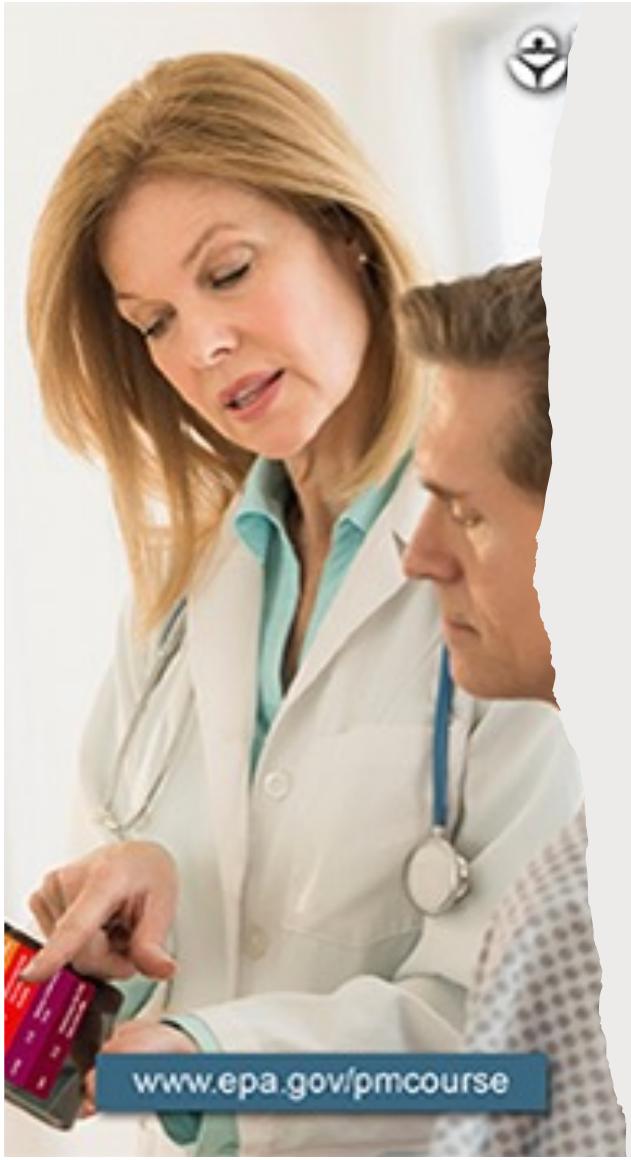
JANUARY 8, 2025 · 5:04 PM ET

HEARD ON ALL THINGS CONSIDERED

By Alejandra Borunda

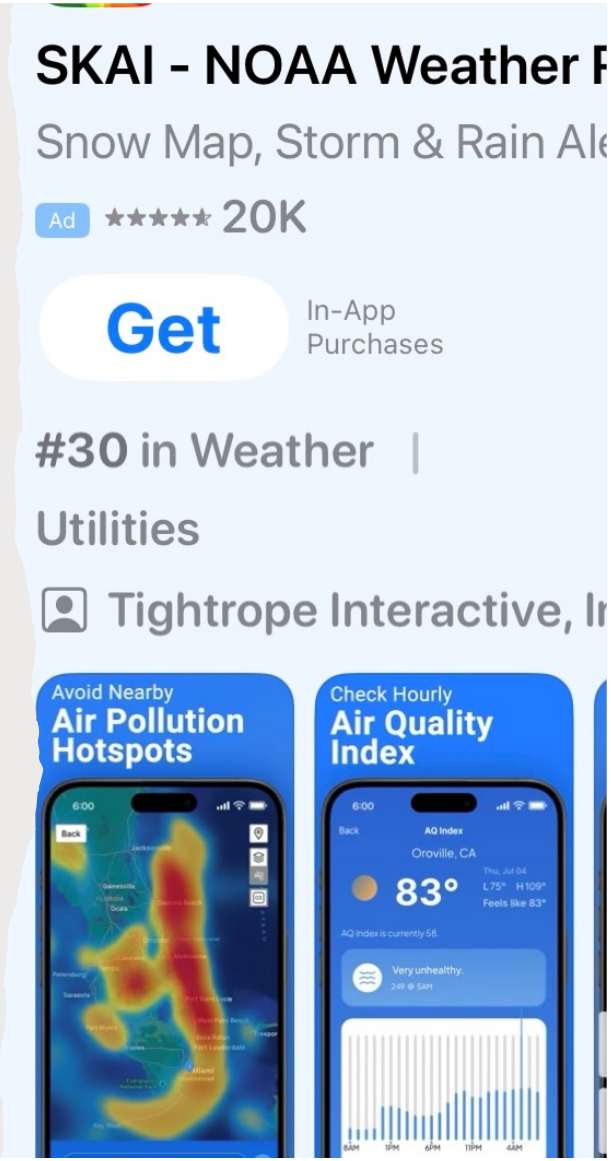
Smoke from a wildfire blankets the sky above Venice Beach in Los Angeles. Air quality in the region is unhealthy because of several wildfires.

Jae C. Hong/AP



Air Quality Index- Got ap?

- Particularly vulnerable those with underlying heart of lung disease or diabetes
- What to do:
  - Check the Air Quality Index (AQI) at www.airnow.gov.
  - Indoors when that is better, adjust activities
  - Consider masks



Air in the Home

Pollutants that exist within homes and buildings also may be harmful to persons with COPD or asthma.

What you can do to control and reduce exposure to environmental hazards

If you or your loved one experience symptoms of COPD or asthma, consult a doctor and follow a management plan outlined by your health care provider. The key to management of these diseases is through preventive measures and reduced exposure to environmental hazards. Take steps to prevent, control and reduce the frequency of symptoms to allow you or your loved one to breathe easier.

