Climate Change and Child Health

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Disclosures

Drs. Ragavan, Lee, and Cisneros are co-chairs of the PA AAP Climate and Environmental Health Committee. Dr. Cisneros serves as co-chair of PA AAP Advocacy Committee.

No other disclosures, financial or otherwise
Objectives

1. Understand what climate change is and why it’s happening

2. Recognize how climate change affects child health including how health inequities are interconnected.

3. Review our role in addressing the problem of climate change
Call for Emergency Action to Limit Global Temperature Increases, Restore Biodiversity, and Protect Health

The climate crisis is a child rights crisis

The 2021 report of the *Lancet* Countdown on health and climate change: code red for a healthy future
Climate change:
What is it and why is it happening?
Most of Earth’s carbon is stored in rocks and sediments.

The rest is in the ocean, atmosphere and in living and decomposing organisms.

**Human activity**, primarily the combustion of fossil fuels, has resulted in the transfer of carbon into the atmosphere and oceans.
Scientific evidence for warming of the climate system is unequivocal. -IPCC
A simple science experiment you can do with your kids at home showing how CO₂ traps heat

All you need is:
- Two 2 L bottles, half filled with water
- Two thermometers
- An infrared heat lamp (sold at pet shops)
- Alka seltzer tabs (NaHCO₃)
- Duct tape to seal the bottles

The bottle with water + alka seltzer will have a higher temp than the bottle with water alone as the CO₂ absorbs infrared radiation

Methane (CH₄), nitrous oxide (N₂O) and ozone (O₃) also trap heat.

Oxygen and nitrogen don’t
2020 tied 2016 as the warmest year on record

The last seven years have been the warmest since the beginning of modern record keeping.
Effects of a warming planet

1) Extreme heat
2) Cold spell
3) River flood
4) Heavy precipitation
5) Landslide
6) Aridity
7) Drought
8) Fire weather
10) Severe wind storm
11) Cyclone
12) Sand and dust storm
13) Glacier retreat
14) Heavy snowfall and ice storm
15) Snow avalanche
16) Coastal flood
17) Ocean acidity
18) Coastal erosion
19) Air pollution weather
20) Ocean temp rise
How climate change impacts PA

- increasing average temps
- heavy precipitation
- flooding
- heat waves
- landslides
- cyclones
- sea level rise
(Delaware estuary)
How does climate change impact child health?
Children are uniquely vulnerable to climate change

“More than 88% of the existing burden of disease attributable to climate change occurs in children younger than 5 years.”
- World Health Organization

“1 billion children (half the world’s children) are at ‘extremely high risk’ of the impacts of climate change.”
- UNICEF
Primary effects

- **Natural disasters and extreme weather events**
  - severe storms, flooding and wildfires place children at risk for injury/death, loss/separation from caregivers, exposure to infectious disease and increased risk of mental health consequences

Analysis reveals nearly 200 died in Texas cold storm and blackouts, almost double the official count.
Primary effects

- **Heat waves**
  - Increase in child morbidity and mortality during extreme heat events especially infants and high school athletes
Secondary effects

- **Respiratory disease/asthma**
  - worsening air quality due to temperature-associated elevations in ozone concentration, pollen counts, allergy season duration and wildfire smoke
Secondary effects

• **Infectious diseases**
  - climate warming has contributed to northern expansion of Lyme disease
  - also projected increased burden of child diarrheal illness, coccidioidomycosis, amoebic meningoencephalitis

[Maps showing reported cases of Lyme disease in the United States, 2001 vs. 2018, from CDC.gov]
Tertiary effects

- Disrupted social foundations of child mental and physical health/well-being
  - sea level rise and loss of biologic diversity impact economies of agriculture, tourism and indigenous communities
  - water scarcity, famine
  - mass migrations
  - increased violent conflicts

Extreme drought in Syria from 2006-2011 exacerbated by climate change resulted in millions of displaced people, followed by social unrest and civil war.
Climate Change Harms the Health of Children

Climate change poses risks to children throughout their development. Here we present a few examples of how climate change harms health from before birth to adolescence.

