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Climate Insurance Working Group

Discussion Concept Paper

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Draft Concept: Neighborhood Protection from Heat

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Heat waves are causing increased risk and the potential for unexpected costs

Extreme heat is one of the deadliest outcomes of climate change, and California's Fourth Climate Assessment anticipates more heat waves with higher temperature, longer duration, and increased frequency. An analysis by the Los Angeles Times found extreme heat caused 3,900 deaths in California over a decade, six times the official count of heat-related fatalities.¹ There have also been increased hospitalizations due to heat-related illnesses. One study found that, on a day with temperatures 10 degrees Fahrenheit above local average, individuals experienced 342% higher risk of hospitalization for heatstroke.² A study by the Natural Resources Defense Council in 2011 found that a 2006 heat wave in California resulted in nearly \$179 million in costs due to hospitalizations, out-patient visits, and emergency room visits.³ These impacts are disproportionately affecting communities of color, persons with disabilities, seniors, children, outdoor workers, and low-income communities, with broader consequences for livability and equity.

We are also seeing, through the massive heat events in the Pacific Northwest of 2021 and in Europe and the Western United States in 2022 that heat waves, like hurricanes, tornadoes, and other disasters, disrupt local economies, transportation systems, hospitals, energy systems, and other critical infrastructure.

¹ Heat waves are far deadlier than we think. How California neglects this climate threat. Los Angeles Times (2021). <https://www.latimes.com/projects/california-extreme-heat-deaths-show-climate-change-risks/>

² Climate Change and Health: Understanding How Global Warming Could Impact Public Health in California. California Senate Office of Research (2018).

³ Health and Climate Change: Accounting for the Costs. Natural Resources Defense Council (2011). <https://www.nrdc.org/sites/default/files/accountingcosts.pdf>

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The costs and impacts of extreme heat reveal protection gaps -- the difference between costs that are insured and those that are not. Without risk reduction, we can anticipate insufficient hospital capacity, lost revenue for businesses due to disruptions, and spiking costs for local governments. Emergency response and public assistance during a heatwave can be limited, ill-matched to needs,⁴ and significantly delayed.⁵ Some of these limitations are related to increased costs and funding constraints.⁶

Better protection and resilience could be provided through additional insurance solutions that can be tailored to a specific neighborhood or community, and that provide incentives for climate adaptation. Insurance has supported faster recovery after disasters, which is positively correlated with better quality and more complete recovery both on the economic and social levels.⁷

By engaging with stakeholders, the California Department of Insurance initiated conceptual development of several approaches that use insurance as a means of reducing and transferring risk associated with extreme heat. We identified opportunities to address immediate preparedness and response needs, as well as longer term innovations that invest in urban greening and building materials. This concept paper focuses on a parametric insurance approach to provide assistance to local governments, Tribes, and public health agencies in order to avert the most acute impacts posed by extreme heat.

Proposed Solution: Neighborhood Preparedness

We propose the development of a parametric insurance policy to protect communities from acute risks associated with extreme heat. It would be activated when agreed upon triggers are met and would provide funds to support communities in preparing for and responding to heat emergencies.

1. Community-based neighborhood protection

Under this proposal, certain expenses incurred in taking protective actions taken before and during a heat wave would be insured. You could imagine a local government, public health agency, or Tribe expending additional funds on temporary cooling shelters for the unhoused, increased numbers of vans and personnel to transport seniors to cooling centers, utility credits or rebates, expanded in-home services for the homebound, communication and social media messaging, and other creative actions designed by the community.

⁴ Extreme Heat Exposure: Access and Barriers to Cooling Centers — Maricopa and Yuma Counties, Arizona, 2010–2020. Mallen, E. et al. (2022). *MMWR Morb. Mortal. Wkly. Rep.* 71, 781–785.

⁵ Delayed emergency response, lag between alerts led to B.C.'s heat dome deaths: Coroner. Crawford, T. (2022). *Vancouver Sun*.

⁶ Adapting to Extreme Heat in California. DeShazo, J.R. et al. (2021). *UCLA Luskin Center for Innovation*.