- **Avoid tobacco smoke**
- **Avoid smoke from wood-burning stoves**
- **Reduce mold, dust mites and cockroaches in your home**
- **Keep pets out of sleeping areas**
- **Check furnace and heating units annually**
- **Fix water leaks promptly**
- **Check the Air Quality Index (AQI)**

Reduce outdoor activity as much as possible on poor air quality days. The AQI reports how clean the air is and whether it will affect your health. If you have access to the Internet, you can learn more about the AQI by visiting www.epa.gov/airnow. If you do not have access to a computer or the internet, you can learn more about the daily AQI through newspaper, television and radio weather reports.

products and substances with irritating odors also may exacerbate these diseases.

Learn More About EPA's Aging Initiative

The 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 about the Aging Initiative, visit **www.epa.gov/aging**.

A poster entitled "Age Healthier Breathe Easier" on COPD, asthma and older adults is also available on the website to download.

Endnotes

1. Centers for Disease Control and Prevention, National Center for Health Statistics. Final Vital Statistics Report. Deaths: Final Data for 2005, Vol. 56, No.10, April 24, 2008.

2. Ibid.

3. U.S. Department of Health and Human Services, National Institutes of Health. National Heart Lung and Blood Institute. Morbidity and Mortality: 2007 Chartbook on Cardiovascular, Lung and Blood Diseases.

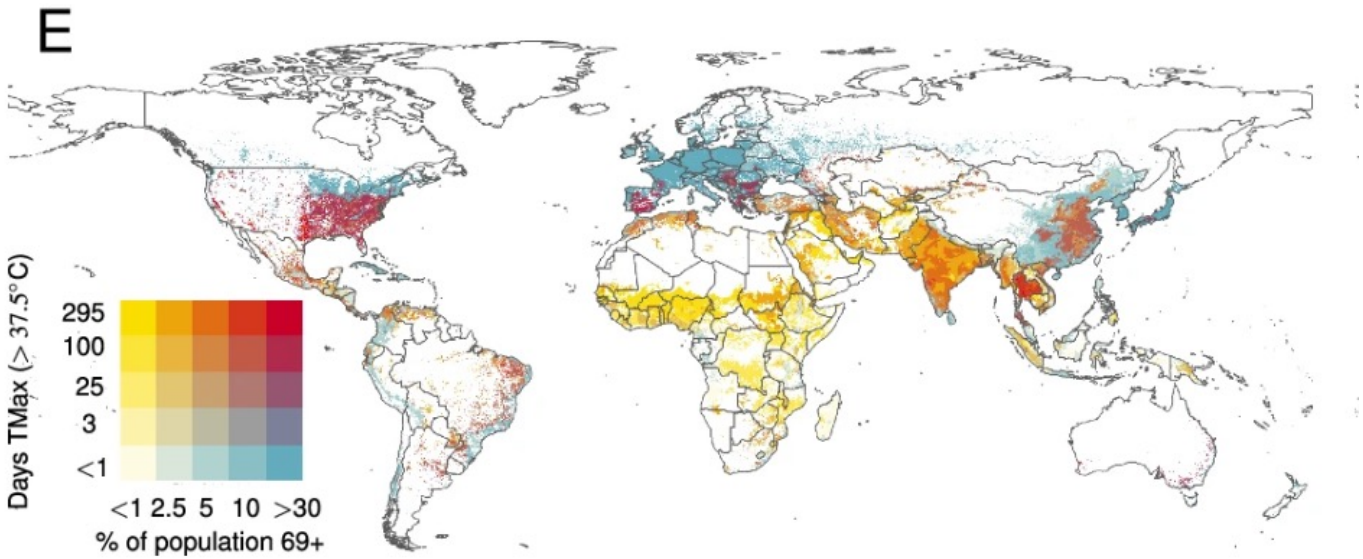
4. National Center for Health Statistics. Raw Data from the National Health Interview Survey, U.S., 1982-1996, 2001-2004.

Publication Number EPA 100-F-09-045

Heat and the Elderly

- 2023 was the warmest year on record ever, until 2024
- The majority of deaths from heat are in older adults
  - Globally, heat related deaths increased by 85% from 1990-2000 and 2013-2022 (Lancet 2021)
  - Of the over 61,000 deaths in the European heat wave of 2022, 90% were over 65y (Nature Medicine 2023)
- Why older adults are particularly vulnerable
  - Impaired thermoregulation: reduced sweat, impaired skin vasodilatation
  - Heart, lungs, renal conditions
  - Medications: diuretics, laxatives, antipsychotics, anticholinergics, BP meds, thyroid hormone
  - Cognitive disorders
  - Mobility limitations
  - Social isolation

