

# The Health Emergency of Climate Change

## *The Special Risks to Older Adults*

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Mini Medical School, Spring 2020

## *Heat waves...*



“Sweat was beading on the forehead of the emergency medical technician as he wheeled in an elderly man with a reported fever, whose apparent confusion had led his wife to call 911. In the midst of a record-breaking heat wave, the pair was found in a top-floor apartment with no air conditioning and only one partially open window. The man was transferred to a bed, where a rectal thermometer registered nearly 106°F. We diagnosed heatstroke and rushed him to our highest-urgency area to begin cooling him.

Renee N. Salas, *The Climate Crisis and Clinical Practice*, Feb 13, 2020, *N Engl J Med*, 382;7.

# *Wildfires...*



Coffey Park, Sonoma County

## **Deaths from fires in Sonoma, Mendocino counties, CA, 2017**

### **Total 44 deaths**

Kai (14) and Kressa Shepherd (17)  
Christina Rose Hanson, 27  
Garrett Paiz, 38 (*Firefighter*)  
Michael Charles Grabow , 40  
Michel Azarian, 41  
Tamara Latrice Thomas, 47 (disabled)  
Karen Sue Aycock, 56  
Michael John Dornbach, 57  
**Carmen Berriz, 75**  
**Arthur (95) and Suiko Grant (75)**  
**Leroy and Donna Halbur, 80**  
**Monte Neil Kirven, 81**  
**Veronica Elizabeth McCombs, 67**  
**Lynne Anderson Powell, 72**  
**Sharon Rae Robinson, 79**  
**Tak Fu Hung, 101**  
**Carmen Colleen McReynolds, 82**  
**Marilyn Carol Ress, 71**  
**Linda May Tunis, 69**  
**Carol Collins, 76**

**Valerie Lynn Evans, 75**  
**Marjorie “Marnie” Schwartz, 68**

**Daniel Martin Southard, 71**  
**Lee Chadwick “Chad” Rogers, 72**  
**George Chaney (89) and Edward Stone (78)**  
**Charles (100) and Sara Rippey (98)**  
**Sally Lewis (80) and Teresa Santos (59)**  
*After a harrowing rescue attempt, Lewis, 90, and her caretaker, Teresa Santos, 59, were overtaken by the Atlas Peak fire.*

**Roy (87) and Irma Bowman (88)**  
**Janet Costanzo (71) and Steve Stelter (56)**

**Jane Gardiner (83) and Elizabeth Foster (64)** *Gardiner died in the fire that destroyed her home Oct. 9 and killed her longtime caregiver, Ms. Foster.*

**Margaret Stephenson, 86**

**29/40 (73%) were adults over 60**

# Floods...



Nursing home residents in Dickinson, Texas, wait for first responders in a flooded room.

A flood at La Vita Bella Assisted Living, Dickinson, Texas  
September 2017

# *The unknown...*

SARA HARRISON

SCIENCE 05.14.2020 07:00 AM

## **Why Has Covid-19 Hit Seniors So Hard?**

It's not one thing, it's everything. Older people are more likely to catch the disease, to suffer from it more severely, and to have a tougher recovery.



# *Extreme weather...*

## Katrina Took Deadly Toll on Elderly

March 5, 2006 · 12:04 PM ET

Heard on [Weekend Edition Sunday](#)

