



Dr. Karthika Kumar

MBBS (India), MPH

The George Institute, London

Integrating Gender in Health Interventions for Adapting to Extreme Heat in LMICs: A Scoping Review

Co Authors: Gabriela Cipriano Flores, Dr Umme Zeinab Mulla,
Dr Jane E Hirst

Over the past century, **global temperatures have risen significantly** due to climate change, so has Extreme Heat Events.

Extreme heat (EH) adversely impacts women's health (1,2,3,4):

General Health



Dehydration,
Tiredness,
Lassitude



Heat
Cramps and
Heat stroke

Sexual and Reproductive Health



Alters hormonal
balance, Disrupts
menstrual cycle.



Increased
Obstetric
Complications

Mental Health



Anxiety,
Depression

Neonatal Health



Foetal
distress,
preterm birth

1. Baharav Y, Nichols L, Wahal A, Gow O, Shickman K, Edwards M, et al. The impact of extreme heat exposure on pregnant people and neonates: a state of the science review. *Journal of Midwifery & Women's Health*. 2023;68(3): 324–332. <https://doi.org/10.1111/jmwh.13502>.

2. Kuehn L, McCormick S. Heat exposure and maternal health in the face of climate change. *International Journal of Environmental Research and Public Health*. 2017;14(8): 853. <https://doi.org/10.3390/ijerph14080853>.

3. Syed S, O'Sullivan TL, Phillips KP. Extreme heat and pregnancy outcomes: a scoping review of the epidemiological evidence. *International Journal of Environmental Research and Public Health*. 2022;19(4): 2412. <https://doi.org/10.3390/ijerph19042412>.

4. Kadio K, Filippi V, Congo M, Scorgie F, Roos N, Lusambili A, et al. Extreme heat, pregnancy and women's well-being in Burkina Faso: an ethnographical study. *BMJ Global Health*. 2024;8(Suppl 3): e014230. <https://doi.org/10.1136/bmjgh-2023-014230>.

5. Ballester J, Quijal-Zamorano M, Méndez Turrubiates RF, Pegenaute F, Herrmann FR, Robine JM, et al. Heat-related mortality in Europe during the summer of 2022. *Nature Medicine*. 2023;29(7): 1857–1866. <https://doi.org/10.1038/s41591-023-02419-z>.

Women in Low- and Middle-Income Country (LMIC)s face a higher risk of poor health outcomes...

**3x
more**

excess deaths in women during the Ahmedabad Heatwaves in 2010⁽¹⁾.

**>200,000
women**

are expected to die during hot years in India, Nigeria, and the United States alone⁽²⁾.

15%

Increased risk of preterm birth and stillbirth⁽³⁾.

.... is compounded by numerous factors that⁽⁴⁾. ...

01 Physiological

02 Environmental

03 Socio Cultural

04 Socio Economic

showcases that **Gender* influences** a woman's experience of **EH**.

**World Health Organization (WHO) definition⁽⁵⁾.*

Gender encompasses the socially constructed characteristics of women, men, girls, and boys such as the norms, behaviours, and roles and their interactions.

1. Azhar GS, Mavalankar D, Nori-Sarma A, Rajiva A, Dutta P, Jaiswal A, et al. Heat-related mortality in india: excess all-cause mortality associated with the 2010 ahmedabad heat wave. *PLoS ONE*. 2014;9(3): e91831. <https://doi.org/10.1371/journal.pone.0091831>.

2. Tandon A. Heat-related deaths '56% higher among women' during record-breaking 2022 European summer. Carbon Brief. <https://www.carbonbrief.org/heat-related-deaths-56-higher-among-women-during-record-breaking-2022-european-summer/> [Accessed 31st May 2024].

3. Ren M, Zhang C, Di J, Chen H, Huang A, Ji JS, et al. Exploration of the preterm birth risk-related heat event thresholds for pregnant women: a population-based cohort study in China. *The Lancet Regional Health. Western Pacific*. 2023;37: 100785. <https://doi.org/10.1016/j.lanwpc.2023.100785>.

4. Desai Z, Zhang Y. Climate change and women's health: a scoping review. *GeoHealth*. 2021;5(9): e2021GH000386. <https://doi.org/10.1029/2021GH000386>.

