# Assessing Heat Action Planning in Arizona Through Hierarchy of Controls and Socio-ecological Model Lens

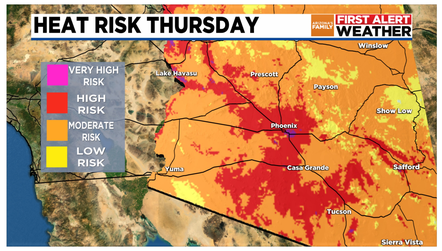
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## Background

- **Extreme heat events** due to climate change present a significant public **health risk**, particularly for under-resourced, **underserved communities**
- In 2023, Arizona experienced **73 days over 100 °F** breaking the previous record of 33 days [1]




- **Objective:** To analyze state and county-level **heat action plans** and prevention strategies in **Arizona** using the **Hierarchy of Controls (HOCs)** and **Socioecological Model (SEM)** frameworks to understand how well they address health inequities and national safety recommendation

| Hierarchy of Controls | |
|---|---|
| **Structure** | **Examples** |
| Elimination [Most effective/ High] | Suspend water shutoffs for low-income residents |
| Substitution | Identify alternate sources of cooling relief |
| Engineering | Establish cooling centers, hydration stations, and respite centers |
| Administrative | Improve statewide heat relief coordination to mitigate heat risk |
| PPE [Least effective/ Low] | Provide resources like naloxone, cooling towels, and water at heat relief centers |

| Socioecological Model | |
|---|---|
| **Component** | **Examples** |
| Policy | Propose impactful policy changes |
| Community | Build awareness and knowledge of heat risks in the community |
| Organizational | Coordinate grassroots heat response activities with state agency efforts |
| Interpersonal | Cool Callers Volunteer Program for telephone-based wellness checks |
| Individual | Focus efforts on vulnerable populations and write materials from their perspective |

## Methods

Identified 5 heat action plans in Arizona from online and gray literature sources

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Data were extracted and coded by using HOCs and SEM frameworks (134 actions/activities data)

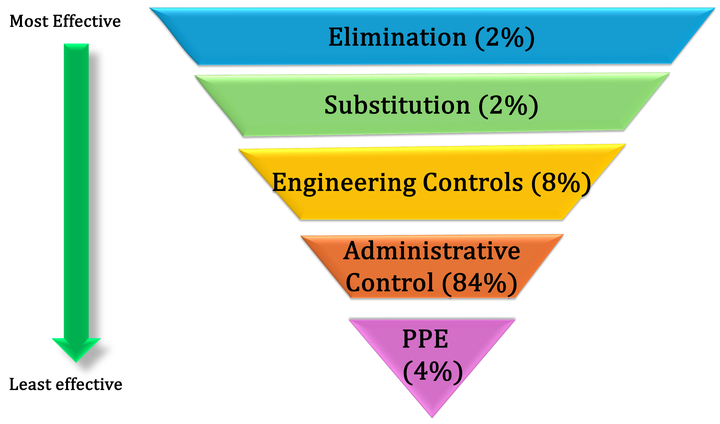
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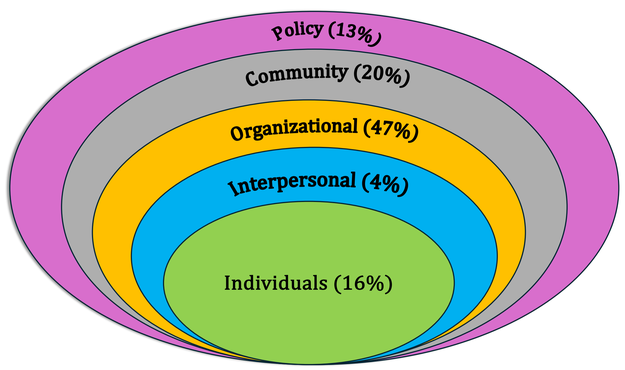
Intercoder reliability (ICR) was used to test the consistency and validity of extracted data

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Data were analyzed by using thematic analysis

## Results




## Discussion

- The **absence of higher-order HOC,** inconsistent implementation of engineering controls, and **insufficient policy-level responses** undermine public health and exacerbate inequities
- These **weaknesses** in state and county planning disproportionately **impact marginalized and low-income populations** who are **least equipped** to manage **heat risks**
- There is a need for a **comprehensive approach** incorporating **elimination and substitution** strategies while strengthening **policy and individual-level** interventions





- **Behavioral change literature** also stresses the **importance** of sustained **public outreach** and **effective communication**

## Conclusion

- Existing **heat action plans lack activities** aligned with **elimination** and **substitution** levels of the HOC, **requiring measures** like **green infrastructure** and **heat-resilient urban design**
- **Policies** need **stronger SEM alignment** through community-based cooling measures, while **individuals** require **support** for **preparedness**, **resource access**, and **awareness**

## References

1.https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/extreme-weather/heat-preparedness/azdhs-recommendations-and-findings.pdf

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