AUDIE CORNISH



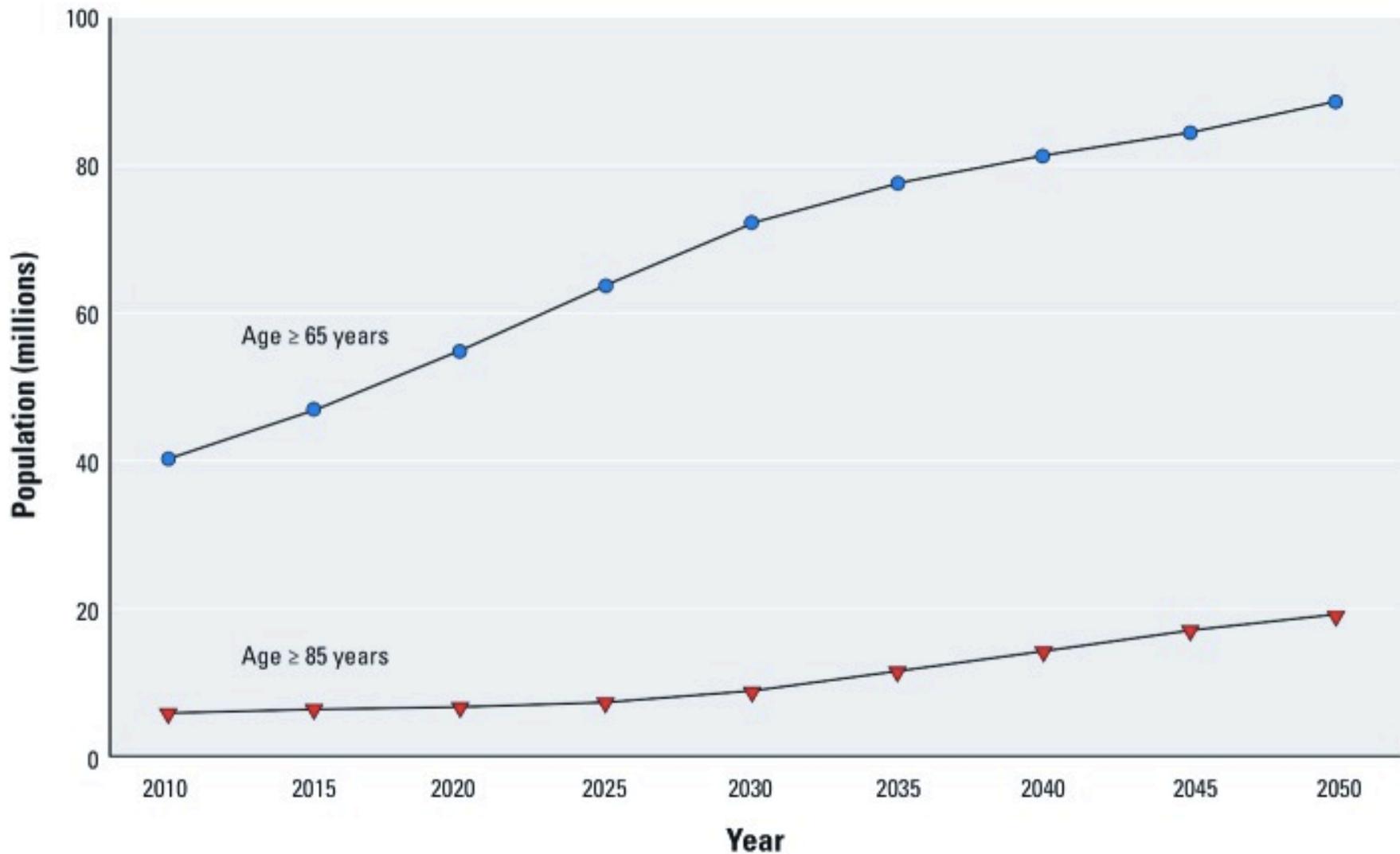
*60% of the flood-related deaths were among people older than 65*

Jonkman, Maaskant, Boyd, & Levitan, 2009

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# Outline

- What is special about older adults?
- How does climate change impact their health specifically?



Projected population of older adults, 2010–2050. Data from U.S. Census Bureau (2008).

Gamble, Environ Health Perspect. 2013 Jan; 121(1): 15–22.