5. Gender and health. <https://www.who.int/health-topics/gender> [Accessed 31st May 2024].

Understand the current health interventions for adapting to EH in LMICS, and evaluate how they consider gender.

Research Question: How do LMICs integrate gender considerations when implementing health interventions to adapt to extreme heat?

Aim

To investigate and explore gender integration within heat adaptation interventions for health in LMICs.

Objectives

1. To identify and describe the community-level heat adaptation interventions for health, implemented in LMICs.
2. To evaluate the extent to which gender is incorporated within these strategies using the World Health Organization (WHO) framework on assessing Gender Responsiveness of Policies and Programmes⁽¹⁾.
3. Delineate potential gaps and highlight best practices for gender-responsive interventions to mitigate the impact of heat on populations in LMICs

Methodology: Scoping Review - JBI Guidelines ⁽¹⁾

P

Population:

- Adult populations

C

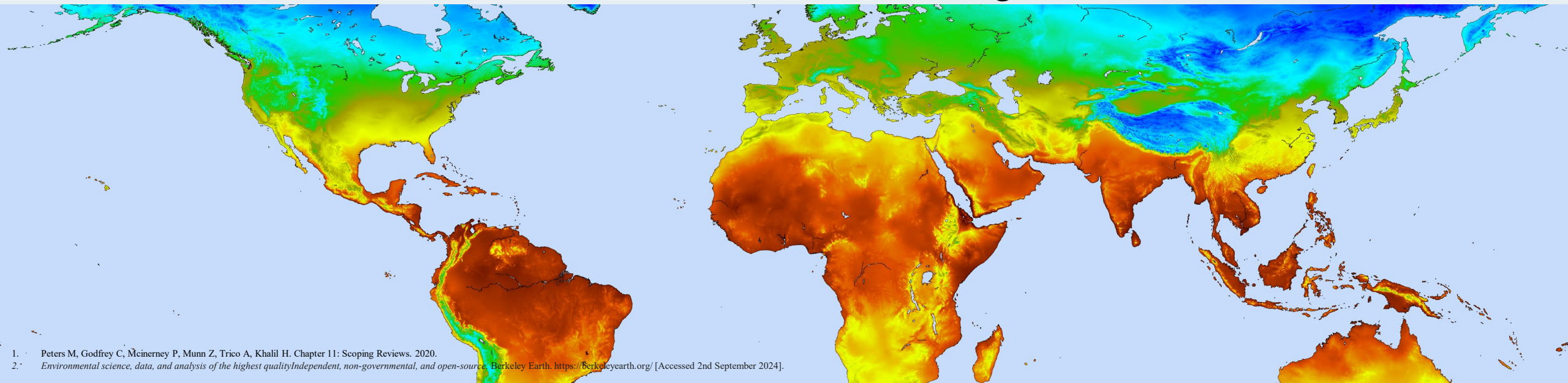
Context :

- LMICs - World Bank Definition

C

Concept:

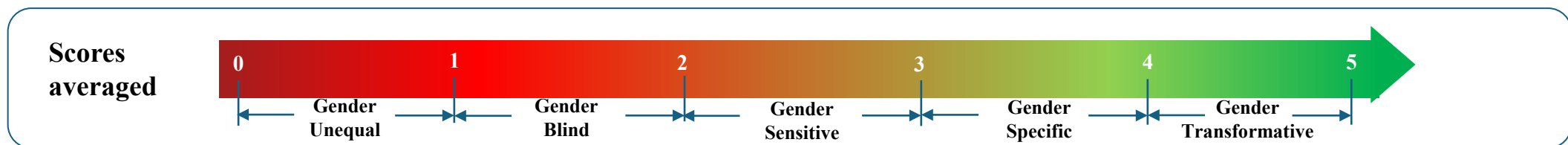
1. EH adaptation interventions for health at the community level.
 - Behavioural adaptations
 - Technical adaptations
2. Integration of Gender



Analysis: Assessment of Integration of Gender

 WHO framework on assessing Gender Responsiveness of Policies and Programmes ^(1,2)