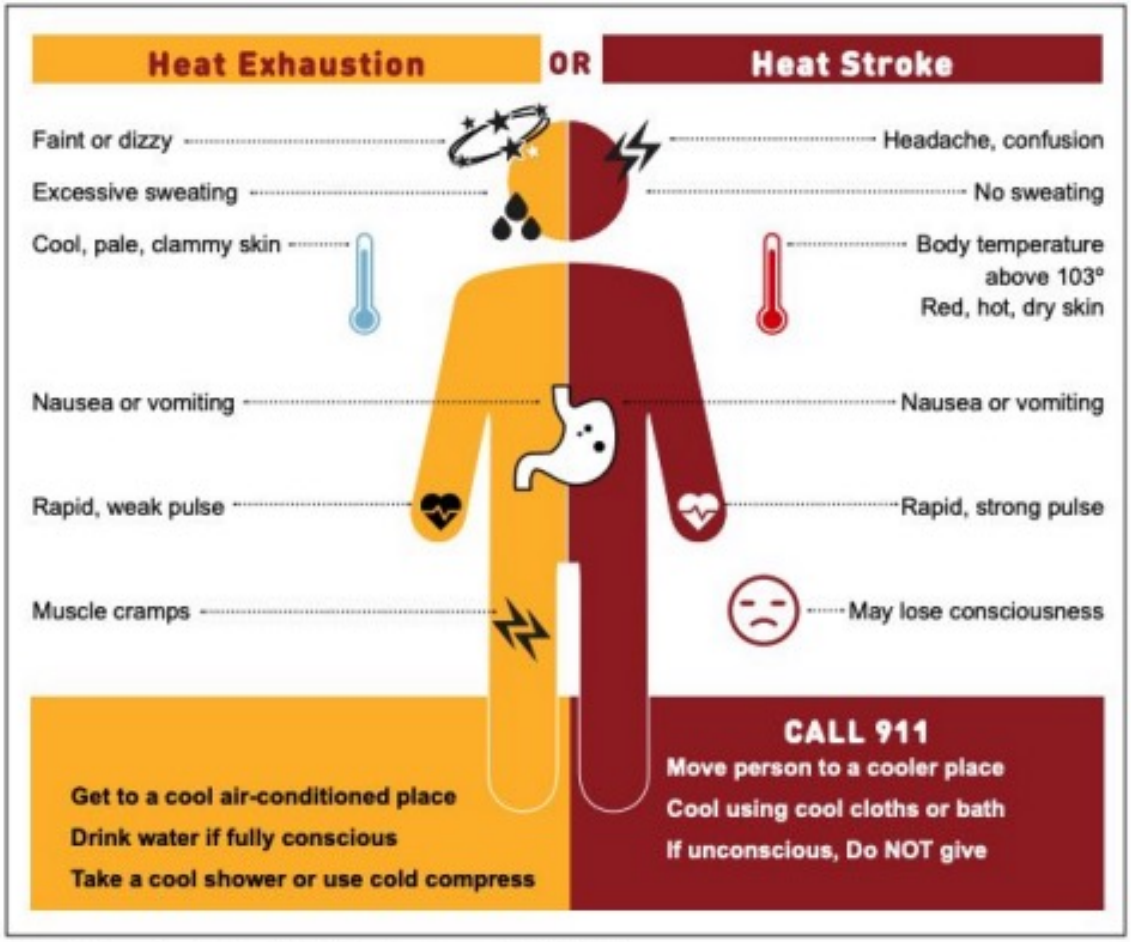
Heat and Elderly Intersection Currently



Falchetta, G., De Cian, E., Sue Wing, I. *et al.* Global projections of heat exposure of older adults. *Nat Commun* **15**, 3678 (2024). https://doi.org/10.1038/s41467-024-47197-5

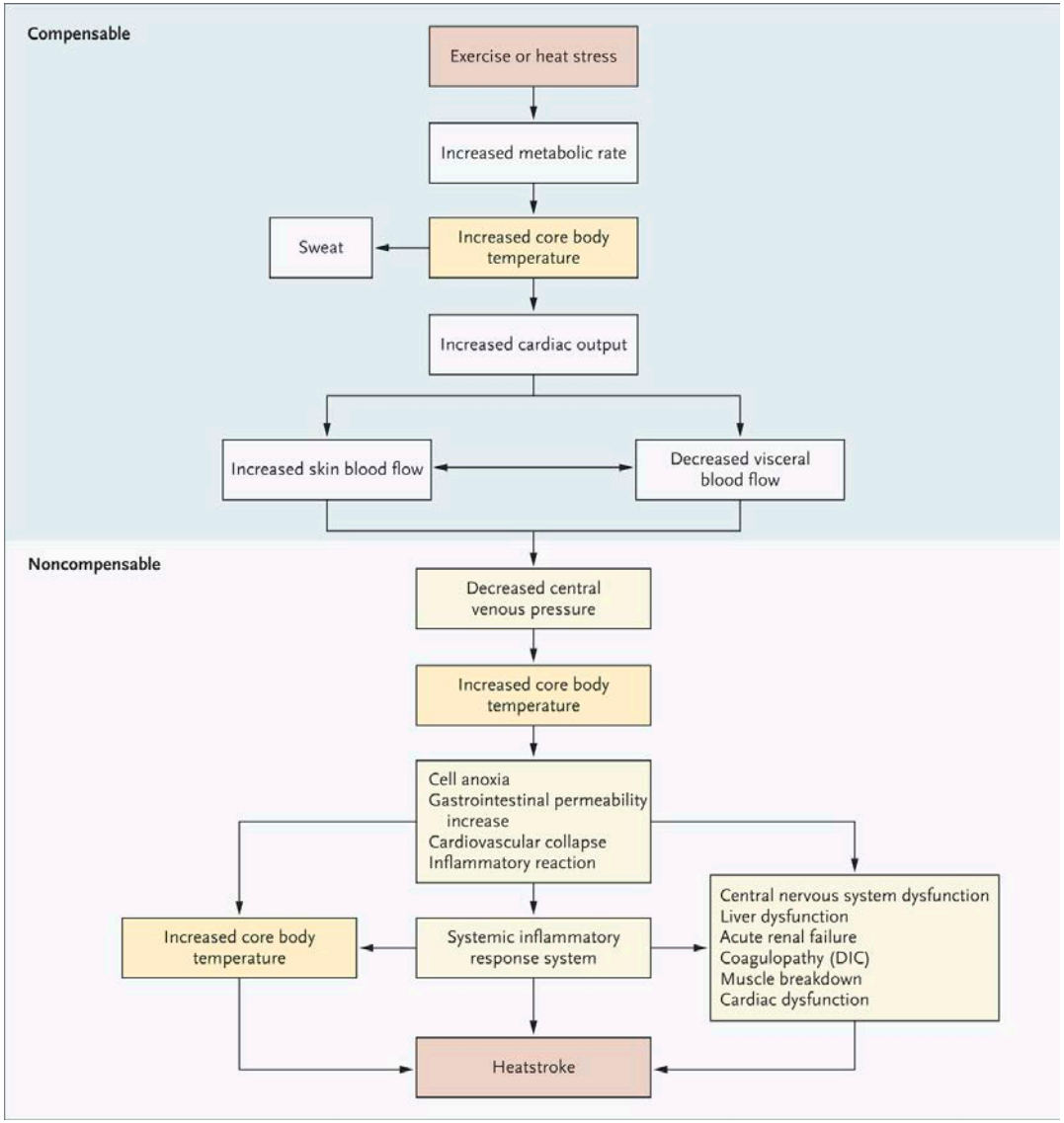
Addressing Heat Stress in Older Patients