# What is an “older adult”?

- Or is it “senior” or “elder” or “elderly”?
- Huge variability, so age is not the only consideration
- Often people 65 and older are considered “older adults” but in some groups (such as those who are experiencing homelessness or live with HIV/AIDS, it can be 50 and older)

# Important considerations about the health of older people

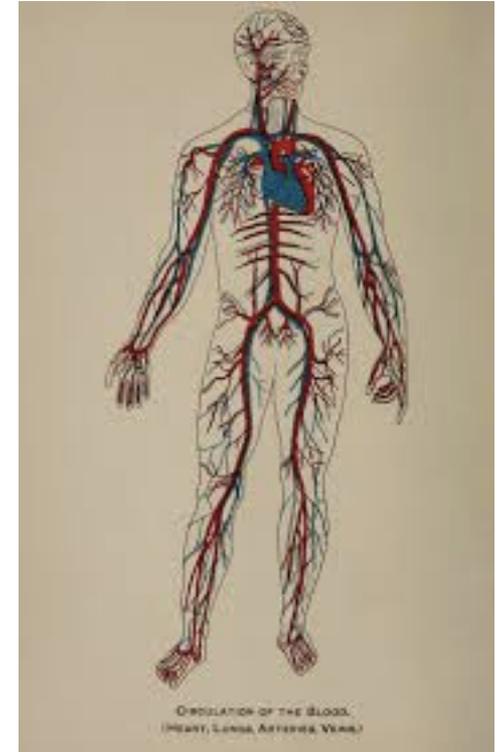


- Usual aging involves many physiologic changes
- Common, normal physiologic changes combined with comorbidities contribute to decreased functional reserve and increased vulnerability

# Important considerations about the health of older people

## ■ Physiologic changes

- Decreased kidney function
- Decreased lean body mass and bone mass
- Decreased vital capacity and VO<sub>2</sub> max
- Decreased cardiac output and increased myocardial and arterial stiffness
- Decreased recall and slowed reaction times
- Decreased vision and hearing



# Biological vulnerabilities

- Older adults have reduced thermoregulatory response to heat and cold
- Chronic conditions (and often more than one!): cardiovascular disease, chronic lung disease
- Reduced physiologic reserve (less “bounce back”)
- Sensory impairments (hearing, vision)
- Cognitive changes
  - Dementia affects 10% of people over 65, 30-50% of people 85 and older. Is is an **abnormal** loss of cognitive abilities
  - Slower processing associated with **normal** aging
- On many medications!



# Social vulnerabilities

## ■ Poverty

- 15% of general older population (by the supplemental measure that takes out of pocket medical expenses into account)
- Much higher as you get older, for racial minorities, and for women

