Climate Psychiatry Wrap Up: Symptoms and Minnesota Public Health

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Highlights of the Day

- A healthy farm is nothing without a healthy farm family - mental health in agriculture – Ted Matthews
- It’s Go Time: Envisioning a Radical Clinical Psychiatry – Carson Brown, MD
- Flash Talks - Linzie Wildenauer; Jeremiah Atkinson, MD; Mete Ercis, MD Facilitator Sheila Specker MD, DFAPA
- Nature Based Therapy – MB Lardizabal, DO, DFAPA, Alex Marie PsyD, LP
- An internist discusses health and equity impacts of extreme heat with a dash of appeal to physician advocacy – VL Surapaneni, MD, MPH
- Indigenous Planetary Health – Nicole Redvers, ND, MPH
Minnesota Climate Issues: https://climate.state.mn.us/local-impacts

Older Minnesotans are in danger from extreme heat

Recreation, tourism threatened by winter warming

Disproportionate heat risks for communities of color

Minnesota is getting warmer and wetter

Farmers face new challenges for crops, livestock

Mega-rains overwhelm rivers, roads, and budgets

What To Do: #1, Heal Thyself: Reducing the Carbon Footprint of Our Practices:

• Telepsychiatry

• Reduce office and hospital space

• Reduce Prescribing - avoid polypharmacy, smaller prescriptions, reduce unnecessary medications

• Reduce food waste, unnecessary supplies and anesthetic gases in affiliated institutions

• Green conference and residency match travel practices
#2: System Prep: Making a Healthcare Resilience Checklist:

1. Make a list of the kinds of threats likely in your region and how much it will change (NRI)
2. Reassess every 5 years
3. Each unit or type of care should do its own specialized assessment
4. Future risk assessment should be built into current risks
5. Engage community partners (EMT, LE) and meteorologists
6. Assessment should include vulnerabilities due to local and greater infrastructure vulnerability and resources
7. Access to supplies and pharmaceuticals
8. Setting up alerts and surveillance eg for heat, air pollution
9. Providing for surge capacity
10. Infrastructure readiness: heating, water, electric, machinery, structural stability, computer vulnerability
11. Emergency management staff and trainings for how you would respond to each type of emergency, particularly informing and evacuation capacity
12. Prevention through patient education and screenings
13. Developing an adequate and accessible knowledge base for accessing disaster funding
14. Developing clean energy and clean air policies


#3: Beth’s Suggestions for System Prep:

1. Has the community planned for the increase in violence, suicide and death that accompanies increased heat?
2. Have the needs of those with mental illness for more support, transportation, help with medications, and their potential responses been included in planning?
3. Has the clinic prepared mechanisms to educate patients about climate effects on their health and connect to patients in climate emergencies?
4. Have the community and clinic provided forums for processing community change to more sustainable ways of doing things?
5. Has the community and community provided training in emotional resilience?
6. Has the community provided adequate contact with the natural world for its residents?
7. Is the community considering mental health co-benefits in choosing its climate initiatives?
8. Has the clinic trained its therapists in climate anxiety techniques?
9. Has the clinic provided support for young people with climate distress?
Assessing the Climate Impacts on Your System: The National Risk Index

The National Risk Index map for social vulnerability and community resilience
Mapping your community assets:


Types of Community Assets: Anything that improves community life

- The strengths and abilities of individuals
- Physical structures like churches, libraries, and rec centers
- Private, public, and non-profit organizations
- Social service agencies
- Disaster response agencies
- Government agencies
- Military agencies
- Natural assets
- Providers of food, medications, and other basics
Regulating Stress Throughout the Phases of a Chronic Cyclical Disaster

The phases of a chronic, cyclical disaster will cause various levels of stress. In response to this stress, there is a spectrum of adaptive (healthy) vs maladaptive (unhealthy) responses that survivors, the community, and responders can have. Achieving adaptive stress regulation through each phase requires different actions by each group. Example key actions that will help each group stay close to the zone of healthy stress regulation are provided below the schematic.

- **If left unmitigated, survivors, the community, and responders will find themselves in the Purple and Red zones of extreme distress. More adaptive actions by individuals and leadership will keep these groups in the Zone of Healthy Stress Regulation.**
**Transformational Resilience Act**

- The product of several years of work by Bob Doppelt (ITRC) and a broad coalition of mental health organizations including the APA
- To be introduced by Paul Tonko (D-NY) and Brian Fitzpatrick (R-PA)
- Establishes funding for small local community grants that use a public health approach to strengthen the capacity for mental wellness across age categories
- Establishes a specific office (CDC most likely) for funding of mental health needs of climate change
- Emphasis is on resilience training

*The International Transformational Resilience Coalition (ITRC) is a network of mental health, social services, disaster management, faith, environmental, social justice, education and other professions working to establish methods to prevent and heal the mental health and psychosocial problems generated by the climate emergency and other adversities. Website: [http://www.theresourceinnovationgroup.org/](http://www.theresourceinnovationgroup.org/)*

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**Resources:**

- [https://toolkit.climate.gov](https://toolkit.climate.gov)
- [https://resilience.climate.gov/#assessment-tool](https://resilience.climate.gov/#assessment-tool)
- [https://www.adaptationclearinghouse.org](https://www.adaptationclearinghouse.org)
- [http://www.cakex.org](http://www.cakex.org)
Resources:

Health Professionals for a Healthy Environment: https://www.facebook.com/groups/hpforhc/

U MN Climate Health Action Program (CHAP): https://med.umn.edu/dom/research/programs-centers/climate-health-action-program

Climate Psychiatry Alliance: https://www.climatepsychiatry.org

Medical Societies Consortium: https://medsocietiesforclimatehealth.org

Committee on Climate Change: jrwortzel@gmail.com, https://www.psychiatry.org/membership/get-involved/

Climate Reality Project: https://www.climateralityproject.org

You don’t need to do everything.
Do what calls your heart:
Effective action comes from love.
It is unstoppable, and it is enough.