- Be aware of the symptoms of heat stress
- Monitor heat and humidity with plan for action
- Highlight medication adjustments; if possible avoid meds that increase risk of HRI during heat waves
    - Diuretics, neuroleptics, ACE/ARB, anticholinergics, maybe statin
    - Consider med plan for power outages (eg, nebulizers, insulin, biologics)
- Identify personal support plan
- Counsel regarding cooling and hydration



Adapted from the National Weather Service and U.S. CDC

Pathophysiology leading to Heat Stroke
From Epstein Y, Yanovich R. NEJM 2019



Treatment of Heat stroke in the Hospital From Epstein Y, YanovichR. NEJM 2019

Table 3. Guidelines for the Treatment of Heatstroke.*

Treatment	Comments
Treatment on site	
CPR	Perform according to ACLS protocol; administer oxygen at 4 liters/min to increase oxygen saturation to >90%
Core body temperature	Monitor rectal temperature and perform cooling in cases of hyperthermia; for exertional heatstroke, cold-water immersion; for classic heatstroke, conductive or evaporative cooling
Fluids	Administer isotonic saline IV (1–2 liters/hr); dehydration is not a major issue
Seizure medication	Administer benzodiazepines IV (5 mg) until seizures cease (not more than 20 mg)
Evacuation	For classic heatstroke, transport immediately to ED; for exertional heatstroke, transport to ED after cooling to body temperature <39.0°C
Treatment in the ED	
Core body temperature	Monitor rectal or intravesical temperature and perform cooling until core temperature <38.0°C; use either a cooling suit or cold fluids (4°C, 1000 ml/30 min) infused through central catheter; antipyretics are toxic and should be avoided; dantrolene has not been proved to be effective
Seizure medication	Administer benzodiazepines IV (5 mg, repeated) or phenytoin IV (loading dose, 15–20 mg/kg in 15 min) until seizures cease
Laboratory testing	Perform CBC, urinalysis, blood cultures, kidney-function and liver-function tests (ALT, AST, ammonia, INR); test for glucose, electrolytes, arterial blood gases and acid–base balance, clotting function, CK, LDH, myoglobin, CRP
Monitoring of circulation	For circulatory failure, administer fluids (30 ml/kg), monitor CVP or perform invasive hemodynamic monitoring, maintain mean arterial pressure at >65 mm Hg (or >75 mm Hg if patient is elderly or has hypertension), all with a goal of normal lactate level and urine output >50 ml/kg/hr; vasopressors should be considered if fluid therapy fails
Treatment in the ICU	
General	Perform CPR according to ACLS protocol; ECMO may be used as needed
	Monitor rectal, intravesical, or blood temperature; continue cooling to maintain core temperature at <38.0°C by infusing cold fluids (4°C, 1000 ml/30 min) through central catheter or use extracorporeal blood cooling for resistant hyperthermia; antipyretics are toxic and should be avoided; dantrolene has not been proved to be effective
	Perform laboratory tests: CBC, glucose, arterial blood gases and acid–base balance, clotting function, CK, LDH, liver function (ALT, AST, ammonia, INR), myoglobin, kidney function, urinalysis, CRP, blood cultures; repeat every 12 hr during the first 48 hr, then every 24 hr
Heart failure	Perform CPR according to ACLS protocol; perform invasive hemodynamic monitoring and echocardiography; for mild multiorgan failure, administer dobutamine IV (1 μg/kg/min, then 2–20 μg/kg/min as needed) or milrinone IV (loading dose, 50 μg/kg in 10 min, then 0.2–0.75 μg/kg/min) or adrenaline IV (1 μg/min); for severe multiorgan failure, ECMO may be used as needed
Acute kidney injury	Administer crystalloid solution to maintain urine output >50 ml/kg/hr; administer furosemide IV (10–20 mg in patients without previous exposure to diuretics; follow-up dose depends on urine output); provide hemodialysis or CVVH in cases of volume overload, severe acidosis, hyperkalemia, or uremia; adjust fluid infusion rate according to blood pressure and urine output; monitor electrolytes and correct as needed
Encephalopathy and brain edema	For a score of <8 on the GCS,† intubate and ventilate; for mild hyperventilation (P_{2}, 34–36 mm Hg) administer hypertonic saline 3% IV (starting dose, 100 ml/30 min, then according to patient's total body water to reach sodium level increase of 12 mmol/day) or mannitol 20% IV (0.25–2 g/kg in 30 min); keep head at 45-degree angle, administer tranquilizers; patients with hyperammonemia require hemofiltration or MARS therapy; condition improves with cooling; consider monitoring ICP
Rhabdomyolysis	Administer IV fluid infusion, 1–2 liters/hr (aggressive fluid treatment in the first hour), then 300 ml/hr; furosemide IV (10–20 mg in patients without previous diuretic treatment; follow-up dose depends on urine output) in case of fluid overload; sodium bicarbonate, 30 mmol/hr (to achieve urine pH >6.5); myoglobinuria is expected; hypercalcemia and metabolic alkalosis (pH >7.5) should be avoided
DIC and other coagulation abnormalities	For bleeding and thrombosis, administer fresh-frozen plasma (bolus dose, 10–15 ml/kg, then 200–400 ml according to coagulation indexes); administer cryoprecipitate (5–10 U each time) for fibrinogen level of <180 mg/dl; administer platelet concentrates (infusion of one therapeutic dose) if platelet count <20 per mm^3 or if there is bleeding and platelet count <50 per mm^3; in patients with hepatic failure, consider PCC to achieve a target INR ≤1.5; inject PCC dose according to INR and patient's weight; avoid heparin; beware of hypothermia and metabolic acidosis
ARDS	Perform intubation and mechanical ventilation; avoid fluid overload
Liver failure	Monitor liver function and mental status for at least 4 days; provide supportive treatment: hemodynamic stability, *N*-acetylcysteine IV (bolus dose, 150 mg/kg in 200 ml of 5% glucose solution for 20 min, then 50 mg/kg in 500 ml of 5% glucose solution for 4 hr, then 100 mg/kg in 1000 ml of 5% glucose solution for 16 hr); administer hypertonic saline 3% IV or mannitol IV (0.25–2 g/kg in 30 min in 20% solution), hemofiltration, laxatives (e.g., oral lactulose, 30 ml every 2 hr until diarrhea occurs), oral rifaximin (400 mg 3 times a day) in case of fulminant liver failure; liver transplantation rarely needed, and there is no evidence that it is effective
ECG changes	Monitor continuously for possible arrhythmias; ECG changes are nonspecific
SIRS	Treat the same as sepsis; consider antibiotics

