Heat Insurance at Work

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Climate change is causing extreme heat now

- In India in 2024:
  - 37 cities surpassed 45° C (113° F)
  - 500 out 741 districts hit 40° C at least once in April/May
  - 3 districts in Maharastra hit 40° C on 48 of 61 days.
- Extreme heat has negative physical, economic and emotional impacts (e.g. Burgess et al. 2017)
- Should social protection systems change to reflect new climate risks?

This paper

- RCT of parametric heat insurance: pays daily wage when temperature passes threshold (41.6° C)
  - Highly subsidised (pay INR300, get INR400 + heat payments)
  - Implemented by the Self-Employed Women's Association (SEWA) in India: 7 states 250,000 women
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- Study impact on behaviours (adaptation, coping strategies) and welfare (health, mental health).
  - Baseline data & participation from SEWA membership database
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- Big picture: Can it exist without subsidies? If not, is it a good use of public / philanthropic funds?

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  - Take actions to reduce exposure/damages (e.g. use aircon / drink water / reduce work hours)
- Why might government intervene:
  - Missing insurance market → support (make obligatory, subsidise) or provide (social insurance)
  - Inefficiently low adaptation → information / subsidies / fix credit markets

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- Key climate adaptation question: do something different or make existing systems work better.

The Self-Employed Women's Association has 3.2 million members

Vendors and Hawkers

Home-based Workers

Labour & Service Providers

Producers (e.g. farmers)

Qualitative impacts of extreme heat on SEWA members

Consistent with empirical literature

- Heat-related health impacts
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- Loss of income → financial and emotional distress
  - High interest informal loans, sale of productive assets
  - Mental stress of financial challenges and increased care responsibilities

Responses to a hot day

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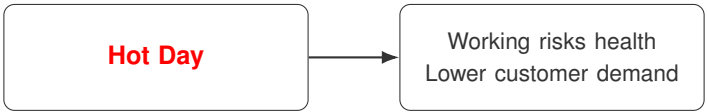

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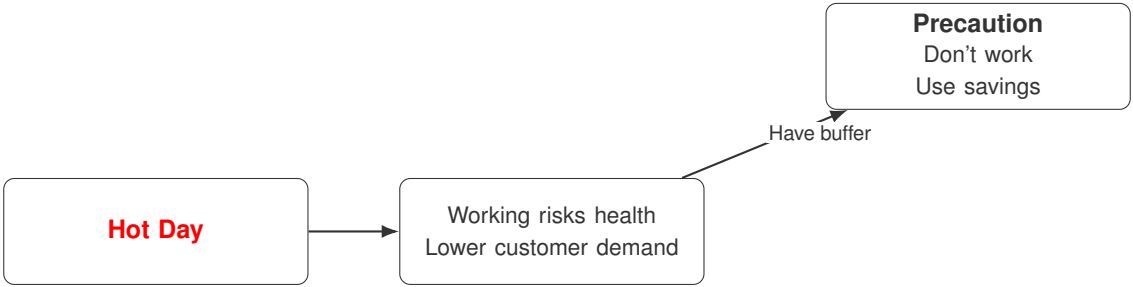

