

Climate Change and Healthcare Disparities: Global Perspectives

Mary T. Quinn Griffin, PhD, RN, FAAN
The May L. Wykle Endowed Professor
and
Associate Dean for Global Affairs




Climate Change

- Increasing changes in the expected weather over a period of time e.g increases in temperature, precipitation etc


United Nations Definition

- "Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle.



Why is the Climate Changing?

- Climate change -the result of the buildup of greenhouse gases in the atmosphere, primarily from burning of fossil fuels for energy and other human activities
- High carbon dioxide concentrations causes retention solar energy at ground level and results in increase in surface temperature
- Alters the global climate resulting in environmental changes that can harm people's health and well-being.



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Greenhouse Effect

The Greenhouse Effect

SUN

Some solar radiation is reflected by the Earth and the atmosphere.

Some of the infrared radiation passes through the atmosphere, and some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth's surface and the lower atmosphere.

Solar radiation passes through the clear atmosphere.

ATMOSPHERE

EARTH

Most radiation is absorbed by the Earth's surface and warms it.

Infrared radiation is emitted from the Earth's surface.

Brenner, J. & Fasshauer, Keith & Blum, George & Cljara, Jan & Easter, Mark & Hillman, Kendrick & Schuler, Jill & Smith, Phil & Williams, Steve. (2022). Phase 1 Progress Report: Quantifying the change in greenhouse

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Sources of Greenhouse Gases

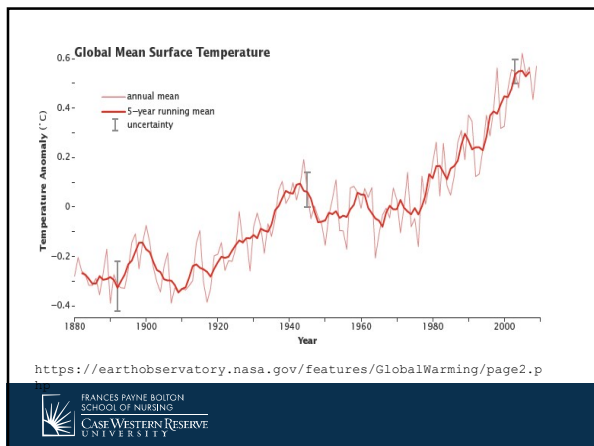
- Burning Fossil fuels
- Rapid increase industrialization
- Using more energy
- Farming livestock
- Pollution - increased consumption
- Transportation
- Deforestation

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Increasing Temperature

- Since 1880, - average global temperatures - increased by about 1 degree Celsius (1.7° degrees Fahrenheit)
- By 2050 - Global temperature projected to increase by about **1.5 degrees Celsius (2.7° degrees Fahrenheit)**
- By 2100 - Increase by 2-4 degrees Celsius (3.6-7.2 degrees Fahrenheit)

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The Paris Agreement

- International Treaty- legally binding
- Adopted in Paris at COP21 in 2015 and enforced November 2016
- 196 countries signed on -1st time all nations
- Goal limit global warming to below 2 Celsius (ideally 1.5

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COP27

Conference of the Parties of the UNFCCC (COP)

November 2021

- Glasgow Climate Pact – agreed by all countries
 - Paris agreement remained in place (1.5 degrees)
 - Urgency in accelerating climate action

November 2022 (6-18)

- COP27 – 120 world Leaders - Egypt
 - Warning by UN secretary general António Guterres
 - “Rich countries must agree a “historic pact” to help the poor address the climate crisis, or “we will be doomed””.

