Climate Change Health Risks & Health Benefits of Climate Action

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Climate Change Is Affecting Many Human Health Outcomes

How climate change may affect health

<table>
<thead>
<tr>
<th>DIRECT EFFECTS</th>
<th>Mediating Process</th>
<th>Health Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal extremes (e.g. heatwaves)</td>
<td>Heat- and cold-related illness and death</td>
<td></td>
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<tr>
<td>Increase in weather disasters</td>
<td>Deaths, injuries and psychological disorders</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INDIRECT EFFECTS</th>
<th>DISTURBANCES OF ECOLOGICAL SYSTEMS</th>
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<tbody>
<tr>
<td>Range/activity of vectors and infective agents</td>
<td>Altered range/pattern of vector-borne diseases</td>
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<tr>
<td>Water- and food-borne infective agents</td>
<td>Diarrheal and other infectious diseases</td>
</tr>
<tr>
<td>Altered food (especially crop) productivity</td>
<td>Malnutrition and hunger; impaired child development</td>
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<tr>
<td>Sea-level rise, with population replacement</td>
<td>Injuries, infections (migration, crowding, contaminated water), psychological disorders</td>
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<tr>
<td>Changes in air pollution, including pollens and spores</td>
<td>Asthma and allergies; other respiratory disorders</td>
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<tr>
<td>Social-demographic dislocations due to assorted climate-change impacts</td>
<td>Many public health consequences (including civil strife?)</td>
</tr>
</tbody>
</table>
Globally, Impacts UNEVEN

• Women, children and the poor are worst affected:
  – Additional 20-25 million under-nourished children by 2050 (17-22% global increase)
  – Low and middle-income countries often unable to adapt - higher exposures, burden of disease
  – Natural disasters kill more women than men
Older Adults At Greatest Risk


*Per 1 million population.
†Underlying cause of death attributed to excess heat exposure classified according to the *International Classification of Diseases, Ninth Revision*, as code E900.0, “due to weather conditions.”

Who is most responsible?:

CO2 emissions per capita:
- High emissions
- Low emissions

Those who contribute the least greenhouse gases will be most impacted by climate change.

Vulnerability to climate change:
- High vulnerability
- Low vulnerability

Who is most at risk?

Samson et al 2011
American Thoracic Society Member Survey on Climate Change and Health

Mona Sarfaty¹, Brittany Bloodhart¹, Gary Ewart², George D. Thurston³, John R. Balmes⁴, Tee L. Guidotti⁵, and Edward W. Maibach¹

Surveyed a random sample of ATS physicians to assess their understanding of, clinical experiences with, and preferred policy responses to climate change.

Responses were received from members in 49 states and the District of Columbia (n = 915); the response rate was 17%.
“Which, if any, of the following groups will disproportionately experience any negative health effects from Climate Change?”

<table>
<thead>
<tr>
<th>Response Options</th>
<th>Percent Response (of total survey responses, N = 915)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young children ages 0 to 4</td>
<td>66%</td>
</tr>
<tr>
<td>Older children ages 5 to 17</td>
<td>33%</td>
</tr>
<tr>
<td>Young adults ages 18 to 39</td>
<td>17%</td>
</tr>
<tr>
<td>Middle aged adults ages 40 to 60</td>
<td>14%</td>
</tr>
<tr>
<td>Older adults ages 60+</td>
<td>63%</td>
</tr>
<tr>
<td>People with chronic diseases</td>
<td>75%</td>
</tr>
<tr>
<td>The poor and the working poor</td>
<td>65%</td>
</tr>
<tr>
<td>People of color</td>
<td>27%</td>
</tr>
<tr>
<td>None of the above because climate change isn’t happening</td>
<td>5%</td>
</tr>
</tbody>
</table>
But What if We Take Action?

What Health Benefits Could We Achieve?