* The recommendations given in this table are general guidelines. Individualized treatment according to the patient's condition is advised. The full picture of organ failure may be evident only 24 to 48 hours after the event. Therefore, follow-up should continue for at least 96 hours. ACLS denotes advanced cardiovascular life support, ALT alanine aminotransferase, AST aspartate aminotransferase, CBC complete blood count, CK creatine kinase, CPR cardiopulmonary resuscitation, CRP C-reactive protein, CVP central venous pressure, CVVH continuous venovenous hemofiltration, ECG electrocardiography, ECMO extracorporeal membrane oxygenation, ED emergency department, ICP intracranial pressure, ICU intensive care unit, INR international normalized ratio, IV intravenous, LDH lactate dehydrogenase, MARS molecular adsorption recirculation system, PCC prothrombin complex concentrate, P_{2} partial pressure of carbon dioxide, and SIRS systemic inflammatory response syndrome.

† Scores on the Glasgow Coma Scale (GCS) range from 3 to 15, with lower scores indicating a reduced level of consciousness.

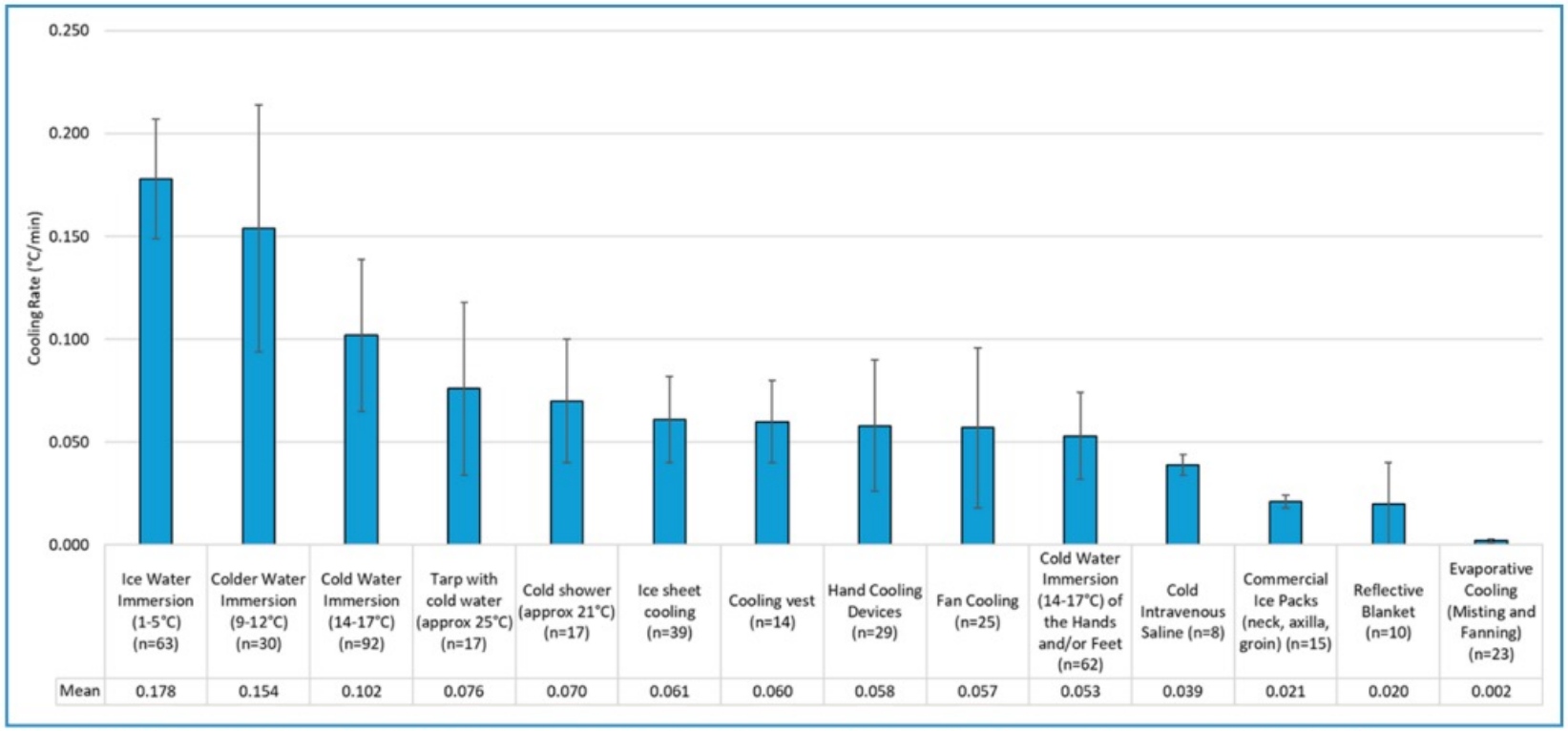


Figure 1. Mean weighted cooling rates by cooling method. To convert Celsius to Fahrenheit multiply by 1.8 and add 32.

Reducing the risk of heat illness in older adults

- AC when you've got it (senior center, movie theater, mall, library, cooling center), esp. if humid
- Cool showers or baths, ice pack or cool washcloth, fan, breeze
- Loose, lightweight, light-colored clothing
- Maintain hydration (avoid alcohol and caffeine)
- Adjust meds (BP meds, diuretics especially)
- Know signs of heat illness and how/when to contact health professional

Health checks during extreme heat events

A guide for doing in-person or remote health checks

Extreme heat events can lead to dangerous indoor temperatures in homes without functioning air conditioning. Health checks are used to assess how people at high risk of heat-related illness are doing during extreme events. In-person health checks are best, but a remote health check is better than no health check.

