The Clinical Relevance of Climate Change: Psychological Effects and What Mental Health Providers Can Do

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Learning Objectives

At the conclusion of this session, the participant will be able to:

1. Recognize the reality of climate change (CC) and its impact on health and mental health;
2. Recognize psychiatric conditions that emerge from and/or are affected by CC;
3. Recognize psychological factors that contribute to the refusal to acknowledge the reality and urgency of CC, as well as the failure to act to address the local and global risks of CC; and
4. Recognize ethical and public health duties for mental health professionals to speak out about these threats and to advocate for rational policies to address the threats to health posed by CC.
Climate Drivers of Health Impacts

**CLIMATE DRIVERS**
- Increased temperatures
- Precipitation extremes
- Extreme weather events
- Sea level rise

**ENVIRONMENTAL & INSTITUTIONAL CONTEXT**
- Land-use change
- Ecosystem change
- Infrastructure condition
- Geography
- Agricultural production & livestock use

**EXPOSURE PATHWAYS**
- Extreme heat
- Poor air quality
- Reduced food & water quality
- Changes in infectious agents
- Population displacement

**HEALTH OUTCOMES**
- Heat-related illness
- Cardiopulmonary illness
- Food-, water-, & vector-borne disease
- Mental health consequences & stress

**SOCIAL & BEHAVIORAL CONTEXT**
- Age & gender
- Race & ethnicity
- Poverty
- Housing & infrastructure
- Education
- Discrimination
- Access to care & community health infrastructure
- Preexisting health conditions
A general systems model of human organism development
(adapted from Bronfenbrenner’s ecological model)

Physical environment

time 1: personal development

time 2: historical change/context

genes
psychological (cognition/emotion)
relational (parents, peers)

social/contextual (neighborhood, school)

physical environment

cultural/historical milieu
Social-Ecological Determinants of Health

![Determinants of Health Diagram](https://www.divisionsbc.ca/kb/socialdeterminants)
Growing Professional Concern

MENTAL HEALTH AND OUR CHANGING CLIMATE: IMPACTS, IMPLICATIONS, AND GUIDANCE
March 2017
Task Force Report Co-Developed by

Both APAs have taken public policy positions on the urgency of climate change effects on population mental health and individuals with mental illness.

Mental and Physical Health Effects

- Combined, not distinct
Mental Health: Indirect Effects

- Mental health impacts from natural disasters and forced migration
  - PTSD
  - Addiction
  - Depression
  - Anxiety

- Global coping and stress from uncertainty
  - Food, water, infrastructure damages, costs

“Renée Funk, who manages hurricane response teams for the Centers for Disease Control and Prevention, says ... ‘mental illness and substance abuse not secondary problems—they are the primary long-term effect of natural disasters.’”

-Politico, 10/12/2017
Lessons Learned Post-Katrina

- K. Sakauye, U.S. Psychiatric & Mental Health Congress, 2006, on Katrina response
  - 61% increase in crisis line calls (despite lower population)
  - 44% of children had new mental health problems
  - 68% increase in mental health conditions among parents and caregivers post Katrina
  - Cognitive and memory problems (anecdotal)
Mental Health: Direct Effects

- 1 Billion extra people/year exposed to heat waves by 2040 (Lancet)
- Heat wave effects increase:
  - Aggression and violence
  - Suicide
  - Psychosis and manic breakdowns
  - Depression
  - Medication effects (50% of deaths in heat wave are people with mental illness)

Task force report; Trombley et al (2017) AJN, 117, 44-52
http://journals.lww.com/ajnonline/Fulltext/2017/04000/Climate_Change_and_Mental_Health.28.aspx
Mental Health: Direct Effects

- **Acute**: Mental health emergencies

- **Gradual**: Pollution effects on brain development, adult function
  - 87% of cities worldwide exceed WHO guidelines (Lancet)

- **Ongoing**: Stress effects on sleep, anxiety, depression
  - Human-caused problem, most difficult to cope with psychologically
Climate and Community Distress

