

Climate Change, Health and Nutrition

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04/06/2022

Learning Objectives

1. Describe four ways climate change impacts health.
2. Identify two ways climate change impact agriculture.
3. Identify two ways to address climate change and improve food production.
4. Identify three ways clinicians can act for climate change solutions

Ms. Anna Mae

C.C- “I need a refill on my inhaler”

Ms. Anna Mae is a 64 y.o. African American non-smoking, woman living in Opa locka, FL with HTN, T2DM, HLD, Mild Intermittent Asthma, Obesity. Adheres to her meds- Lisinopril 20mg daily, Amlodipine 5mg daily, Metformin 1000mg twice daily, Pravastatin 80mg nightly, Aspirin 81 mg daily, Albuterol prn. She presented for an earlier visit for an albuterol refill. Asked that I complete her Florida Power and Light application form for reduction in her bill.

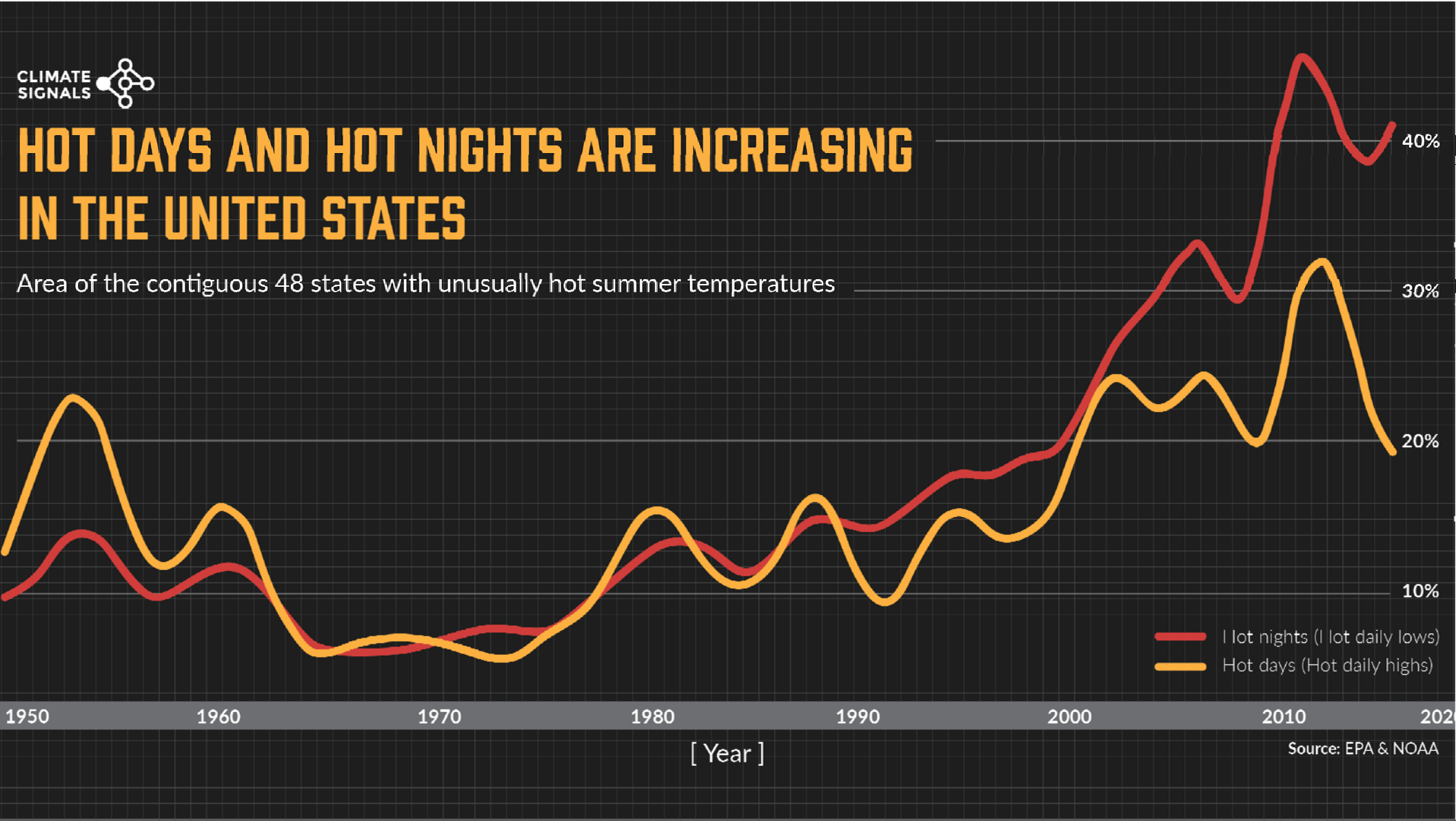
Source: Developed by the DC Department of Health. ©2004.