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Climate Change

- Climate change is affecting the health of all individuals globally
- The U.S. Department of Health and Human Services (HHS) considers climate change to be one of the top public health challenges.
- Has the potential to undermine the past 50 years of public health gains
- Climate Change is a major challenge for Global Health



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Climate Change

- As the climate continues to change, the risks to human health will increase intensifying existing health threats and creating new public health challenges
- *"Climate change is happening now and to all of us. No country or community is immune," said UN Secretary-General António Guterres. "And, as is always the case, the poor and vulnerable are the first to suffer and the worst hit."*



Nursing

American Nurses Association, the American Academy of Nursing, the National League for Nursing, and National Student Nurses Association have issued policy statements or resolutions to:

- ❖ Help decrease health care's carbon footprint
- ❖ Advocate for government policies that reduce greenhouse gas emissions
- ❖ Educate patients and communities about climate change and health
- ❖ Reduce the emissions of greenhouse gases by



...to clean renewable energy

International Council of Nurses

Position Statement Nurses, Climate Change and Health (Adopted in 2008 Revised in 2018)

- “Nurses can make a **powerful contribution** to both mitigate climate change and to support people and communities around the world to adapt to its impacts. Leadership from nurses to take immediate action to build climate resilient health systems is necessary.”
- “**The nursing profession has a duty to contribute to climate change adaptation** (reducing vulnerability to the harmful effects) and mitigation (reducing or preventing green house gas emissions) as it is committed to protecting health and wellbeing and to promoting social justice”



WHO State of the World's Nursing Report 2020

- Nurses are critical to deliver on the promise of “leaving no one behind” and the global effort to achieve the Sustainable Development Goals (SDGs)



UN Sustainable Development Goals

Goal 13 - Climate Action

- Take urgent action to combat climate change and its impacts

All of 12 to a goal 7 and



Social Determinants of Health

<https://www.cdc.gov/publichealthgateway/sdoh/index.html>

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Nurses' Role in Climate Health Care

Nurses have many Essential Assets:

- Comprise about 60% of health professionals worldwide
- 28 million nurses globally
- 4.2 million nurses in the USA
- Work in many public health sectors, academic and clinical arenas
- Work with many vulnerable populations impacted by climate change
- Have the potential to change the trajectory of climate change

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Nurses: the most trusted profession

- Climate Change -Major Challenge for Global Health
- ❖ Impact of Climate Change felt disproportionately by disadvantaged and vulnerable groups
- Climate Change is cumulative
- Projected 250,000 deaths/year by 2030-2050
 - Heat Exposure
 - Malnutrition
 - Infectious Diseases
 - Malaria (60,000 deaths)

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By 2030 -100m in Developing countries below the poverty level

- Women and children 14 times more likely than men to die in climate change disasters
 - Also most at risk of food insecurity and drought




Impact of Climate Change on Human Health Model

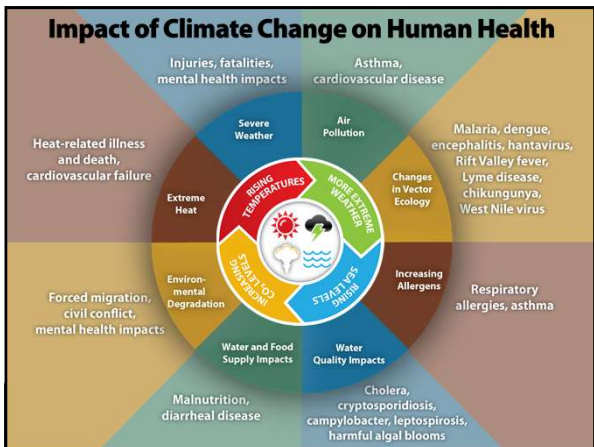
CDC Model illustrates:

- The most significant climate change impacts
- Their effect on exposures
- The subsequent health outcomes that can result from these changes in exposure

<https://www.cdc.gov/climateandhealth/factsheet.htm>

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Rising Temperatures

- Higher Temperatures = Warmer climate
- Changing weather patterns so wet areas are wetter and drier areas drier
- Results in increasing droughts
- More heat waves
- Storms and flooding
- More difficult for farmers to raise livestock and grow crops
- Reducing food availability and increasing cost food



Rising Temperatures

- Older individuals tend to experience worse health outcomes due to cardiac strain created by exposure to heat
- Young children sweat less, which limits their body's ability to naturally cool
- Access to air conditioning can mitigate one's risk of health impacts from extreme heat
- Look at relationship between extreme temperature, mortality and race, poverty, residence in an urban environment