- Stages of adaptation
  - Analogy of Motivational Interviewing, Stages of Change
  - Initial denial or paralysis prior to integration/engagement
- Community level biases and coping strategies
  - Psychology: ideology formation and rigidity
  - Psychology: identity-preserving cognitive biases
    - Denying to the Grave, Gorman & Gorman, 2016
  - Sociology: populist anti-intellectual/anti-science trends
- Amplified by cynical misinformation campaign by vested interests

Oreskes & Conway, 2010
Growing Pressure on Communities

Figure 8  Number of effectively inundated communities for each sea level rise scenario. Number of effectively inundated communities by year for the three scenarios analyzed in this study: Highest (yellow); Intermediate-High (pink); Intermediate-Low (green). Dahl KA, Spanger-Siegfried E, Caldas A, Udvardy S. Effective inundation of continental United States communities with 21st century sea level rise. Elem Sci Anth. 2017;5:37. DOI: http://doi.org/10.1525/elementa.234
Solastalgia: (Ulrich, 1984) psychological response to degradation of your home:

- “An attack on one’s sense of place...erosion of sense of belonging (identity) to ...place ...feeling of distress (desolation) about its transformation.”

- Hopelessness, anger, sadness, discomfort; loss; fatalism

- Studied in relation to disasters and climate change overall, as a marker of psychological distress
Psychologically Engaging

- Reducing psychological distance
  - Connecting to what’s happening in real communities

- Promoting social norms
  - Making climate action a group experience

- Avoiding loss aversion
  - Talking about what we’re gaining via climate action

- Reducing feelings of powerlessness
  - Informing others of concrete action

- Applicability of MI techniques

Klonek et al., 2015, *Front Psychol*; Semenza et al., 2011, *Environ Health*
Social Determinants of Vulnerability

**EXPOSURE**
Exposure is contact between a person and one or more biological, psychosocial, chemical, or physical stressors, including stressors affected by climate change.

**SENSITIVITY**
Sensitivity is the degree to which people or communities are affected, either adversely or beneficially, by climate variability or change.

**ADAPTIVE CAPACITY**
Adaptive capacity is the ability of communities, institutions, or people to adjust to potential hazards, to take advantage of opportunities, or to respond to consequences.

**VULNERABILITY of Human Health to Climate Change**

**HEALTH IMPACTS**
Injury, acute and chronic illness (including mental health and stress-related illness), developmental issues, and death
Environmental, Climate, and Social Justice

- Demographic, geographic, social factors affect vulnerability to health/MH effects of climate change
  - Location, age, gender, SES, health status, disability
  - Existing systems of oppression

- Any efforts toward equity contribute to environmental justice
  - Human and civil rights, housing equity, food security, transportation accessibility, law enforcement accountability, healthcare access, just energy transitions, etc, etc, etc.

Children and Climate Change Stress

- Disproportionately vulnerable to adverse biological and psychological effects

- Recommendations similar to grief work
  - Offering information/answering questions with age-appropriate honesty
  - Monitoring fear
  - Meaning-making, positive engagement

- Age-appropriate resources
  - NASA ClimateKids
  - Alliance for Climate Education

Perera, 2017, Environ Health Perspect; Sheffield et al., 2011, Environ Health Perspect
Holding onto Concern and Optimism
The Solar News

Engineering students develop lightweight solar car.

Australia could source 100% of power from renewables by 2050.

Delhi metro could soon go fully solar.

“The price of solar electric panels has fallen dramatically as it becomes more widely used across the world, and we are now seeing it used in so many industries and inventions.”

Solar could meet California energy demand three to five times over.

Half of Europe’s electricity set to be from renewables by 2030.

Solar plane takes off in ‘moment of truth’ for longest solo flight in history.