HOT DAYS AND HOT NIGHTS ARE INCREASING IN THE UNITED STATES

Area of the contiguous 48 states with unusually hot summer temperatures



Source: EPA & NOAA

THE BIG PICTURE

In the atmosphere

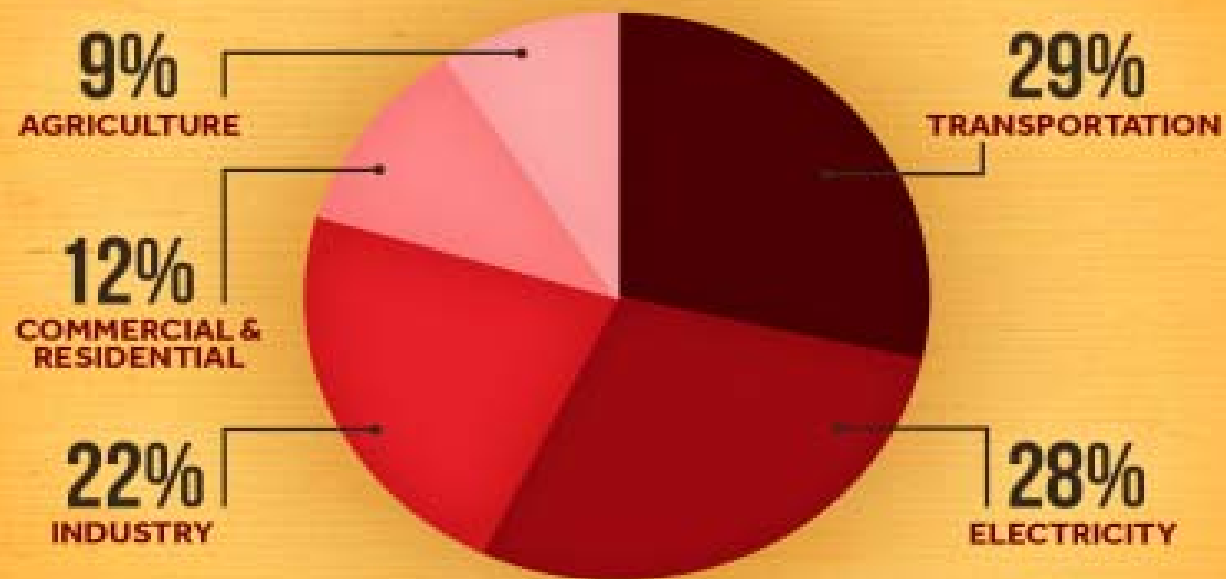
TOO MUCH CO₂

now traps

TOO MUCH heat

GREENHOUSE GAS SOURCES

UNITED STATES EMISSIONS BY SECTOR



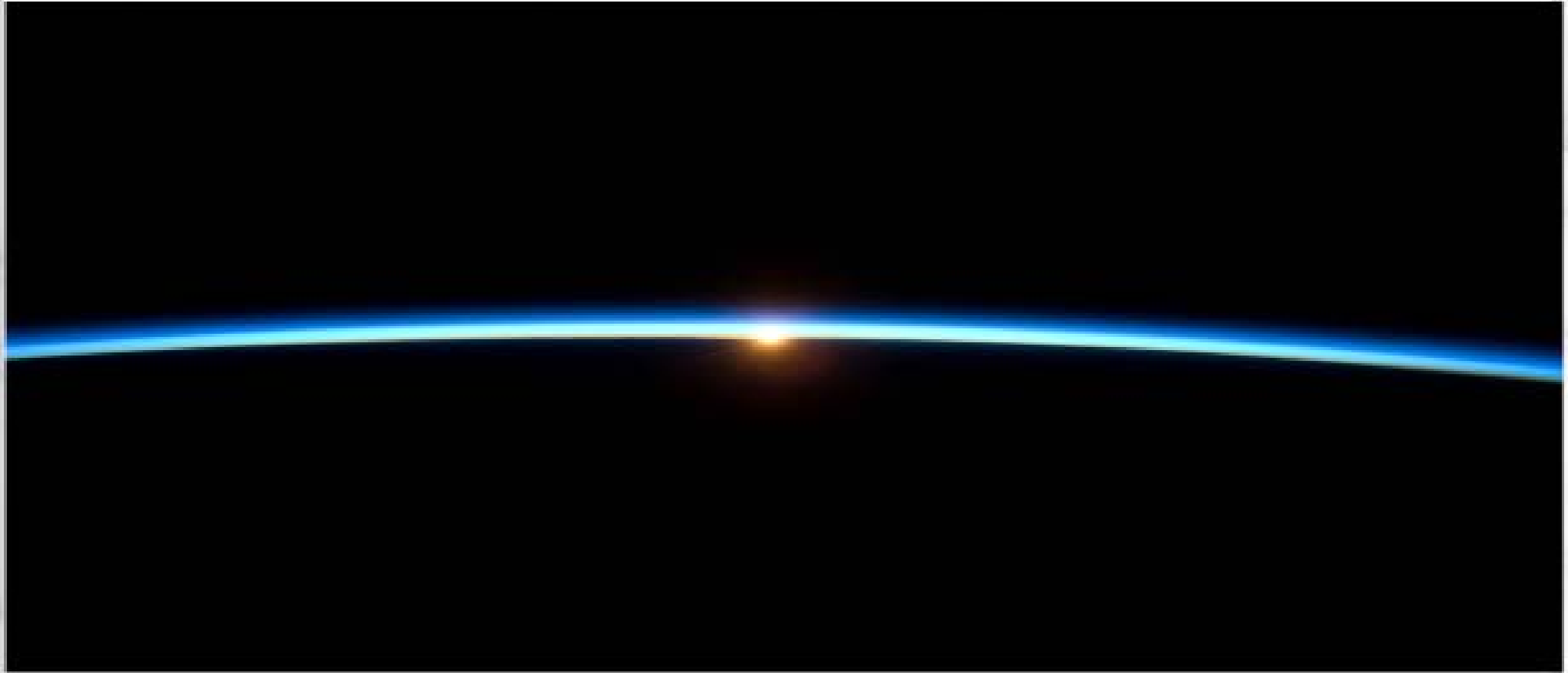
Source: U.S. EPA 2017 (released 2018)

CLIMATE  CENTRAL

Agriculture

1. 24% of greenhouse gasses worldwide

Thin Line



Four Major Impact Categories

1. Direct Impact

- Extreme Heat
- Air Pollution
- Extreme Weather

2. Spread Disease

- Insects & Vectors

3. Disruption of water and food supply

- Contaminated Water
- Contaminated Food
- Hunger & Malnutrition

• Disrupt Emotional Well Being

- Emotional stress

COVER

Environmental factors have adverse impacts on pregnancies, and there are clear racial disparities

.....

By Avery Ellfeldt, E&E News on June 22, 2020



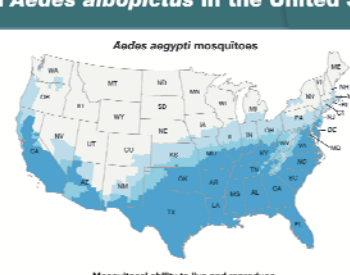
Asthma

- High CO₂ Causes:
 - Increase ground level ozone (fog).
 - 60% more pollen from ragweed.
 - Trees flower 3-5 weeks earlier.
 - Incidence of asthma
 - 1:9 African Americans and 1:7 in Hispanics
 - AA Women have the highest rate of asthma, and more have died from asthma than any other group
- www.stateoftheair.org



A detailed illustration of a mosquito, likely a species of Anopheles, shown from a side profile. The mosquito has a brown and white patterned body, long thin legs, and large wings. It is positioned diagonally across the frame, with its head pointing towards the bottom right. The background is a plain, light gray.

- ## ESTIMATED potential range of *Aedes aegypti* and *Aedes albopictus* in the United States, 2017*



***Aedes aegypti* mosquitoes**

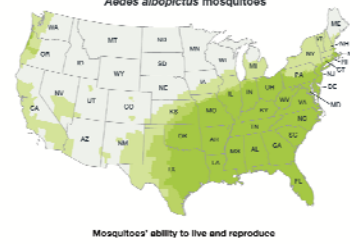
Aedes aegypti mosquitoes are more likely to spread Zika, dengue, chikungunya, and other viruses than other types of mosquitoes such as *A. albopictus*.

