

# Understanding cooling poverty and thermal comfort in disadvantaged communities of Rio de Janeiro



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## Rationale

The increase in duration, frequency, and magnitude of heatwaves around the world poses serious risks to human health. Access to thermal safety in such a changing climate should be targeted as a priority. It is, however, exceptionally understudied in development and energy poverty studies. Current definitions of energy/fuel poverty tend to focus on heating rather than cooling. This research aims to fill a gap in the literature and contribute to the field with empirical evidence of how low-income marginalised communities find intuitive strategies to deal with excessive heat in a tropical megalopolis.

## Aim

This project aims to understand the lived experiences of cooling poverty in vulnerable black communities and the interactions between different sources of material and immaterial deprivations.

## Summary of research activity

Upon obtaining the ethical approval by the Central University Research Ethics Committee (CUREC) in April 2021, the partner NGO in the field was able to identify a total of 38 participants from vulnerable communities. Upon signing the consent forms, participants were engaged in virtual ethnography. Participants have been given some vouchers as a token for their participation in this research and for their time. Alongside the qualitative interviews, we also included energy biographies (also known as energy diaries) in which five participants related their daily struggle with heat and energy poverty.

## Methodologies

Virtual ethnography, qualitative interviews, energy diaries, participatory research, visual and art-based methods.

## Findings

Increasing temperatures and heatwaves are a deadly threat to three-quarters of the global population. Paying the highest price of global warming are the most vulnerable and impoverished people, especially in emerging economies, where systemic and historical inequality in combination, with unplanned urbanisation, creates new forms of climate change-related thermal vulnerabilities. This project aims to understand the challenges for vulnerable communities to achieve cooling comfort and reflects on the notion of 'cooling poverty' intended here as a condition resulting from a multitude of systemic, material, and spatial deprivations affecting people's health and lived experiences with thermal comfort. The case study is Rio de Janeiro, home of more than 1,000 informal settings (favelas) in which 1.5 million people, mostly part of the black community, live because of racial laws that denied them access to land in 19th century. This makes the favelas and Rio's suburbs prevalently composed of black impoverished communities who suffer systematic societal exclusion and material deprivation. In this underprivileged tropical geography, cooling poverty interlinks with other forms of deprivation, which put people's physical and mental wellbeing at risk.

Through virtual ethnography in marginalised communities, this research found that:

- Marginalised communities lack access to ventilation, green and blue surfaces.
- People in marginalised communities live in thermally unsafe dwellings due to inadequate building materials and dwelling clustering.
- Intuitive solutions such as hydro practices (using water to cool the body during the day) are widely diffused in the favelas as a coping strategy, however, the lack of sanitation and safe drinking water jeopardise the effectiveness and safety of cooling strategies.
- Impoverished people in Rio de Janeiro lack access to public drinking water stations.
- Outdoor workers (who are generally favelas dwellers) are exceptionally exposed to heat and humidity and lack essential basic cooling solutions such as shading and potable water.
- Participants report an increase in illegal energy connections due to the increasing need for cooling, in combination with high unemployment rates and high energy bills occurred in the last two years.
- Participants reported an increase in the frequency of electricity interruptions due to overload.
- Participants were unaware of most of the energy safety nets available to help with cooking energy and discounts in electricity tariffs.
- Generally, the speed with which the energy utility fixes energy interruptions is proportional to the income level of the area affected by short, localised blackouts. This implies that there are issues of inequalities not only in access but also in maintenance and operation of the grid.
- Thermal comfort and thermal safety are not contemplated in public policies.

## Recommendations

1. Increasing temperatures should drive the creation of public policies that consider access to cooling comfort as a human right.
2. Energy safety nets should be accompanied by building retrofit programmes (passive cooling) to improve the thermal comfort of indoor spaces for the local climate.
3. Building code regulations should be appropriate to the local climate and should take account of increasing temperatures.
4. Tropical urban areas should consider the negative effects, on people and infrastructures, of the combined heat and humidity increases.
5. Policies regulating urban planning and design should consider the adoption of cooling surfaces (white paint, reflective surfaces, and nature-based solutions).
6. Cooling centres should be made available and freely accessible in the city for the most vulnerable and marginalised groups.

## Outputs

1. Two original research papers have been drafted and soon to be submitted to top ranking journals.
2. A policy brief drafted with the collaboration of two in-kind contributors (Khosla and Yenneti), which will be presented to policymakers in Brazil and to the advisory board of the Future of Cooling (University of Oxford).
3. Some of the findings of this research have been helpful for my contribution to Chapter 6 of the '[Handbook of Cooling Beating the Heat: A Sustainable Cooling Handbook for Cities](#)' published in November 2021 at COP26, by UNEP and the Cool Coalition, United Nations Environment Programme (UNEP), RMI, Global Covenant of Mayors for Climate & Energy (GCoM), Mission Innovation and Clean Cooling Collaborative.
4. Some findings of this research have been helpful in writing the press piece '[How to survive in an ever-warming world](#)'- with United Nations Framework Convention on Climate Change (UNFCCC).
5. One is the participation in a workshop at University of Venice titled '[ENERGYA 2nd scientific workshop - Frontiers in climate change adaptation](#)'.
6. Organisation of a photographic exhibition in Venice, featuring pictures from this research
7. This research has been nominated for the [Innovation Award in Energy Social Sciences and Humanities](#), EnergyShiftEU in the categories ESASociology and Energy Geography.

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## About the Funder

The [Fuel Poverty Research Network](#) (FPRN) was established in 2016 by researchers who were all concerned with different aspects of the interaction between people, homes and energy. The charity supports researchers and facilitates dialogue between researchers, policy and practice. FPRN's grant programme, Engaging in Energy Poverty in Early Career (EPEC), supports early career researchers (ECRs), postgraduate students (PGRs), and early career practitioners (ECPs) based in any country to contribute to efforts to tackle fuel and energy poverty through original research and publication.