New renewable energy supported:
- 76,750 megawatts by 2025

Annual carbon dioxide reductions:
- 183 million metric tons

Equivalent to:
- 44 million acres of trees
- 50 million less cars

Projected development assuming states achieve annual renewable energy targets.
Transformational Resilience

- Bio-psycho-social-spiritual impacts of CC felt at all levels: individual, family, community, region, nation

- Rapid reductions in carbon emissions and preparing human infrastructures and natural resources to withstand CC impacts are essential public health tasks.

- Equally important: proactively build capacity of entire communities to cope with climate adversities and remain healthy in the process.
Transformational Resilience Goals

- Empower all adults/youth to:
  - Think and act in healthy ways even in ongoing unhealthy conditions
  - Use adversities as catalysts to find meaning, direction, and hope
  - Remain actively involved in climate change initiatives
How to Effectively and Persuasively Communicate about Climate Change?

- Talking about distant concepts (geographic or chronologic) is not effective.
- Simply listing innumerable potential harms is counterproductive (e.g., gun control, anti-vaccine).
- Focusing on what is in the listener’s best interest may be effective.
- Health impacts have been shown to be among the most effective concepts to move opinions.
CC: The Ultimate Social Determinant

Would people care more about climate change if we called it... GLOBOLA?
The planet is burning up with fever, spread by emissions of its bodily fluids.

Scientists are gravely concerned.
Center for Atmospheric Disease Control

We might survive Globola if we avoid risky behavior...
... like filling up our cars with earth discharge.

Some villagers refuse to cooperate.
We'd like to show you how to prevent Globola.

The only way it can be stopped is to quarantine oil and gas executives.

Come any closer and I'll shoot.

Let us out or we'll sue!

No way. You guys are vectors.

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Engaging with reality is foundational to promoting and maintaining mental health and public health.

AMA Principles of Medical Ethics
- “A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health.”

American Psychological Association (2010, 2016)
- Principles of Beneficence, Responsibility, Justice, Respect for People’s Rights and Dignity
Professional Advocacy & Duty to Warn

• Criteria to evaluate the extent to which health professionals have special obligations to advocate for actions to address Climate Change*
  • Expertise
  • Proximity
  • Effectiveness
  • Low cost or risk
  • Unique
  • Severity
  • Public Trust

*MacPherson & Wynia, AMA J of Ethics, 12-17
We Can Create a Good Enough Mother....Earth!

Climate Change: A Call to Action for the Psychiatric Profession

John Coverdale, Richard Balon, Eugene V. Beresin, Adam M. Brenner, Anthony P. S. Guerrero, Alan K. Louie, Laura Weiss Roberts

Academic Psychiatry, Feb 2018 Editorial
Constructive Steps for the Profession: CARE

- **Clinical**
  - Understand, prevent, treat MH impacts, participate in Transformational Resilience efforts

- **Administrative**
  - Green our practices, hospitals, research facilities; disaster prep

- **Research**
  - Develop interventions at all levels

- **Education**
  - Why you’re here today, incorporate into all health trainee curricula, stay up to date

Action Items

• Connect with people and organizations

• Work toward reducing individual and collective carbon footprint
  • Individually
    • Reduce footprint (transport, food, etc.)
    • Self-care
  • Collectively
    • Advocate for policy solutions (e.g., Solutions Project)
    • Fight misinformation (actual “fake news”)
    • Advocate for community, environment, future
Professional Organizations

- American Psychiatric Association
- American Psychological Association
- Medical Society Consortium on Climate and Health
- Climate Psychiatry Alliance
- Climate Psychology Alliance
  - Active in UK, emerging in US/Canada
- Amer. Assoc. of Community Psychiatrists
Major Advocacy Organizations

- Eco-America
- American Public Health Assoc.
- Union of Concerned Scientists
- Physicians for Social Responsibility
- US Climate & Health Alliance
- Health Care without Harm
- American Lung Assoc.
- Citizens Climate Lobby
- Our Children’s Trust
- 350.org and 350.pdx.org
- International Transformational Resilience Coalition
- Oregon Climate and Health Resilience Plan
Community Organizations

