

# FROM INTRA-URBAN INEQUITIES TO ULTRA-LOCAL ACTION

How the Urban Health Observatory turns mixed-methods evidence into city decisions

Mixed methods • ultra-local data • co-production • action

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**Data to Decision: City Health Data for Action**

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# Cities are not homogeneous

## Belo Horizonte

**Population (2022):** 2.315.560

**Area:** 331.354 km<sup>2</sup> (0.06% of MG)

**Density:** 6.988,2 inhab./km<sup>2</sup>

**HDI (2010):** 0.81

**GINI Index (2010):** 0.61

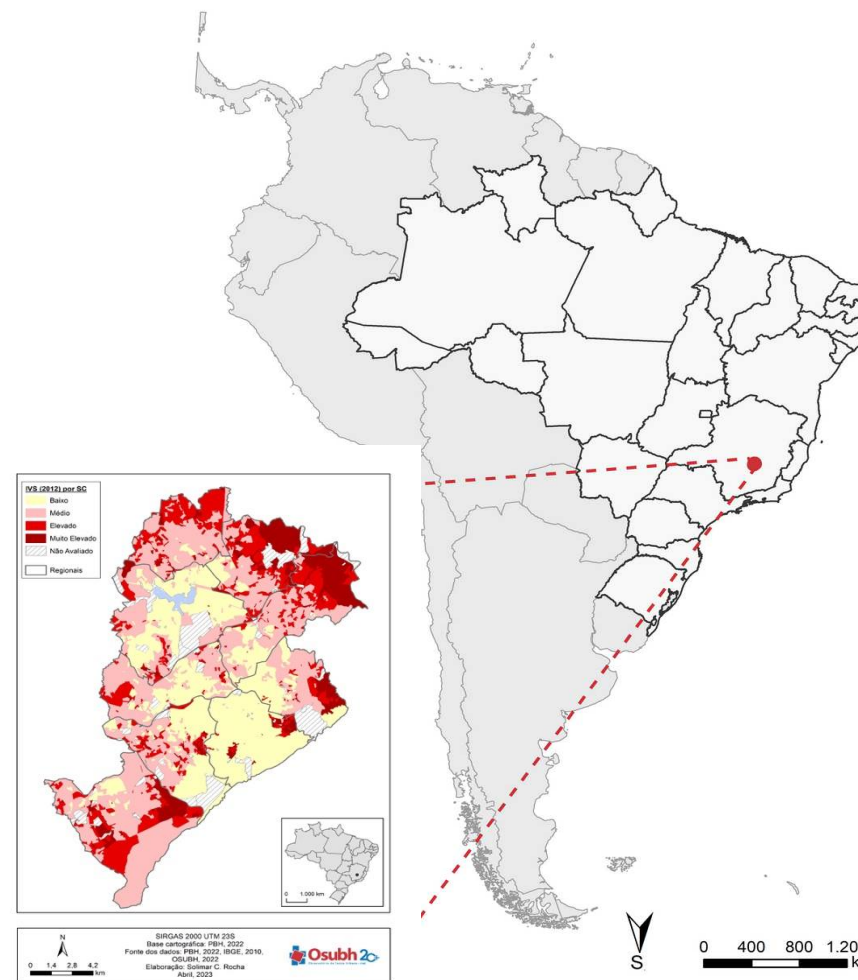
**Elevation:** 852 m avg.