**Prenatal**
- Poor pregnancy outcomes like low birth weight and pre-term delivery
- Increased risk of low birth weight and neonatal death

**Infancy**
- Higher risk for heat-related illness because developing bodies are less able to control temperature
- Heightened risk of water- and food-borne infections while immune system is developing

**Childhood**
- Long-term lung problems and more frequent asthma attacks
- Outdoor exposure increases risk of diseases from insects, like Lyme disease

**Adolescence**
- Post-traumatic stress and anxiety in survivors
- Negative impacts on ability to think, outdoor recreation and the ability to play sports

Impact of Climate Change on Human Health

- Injuries, fatalities, mental health impacts
- Asthma, cardiovascular disease
- Heat-related illness and death, cardiovascular failure
- Malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, West Nile virus
- Forced migration, civil conflict, mental health impacts
- Respiratory allergies, asthma
- Extreme heat
- More extreme weather
- Changes in vector ecology
- Increasing allergens
- Rising temperatures
- Severe weather
- Air pollution
- Rising sea levels
- Coastal erosion
- Malnutrition, diarrheal disease
- Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms
- Water and food supply impacts
- Water quality impacts
- Environmental degradation

CDC
Planetary health is interwoven with social justice
Levy et al. 2015. Annals of Global health
U.S. ranks 10th in the world in CO2 emissions per capita, but 80th in child risk from climate change.

Table 4: Top 20 countries ranked on CO2 emissions (per capita) and corresponding CCRI rank

<table>
<thead>
<tr>
<th>CO₂ EMISSIONS PER CAPITA RANK (MT)</th>
<th>COUNTRY</th>
<th>CLIMATE AND ENVIRONMENTAL SHOCKS (PI LLAR 1)</th>
<th>CHILD VULNERABILITY (PI LLAR 2)</th>
<th>CHILDREN’S CLIMATE RISK INDEX (CCRI)</th>
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Source: See Methodology for CCRI data. CO₂ emissions data downloaded from World Bank WDI data catalogue, original source: Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States. Reference Year: 2018. Note: Per cent of global emissions is a calculated indicator using CO₂ emissions (thousand metric tonnes of CO₂) per country.
A Global Perspective:

Since 2008, 24 million people per year have been displaced due to natural disasters.

-Internal displacement monitoring center
A legacy of structural racism

**Redlining**: Federal housing policy of the 1930s that systematically diverted investment from communities of color while initiating highways, landfill projects in these same areas.

- Mapping temperature, land surface, health indicators & historical redlining in 108 US cities
- 94% of formerly redlined areas were hotter than surrounding neighborhoods
- Temp up to 7°C degrees hotter; Nationally, 2.6°C hotter
- ↑ proportion EMS calls and hospital visits for heat-related illness on extremely hot days

“...historical housing policies may, in fact, be directly responsible for disproportionate exposure to current heat events.”

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Important for pediatricians to view climate change as a social influence of health, and something that deeply impacts other social influences of health.

Critical to our mission of dismantling health inequities and structural racism.

Centering the voices of marginalized communities is critical in order to combat climate change and promote health equity.
“Given this knowledge, failure to take prompt, substantive action would be an act of injustice to all children.”
What can we do?

- Health Systems
- Power of Coalitions
- Medical Education
- Individual Advocacy
- Anticipatory Guidance
Work with Health Systems

Decrease carbon emissions in healthcare spaces
First, do no harm: Medical ethics and climate change

- US healthcare sector contributes **9-10% of US greenhouse gas emissions (GHG)**\(^1\)

- If US healthcare were a country, we would rank **13\(^{th}\) in global GHG emissions**

- Harms to health from healthcare pollution:\(^2\)
  - >400,000 disability adjusted life years (DALYs)
  - 44-98,000 deaths

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#goals

• Boston Medical Center: Carbon neutral since 2020

• Seattle Children’s Hospital: Carbon neutral by 2025

• City of Pittsburgh: Cut emissions 50% by 2030

• University of Pittsburgh: Carbon neutral by 2037

• UPMC: ??

• General Motors: phase out gas powered cars by 2035
Green offices

- Earn office certificate from My Green Doctor
- Recognizes your ongoing commitment to a healthier office and community
- Requires completion of five Green Team meetings, five Action Steps, and five Education Steps
- Certificate valid for 3 years
Medical Education
Climate Crisis and Clinical Medicine Virtual Elective for Medical Students

POSTED ON APRIL 30, 2020 / POSTED IN CLIMATE & AIR, HEALTHCARE

Today’s medical students will be on the front lines of clinical medicine in the Anthropocene, the geologic era marked by human activity and climate change. Climate-driven exposures harm patients and increasingly intense natural disasters disrupt healthcare delivery. At the same time, many of the actions needed to address climate change — to reduce carbon emissions and transition to a more sustainable future — also benefit health. This virtual elective is designed for M3 and M4 students who are interested in furthering their understanding of the...
Anticipatory Guidance
Parents perspectives about whether pediatricians should discussed climate change during well-child visits

Parents recruited from CCP Cranberry, PCC in Oakland, and Pitt + Me

372 participants total, 82% female; 83% White
In the past 12 months has your child’s doctor talked with you about climate change during a well-child visit