⁷ Protecting Communities, Preserving Nature, and Building Resiliency; How First-of-Its-Kind Climate Insurance Will Help Combat the Costs of Wildfires, Extreme Heat, and Floods. *Climate Insurance Working Group (2021). California Department of Insurance.*

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Hospitals may need to rent generators and chillers to continue operating. They also may be viewed as refuges from the heat, and see a flood of unexpected visitors. In response, they could experience new safety and security concerns, supply chain issues, increased transmission of disease, and other impacts.

Local governments may need to cool infrastructure like bridges and light rail to keep them operational. Roads may buckle and airport runways may melt, leading to significant disruptions in the local economy. Local governments should consider using local Heat Action Plans to identify risks and mitigation strategies.

The core elements of this community heat insurance proposal can be applied to benefit multiple types of jurisdictions. A community heat insurance policy could be designed as a single policy held by a trust fund or facility on behalf of multiple entities.⁸ See [Multiple Entities Model](#). Alternatively, a single local government, Tribe, or public health agency could develop and purchase such a policy on its own. See [Single Entity Model](#).

Community insurance policies provide multiple public benefits. A community policy could provide cost savings, incentivize risk reduction, and empower communities.⁹ It could increase resilience by reducing initial harm from a heat event, and by reducing the time to recovery after the heat event.¹⁰

2. Parametric insurance approach

Consistent with an important community flood insurance example described in Kousky and Shabman (2015), the proposed heat community insurance policy would rely on a two-phase trigger criteria and a proof of loss to cover direct or indirect losses.

The first trigger would be a physical measurement, such as a particular temperature, or particular temperature plus humidity, or a specific heat wave ranking. Insurance Commissioner Lara sponsored legislation in 2022 that was signed by the Governor to create a heat wave ranking system for California.

⁸ See, e.g., Carolyn Kousky and Leonard Shabman, *A Proposed Design for Community Flood Insurance*, Resources for the Future, 2015

⁹ Kousky and Shabman (2015)

¹⁰ Analogous to the benefits of community insurance in relation to flood, as described in Kousky and Shabman (2015).

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The second trigger would be associated with the severity, duration, or frequency of the heat event. To address severity, the policy could be limited, for example, to heat waves that rank category 3 or higher. The policy could also be limited based on frequency; if a local jurisdiction has budgeted for and incurred expenses for three days of extreme heat per year, a fourth day of extreme heat would trigger the policy.

After meeting the physical and severity triggers, the insured would need to demonstrate a verifiable loss. This proof of loss is a significantly lower burden than needed for traditional indemnity insurance and does not require dollar for dollar accounting. Rather, the proof of loss would be agreed upon in the negotiated insurance contract. It could, for example, be the completion of previously agreed upon steps the insured has taken to reduce heat risk. Alternatively, the proof of loss could be a previously agreed upon dollar amount the insured has already spent on heat preparedness and response.

Ideally, participating entities would already have identified gaps in funding needs that could be addressed through insurance. There are a variety of possibilities for conducting this kind of financial gap analysis, including, for example:

- The California Department of Public Health and the Governor's Office of Planning and Research are assisting local governments with developing [local heat adaptation plans](#) .
- The California Office of Emergency Services assistance for [local hazard mitigation plans](#).
- Some tribes and local governments have completed vulnerability assessments, including vulnerability to heat. See, for example, [County of Los Angeles](#) and [Pala Tribe](#)

Such planning documents and strategies delineate actions to be taken in the event of extreme heat. A heat action plan, vulnerability assessment, or local hazard mitigation plan could be crafted to define roles and responsibilities and establish preparedness and emergency actions that not only reduce risk but help determine whether and when insurance is an appropriate tool. They can also be used to calculate the amount of insurance coverage needed to bridge any possible financing gaps.

Why Is Insurance an Appropriate Tool?

The proposed solution will transform heat preparedness efforts at the neighborhood and community level by uniting risk reduction and recovery planning. It provides the dual benefits of risk reduction, by covering costs of preparedness rather than just losses, and risk transfer, through coverage of expenses and losses associated with disaster response.