Mosquitoes' ability to live and reproduce

very unlikely
 unlikely
 likely
 very likely

These maps DO NOT show exact locations or numbers of mosquitoes living in an area.

Risk is likelihood that these mosquitoes will spread viruses.



***Aedes albopictus* mosquitoes**

These maps show CDC's best estimate of the potential range of the mosquito living in the United States.

Areas where mosquitoes are or have been previously found.


Mosquitoes' ability to live and reproduce


very unlikely
 unlikely
 likely
 very likely

These maps show CDC's best estimate of the potential range of the mosquito living in the United States.

Areas where mosquitoes are or have been previously found.

* CDC has updated the estimated range maps for *A. aegypti* and *A. albopictus* mosquitoes by using a model that predicts *probable geographic ranges for these mosquitoes in the contiguous United States. This model uses temperature, precipitation, and climate data to predict the likelihood that these mosquitoes will spread Zika, dengue, chikungunya, and other viruses than other types of mosquitoes such as A. albopictus.*





U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Mental Health

1. Puerto Rico Se Levanta (“Puerto Rico Rises”): From Denial and Passivity to Action and Hope

Carissa Cabán-Alemán, MD

August 2, 2019

Climate Change, Disaster Psychiatry

<https://www.psychiatrictimes.com/climate-change/puerto-rico-se-levanta-puerto-rico-rises-denial-and-passivity-action-and-hope>

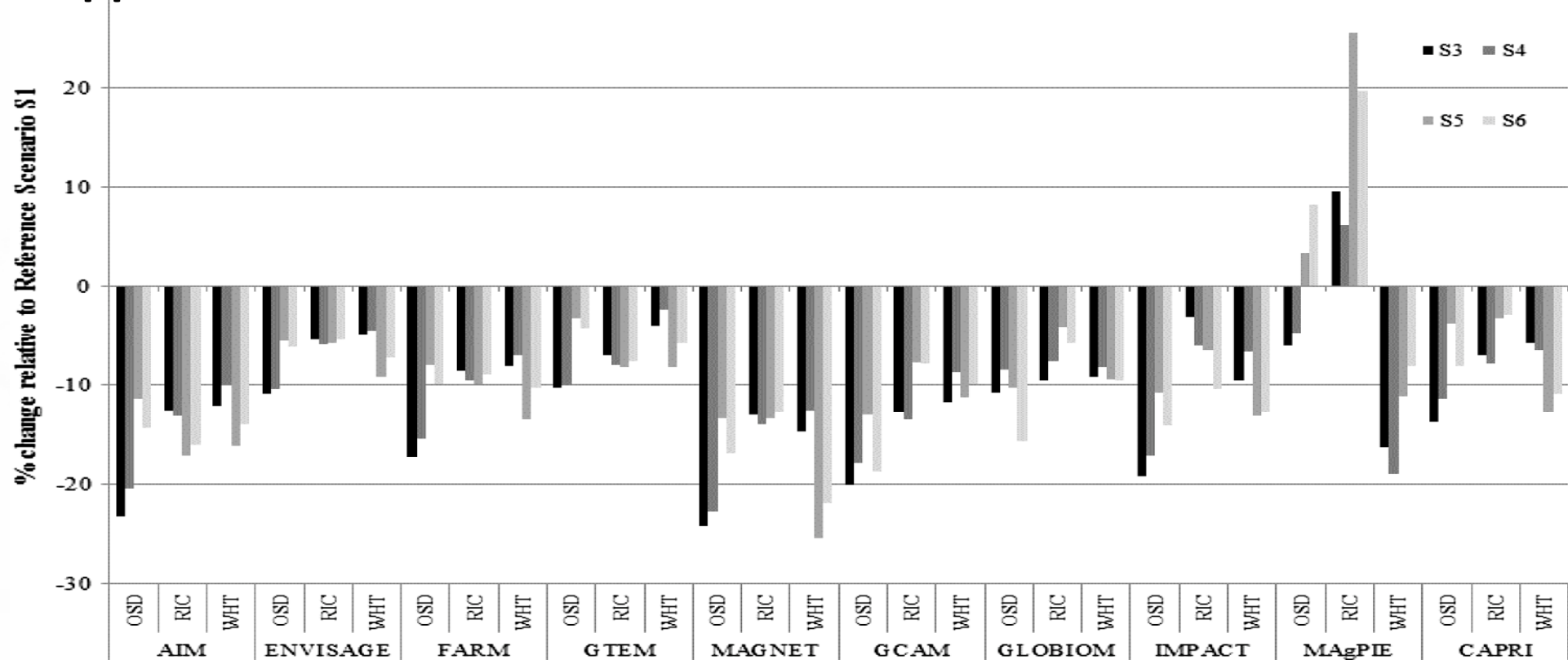
Food Supply

1. Agriculture and fisheries depend on specific climate conditions.
2. Habitat ranges and crop planting dates shift.
3. Droughts and floods due to climate change may hinder farming practices.
4. Increased CO₂- faster growth and decreased nutritional content.

