

**The Bree Collaborative**  
**Health Impacts of Extreme Heat & Wildfire Smoke**

### Problem Statement

Climate change is widespread, rapid, and intensifying with a direct regional health impact.<sup>1</sup> Washington has seen an increase in climate related illnesses including such as hyperthermia and respiratory disease from short-term temperature increases and increased smoke exposure from wildfires. During the heat dome of 2021, over 400 Washingtonians lost their lives due to heat related illnesses. Extreme heat disproportionately impacts children, pregnant individuals, the elderly, outdoor and some indoor workers, people with disabilities, low-income communities and communities of color.<sup>2</sup> Agricultural workers, construction workers, and electricity and pipeline utility workers are at increased risk for heat-related illness and deaths.<sup>3</sup> Short and long-term heat exposure increases severe maternal morbidity (SMM).<sup>4</sup> Wildfire smoke in 2020 was associated with approximately 92 more all-cause mortality cases, and those in Eastern and Central Washington were estimated to experience the highest per-capita mortality during the episode.<sup>5</sup> Coordinated efforts across sectors are needed to prevent and respond to the health effects of extreme heat and wildfire smoke, including early detection and warning systems, preventative education and communication with communities at highest risk, home environment measures, and standardized clinical protocols for reducing risk related to heat and wildfire smoke.

### Aim

To prevent and reduce heat-related and wildfire smoke-related disease burden in Washington state, especially for vulnerable populations.

### Purpose

To propose evidence-informed guidelines to the full Bree Collaborative on practical and evidence-based methods for reducing heat-related and wildfire smoke-related disease burden, including:

- Defining topic area and scope
- Improving access to and use of protocols for clinicians and healthcare teams to identify patients at risk for heat-related and/or smoke-related illness, evidence-informed patient education and counseling, and strategies to reduce risk, especially for vulnerable groups.
- Improve uptake of extreme heat and wildfire smoke resilience for health systems, including identification of heat and smoke vulnerable populations, planning for uninterrupted delivery of healthcare services, and infrastructure.
- Amplify effective and culturally and linguistically appropriate communication and education strategies to increase patient and public awareness around health risks associated with heat and wildfire smoke.
- Communication, coordination and data sharing across systems, organizations and jurisdictions to prevent and respond to negative health impacts of extreme heat and wildfire smoke.
- Funding mechanisms for high-quality care and public health strategies for extreme heat and wildfire smoke, such as cooling centers, air conditioners and air filtration.
- Reinforce guidelines on effects of urban heat islands and considerations for rural communities
- Review and uplift concerns for populations with overlapping inequities who are disproportionately affected by climate change (e.g., comorbidities, social and economic drivers of health)
- ~~Address wildfire smoke considerations as they overlap with the considerations for extreme heat.~~

### Duties & Functions

The workgroup will: (Choose several or add more)

- Research evidence-informed and expert-opinion informed guidelines and best practices (emerging and established).
- Identify current barriers and future opportunities for implementing interventions.
- Consult relevant professional associations and other stakeholder organizations and subject matter experts for feedback, as appropriate.
- Meet for approximately nine months, as needed.
- Provide updates at Bree Collaborative meetings.
- Post draft report(s) on the Bree Collaborative website for public comment prior to sending report to the Bree Collaborative for approval and adoption.
- Present findings and recommendations in a report.
- Recommend data-driven and practical implementation strategies including metrics or a process for measurement.
- Revise this charter as necessary based on scope of work.

## Structure

The workgroup will consist of individuals confirmed by Bree Collaborative members or appointed by the chair of the Bree Collaborative. The Bree Collaborative director and program coordinator will staff and provide management and support services for the workgroup.

Less than the full workgroup may convene to: gather and discuss information; conduct research; analyze relevant issues and facts; or draft recommendations for the deliberation of the full workgroup. A quorum shall be a simple majority and shall be required to accept and approve recommendations to send to the Bree Collaborative.

## Meetings

The workgroup will hold meetings as necessary. Bree Collaborative staff will conduct meetings, arrange for the recording of each meeting, and distribute meeting agendas and other materials prior to each meeting. Additional workgroup members may be added at the discretion of the Bree Collaborative director.

| Name                         | Title                                                   | Organization                                              |
|------------------------------|---------------------------------------------------------|-----------------------------------------------------------|
| Christopher Chen, MD (chair) | Medical Director for Medicaid                           | HCA                                                       |
| Brad Kramer, PhD             | Program Manager                                         | Public Health SKC                                         |
| Kristina Petsas              | Chief Medical Officer for Employer and Individual Plans | UnitedHealthcare                                          |
| Bre Holt                     | Senior Director Population Health                       | Comagine Health                                           |
| Jessi Kelly                  | Research Coordinator                                    | UW Collaborative for Extreme Event Resilience             |
| Jeff Duchin                  | Health Office                                           | King County                                               |
| Stefan Wheat, MD             | Emergency Medicine Physician                            | UW                                                        |
| Raj Sundar, MD               | Family Medicine Physician                               | KP                                                        |
| Jessica Symank               | Senior Director, Safety and Quality and Rural Programs  | WSHA                                                      |
| Kelly Naismith               | Climate Change and Health Epidemiologist Supervisor     | DOH                                                       |
| LuAnn Chen, MD, MHA          | Medical Director                                        | CHPW                                                      |
| June Spector, MD, MPH        | Internal Medicine Physician/Scientist                   | LNI                                                       |
| Mary Beth Bennett, MD        | Pediatric Resident                                      | Seattle Children's                                        |
| Seth Doyle, MA               | Director of Strategic Initiatives/President             | NWRPCA/WAPH                                               |
| Raymond Moeller              |                                                         | Medical Reserve Corps                                     |
| Yonit Yogev                  |                                                         | Medical Reserve Corps, Thurston County                    |
| Brian Henning, MD            | Director                                                | Gonzaga Institute for Climate, Water, and the Environment |

<sup>1</sup> Haines, A., & Ebi, K. (2019). The Imperative for Climate Action to Protect Health. The New England journal of medicine, 380(3), 263–273. <https://doi.org/10.1056/NEJMra1807873>

<sup>2</sup> National Integrated Heat Health Information System. (n.d.)Who is at risk to extreme heat? Retrieved from [HEAT.gov](https://heat.gov)

<sup>3</sup> Arbury, S., Jacklitsch, B., Farquah, O., Hodgson, M., Lamson, G., Martin, H., Profitt, A., & Office of Occupational Health Nursing, Occupational Safety and Health Administration (OSHA) (2014). Heat illness and death among workers - United States, 2012-2013. *MMWR. Morbidity and mortality weekly report*, 63(31), 661–665.

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<sup>4</sup> Jiao, A., Sun, Y., Avila, C., Chiu, V., Slezak, J., Sacks, D. A., Abatzoglou, J. T., Molitor, J., Chen, J. C., Benmarhnia, T., Getahun, D., & Wu, J. (2023). Analysis of Heat Exposure During Pregnancy and Severe Maternal Morbidity. *JAMA network open*, 6(9), e2332780. <https://doi.org/10.1001/jamanetworkopen.2023.32780>

<sup>5</sup> Liu, Y., Austin, E., Xiang, J., Gould, T., Larson, T., & Seto, E. (2021). Health Impact Assessment of the 2020 Washington State Wildfire Smoke Episode: Excess Health Burden Attributable to Increased PM<sub>2.5</sub> Exposures and Potential Exposure Reductions. *GeoHealth*, 5(5), e2020GH000359. <https://doi.org/10.1029/2020GH000359>