Strategies to Mitigate the Adverse Health Effects of a Changing Planet

University of Michigan Medical School
White Coats for Planetary Health

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Great Lakes Bioneers Detroit Conference 2019
Impact of Healthcare on the Environment

- Healthcare industry makes up 8-10% of US greenhouse gases
  - US produced 1.51 tCO2/capita, compared to 0.83 in Canada, 0.61 in UK
- Produces 4 billion pounds of landfill bound waste annually (second only to food industry)
- Supply procurement accounts of 65% of UK NHS carbon footprint
Why Healthcare?

- Consistently high lighting and HVAC demands
- Increased use of disposable products for infection control
A Tale of Two Speculums
A Tale of Two Speculums
Next Steps in Healthcare Sustainability

- Addressing regulations that promote wasteful practices
- Reducing HVAC and lighting demands
- Investing in renewable energy to offset carbon footprint that cannot be reduced
How has our changing planet affected your, or a loved one’s, health?
RESPIRATORY DISEASE AND ENVIRONMENTAL CHANGE

- People at risk: Anyone!
  - Particularly pre-existing respiratory conditions such as asthma or chronic lung disease
**Asthma**

1. Climate change (temperatures, precipitation patterns, concentrations of atmospheric CO2) $\rightarrow$ increasing levels of airborne allergens
2. Air pollutants (O3, PM, VOCs, NO.) can directly and indirectly induce airway inflammation, airway hyperresponsiveness
Our built environment and our pulmonary health

Plank, Kaela, An Examination of Air Pollution and Rates of Pulmonary and Cardiovascular Events for Traffic Dense Areas: A Spatial Analysis of the California Bay Area for 2012
Clean Air initiatives; opportunity for advocacy

BREATHE LIFE

A global campaign for clean air

Yes, I commit to reduce air pollution in my home and city for a Pollution Free Planet, supporting the outcomes of the UN Environment Pollution Summit in December 2017. Please send me information on actions I can take with my family and community.

ACT NOW
Protecting your lungs

1. Check daily air pollution forecasts in your area. (airnow.gov)

2. Avoid exercising outdoors when pollution levels are high. Always avoid exercising near high traffic area.

3. Petition school’s to reduce school bus emissions with no bus idle zones (US EPA Clean School Bus Campaign)

4. House plants for “scrubbing” indoor air pollution
   a. Gerbera Daisy, English Ivy, Snake Plant
**Vector Borne Illness and Climate Change**

**Mosquito-borne diseases:** West Nile virus, malaria, Zika, dengue, St. Louis encephalitis, eastern equine encephalitis, chikungunya

**Tick-borne diseases:** Lyme disease, Rocky Mountain Spotted Fever, Anaplasmosis, Babesiosis, Tularemia
2050

# months/year when disease transmission by Aedes aegypti is possible

Lyme Disease

- Caused by spirochete *Borrelia burgdorferi*, carried by the Ixodes tick.
  
  - **Early localized:** skin rash; fatigue, anorexia, headache, neck stiffness, myalgias, arthralgias, lymphadenopathy, and fever occurring days-weeks after infection
  
  - **Early disseminated disease:** skin rashes, neurologic symptoms, cardiac symptoms occurring weeks-months after infection
  
  - **Late disease:** intermittent/persistent arthritis (large joint), neurologic problems occurring months-years after infection
LYME DISEASE IN UNITED STATES

Figure 1. Reported Cases of Lyme Disease in the United States, 1991–2014

Figure 2. Change in Reported Lyme Disease Incidence in the Northeast and Upper Midwest, 1991–2014

Reported Lyme Disease Cases in 1996 and 2014

1996

2014

Total increase in cases per 100,000 people:

Trend not able to be calculated
PROTECTING YOURSELF

Avoid tick-infested areas.
- Walk in the center of trails to avoid contact with overgrown grass or brush at trail edges.
- If hiking in deep woods, or exploring off trail, keep legs and arms covered.
- Protect your pets with tick prevention products.

Perform daily tick checks.
- Always check yourself and your animal for ticks after being outdoors. Checking during shower/bath can help inspect all body surface areas.
- Remove attached ticks with tweezers: grasp the tick firmly close to the skin, with a steady motion pull the tick’s body away from the skin.
Crop-damaging temperatures increase suicide rates in India

Ecological grief as a mental health response to climate change-related loss

Correlation Between Climate Change and Dysphoria in Primary Care

Jonathan L. Temte, MD, PhD; John R. Holzhauer, MD; Kenneth P. Kushner, PhD

Nature Climate Change 8, 723–729 (2018)
Mental Health & Climate Change

“Ecological Grief”: intense feelings of grief as people suffer climate-related losses to valued species, ecosystems and landscapes.
<table>
<thead>
<tr>
<th>Category</th>
<th>Effects</th>
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<tbody>
<tr>
<td>Acute Climate-Related</td>
<td>- Increased PTSD</td>
</tr>
<tr>
<td>Events</td>
<td>- Increased anxiety</td>
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<tr>
<td></td>
<td>- Increased grief</td>
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<tr>
<td>Subacute Climate-Related</td>
<td>- Heat waves increase mental health issues, especially in those with existing conditions</td>
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<tr>
<td>Events</td>
<td>- Increased ambient temperatures increases criminal and aggressive behavior</td>
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<tr>
<td>Long-Lasting Climate-</td>
<td>- Existential threat of Climate Change</td>
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<td>Related Effects</td>
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Mental Health, The Environment, & YOU

Research in the growing field of Ecotherapy shows a strong connection between time spent in nature and reduced levels of stress, anxiety, and depression.

There’s a significant difference between active time spent in urban settings versus active time spent in natural settings!

- Decreased self-reported rumination
- Decreased activity in the subgenual prefrontal cortex (associated with self-focused behavioral withdrawal)
A Capitalist Mindset & Mental Health

Capitalist Mindset

- Emphasis on Efficiency
- Emphasis on Production

  - Lack of Time/Priority to Access Nature
  - Lack of Access to Green Spaces

Detrimental Effects on Mental Health
How can we mitigate this?

Intentional connection with ourselves through change in and around us...
Better Healthcare

Mayo Clinic

Operates its own recycling facility in Rochester, Minnesota. Food waste is repurposed for composting and animal feed at local farms.

Gundersen Health System

Partnered with La Crosse County to capture waste biogas at a local landfill, turning it into electricity and heat. Onalaska multi-building campus is 100 percent energy independent.

New York State Nurses Association

Nurses are engaged in local, statewide and national struggles for clean air, land and water. Advocating for environmental health justice.
A better clinic?

Following the **Union Carbide toxic gas release in 1984**, the **Sambhavna Clinic** was opened in Bhopal, India to treat those injured.

Sustainable model of free, appropriate scale and **integration** of the best of western medicine, ayurveda (indigenous systems of medicine based on herbs) and yoga therapy.
**Activity**

Imagine you are forming a healthcare clinic in your local community, that will engage with the physical, emotional and spiritual impacts of our changing planet. What does this clinic look like?