<https://www.epa.gov/agriculture/agriculture-and-climate>

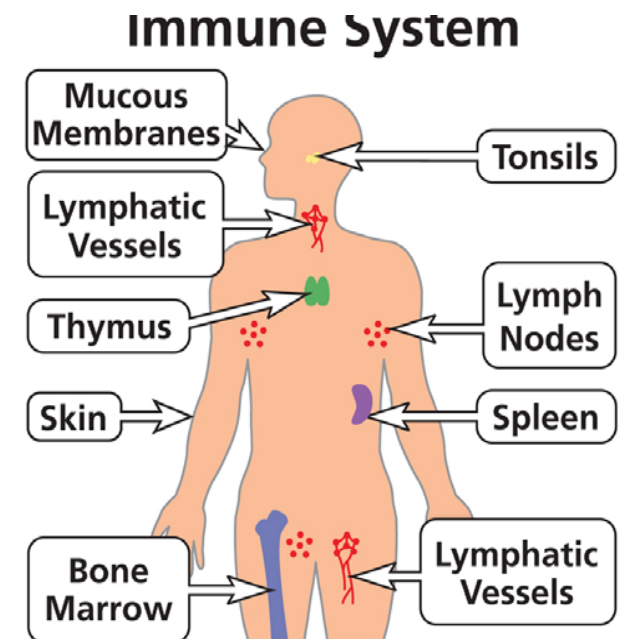
Economic impacts of climate change on agriculture: the AgMIP approach

J. of Applied Remote Sensing, 9(1), 097099 (2015). <https://doi.org/10.1117/1.JRS.9.097099>



Key Immune Responses

- Oxidative Burst
- Proliferation
- Inflammation



Immune System, 2021

Nutrients That Support a Healthy Immune System

- Vitamin A
- Vitamin B12
- Vitamin B6
- Vitamin C
- Vitamin D
- Vitamin E
- Zinc
- Iron

Foods Rich in Vitamin A/Beta Carotene

- Fish
- Liver
- Dairy Products
- Orange and Red Fruits/Vegetable
- Broccoli
- Black Eyed Peas





Foods Rich in Vitamin B12

- Animal products (meat, eggs, dairy)
 - Fortified cereals and non-dairy milk
-

Foods Rich in Vitamin B6

- Fish
- Liver
- Starchy Vegetables
- Non-Citrus fruits



Foods Rich in Vitamin C

- Citrus Fruits
- Red and Green Bell Peppers
- Kiwi
- Broccoli
- Cabbage
- Cantaloupe
- Cassava



Foods Rich in Vitamin E

- Wheat Germ
- Peanuts/Peanut butter
- Sunflower seeds
- Green leafy vegetables



Foods Rich in Iron

- Meat
- Seafood
- Beans
- Nuts
- Dried Fruits
- Green leafy vegetables
- Whole Grain Products