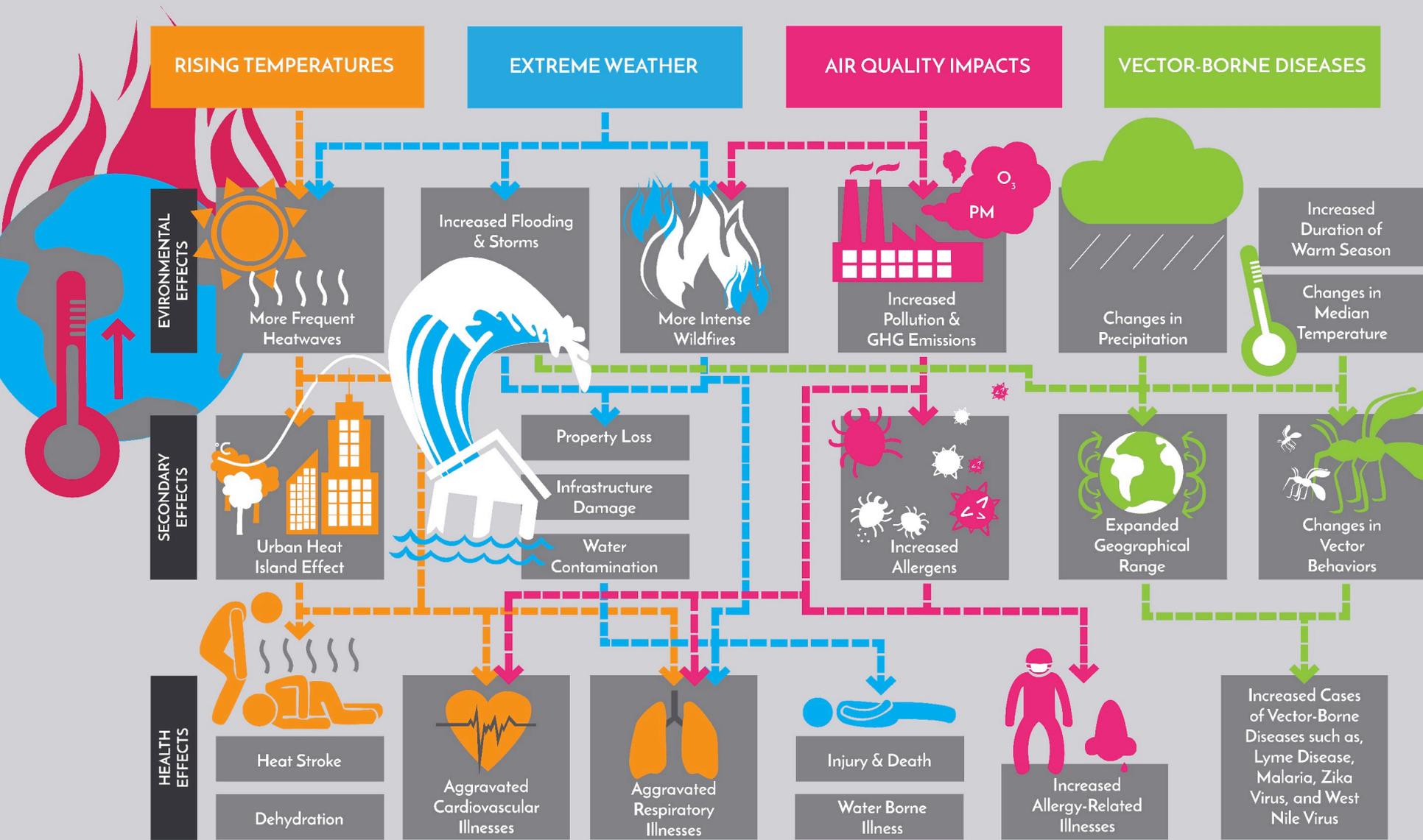
## ■ Social isolation: 1/3 of older adults live alone