This guide has five pages with important information for doing health checks during extreme heat events.

Rapid risk assessment checklist

To assess whether someone is at risk, check all the personal factors that apply on the following list. The more boxes checked, the higher the potential risk.

☐ Older adult (60 years+)	The body's ability to cool itself is impaired as people age.
☐ Mental illness or cognitive impairment	Conditions such as schizophrenia, depression, anxiety, and dementia can reduce awareness of heat-related risks.
☐ Chronic disease	Chronic diseases such as diabetes, heart disease, respiratory diseases, and cancer can limit the body's ability to cool.
☐ Living alone or socially isolated	People who live alone or do not have strong social connections are at higher risk because they have fewer people looking out for them.
☐ Substance dependency or use	The ability to sense and respond to heat can be affected by use of drugs or alcohol, especially for those who are dependent.
☐ Impaired or decreased mobility	People with impaired or reduced mobility might be less able to take protective measures during extreme heat events.
☐ Medication use	Some prescription medications for common conditions can cause dehydration and affect the body's ability to cool itself.
☐ Poor physical fitness	People who are not engaged in regular physical activity are less able to keep cool in the heat.

National Collaborating Centre for Environmental Health
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www.ncceh.ca

Recognizing and responding to heat-related illness

Heat-related illness occurs when the body overheats. It is caused by prolonged exposure to high temperatures, and can be made worse by high humidity. The signs and symptoms of heat-related illness can range from mild to severe and can progress rapidly. If you are unsure, treat it like a life-threatening emergency and start cooling measures.

Severe heat-related illness

Severe heat-related illness is a life-threatening emergency. Act immediately to get help and start emergency cooling measures.

Signs and symptoms

Any of the following can be signs of **severe** heat-related illness:

- Fainting or loss of consciousness
- Unusual confusion or disorientation
- Severe nausea and vomiting
- Difficulty speaking
- Unusual coordination problems
- Hot, flushed skin or very pale skin
- Not sweating
- Rapid breathing and faint, rapid heart rate
- Body temperature >39°C (102°F)
- Very low, dark urine output

Emergency measures

If someone is experiencing severe heat-related illness, **take all the following actions:**

- Call 911 immediately
- Stay with the individual until emergency services arrive
- Move to a cooler area, if possible
- Remove excess clothing
- Have the individual rest comfortably flat on their back facing up or in a semi-upright position and offer water
- Apply cool, wet towels or ice packs around the body, especially to the neck, armpits, and groin, until emergency services arrive

Moderate heat-related illness

Moderate heat-related illness can rapidly become severe heat-related illness. Immediate cooling is important to prevent progression.

Signs and symptoms

Any of the following can be signs of **moderate** heat-related illness:

- Nausea
- Light-headedness
- Weakness
- Extreme fatigue, malaise
- Very thirsty or dry mouth
- Difficulty swallowing
- Heat rash, unusual swelling, or cramps
- Rapid heart rate
- Body temperature >38°C (100°F)
- Reduced, dark urine output

Mild heat-related illness

Mild heat-related illness can rapidly become severe heat-related illness. Immediate cooling is important to prevent progression.

Signs and symptoms

Any of the following can be signs of **mild** heat-related illness:

- Feeling unwell
- Dizziness
- Headache
- Irritability
- Fatigue
- Thirst
- Skin feels very warm and sweaty
- Increase in resting heart rate
- Reduced urine output

Immediate measures for mild to moderate heat-related illness

If someone is experiencing mild to moderate heat-related illness, **take as many of the following cooling actions as possible:**

- Relocate individual to a cooler area
- Remove excess clothing and provide low-level fanning
- Activate air conditioning or open windows in different areas to create a cross-breeze
- Keep the individual resting comfortably flat on their back facing up or in a semi-upright position.
- Encourage sitting upright and drinking water
- Apply cool, wet towels or ice packs around the body, especially to the neck, armpits, and groin
- Call 911 if symptoms persist or get worse

In-person health checks

Before doing a health check, read page 2 on Recognizing and responding to heat-related illness

What you should have for an IN-PERSON HEALTH CHECK

- ☐ This 5-page document, either printed or digital
- ☐ Fully charged cell phone for emergency calls
- ☐ Information about others to contact if the individual is at risk
- ☐ Ear or mouth thermometer for taking body temperature
- ☐ Environmental thermometer for taking room temperature
- ☐ Wash cloths or towels for soaking in cool water
- ☐ Spray bottle
- ☐ Bottled water
- ☐ Ice packs and extra ziplock bags

Guidance for in-person health checks

- Do health checks at least twice daily, because heat-related illness can come on fast. Do one check during the evening hours when it is hottest indoors.
- When you enter the home, make sure the person is not in immediate distress and can communicate with you. If someone is in immediate distress or cannot communicate with you, follow emergency measures (page 2).
- Assess the situation with your own senses. Does the individual look or seem unwell? Does the environment feel hot? If someone seems unwell and the environment is hot, take immediate measures to start cooling (page 2) and alert others to the situation. Ask the individual for emergency contacts if you do not have this information.
- If you see no immediate risk, consider the rapid risk assessment checklist (page 1). If you do not know the individual well, ask them some questions to help with your risk assessment.
- Ask the individual about whether they have had any signs and symptoms of heat-related illness (page 2) since their last health check.
- If possible, use personal and environmental thermometers to help you understand the situation. See table on page 5 for information on measuring temperatures and cooling strategies.
- If you feel that the situation could become risky, alert others. Ask the individual for emergency contacts if you do not have this information.
- If you feel confident that the situation is safe, let the individual know when to expect the next health check, if possible.

Remote health checks

In-person health checks are best
It is much more difficult to assess how someone is coping with extreme heat during a health check by phone or digital media. However, remote health checks are better than no health checks. If you cannot get through to the individual for a remote health check, take action. Call someone who can help to arrange an in-person health check, such as a relative, a neighbour, a friend, or 911.