Grace happens when we act with others on behalf of our world.

- Joanna Macy
Extreme Weather: Polycrisis/Multiple Disaster Model

Infectious Diseases:

- Unpredictable Interactive Effects
- Multiple vectors, habitats, and hosts all differentially impacted by climate changes
- Variable human response systems
- 1500 human pathogens

Altizer, Science, 2013
Two Examples relevant to Minnesota Psychiatrists:

- Increased survival season and change in range of mosquitoes, ticks and other vectors
- Increased water-borne diseases (cholera and typhoid) due to flooding and natural disasters

Extreme Heat

National weather service, July 14, 2023
Extreme Heat Incompatible with Life

Heat-stroke migrant deaths in USA 2022
KSAT/NY Post, June 27, 2022

Deaths in Pakistani heat wave, 2015
Rizwan Tabassum, AFP

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Psychiatric patients have high heat mortality

- Mental Illness carried an increased risk of death and ER visits/hospitalization during heat waves with approximate OR 3.6. Dementia, schizophrenia, & substance abuse dx had the greatest risk.

- Patients with mental disorders have more social risks of heat illness and death: Homelessness, poverty, urban residence, disability, failure to leave home, poor social support, lack of air con/fan.

- Psychiatric Medications increase heat morbidity and mortality, especially antipsychotics, anxiolytics and anticholinergics.

- Thermoregulation is different in psychiatric patients: Schizophrenia, Neuroleptic malignant syndrome, depression etc.

Collapse of Heat Response: (Heat Exhaustion and) Heat Stroke

Body Temp HOT: over 40.5°C or 105°F

- Impaired sweating, skin hot and dry
- Na+ and K+ depletion, increased IL-6 & HSP72
- Pupils constricted as cholinergic action tries to increase vasodilatation
- BP decreased, HR increased
- Cerebral edema with listlessness, seizures and coma
- Cardiovascular collapse, DIC, organ failure
- Edematous gut from poor perfusion releases toxins
- Temperature sensitive enzymatic reactions fail; cellular death

MORTALITY: up to 80%

From Nursing Education Consultants, 2007
Brain imaging in heat death

Figure 3. MRI for case 1 on day 1 (A) and day 9 (B). DWI on day 1 showed a dotted lesion in the white matter and FLAIR on day 1 showed a high-intensity area in the white matter. On day 9, white matter lesions had expanded.

Figure 4. MRI for case 2 on admission to our hospital. DWI revealed a dotted lesion in the posterior lobe. Cerebellar lesions were homogeneous, but posterior lesions resembled dot-like aggregates.

What the breakdown of the gut lining looks like:

Figure 4. Transmission electron micrographs of small intestinal epithelial cells from one control rat and two rats heated to 42.5°C core temperature. Each image partially depicts two adjacent enterocytes. In heat-stressed rats 1 and 2, there is visible damage to the microvilli compared with the control cells. Bar represents 1 μm. Reprinted with permission from [20], copyright (2002), American Physiological Society.

Fung et al 2021
**Most Heat Morbidity & Mortality from Underlying Illness**


**Suicide Rates Increase with Higher Temperatures**

1% per 1°C over ~70°F

Dixon et al 2014
Suicide as a function of lowest daily temperature over 4 seasons, with summer and fall at the bottom

Burke M et al 2018
Suicide as a function of monthly average temperature

Fountoulakis et al 2016
Suicide as a function of mean annual temperature
Heat increases both interpersonal and civic violence

- Rape in USA by jurisdictional temperature
- Violent individual crime in USA by temperature Anomaly
- African Civil wars by average country temperature
- Group on group violence in USA by rainfall loss
- Rain makes us nice
- Global Tropical Conflict by ocean temperature

How to Cool Off:

- Image of a dog laying on the ground, possibly sleeping or resting.

Acclimatization:

- Involves changes in >210 genes
- Improves ability to stay cool APPROX 25%
- Day 1: 24 subjects can walk a few hundred yards in 120° heat; Day 8: They can walk for 100 minutes.
- Changes include primarily improved sweating, reduced HR and temp
- Increased sodium resorption such that sweat has only 15% of prior sodium.
- Thirst sensitivity improves, plasma volume expands
- Most of benefit in 4-7 days of 2 hrs, 30 min exercise exposure

New OSHA Heat Policy

On April 12, 2022, OSHA announced the workers’ protection NEP, (National Emphasis Project)

RECOMMENDS:

- Training for all in heat illness and first aid
- Using dermal pads/sensors and HR monitors to monitor core temp and HR in high risk environment
- Cooling vests and reflective clothing
- Improve air conditioning, venting, steam leaks, shade and other aspects of built environment
- Specific acclimatization schedules
- Flexible work hours, relief workers and work/rest cycles
Preparing for Heat

- Prepare for heat by insulating air conditioning ducts, putting aluminum-foil covered cardboard/reflective surfaces in windows, & setting up a go-kit for power failures

- Check on neighbors, pets and children frequently

- Download the FEMA App or go to NOAA Weather Radio for heat alerts

- Text SHELTER + your zip code to 4FEMA (43362) for the nearest cooling center