Yes: 4%

No: 96%
My child’s doctor should talk with me about how global warming could affect my child’s health

- 51% Strongly agree
- 29% Agree
- 15% Disagree
- 6% Strongly disagree
My child’s doctor should talk with me about what to do if my child is feeling stressed about global warming

- Strongly agree: 31%
- Agree: 53%
- Disagree: 8%
- Strongly disagree: 6%
Suggestions for incorporating climate change in pediatric visits

• Discussing air quality during asthma visits
• Including prevention of heat illnesses during sports visits
• Discussing changing pollen counts during visits for worsening allergies
• Review civic engagement during adolescent visits
• Planetary health education in clinics
• Education and resources on eco-anxiety and talking to your children about climate change
• Considering climate change as a social influence of health
• Others?
For your Patients

CATEGORIES

HEALTH BENEFITS OF CLIMATE ACTION POSTERS
ASTHMA & HEAT RESOURCES
MY GREEN DOCTOR BROCHURES

HEALTH IMPACTS OF CLIMATE CHANGE POSTERS
CLIMATE CHANGE & YOUR HEALTH: ACP FACT SHEET
CLIMATE CHANGE & CHILDREN’S HEALTH
How Climate Change Affects Children: AAP Policy Explained

By: Claire McCarthy, MD, FAAP

When pediatricians take care of children, we aren’t just thinking about their health and safety now—we are thinking about their health and safety in the future, too.

When we talk with parents about healthy diet and exercise, we aren’t just thinking about their health now—we are thinking about what they need to do to promote a healthy lifestyle as they grow up.
Talking with Children about Climate Change

By: Steph Lee, MD, MPH, FAAP

Your children may have questions about the changing climate. Many are hearing about or experiencing climate-change-fueled disasters such as wildfires and severe storms.

Climate change affects everyone, but it impacts kids the most. Children are especially vulnerable to environmental health harms since they are still growing and have higher exposure to air, food, and water based on weight.

While the climate crisis can feel like an overwhelming topic, there are healthy ways to talk with kids about it. We can communicate in a way that is honest, hopeful, developmentally appropriate, and action oriented. By helping kids understand the issue of climate change and how it affects their health and futures, we empower them to make a difference.

Toddlers and Young Children (age 1-5)

Toddlers are just beginning to learn about their relationship with the world. It's a perfect time to introduce them to the joys of nature. Here are some ideas:

- **Nature walks.** Take walks to show how weather affects nature. Talk about how weather makes the seasons. You can point out bird nests, for example, and talk about how weather influences when and where birds make their nests. Talk about other wild animals and discuss how they all have homes that need protecting.
Individual Advocacy
Pennsylvania Blueprint for Children 2021-2022

Includes policy recommendations on:

• COVID-19
• **Climate change and environmental health**
• Mental health
• Access to care and child poverty
• Practice-related issues
• Immunizations
• Gun violence prevention
• Anti-racism and immigrant health
PA ranks 4\textsuperscript{th} in U.S. for carbon emissions

Source: U.S. Energy Information Administration
Regional Greenhouse Gas Initiative (RGGI)

Partnership between northeastern and mid-Atlantic states to cap & reduce carbon emissions from fossil fuel power plants

- Electricity use is 2nd leading source of carbon emissions
- Since 2005, RGGI states have reduced carbon emissions by 45%
- In June 2020 Gov Wolf signed Executive Order to begin process of joining RGGI
- PA legislature passed HB 2025 requiring legislature’s approval to join RGGI, Wolf vetoed
Climate-related Legislation

Zero emissions vehicles regulatory proposal
• PA Clean Vehicles Program does not incorporate California fuels requirements or Zero Emission Vehicle (ZEV) requirements
Climate-related Legislation

Senate Bill 275

- will stop local ordinances from adopting stricter carbon reduction strategies like switching to electric options for energy usage
Individual Actions

- Trade in gas car for EV
- Plant-based diet
- Invest in renewable energy sources
- Improve home energy efficiency
  - smart thermostat, insulating window shades
- Travel smart
Ashley Cecil, local artist, *Violence in Eden* exhibition at Zynka Gallery in Milvale captures the suffering of women and children from climate change.
Founded in 2019, MS4SF is dedicated to uniting medical students invested in the health of our planet and patients and providing them with tools to make a difference at their institutions and in their communities through advocacy, curriculum reform, research, and climate-smart health care. Learn more about our different work areas here.
Climate change is harming child health in many ways and will worsen if we don’t cut carbon emissions

Join our newly formed climate committee!!

Casey O’Neill
Advocacy Coordinator
coneill@paaap.org

Acknowledgments: Dr. Rebecca Philipsborn