Category	0	1	2	3	4	5
Objectives and Approach	No gender-related objectives, consultation, accountability or budgetary allocation.	Discriminatory objectives reinforce existing stereotypes.	Gender not considered or intervention and budgetary allocation based on stereotype.	Basic consultation with some tailoring of intervention to gendered needs.	In-depth consultation and tailoring of intervention with dedicated resources and accountability for gendered needs.	Transformative objectives, challenges gender inequalities with significant resources allocated for gender.
Participation and Consultation						
Intervention						
Accountability						
Budget and Resources						



1. CID 02458676 Integrating Gender in Health Interventions for Adapting to Extreme Heat in LMICs: A Scoping Review Masters thesis. Imperial College London; 2024.
 2. World Health Organisation. Gender and health. https://www.who.int/health-topics/gender#tab=tab_1.

Scoping Review: Inclusion and Exclusion Criteria ⁽¹⁾

Inclusion Criteria

- ✓ *Primary studies* from *Peer-Reviewed Literature*.
- ✓ *Human studies* conducted in *LMICs* as defined by the World Bank.
- ✓ *Community-level* interventions aimed at adapting to extreme heat.
- ✓ Interventions encompassing either *behavioural or technical adaptations to EH*
- ✓ Studies *must report health outcomes* related to EH (morbidity, mortality)
- ✓ Interventions must be in *English* and published between *2013 and 2024*.

Exclusion Criteria

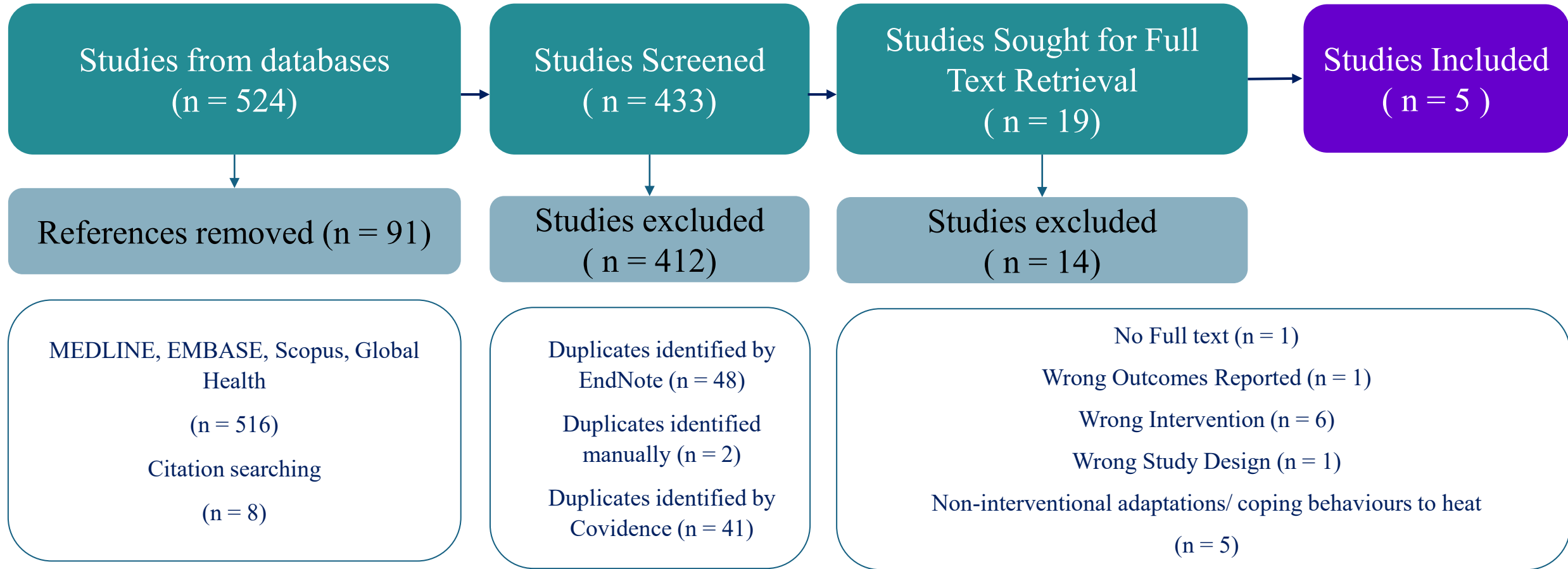
- ✗ Studies conducted in High/ Upper Middle-income Countries or regions not classified as LMICs by the World Bank.
- ✗ Gray Literature
- ✗ Non – human studies.
- ✗ Interventions at the individual level Or National Level adaptations to heat.
- ✗ Studies that do not report health outcomes.
- ✗ Interventions or studies outside the timeframe.
- ✗ Studies not available in English.