**Climate:** Tropical with dry season

**Biomes:** Cerrado & Atlantic Forest

**Watersheds:** 3 main systems

**Preservation:** 4 main areas



**Social Vulnerability Index**

# Health follows a clear social gradient within cities

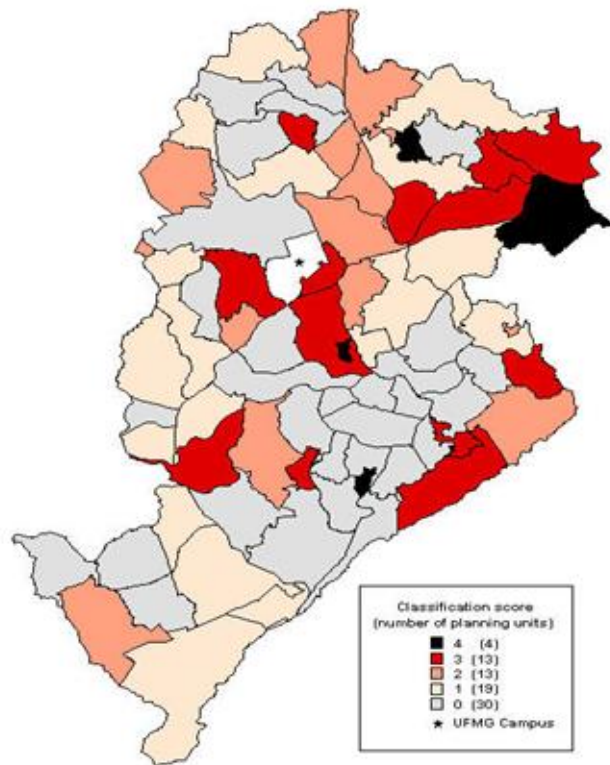
## Coexistence of diseases, 1997-2003

Cad. Saúde Pública, Rio de Janeiro, 21(3):958-967, mai-jun, 2005

**The urban environment from the health perspective: the case of Belo Horizonte, Minas Gerais, Brazil**

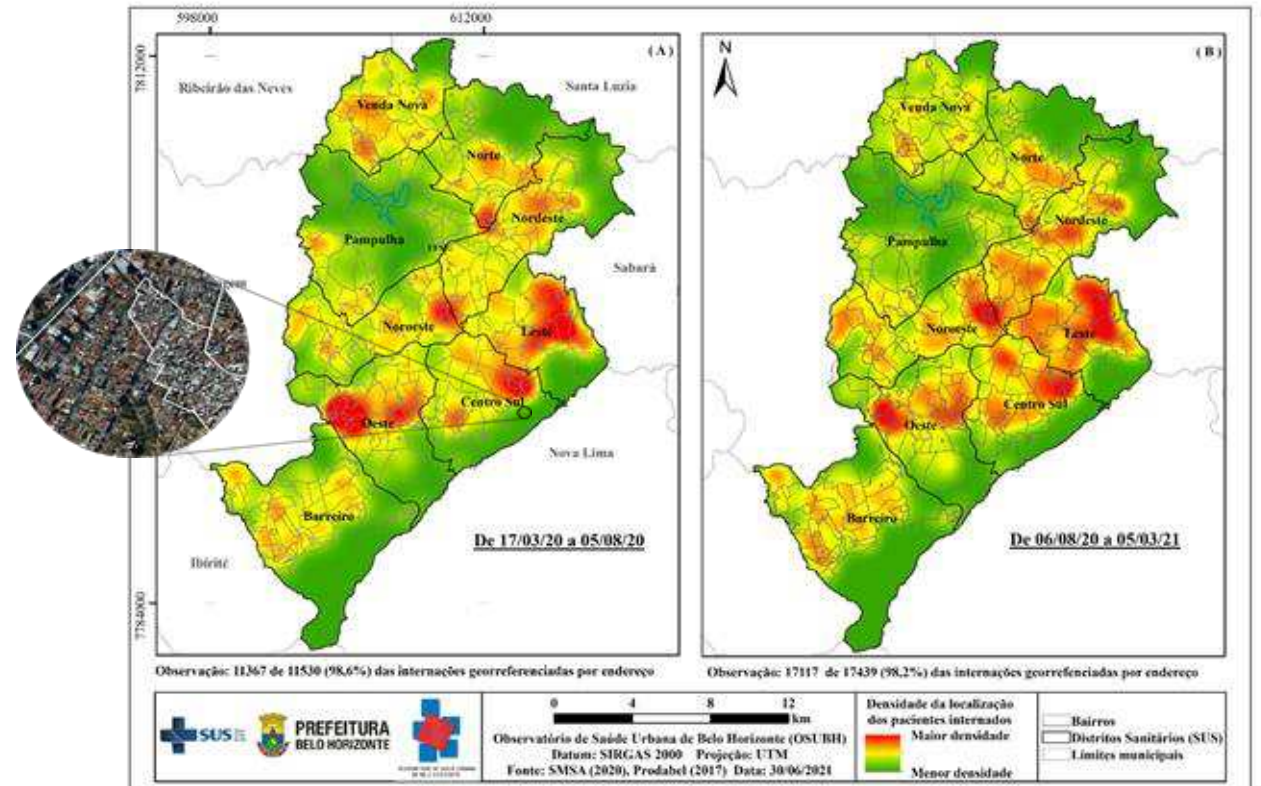
O urbano sob o olhar da saúde:  
o caso de Belo Horizonte, Minas Gerais, Brasil

