The Impact of Blue-Green Infrastructure on Morbidity and Mortality during Extreme Heat

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Overview

This PubMed literature review examined the current evidence regarding the impact of blue-green infrastructures on human morbidity and mortality during extreme heat.

Background

- **Extreme heat events are one of the deadliest effects of our changing climate.**
- The United Nations issued a Global Call to Action on July 25, 2024, to advance data-driven solutions to extreme heat.
- Urban heat islands, impermeable areas without vegetation or water, augment the effects of extreme heat.
- Blue-green infrastructure, such as trees, green walls, and lakes, significantly decreases ambient temperatures and positively affects human health.

Search and Selection

- **PubMed Search Terms**: (("green roof") OR ("green wall") OR ("urban forest") OR (park) OR (garden) OR (permeable pavement) OR ("rain garden") OR ("green street") OR ("urban pond") OR ("urban lake") OR (green space) OR (blue space) OR ("urban water")) AND (("extreme heat") OR (heatwave) OR ("heat wave") OR ("heat dome") OR ("severe heat")) AND (health)
- **Inclusion** criteria required all 3 elements to be present: human health measurement, extreme heat measurement, and blue-green element measurement.
- **Exclusion** criteria: academic articles and non-in situ setting.

Results

Figure 1: PRISMA flow diagram

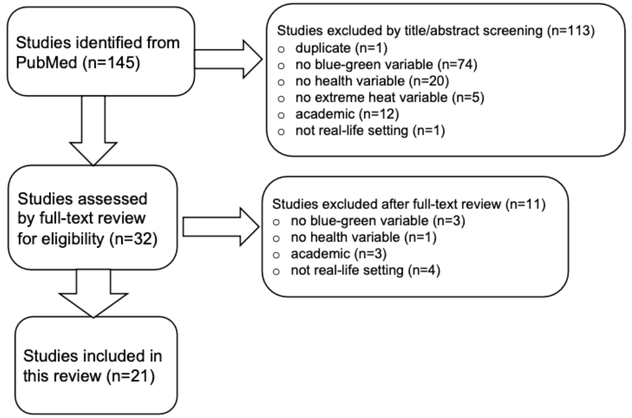
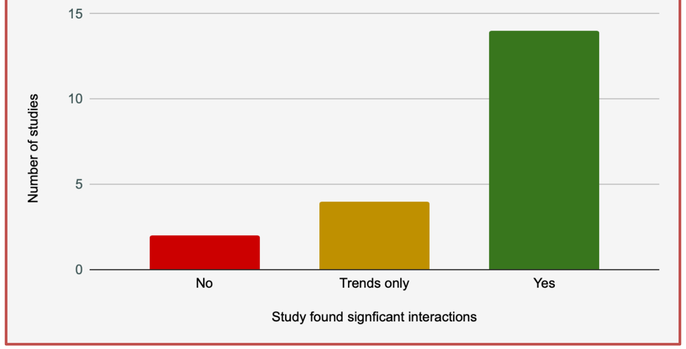


Figure 2: Findings for significant interaction between blue-green infrastructure and health during extreme heat



Significant Findings

Significant Findings ($p<0.05$) were noted in studies focused on:

- Morbidity 44%
- Mental Health 29%
- Children's Health 22%
- Hypertension 5%

11 studies found that low levels of blue-green infrastructure were associated with increased health risk during extreme heat.

11 studies found high levels of blue-green infrastructure to be protective during extreme heat.

Includes trends and significant findings. Four studies contained both findings

Conclusion

- 84% of the studies reviewed found an association between the presence of blue-green infrastructure and health outcomes, 67% statistically significantly so.
- Although the statistical significance in each study was often small, the cumulative effect suggests that greater integration of **blue-green infrastructure into our global communities could protect millions of people from the detrimental effects of extreme temperatures.**