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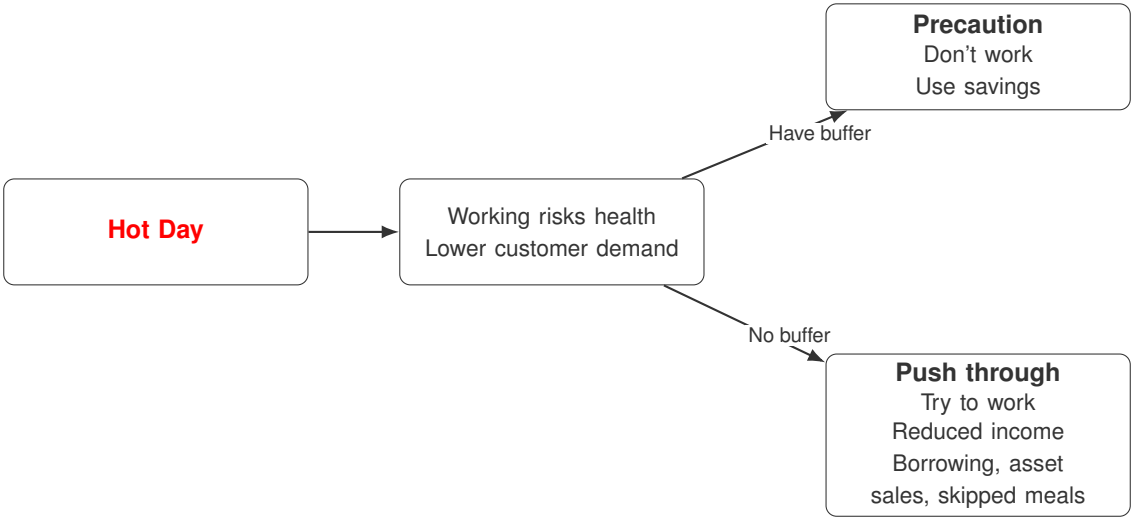

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- A reminder about the health and livelihood risks associated with extreme heat
- A signal that a threshold exists beyond which conditions are especially hazardous
- A message of support - conveying that "someone is looking out for me" during climate stress

A Theory of Change

Sign-up
Increase expected
income after hot days
Shift climate beliefs?

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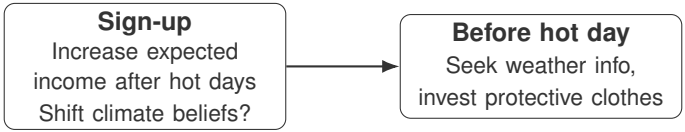

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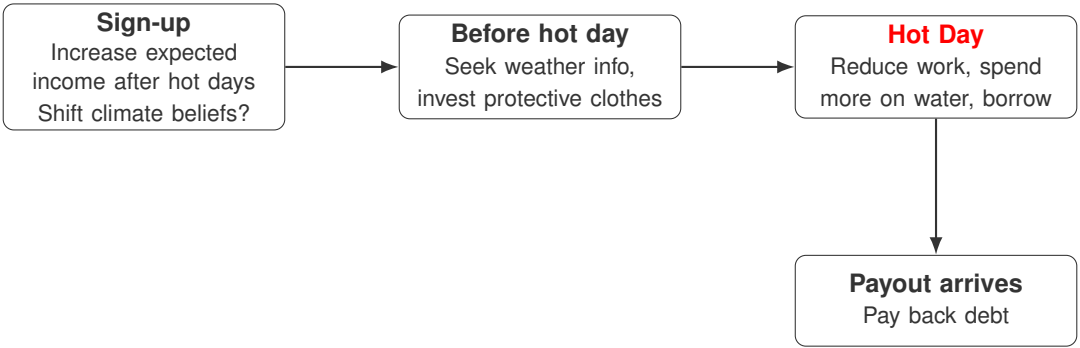

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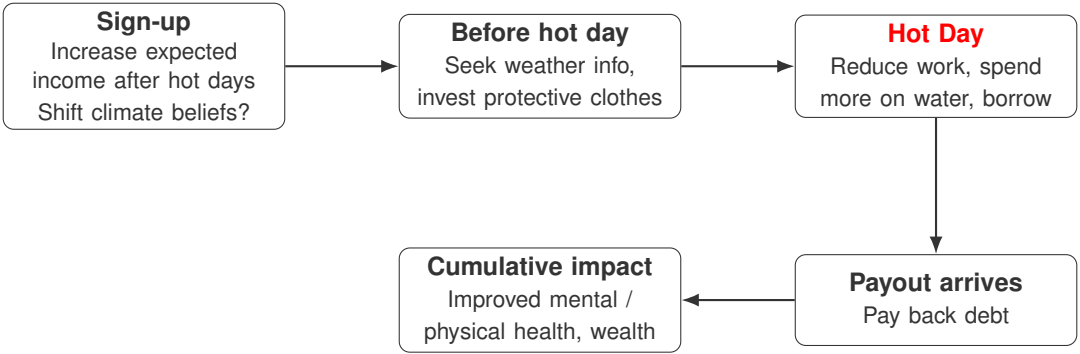