- OPAL Environmental Justice Oregon
- Coalition for Communities of Color
- Native American Youth and Family Center
- Asian Pacific American Network of Oregon
- NAACP Portland Branch
- Verde
- Basic Rights Oregon
- CAUSA
- Immigrant and Refugee Community Organization
- Oregon Environmental Council
- World Forestry Center
Professional Resources

- Lancet Planetary Health Journal
  - As of January 2018; Open-access

- “Health Care Ethics and Professionalism in the Era of Climate Change”
  - December 2017 issue of AMA Journal of Ethics

- “Mental Health and Our Changing Climate”
  - Developed/sponsored by: American Psychological Association, Climate for Health, ecoAmerica

- There is the need and opportunity to promote this work in our professional organizations
Conclusions

- Mental health impacts of Climate Change are significant, current, expanding, and last to resolve.
- Mental health professionals have the skills and obligation to participate in addressing impacts.
- Climate change is the ultimate, cross-cuttingsocial/structural determinant of health, a slow moving mega-disaster.
- Ample opportunities for constructive engagement and positive change for us and society.
Thank You
<table>
<thead>
<tr>
<th>Climate Driver</th>
<th>Exposure</th>
<th>Health Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>More frequent, severe, prolonged heat events.</td>
<td>Elevated temps</td>
<td>Heat-related illness, death, *worsened if on psych meds &amp;/or SPMI, ind/ind &amp; gp/gp violence</td>
</tr>
<tr>
<td>Increasing temps, changing precip patterns.</td>
<td>Worse air quality (e.g., ozone, particulates, pollen)</td>
<td>Acute/chronic cardiovasc, resp illness, anxiety &amp; neurotoxin exposure.</td>
</tr>
<tr>
<td>Rising sea levels, more extreme precip, hurricanes, etc.</td>
<td>Contaminated water, disrupted infrastructure.</td>
<td>Injuries, drowning, GI and other illnesses.</td>
</tr>
<tr>
<td>Changes in temp extremes and seasonal weather patterns.</td>
<td>Geographically expanded insect activity.</td>
<td>Increased incidence of Lyme disease, Zika, Ebola, etc., <em>fear/anxiety</em></td>
</tr>
<tr>
<td>Increasing temps, humidity, season length.</td>
<td>Increased pathogen growth.</td>
<td>Increased incidence of foodborne, GI illnesses,</td>
</tr>
<tr>
<td>Climate change effects, extreme weather.</td>
<td>Level of exposure to acute and chronic traumatic events.</td>
<td>Eco-anxiety, solastalgia, mood, and trauma, distress, grief, social impacts, resilience.</td>
</tr>
</tbody>
</table>
Another View of Integration
Climate and Community Distress

- Cynical misinformation campaign by vested interests and misinformation (Oreskes & Conway, 2010)
- Political polarization and paralysis—relevant science
  - Psychology: ideology formation and rigidity
  - Psychology: identity-preserving cognitive biases
    - Denying to the Grave, Gorman & Gorman, 2016
    - Sociology: populist anti-intellectual/anti-science trends
- Amplifying distress as the community faces both the threat and social-political conflict about the threat
Problems will not ebb and flow—but they will accumulate, adding ever increasing pressure to human psychological resources.
Problems will not ebb and flow—but they will accumulate, adding ever increasing pressure to human psychological resources.

Shanghai after 2 degrees C increase (artists impression)

image http://www.climatecentral.org/
Effectively inundated communities under intermediate estimates of sea level rise
Ecological Model

- Better seen as a social rather than “environmental” challenge or issue
Both professional organizations have taken public policy positions on climate change effects on mental health and illness.
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.
“With unchecked climate change and air pollution, the very fabric of life on Earth, including that of humans, is at grave risk. We propose scalable solutions to avoid such catastrophic changes. There is less than a decade to put these solutions in place to preserve our quality of life for generations to come. The time to act is now.”

-Pontifical Academy of Sciences, 2017