Rising Sea Levels

- New Jersey Flooding



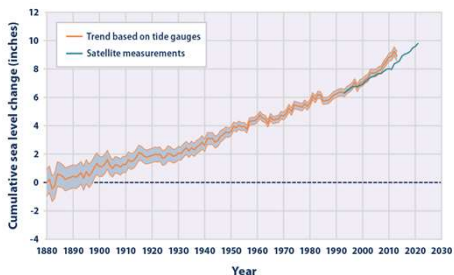
Rising Sea levels

Primary Causes:

- Added water from melting ice sheets and glaciers
- Expansion of seawater as it warms
- Water intake from Unpredicted rainfall
- August 2022 103 (± 4.0)mm



Rising Sea Levels



<https://www.epa.gov/climate-indicators/climate-change-indicators-sea-level>



Severe Weather



Hurricane Ian- Fort Myers Beach



• Tampabay.com



Low-income areas in Fort Myers hit by Hurricane Ian



<https://www.abcactionnews.com/weather/hurricane-ian/low-income-areas-in-fort-myers-hit-by-hurricane-ian-need-help>



First responders transport a person out of the Avante nursing home in the aftermath of Hurricane Ian on Thursday in Orlando. Hurricane Ian carved a path of destruction across Florida. (Photo/John Raoux/Associated Press)



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Katrina

August 2005 - Category 5 Hurricane

- Katrina caused over 1,800 deaths and \$125 billion in damage.
- New Orleans was particularly hit hard due to flooding.
- 19-foot storm surge broke through the city's flood walls and the levees. The failure blamed on engineering flaws

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Flooding and Property

- Vulnerable groups
- See less adaptation measures in areas with lower market values
- Socially vulnerable communities are more likely to reside in these areas

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Traffic and Flooding

- Traffic delays from high-tide flooding
 - Disproportionately affect those with low income, minorities, and those without a high school diploma



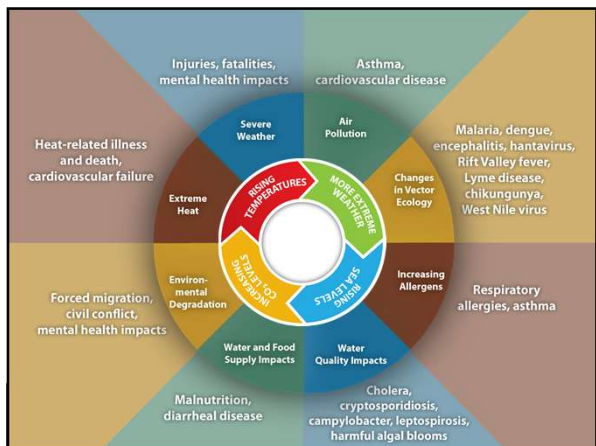
California Fires

- Firefighters try to get control of the scene as the Dixie fire burns dozens of homes in the Indian Falls neighborhood of unincorporated Plumas County, California, on July 24, 2021. Credit: Josh Edelson/AFP via Getty Images



- California Fires
- Wild fires in Australia 2019-2020





Air Pollution

- Air pollution - comes from energy use and production
- Air pollutants - methane and carbon dioxide raise the earth's temperature
- Climate change increases production of allergenic air pollutants e.g. mold (due to damp conditions after flooding and extreme weather) and pollen (due to longer pollen season)

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Air Quality

- Changes in air quality - significant respiratory and cardiovascular health effects
- Premature deaths for individuals ages 65 and older
- Minorities, individuals with lower income, and individuals with lower educational attainment - increased risk of ambient air pollution exposure and health effects related to exposure
- Race - significant role in determining one's risk of exposure to air pollution, even after controlling for other socioeconomic and

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- New childhood asthma diagnoses associated with climate change-driven increases in particulate matter
- Climate change is projected to increase the annual number of asthma diagnosed in children ages 0 to 17 years in many regions of the U.S., particularly the Southwest and Southeast
- Some Northern and Midwestern areas are projected to experience decreases due to higher numbers of rainy days