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A parametric insurance concept is attractive for a variety of reasons. First, it provides critical benefits when dealing with a health and safety emergency: speed, and ease. Payout is swift, providing immediate funding where it is most needed. And the adjustment of loss process is more streamlined. As the National Association of Insurance Commissioners has recognized, “Firms insuring against business interruption risk, government agencies responsible for disaster response, and non-governmental organizations (NGOs) providing assistance all benefit from receiving payout faster because resources can be deployed more rapidly at the most critical time, right after the disaster has struck.”¹¹ A study commissioned by the United Kingdom’s Department for International Development and completed by Risk Management Solutions found that parametric insurance – through faster availability of funds that accelerate disaster response and deescalate losses – can be 3.5 times as effective as delayed payments from aid.¹²

Second, parametric insurance is not limited to physical property damage. Payouts can be used flexibly for any number of community-identified needs, including preparedness, disaster response, infrastructure, business interruption, and investments in long-term solutions like urban forests or cool technologies.

Parametric policies can also save administrative costs and improve resilience by quickly providing liquidity and the opportunity to invest in hazard mitigation measures, such as reinforcing a climate resilient energy, transportation, and cooling infrastructure.

Of course, insurance is only one of many disaster risk financing tools. One potential concern with using parametric insurance to cover unanticipated losses is the price of the policy: in order to make the product a worthwhile venture, insurers would add some kind of risk margin and profit considerations, which could make the policy too expensive, particularly for low-income communities. We have attempted to limit policy costs in this concept note by recommending that insurance is only provided after a frequency/severity test has been met.

Other options beyond insurance exist; some have suggested the creation of a state-funded program to provide anticipatory grants to local governments. Such a program would alleviate some need to purchase insurance. However, government operated grant and reimbursement programs have traditionally been slower and more cumbersome than parametric insurance. In addition, the cost of creating a new state program is not insignificant, and one-time funding is strongly favored over ongoing programmatic funding.

¹¹ [Parametric Disaster Insurance \(naic.org\)](https://www.naic.org/parametric-disaster-insurance)

¹² [Parametric Disaster Insurance \(naic.org\)](https://www.naic.org/parametric-disaster-insurance)

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The two concepts are not mutually exclusive; federal and state grants and available disaster recovery assistance¹³ for higher frequency/lower severity events could be appropriate. Insurance would better address the lower frequency/higher severity heat events that require higher levels of resources and more immediate cost recovery.

Key Research Questions

Additional research to further describe health impacts and costs will strengthen the concept outlined in this concept paper, both in terms of health impacts and cost. We have divided the research priorities into four categories:

Community outreach. It is critical that this proposal be discussed with local governments and communities to ensure that any ensuing insurance policy meets their needs. The Department intends to conduct outreach to targeted disadvantaged communities in California that are disproportionately affected by heat. We anticipate several conversations with diverse communities across the state to better understand their needs and concerns. Questions would include:

- How are local communities affected by heat?
- What pre-disaster mitigation activities would specific local communities prioritize, and can they produce a prioritized list of actions?
- How could the requirement of a heat action plan be structured and managed to sufficiently reduce risk, while still maintaining flexibility and adaptive capacity?
- Would the proposed project facilitate implementation of pre-disaster mitigation to protect their residents from extreme heat?
- Do local jurisdictions have existing heat action plans they can rely on, or would they need to develop such plans?

Testing the idea with insurers and communities. The next step would involve bringing communities and (re)insurance companies together to deliberate the specific details of the neighborhood plans. Facilitated conversation between insurers and community representatives would allow for a deeper and more deliberative analysis. Questions would include:

- What unexpected costs or losses should be insured?
- How would loss be defined, and what is sufficient proof of loss?
- Are temperature or other physical heat metrics appropriate triggering events?

¹³ California Disaster Assistance Act. California Governor's Office of Emergency Services.
<https://www.caloes.ca.gov/office-of-the-director/operations/recovery-directorate/recovery-operations/public-assistance/california-disaster-assistance-act/>

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- How much would this type of parametric policy cost, and do the benefits outweigh the costs? How could the policy be structured to provide sufficient coverage while remaining affordable?
- What are the tradeoffs for providing resilience benefits from insurance, as compared with catastrophe bonds, local taxes, or other financing mechanisms

Coordination with other state agencies. Many agencies in California are working to alleviate the threat of extreme heat. Our proposal will have a much greater chance of success if we coordinate with our sister agencies.