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Homicide  
 Adolescent mothers (<20y)  
 Asthma hospitalization ( $\leq 5y$ )  
 Dengue  
 Visceral Leishmaniasis

Caiaffa et al., 2005.



InfoCOVID, 2021-22; Poirier et al, 2024.

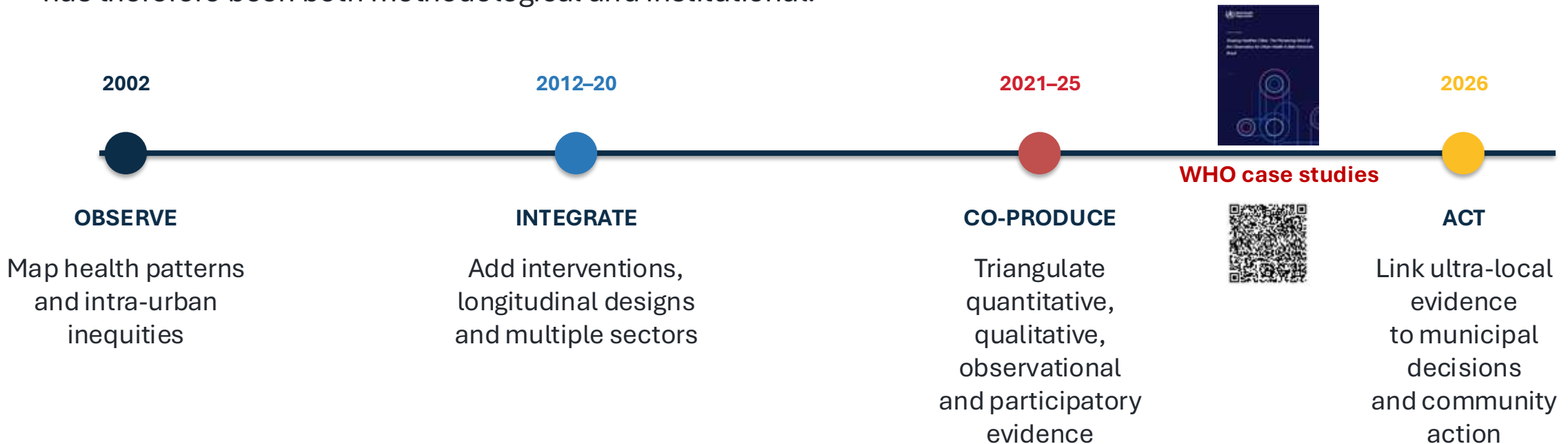
<https://www.medicina.ufmg.br/coronavirus/informacao/infocovid/>

**Who is at risk, where are they, what combination of conditions produces that risk, and what can we do differently in that territory?**