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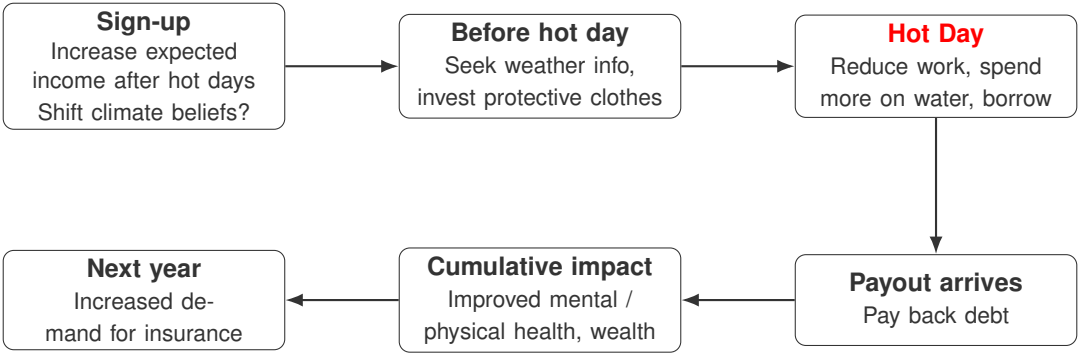

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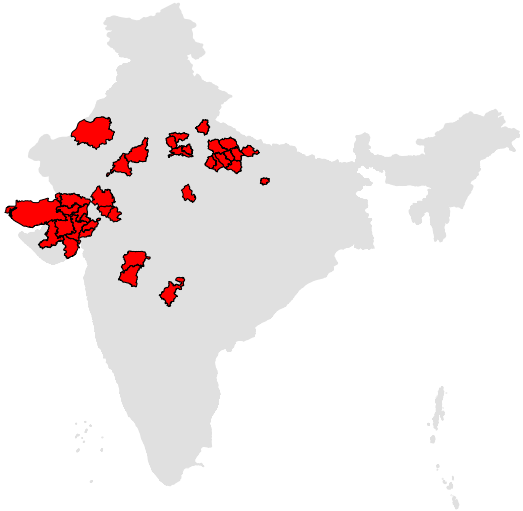
- Use village-level treatment assignment as an IV for individual participation.

Study covers 5,631 villages in Gujarat, UP, Rajasthan, and Maharashtra



Key outcomes

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- **Use of financial coping strategies** e.g. skipping meals, borrowing, or selling assets.

Secondary outcomes

- Heat-related health problems
- Healthcare use (expenditure and visits)
- Assets and liabilities
- Consumption and income
- Women's empowerment
- Climate beliefs and willingness to pay for insurance
- Understanding of insurance mechanisms
- Spillovers on household members (e.g., labour supply, education)

Heterogeneity analysis (examples)

- **Occupation:**
  - Differences in workplace, conditions and flexibility impact (i) heat exposure (ii) avoidance potential.
  - Test for heterogeneity by occupational group, ‘heat exposure’ and market power.
- **Access to credit and savings:**
  - Insurance may benefit those lacking financial buffers the most.
  - Test for heterogeneity by baseline income and local credit market access.
- **Prior exposure to heat events:**
  - Past heatwave exposure may shift perceptions and responses.
  - Construct weather histories from secondary data.

Number of payments RDD

- Leverage payout threshold to implement regression discontinuity design (RDD).
- Compare “just eligible” vs. “just ineligible” by simulating eligibility under slightly adjusted thresholds.
  - **Control group**: villages that would have received an additional payout under a higher threshold.
  - **Treatment group**: villages that would have received one fewer payouts under lower threshold.