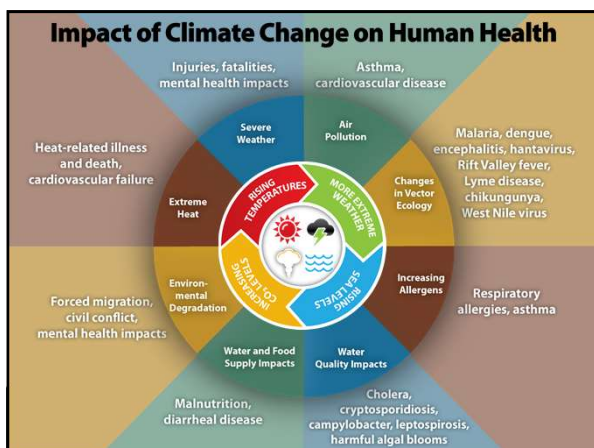
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Carbon Dioxide Emissions by State 2019

Texas	683.2	Vermont	6.0
California	358.2	Rhode Island	10.4
Florida	233.6	Delaware	13.6
Pennsylvania	218.7	New Hampshire	13.9
Illinois	203.4		
Ohio	196.7		

Choose Energy, Inc. a Red Ventures

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How does Climate Change Effect Health?

- Increasing the frequency and severity of heat waves- health impacts -**heat-related illnesses, dehydration, kidney disease, deaths**
- Increasing temperatures and poor air quality - health impact – **cardiovascular and respiratory disease**
- Severe storms and air pollution - due to increased temperature and humidity leads to increasing exposure to pollen and molds - Health Impacts - **allergies and other lung diseases, such as asthma.**

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How does Climate Change Effect Health?

- Increasing the frequency and severity of extreme weather events (Floods and droughts)– Health Impacts - **injuries, deaths, illnesses, and effects on mental health, food and water shortages**
- Increasing flooding events and rising sea levels can contaminate water – Health Impact - **foodborne and waterborne illnesses, infectious diseases**
- Changing the range of disease-carrying insects, such as mosquitoes, ticks, and fleas that transmit **West Nile Virus, dengue fever, Lyme disease, and malaria** to humans.

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Effects of Climate Hazards

A person's **vulnerability** to climate change impacts depends on three key factors:

- **Exposure**
- **Sensitivity**
- **Adaptive capacity**



Vulnerability

Vulnerability leads to health outcomes

- Death
- Increased chronic illness
- Mental health
- Stress
- Emotional distress
- Injury
- Loss of function
- Hospitalization



Who is most at Risk

- Children
- Older adults
- Pregnant women
- Socially vulnerable individuals
- Minority populations
- Individuals with disabilities



Climate Change Strategies

Nursing can have roles to address climate change through 3 strategies:

- 1. Adaptation**
- 2. Mitigation**
- 3. Resilience**

Each climate strategy is interrelated and occurs in concert with the other



Climate Change Strategies

1. Adaptation Strategy - assessing the impact of climate change, planning for the effects, and managing health-related illnesses

Examples of Nursing Roles

- Vulnerable populations disproportionately impacted by climate change
- WHO estimates 80% of the current health effects of climate change impact children under five
- Pediatric Nurse Practitioners- Educate parents and assess risks
- Nurses could lead initiatives to reduce health-related effects of heat-related illnesses resulting from extreme heat due to rising temperatures
- Nurses could lead, develop, and initiate programs to reduce the impact of poor air quality, reducing the incidence of rising respiratory illness rates



- Need to educate individuals about climate change and its effects
- Provide information written at different literacy levels
- Provide information and access to cooling centers
- Perhaps ask patients some short questions about their perceived risks of Climate change effects



2. Mitigation Strategy - efforts to prevent or decrease strain on planet through Green House Gas (GHG) emissions

The health care sector has significant climate impact
- Major contributor to emissions

Health Care Without Harm estimates that in 2019 the healthcare sector was responsible for 4.4% of net global emissions.