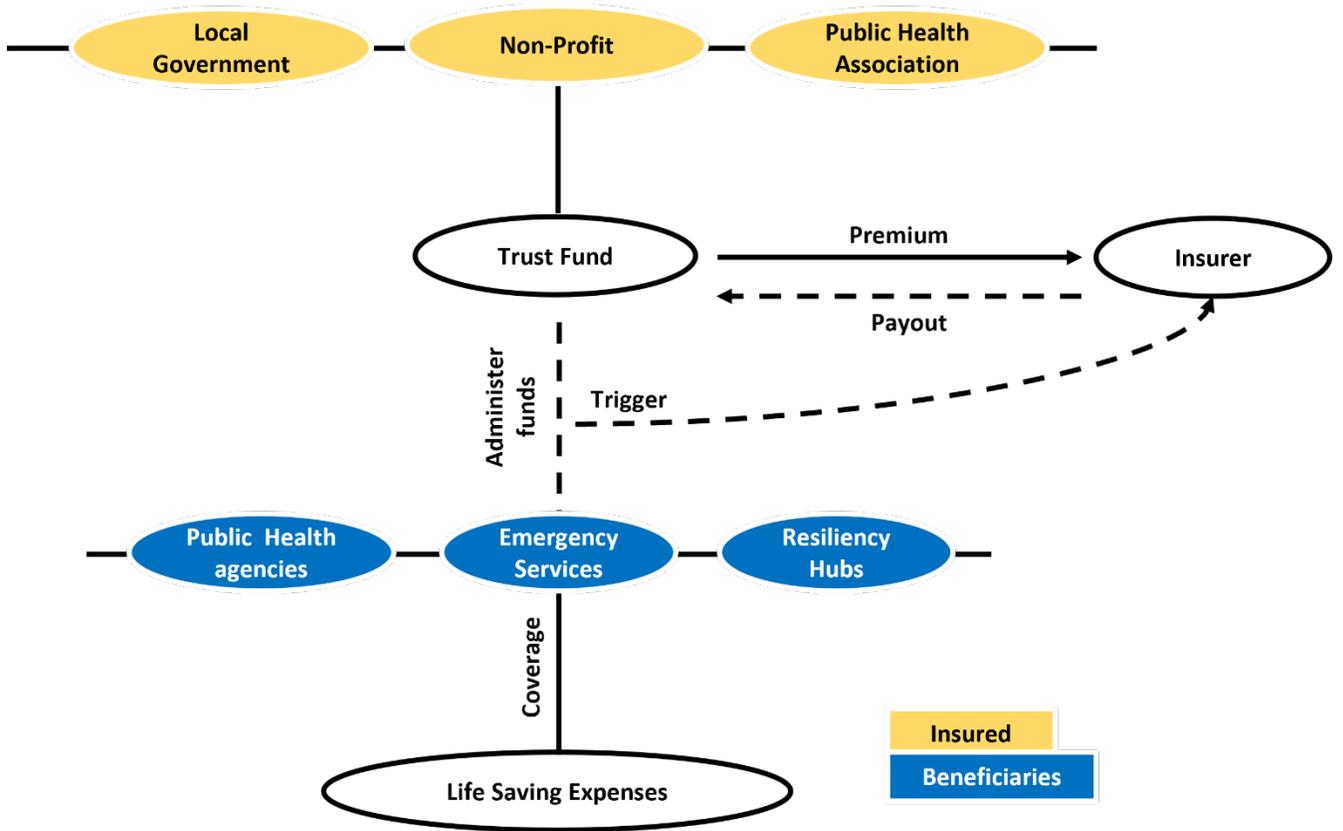
- Where will funding to purchase the policy come from? In order to scale this concept and decrease the cost of individual policies, is there opportunity for cost-sharing and risk pooling between communities and the state? Would philanthropies or businesses have an interest in participating?
- Are there existing disaster risk financing opportunities in California that we should build on, rather than creating a new program?

Longevity of the program. While we anticipate pilot projects to test the concept out, we seek to design an enduring risk reduction and risk transfer program. We will design a means of testing and proving the concept, and will write up our analysis and findings.

- How can we make this sustainable over time?
- What kind of monitoring and evaluation will be necessary?

Pre-Disaster Neighborhood Protection from Heat Possible Delivery Models

Multiple Entities



Single Entity