Foods Rich in Vitamin D

- Fatty Fish
- Egg Yolks
- Cheese
- Mushrooms
- Fortified products- milk, cereal



How Climate Change Can Impact Health

H

Heat illness

E

**Exacerbate heart
and lung conditions**

A

Asthma

T

Traumatic injury

W

**Water and
foodborne illnesses**

A

Allergies

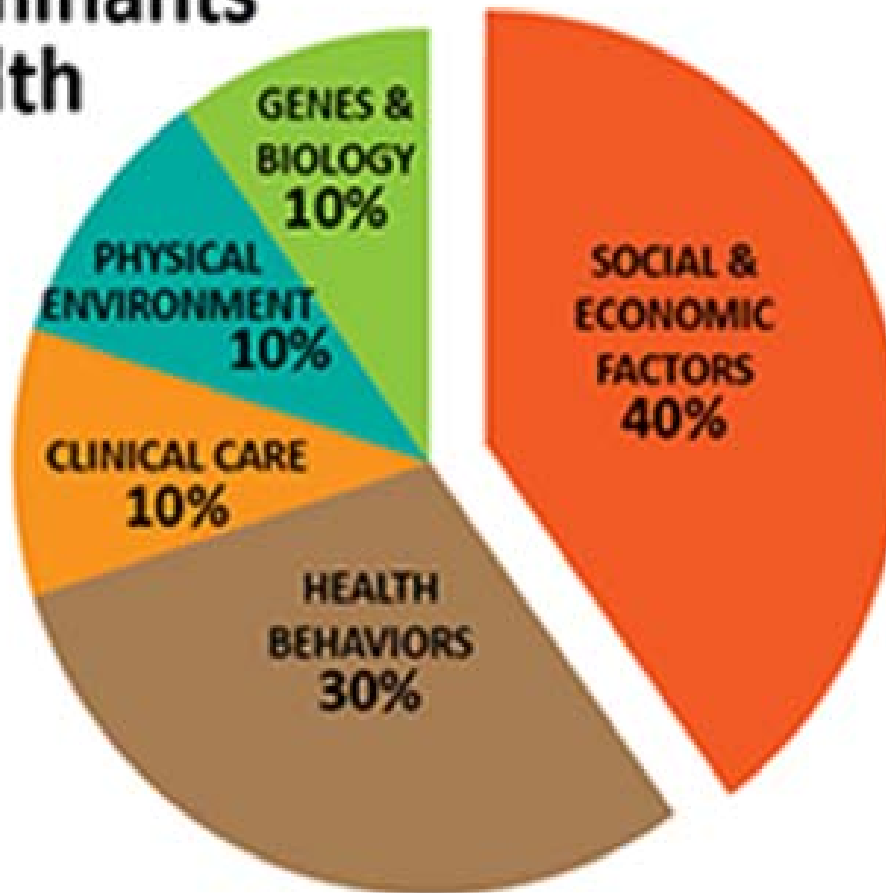
V

Vector-borne disease

E

Emotional Stress

Determinants of health



Tarlov AR. *Public policy frameworks for improving population health*. Ann N.Y Acad Sci 1999; 896: 281-93.