In the USA produces nearly 10% of the total GHG

- Switching energy systems from fossil fuels to renewables e.g. solar or wind will reduce the emissions driving climate change

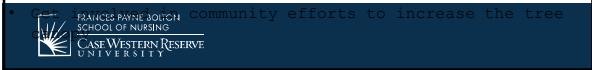


2. Mitigation Strategy

Examples of Nursing Leadership Roles

Nurses can lead the way to create sustainable, climate-smart hospitals and health systems

- Nurses can take leadership roles in the workplace to reduce GHGs by implementing programs to Reduce, Reuse, and Recycle
- Nurses can help develop, as well as identify and use energy efficient products in healthcare setting and their homes
- Lead hospital and community committees on sustainability, and healthy work environments
- Leading Quality Initiative projects on reducing GHG emissions
- Educate communities about Reduce, Reuse, and Recycle



- Nurses can include mitigation approaches in education of the community, patients and families on diet and exercise


Include education on:

- Reducing red meat consumption
- increasing plant-based food consumption
- Encouraging active transportation such as walking and cycling




Tree Canopy

- **Trees**
 - > Decrease the concentration of CO2 in the atmosphere
 - > Use CO2 during photosynthesis and release Oxygen to the atmosphere
 - > Planting more trees absorbs more CO2
 - > Average tree can store hundreds pounds CO2 over its lifetime
 - > Neighborhoods with well-shaded trees can be 6-10 degrees cooler than areas without trees- reducing energy needs
 - > Trees properly placed around a house - save up to 30% of energy use
 - > Keep urban neighborhoods cooler
 - > Make air conditioning bills manageable
 - > Help capture stormwater runoff
 - > Reduce air conditioning use



- Cleveland – Forest City
- Lost 200,000 trees, probably, since the 1950s
- When houses demolished the trees were also felled
- Some cities moving to increase the tree canopy- shield against the worst effects of climate change



- Research - low-income neighborhoods generally have fewer trees than wealthier ones
- Research- a large majority of American cities, people of color were more likely to live in neighborhoods that suffer from hotter temperatures, driven in part by a lack of tree cover
- Poorer neighborhoods arguably need trees the most
- Often lack air conditioning
- Suffer disproportionately from poor health
- Trees may improve emotional and mental wellbeing
- Tree planting strategies – careful planning with funding and education



Everyday things we can do

Conserve energy in your everyday life

1. Turn off the lights.
2. Close doors immediately so heat does not escape.
3. Take short showers.
4. Walk or bike if you can rather than drive.
5. Turn off your computer when not in use

- Live the Reduce, Reuse, Recycle mantra
- Think sustainability



Resilience

3. Resilience Strategy - ability to strengthen communities to withstand climate change by creating processes to reorganize and endure extreme weather, food and water insecurity, and emerging disease

Examples of Nursing Leadership Roles

- Leadership roles to assist and strengthen communities through empowering communities to engage in climate change policy development
- Nurses must advocate for regulations and health policy related to climate change as it effects communities
- Facilitate community engagement to prepare for food and water shortages, and



- Nurses can advise and help families and patients create a plan for disaster preparedness.
- They can also work with local communities and federal agencies to develop disaster preparedness plans
- Nurses and particularly pediatric health care providers can influence climate and child health policy is using their expertise to educate the public about climate change threats to child health
- With the resilience strategy - Need strong interprofessional efforts focused on policy advancement



Nursing Education and Climate Change

- Develop a nursing workforce responsive to climate health
- Well prepared nurses educated in climate health can support climate change strategies in communities
- Inclusion of climate change content in nursing education is critical to ensure nurses are prepared to understand and lead climate change efforts in all populations



Nurses and Leadership in Climate Change and Health

- Foster representation of nurses on international and national boards, congresses, governmental panels, and delegations as senior decision makers for climate change
- Develop leadership in sustainable healthcare initiatives in the workplace and community



Climate change will have a major impact on human health for decades and nurses will have a critical role in climate change research, education and patient care initiatives

We must take up the challenge and lead climate initiatives globally and in our own community



THANK YOU