• The Lancet Commission has recommended that, over the next five years, governments:
  
  1. Invest in climate and public health research, monitoring and surveillance
  2. Scale-up financing for climate-ready health systems
  3. Rapid phase out of coal-fired plants to protect cardiovascular and respiratory health
  4. Encourage a transition to cities that support and promote healthy lifestyles

2015 Lancet Commission Conclusion:

Acting to prevent to climate change could be the biggest global health opportunity of the 21st century
Climate Change: The Greatest Public Health Threat
Climate Mitigation: The Greatest Public Health Opportunity

WATCH LANCET COMMISSION VIDEO: https://www.youtube.com/watch?v=sWhoe9xTC4A
The Quandary of Climate Change Policy: The Carrot or the Stick? (Thurston, Nature, 2013)

• The limitations of climate change disaster fears as a policy action motivator are:
  – the most severe potential effects of climate change are decades away
    • Society tends to discount things in the future.
  – most of the climate benefits of mitigation are not local
    • Those investing in mitigation receive little more climate benefit than those who do nothing

https://www.nature.com/articles/nclimate2013
The Quandary of Climate Change Policy: The Carrot or the Stick? (Thurston, Nature, 2013)

- In contrast, the mitigation associated clean air health benefits (and their monetary valuations) are:
  - more immediate in time
  - local to the places that do the improvement
    - occurring primarily in the regions and nations that take these steps to mitigate CO$_2$ (See Figure 1)

- Clean air health better motivates climate mitigation action

https://www.nature.com/articles/nclimate2013
Climate Mitigation Measures that Will Improve Your Health (While Saving the Planet) (Thurston et al., ES&T, 2018)

• Eat less meat, more legumes
  – Reduce heart disease, less infectious disease from Concentrated Animal Feeding Operations (CAFOs)

• Reduce Fossil Fuel Extraction
  – Fewer black lung cases and fewer mine accidents

• Reduce Fossil Fuel Combustion
  – Lower Air Pollution and fewer associated adverse health effects

(https://pubs.acs.org/doi/10.1021/acs.est.8b00859)
Air Quality Co-Benefits Come with Climate Change Mitigation

- Many policies to improve air quality would lower GHG emissions.
- Many policies to avoid/mitigate climate change would improve air quality right away.

Air Quality Policies  Climate Change Policies

Human Health
Air Pollution Reductions From EPA Clean Power Plan Climate Program (Driscoll et al, Nature, 2015)

Figure 2 | Maps for the continental USA of difference in annual average concentrations of PM$_{2.5}$ in 2020 for scenarios 1 and 2, less the reference scenario. a, Scenario 1; and b, scenario 2.

Figure 3 | Maps for the continental USA of difference in annual average concentrations of peak summertime O$_3$ in 2020 for scenarios 1 and 2, less the reference scenario. a, Scenario 1; and b, scenario 2.

http://www.nature.com/nclimate/journal/v5/n6/full/nclimate2598.html
Implications

• While damage from Climate Change has begun, the greatest effects of climate change are distant in time (which the public and politicians tend to discount).

• Taking action to reduce Climate Change CO₂ emissions will also lower other air pollutants.

• These other pollutant reductions provide significant immediate and local human health co-benefits and dollar valuations, especially if it reduces coal burning.

• Making the public more aware of such local and immediate health benefits of climate action will:
  – Lower their personal distance from the issue
  – Change their attitude towards climate change action.
The Take-Home Message

• The health and science community has a **vital role to play** in accelerating progress to tackle climate change (as it did with public sanitation and smoking)

• Key needs:
  – Ensuring mitigation strengthens public health
  – Communication about health and climate risks and public health opportunities from mitigation
  – Adapting to face new and emerging health risks
You have a Platform: Use it!

Scientists Are Among the Most Trusted by the Public

Pew Research Center (Nature, 06 August 2019)
https://www.nature.com/articles/d41586-019-02389-8
We Can All Benefit from Climate Action

CLIMATE SUMMIT

WHAT IF IT'S A BIG HOAX AND WE CREATE A BETTER WORLD FOR NOTHING?

- Energy Independence
- Preserve Rainforests
- Sustainability
- Green Jobs
- Livable Cities
- Renewables
- Clean Water, Air
- Healthy Children
- Etc. etc.