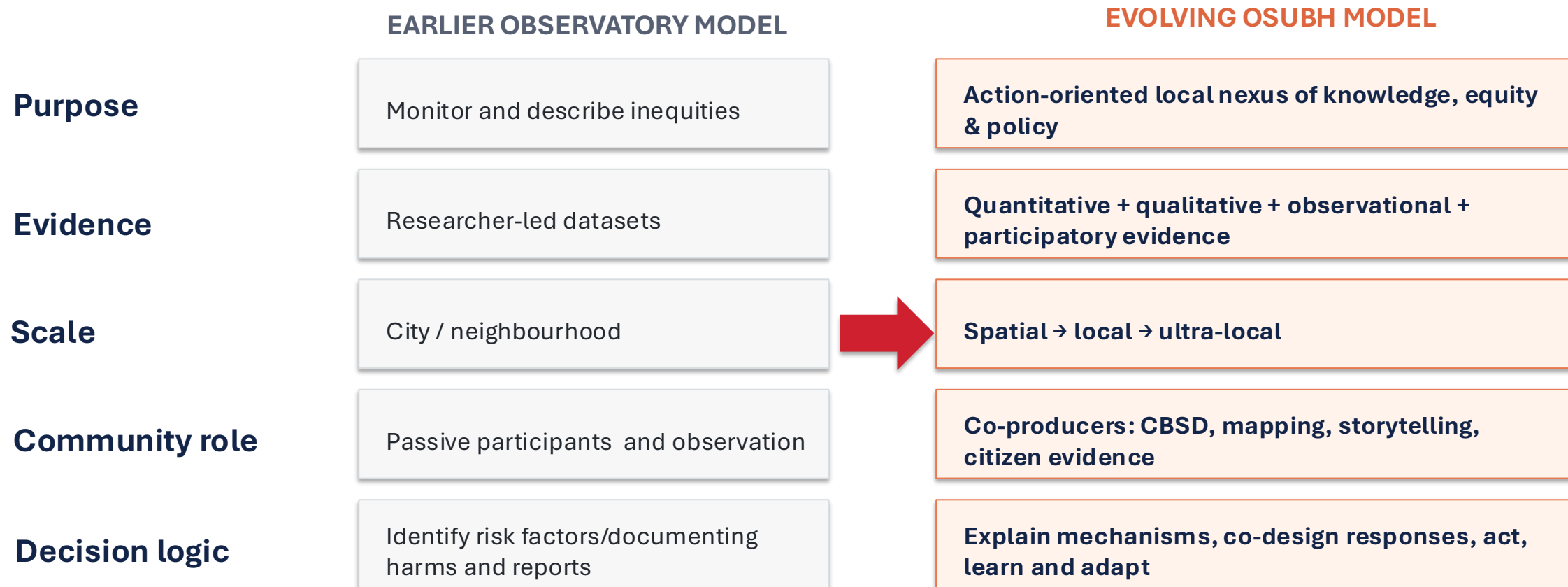
# OSUBH has evolved because cities are not averages

Health is unevenly distributed within cities; social, environmental, and climate risks overlap. OSUBH's evolution has therefore been both methodological and institutional.



**The shift is not simply toward more data. It is toward a different relationship between data, territory, people and decision-makers.**

# The paradigm shift: from observing inequities to co-producing action



*From social determinants of health (SDoH)*

*To social determination of health (SDnH)*

Marmot et al., 2008; Breilh, 2021; Borde et al., 2019

**From mixed-methods and ultra-local data to  
actionable territory.**



# Why mixed methods matter: measured gains $\neq$ lived reality: BH-Viva Project

## WHAT QUANTITATIVE DATA CAN SHOW

- ↓ violence rates
- ↑ housing conditions
- ↑ infrastructure access
- ↑ aggregate health indicators

BH-VIVA: measurable gains after urban transformation

## WHAT QUALITATIVE DATA REVEAL

- persistent fear and insecurity
- loss of social ties & displacement
- constraints in new housing and shared spaces
- environmental risks and unfinished works

Mechanisms, trade-offs and unintended consequences

**Mixed methods change the question from “Did it work?” to “For whom, how, where — and at what cost?”**

Dias et al, 2019; Friche et al, 2015

# Ultra-local data: from city averages to actionable territory

ULTRA-LOCAL = GRANULAR + CROSS-SECTORAL + PLACE-BASED

- 1 LOCATE THE INEQUITY
- 2 INTEGRATE VOICES & MAP THE SYSTEM
- 3 IDENTIFY LEVERAGE → ACTION

Ultra-local data are useful when they sharpen targeting, interpretation, and action.