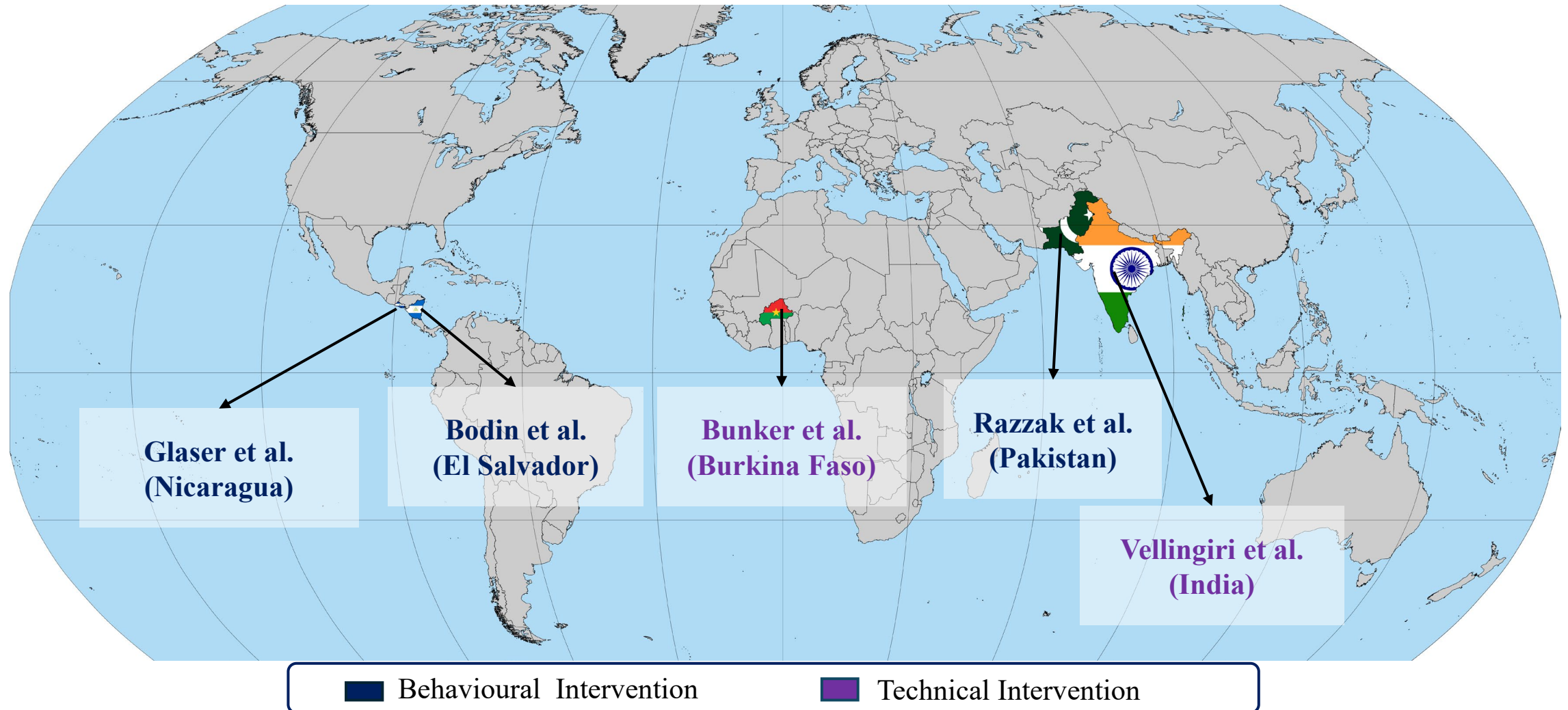
Results



Studies that made the cut...



What are the **community-level heat adaptation interventions** in **LMICs** for health?



What are the **community level heat adaptation interventions for health**, in LMICs?