Before doing a health check, read page 2 on Recognizing and responding to heat-related illness

What you should have for a REMOTE HEALTH CHECK

- ☐ This 5-page document, either printed or digital
- ☐ Residential address of the individual in case you need to call 911
- ☐ Information about others to contact if the individual is at risk
- ☐ Some personal information about the individual such as age and general health

Guidance for remote health checks

- Do health checks at least twice daily, because heat-related illness can come on fast. Do one check during the evening hours when it is hottest indoors.
- Start by asking the individual simple questions about themselves and their general wellbeing. Listen carefully to how they respond, considering the signs and symptoms of heat-related illness (page 2).
- Ask the individual about the general temperature of their home. If they have a thermostat or thermometer, ask them to tell you the current temperature. See table on page 5 for information on indoor temperatures.
- Ask about how much water or other fluids they have been drinking. Recommend that the individual drink water regularly through all hours of the day.
- Ask about how they have been sleeping in the heat and what they have been doing to stay cool overnight.
- Make suggestions for keeping themselves and their home cool. See table on page 5 for information on cooling strategies.
- If you feel that the situation could become risky, alert others. Ask the individual for emergency contacts if you do not have this information.
- If you feel confident that the situation is safe, let the individual know when to expect the next health check, if possible.

Measuring body and room temperature

If you can get information on body temperature or room temperature, it may help you to assess the situation during health checks. Use the following tables to guide you.

Body temperature

- A normal body temperature is 36.5-37.0°C (97.7-98.6°F).
- A resting body temperature over 38°C (100.4°F) may indicate moderate heat-related illness.
- A resting body temperature over 39°C (102.2°F) requires immediate emergency attention.

Indoor temperature

- Indoor temperatures of 26°C (78.8°F) and below are usually safe.
- Risk of heat-related illness starts to increase at indoor temperatures over 26°C (78.8°F) for susceptible people.
- Risk of heat-related illness increases significantly at sustained indoor temperatures over 31°C (87.8°F) for susceptible people (page 1).

Reducing body temperature

- ☐ Take off extra layers of clothing to expose as much skin as possible.
- ☐ Have access to cool drinking water and drink regularly, even when not feeling thirsty.
- ☐ Prepare damp towels in a plastic bag and put them in the fridge to apply on the body regularly.
- ☐ Take cool showers or baths or sit with feet in cool water.
- ☐ Fill a spray bottle with cool water for misting.
- ☐ Limit physical activity and exposure to the outdoors during the hottest hours.

Reducing indoor temperatures

- ☐ Turn on an air conditioner, if available.
- ☐ Turn on fans if the room temperature is below 35°C.
- ☐ Move to a cooler space within the home, if safe to do so.
- ☐ Draw curtains, shades, or shutters to help block direct sunlight.
- ☐ Cover windows with a blanket or cardboard if there are no curtains or shades.
- ☐ Close windows during the heat of the day to trap cooler air indoors.
- ☐ Open windows overnight or whenever there is a cool breeze, keeping safety in mind.
- ☐ Turn off heat-generating devices such as appliances, electronics, lights, etc.

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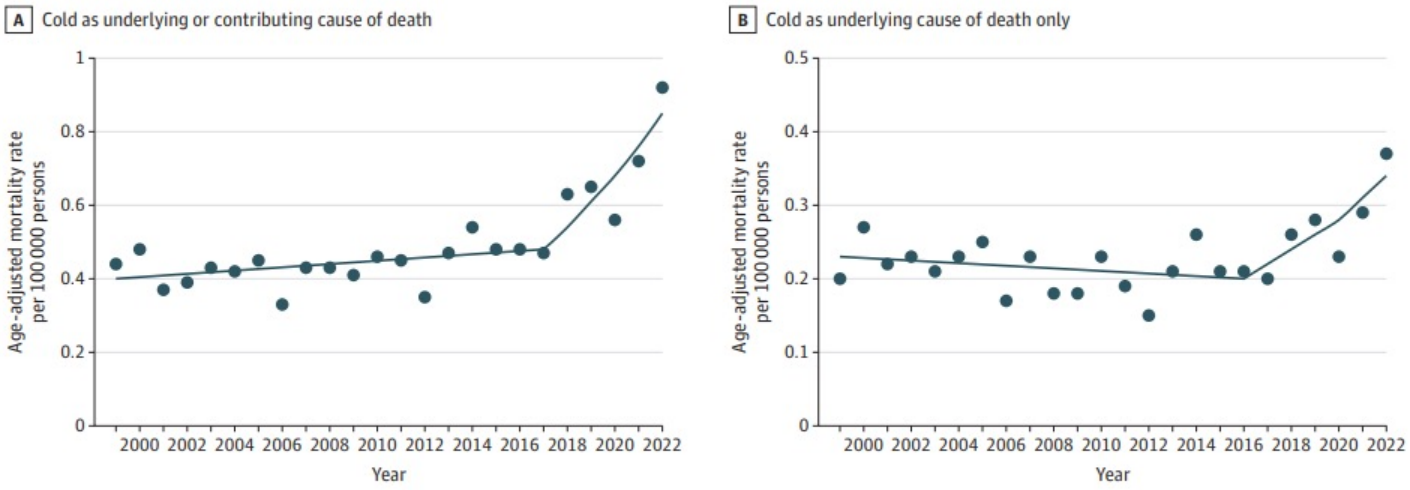
So…just move North to avoid the heat? Not so fast

Figure. Age-Adjusted Cold-Related Mortality Rates in the US, 1999-2022



Mortality rates were age-adjusted to the US population in 2000. Cold-related mortality rates are plotted as dots, with a Joinpoint model plotted as a line and a single Joinpoint in either 2017 (panel A) or 2016 (panel B).

JAMA Feb 4, 2025 ; Liu M, Patel VR, Wadhera RK.