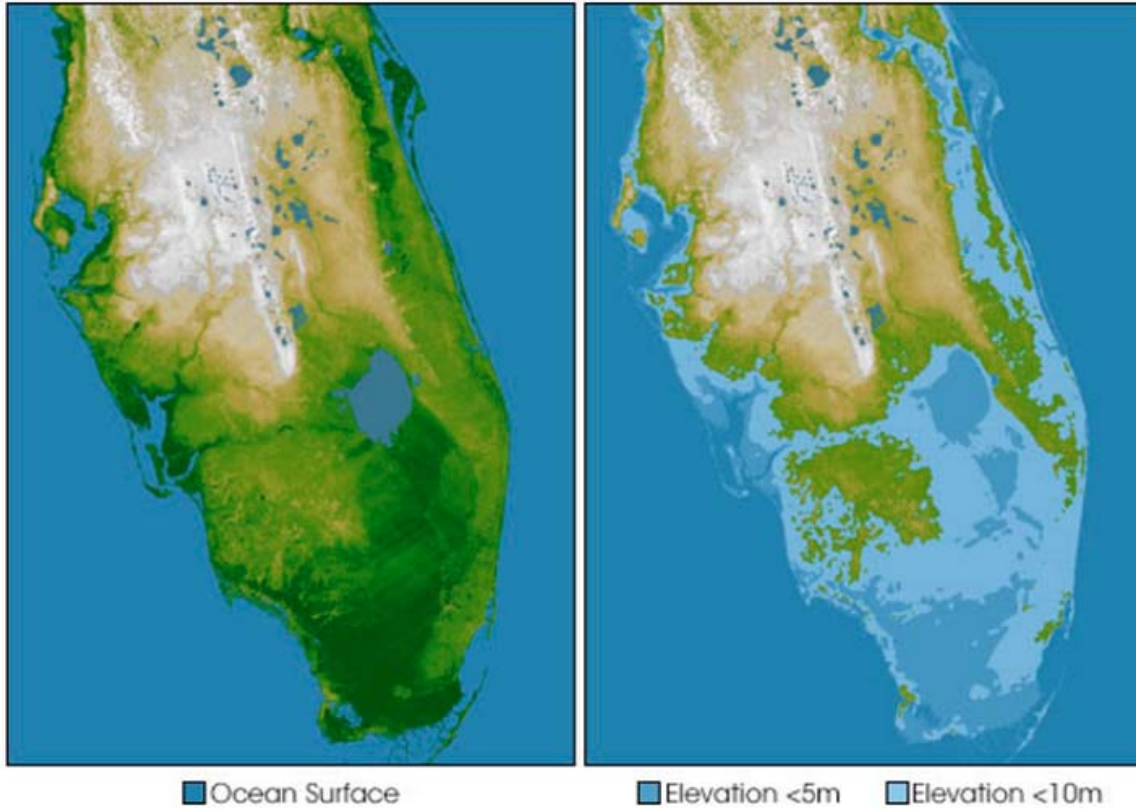
Social Determinants of Health

The World Health Organization (WHO) defines social determinants of health as the conditions, social and cultural, under which people are born and spend their entire lives.

These conditions encompass the systems that impact individuals including the health care system, monetary systems, the political system, and resources

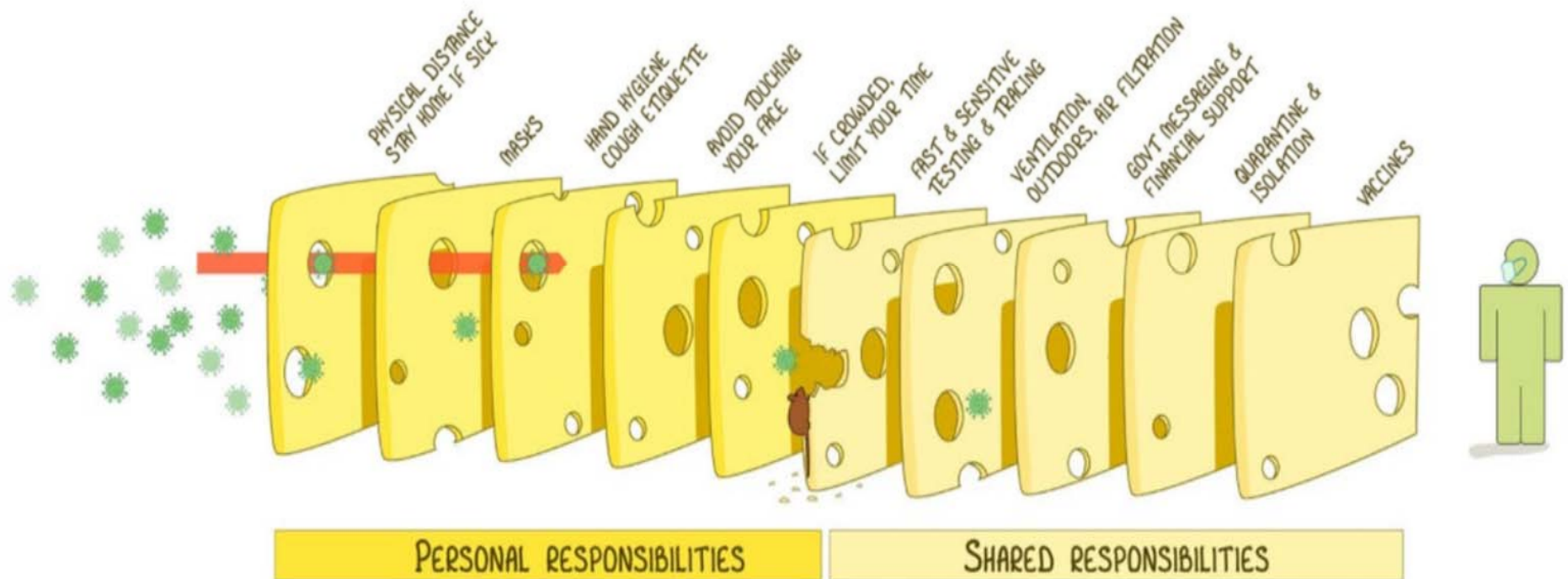
POLICY MATTERS MOST

Sea Level Rise www.miamiherald.com/news/nation-world/national/article172347252.html





The Swiss Cheese Respiratory Virus Pandemic Defense: Recognizing that No Single Intervention is Perfect at Preventing Spread



EACH INTERVENTION (LAYER) HAS IMPERFECTIONS (HOLES).
MULTIPLE LAYERS IMPROVE SUCCESS.