Year	Author	Country	Intervention	Study Design	Population Urban/ Rural; Size	Health Outcomes
2022	Razzak et al.	Pakistan	Awareness Programme	Randomised controlled trial	Urban; 18544 Individuals	Mortality reduction, heat-health knowledge, behaviours
2022	Glaser et al.	Nicaragua	Water, Rest, Shade Programme	Cohort study	Rural – Coastal.; 525 Workers	Reduction in acute kidney injury (AKI)
2016	Bodin et al.	El Salvador	Water, Rest, Shade Programme	Quasi-experimental	Rural – Coastal; 130 Workers.	Heat-related morbidity, wellbeing, heat-health knowledge
2020	Vellingiri et al.	India	Cool Roofing	Cross-sectional study	Urban Slums;16 Slum Households	Heat-related morbidity, wellbeing, heat-health knowledge
2024	Bunker et al. (Ongoing)	Burkina Faso	Cool Roofing	Randomised controlled trial	Urban; 1200 Individuals	Heat-related morbidity, life satisfaction, gender-based violence, food consumption

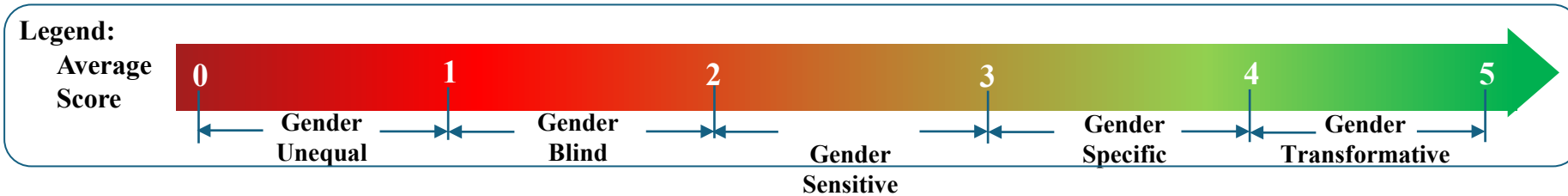
■ Behavioural Intervention ■ Technical Intervention

Extent to which gender is incorporated within these strategies...



1. WHO framework on assessing Gender Responsiveness of Policies and Programmes

	Vellingiri et al.	Razzak et al.	Glaser et al.	Bunker et al.	Bodin et al.
Average Score	4.5	2	2.5	2.5	2.75



2. Narrative Analysis of the full text

	Vellingiri et al.	Razzak et al.	Glaser et al.	Bunker et al.	Bodin et al.
Categorisation	Gender Specific	Gender Blind	Gender Blind	Gender Blind	Gender Sensitive

Discussion and Implications



Critical Gaps

5 out of **524***

Studies reviewed were adaptations for health in LMICs.

*includes duplicates of studies

- ✓ **Poor focus** on Health and **Health Impacts** of EH.
- ✓ **Disproportionate emphasis** on adaptations for **agriculture, livelihoods, and economic security.**

4 out of **5**

Studies did not account for the gender-specific impacts of EH

- ✓ Gender is used as an **additional explanatory variable.**
- ✓ The underrepresentation of women is likely due to the **entrenched gender biases.**

Limitations...

...of the reviewed studies

Sample Size and Representation

External Factors

Reliance on Self-Reported Data

Sustainability and Scalability Challenges

...of the scoping review

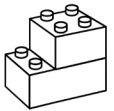
Exclusion of Gray Literature

Exclusion of non-English studies

Diverse study designs

Lack of explicit gender reporting

Recommendations for policy...



Encourage researchers and funders to **explore the intersection of health in existing adaptations.**



Use the **WHO Gender Responsiveness Framework** to guide intervention design.



Engage local communities in all stages of **intervention planning** and implementation.



Prioritize interventions that can be **sustained using local resources and knowledge** in LMICs.

Take Home Messages

Critical Research Gap: Only 5 out of 524 studies focused on health interventions for EH.

Limited Gender Integration: Highlighting the urgent need for more gender-responsive approaches.

Call to Action: Need for interdisciplinary research and gender-transformative interventions to address the disproportionate impact of EH on women's health in LMICs.

Thank You