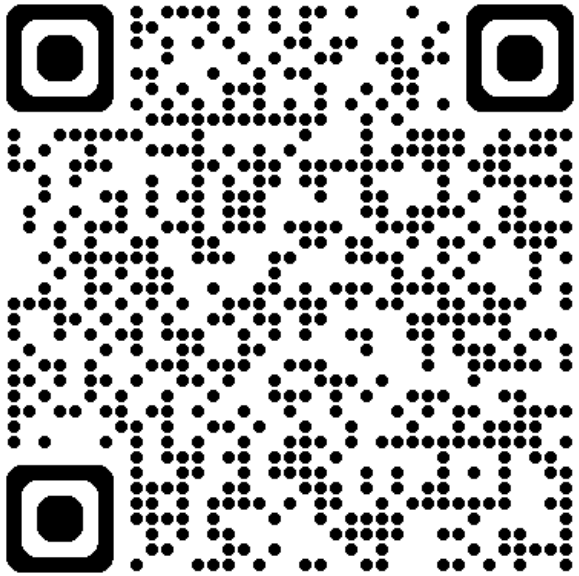
Cold and older adults

- Why are older adults vulnerable to the cold?
  - Skin thinning and reduced ability to insulate
  - Decreased ability to sense cold and generate body heat (lower muscle mass)
  - May live alone, have mobility, cognitive, or financial limitations that make evacuating more difficult
  - May take meds that blunt shivering or blood vessel constriction

- Health impacts
  - Hypothermia= core temp below 95F, can cause delirium, arrhythmias, ultimately vascular collapse
  - Frost bite/cold tissue infarction
  - Vasoconstriction can contribute to CV events
  - Carbon monoxide poisoning
  - Power dependent issues: Oxygen, CPAP, HD, refrigeration of meds
  - Supply chain disruption of chronic meds
  - Meds that raise cold risk: thyroid hormone (inadequate), opiates, neuroleptics, sedatives, vasodilators, beta-blockers (and alcohol or other sedating substances)

Preparing our patients for cold

- Medications: instructions for meds to reduce or hold, ample supply when access may become problematic; printed list
- Cold weather plan: who to call, who will check on them, how to self-monitor if power is out (eg, sx to watch for and weight to trigger concern if missed HD); printed copy of phone contacts, shelters, emergency services
- Adjusting the environment: closing off unused rooms, layering clothes, sealing drafts, smoke alarms and CO detectors
- How to use space heaters or power generators safely
- If must go outside, ensure access to shoes with appropriate soles and ambulatory devices have no-slip tips; limit times out of doors and use wind-chill to forecast safe duration
- Have on hand shelf-stable foods and can opener



Flooding

- The most common and costly natural disaster in the US
- Obvious impact on housing, roads, physical environment, animal habitats/biodiversity
- River erosion a particular problem
- Rising ocean

Health Impact from Flooding

- Direct trauma
  - Drowning
  - Injury from debris
  - Electrocution from downed power lines
- Chronic disease exacerbation
  - Medication supply, power outage, access to care
- Longer term health risks
  - Mold
  - Contaminated water—infections (hep A, cholera), diarrheal diseases
  - Spoiled food
  - Stagnant water breed mosquitos and vectors
- Mental Health

How to prepare your patients before and after flooding

- Assess risks specific to the patient: mind, mobility, chronic conditions, social support
- Review meds identifying critical ones and those that need refrigeration; make list of meds with stars next to highest priority
- Equipment needs, esp electricity-dependent
- Contacts—at least 2
- Copy of documents: paper and cloud (insurance, advanced directive)
- Planned exit and communications
- Go Kit
- Vaccines up to date (Tetanus and others)
- Cell with FEMA ap or NOAA or other weather ap, programmed contacts; power source
- Evacuate early
- Avoid contact with flood water
- Bottled/boiled water
- Avoid mold: dry 24-48h; clean using N95, gloves, goggles
- Monitor skin if contact with water
- Address mental health risks
- Don’t grill or use generator indoors
- CO detector in the home

Other important areas to consider

- Reductions in global production of food
- Emerging pathogens
- Increased violence and mental health instability
- Draughts
- Reduced biodiversity
- Climate Refugees
- Disasters, 500-year storms happening every 5 years

The Age Friendly 4 Ms and Climate Change Preparedness

- Matters Most
- Mobility
- Medications
- Mind

The Age Friendly 4 Ms and Climate Change Preparedness

Matters Most

- Always the foundation for providing patient-centered care and prioritizing decisions
- What goes in your escape bag? Who goes with you? Where?
- Who are your people?
- Are there activities you might curtail?

Mobility

Medications

Mind

The Age Friendly 4 Ms and Climate Change Preparedness

Matters Most

Mobility

- DME availability, obscured pathways owing to debris/flood/snow
- Poor air quality or extreme heat might cause new mobility impairment related to CV tolerance
- Evacuate early esp. for high risk
- Helpers

Medications

Mind

The Age Friendly 4 Ms and Climate Change Preparedness

Matters Most

Mobility

Medications

- Should be adjusted in heat (diuretics, anticholinergics, BP meds)
- May interfere with planning to react to the environment or seeking help (sedatives, opiates, muscle relaxants)
- Need plan for refrigeration (insulin, biologics)
- Some require machines to administer (nebulizers, dialysis)
- Plan for supply chain disruptions, plan how to ration

Mind

The Age Friendly 4 Ms and Climate Change Preparedness

Matters Most

Mobility

Medications

Mind

- Mental health support, esp with pre-existing anxiety, dementia, other mental illnesses but also post-trauma
- Physical abuse rates increase with heat
- High ambient temperatures during sleep contribute to worsened cognition
- Air pollution is associated with higher rates of dementia
- People with dementia more likely to be hospitalized during heat waves
- Helpers for people with cognitive impairment

Go kit

- 7-14 d meds in waterproof bag (ice packs for heat sensitive meds)
- Documents: med list, contacts, emergency assistance, advanced directives, list of med problems, ID, insurance, maps
- Spare glasses, hearing aids w batteries, dentures/adhesive
- Continence care, wipes, sealable bag
- Gloves, hand sanitizer
- 1 gal/day water
- Shelf-stable food with fork and can opener
- Flashlight
- Whistle
- First aid kit
- Cell charger/power source
- Radio w batteries
- Tarp, blanket

FEMA resources for older adults

Alzheimer's Association resources

We are her and she is us and we are all one

"What happens, from here, we be entirely our doing." David Wallace-Wells