## ■ Digital divide: HUGE!

## ■ More likely to live in congregate housing, like assisted living or nursing home

## ■ Among those 70 and older, about 1/3 require personal care on a regular basis from another person

# HOW CLIMATE CHANGE AFFECTS YOUR HEALTH

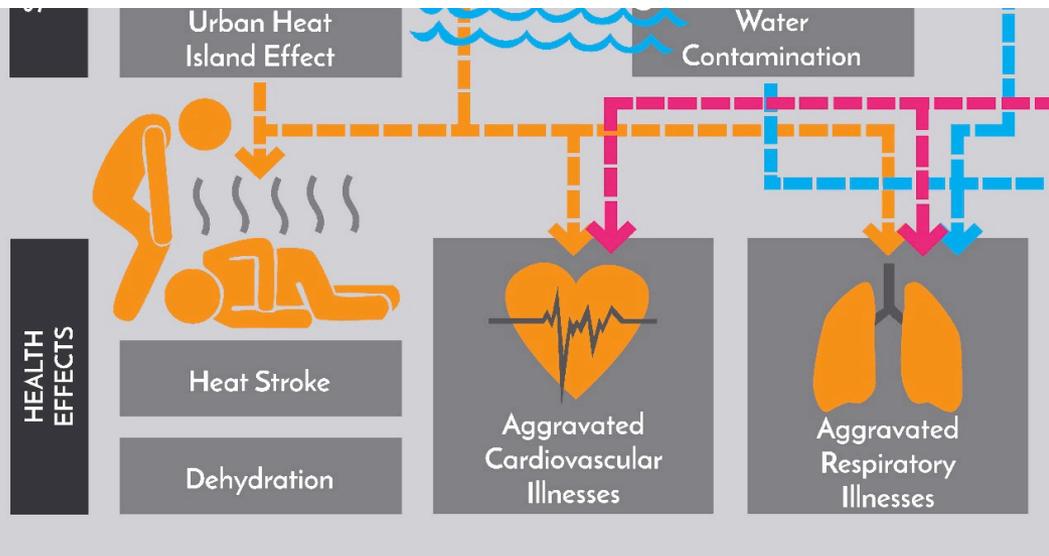


# Climate change is an environmental stressor

- You are vulnerable to it because of:
  - **exposure**, the contact people have with the stressor
  - **sensitivity**, the degree to which people are affected by the stressor;
  - **adaptive capacity**, the ability of people to adjust to the stressor
- Older adults have heightened vulnerability for social and biophysical reasons that impact their exposure (e.g. *poor housing*), sensitivity (e.g. reduced kidney function), and adaptive capacity (e.g. *disability preventing them from searching from doing cooling measures*)

Mcdermott-Levy Journal of Gerontological Nursing, 45(11), 21-29.

## RISING TEMPERATURES



The impact may be greater in older adults because:

- Less able to thermoregulate -> more heat-related illness
- Inability to move to a cooler location or take corrective measures
- Several common medications can exacerbate heat's effects
- Air pollution, made worse by heat, is linked to respiratory illness, and cardiovascular hospital readmissions and deaths

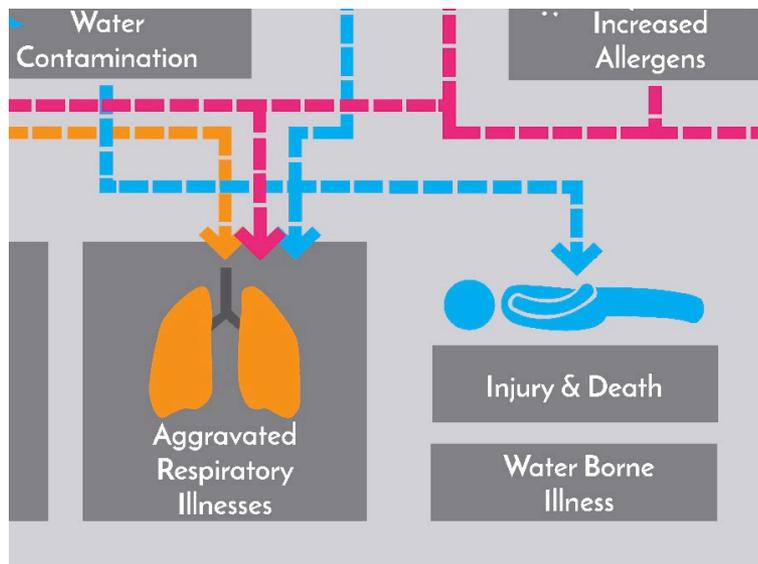
Leiser, J. Clin. Med. 2019, 8;2114.

# Common medications that impact the body's response to heat

- Diuretics (“water pills”, such as furosemide)
- Angiotensin converting enzyme inhibitor or angiotensin II receptor blocker (for blood pressure)
- Anticholinergics (many medications! bladder medications such as oxybutynin, Benadryl, Dramamine)
- Psychotropic medication (antidepressants, such as SSRIs)

Westaway et al., Journal of Clinical Pharmacy and Therapeutics, 40(4), 363– 367. 2015

## EXTREME WEATHER



The impact of extreme weather on injury/death may be great in older adults because:

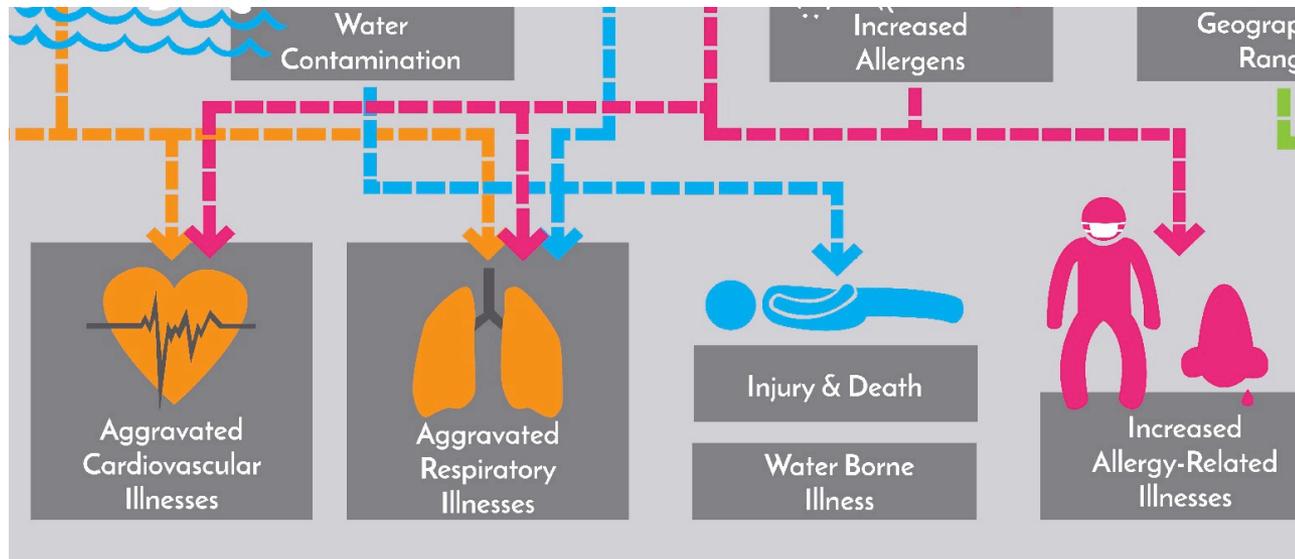
- Less ability to flee or take cover quickly
- More harm from injury
- 60% of deaths in Hurricane Katrina were people 65 and older

Water-borne illness:

- Contamination of water with microbes that can cause serious illness could be more harmful to an older person, e.g. cholera.

## AIR QUALITY IMPACTS

↑ *ground-level ozone and higher atmospheric concentrations of fine particulates, such as dust and allergenic pollen*



- Again, air quality can affect hospitalization and mortality from lung and cardiovascular disease.
- Allergies can become more severe and really affect quality of life or require medications that have side effects

## VECTOR-BORNE DISEASES

### Behaviors

Increased Cases  
of Vector-Borne  
Diseases such as,  
Lyme Disease,  
Malaria, Zika  
Virus, and West  
Nile Virus

Some vector borne disease have higher severity in older adults, particularly West Nile.

# Additional impacts

- Mental health
  - Eco-anxiety
  - Trauma
  
- Caregiver health and wellbeing
  - The foundation of health of the older person

# What can you do?

- Be aware of the local risks
  - A heat wave that is dangerous in Oregon is possible at lower temperatures than in Arizona
- Be aware of your risks: medications, conditions, functional needs
- Make a plan
  - Look at local resources and see how you can help create safeguards to emergency situations
  - E.g. PG&E

# Take Homes

## *The Health Impacts of Climate Change on Older Adults*

- We are an aging society and the impact of climate change on older adults will become a more important issue
- A particular older person may be more vulnerable to certain outcomes of climate change for a combination of social and physical factors
  - Where they live
  - What resources they have
  - What conditions they have and what medications they take

Thank you!

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