Environment



Expand & Preserve
Urban Tree Canopy



Protect &
expand habitat



Green our
playgrounds



Depave



Support community
gardens



Adapt Cooling Centers



Enhance pedestrian
and biker experience



Implement the
Better Bus Network



Enhance public
transportation services



Pilot innovative
materials



Prioritize affordable
housing



Pilot innovative
streetscapes

Infrastructure



Scale weatherization
program



Implement active and
passive cooling



Partner with schools



Enhance equitable
access



Shade
Bus Stops



Create Heat Health
PSAs



Enhance Data on Health
outcomes



Complete Heat
Action Plan



Prioritize workforce
education and training



Establish Public/Private
Partnerships



Support regulations for
workers' rights



Create Neighborhood Heat
Ambassador Program



Integrate Heat into
Plans



Communicate heat
warnings/advisories

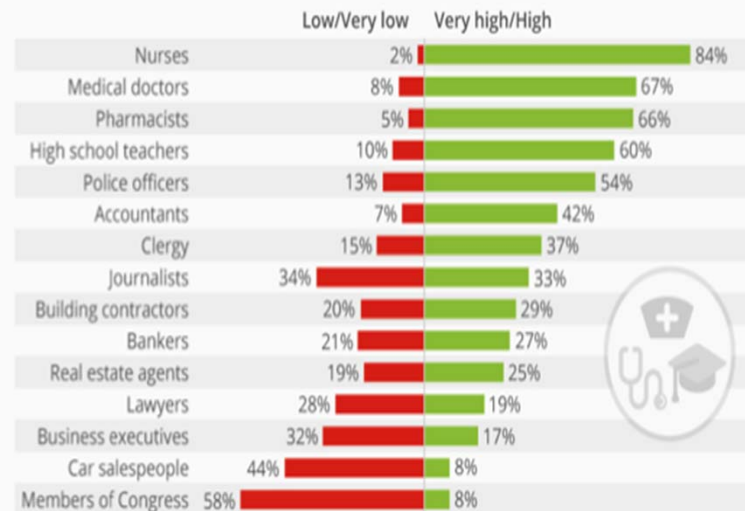


Develop & Maintain
Networks

Health Professionals are the best messengers!!

America's Most & Least Trusted Professions

Rating of selected U.S. professions in terms of honesty and ethical standards in 2018



CC BY ND n=1,025 U.S. adults
@StatistaCharts Source: Gallup

statista

Health Sector

A. 22 U.S. million health sector workers

1. 3.8 million nurses
2. 1 million doctors
3. 300 K pharmacists

B. Caribbean

1. nurses -4-7/ 1000 persons
2. MDs - <1.0 – 4.0/1000 persons

<https://www.oecd-ilibrary.org/sites/b209ca26-en/index.html?itemId=/content/component/b209ca26-en>

Better Agriculture Practices

1. Lower emissions from cropland and pastures, including methane generated by growing rice and raising ruminants
2. Diminish use of fertilizers to decrease nitrous oxide emission.
3. Diminish soil disturbance to decrease carbon dioxide released.

Agriculture Solutions

1. Educate women and girls
2. Support small farms (esp. women led farms)
3. Eat a more plant based diet.
4. Reduce food waste

<https://drawdown.org/references#food>

Actions You Can Take To Advocate for Climate Solutions

1. **Engage-** Learn more about climate change. Participate in programs like Michael Hawken's **Project Drawdown**
2. **Educate** - about climate change with your family, friends, colleagues, community, legislature- **EVERYONE**
3. **Advocate-** **Join** an organization advocating for solutions to climate change, **VOTE**
 - Florida Clinicians for Climate Action (FCCA) www.FloridaClinicians.org
 - Alliance of Nurses for Healthy Environments (ANHE) <https://envirn.org/>
 - www.momscleanairforce.org
 - <https://medsocietiesforclimatehealth.org/>

ACT NOW

1. Remodel agriculture production to support women and small farmers.
2. Perform climate related health research.
3. Prepare our patients mentally and physically for the health impacts.
4. “Green” our health facilities , businesses and home.
5. ADVOCATE for policy changes to decrease fossil fuel use.

UN –IPPC REPORT 2/28/22

“Efforts that improve liveability while also reducing greenhouse gas emissions are "more urgent than previously thought". Actions that prioritize equity and justice, including tackling gender or income inequalities, have better overall outcomes”.

Physicians, Nurses, and other Health Professionals,

“**Mitigating climate change presents unrivaled opportunities
for improving public health**” – Ian Roberts, Clinical Medicine 2009.

Health Professionals are key to the solution.
Please join us!



Visit our website

FCCA

Florida Clinicians for Climate Action

Learn more at
www.FloridaClinicians.org
Free to Join