# Ultra-local data become actionable through community-informed research



- Community-Based System Dynamics approach, leveraging shared learning across 4 cities to evaluate climate challenges in Global South Cities:  
**Global Diet and Activity Research Network (GDAR)**

- Belo Horizonte (BH, Brazil)
- Yaoundé (Cameroon)
- Kingston (Jamaica)
- Kisumu (Kenya)



Morais LMO, Borde E, Tatch L, Thondoo M, Wayas FA, Gordon-Strachan G, Obonyo C, Assah F, Oni T, Caiaffa WT and Garcia L (2025) Collective learning for resilience in Global South cities: a community-based systems mapping approach to integrated climate and health action. Front. Public Health 13:1582550. doi: 10.3389/fpubh.2025.1582550

# Ultra-local data: from city averages to actionable territory – MapIO Project

## MapIO: mapping intra-urban inequities and opportunities in Belo Horizonte

- **Quantitative component**

**49 indicators** across demographic, social, economic, health, public safety, environmental and climate domains

**11 secondary databases:** public sources and municipal institutes and departments

**Unit of analysis: the neighborhood** (493 neighborhoods)

Compatible with all indicators

Recognized by civil society, which makes **co-creation** and **co-participation** in urban policy possible

- **Qualitative component**

**60+ interviews** with residents of selected neighborhoods

**Participatory workshops** with managers and civil society

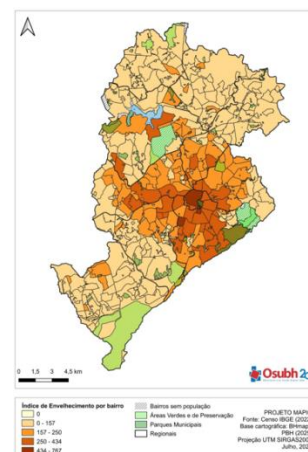
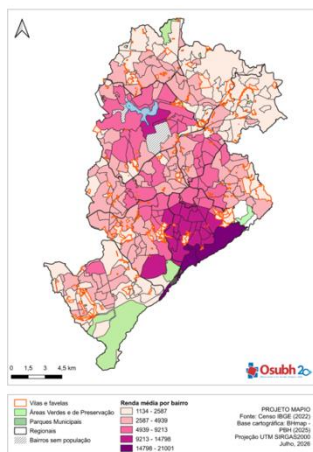
**Neighborhood-level data reveal what averages hide, and lived experience helps us read them better.**



# Ultra-local data: accumulation of vulnerabilities – MapIO Project

Monthly household head income: US\$ 400.00  
(US\$ 1,133.50–R\$ 21,000.70)

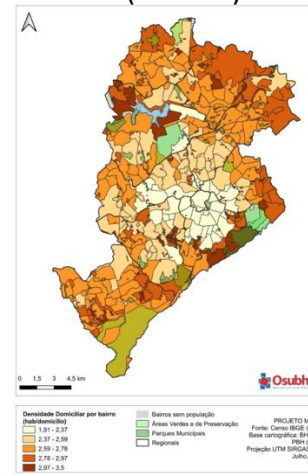
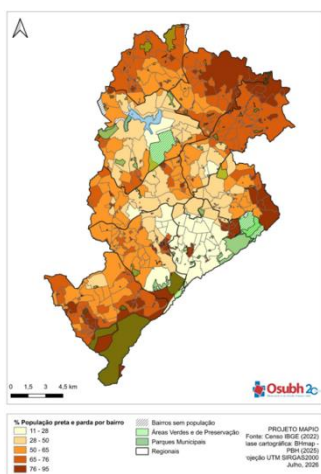
Population Aging index (60+/0-14 yo): 129/100  
(8.5–766.7)



- From CBSD:
  - More older people in vulnerable situations live in middle-class neighborhoods.

Black and Brown population: 56.2%  
(11.3–94.7)

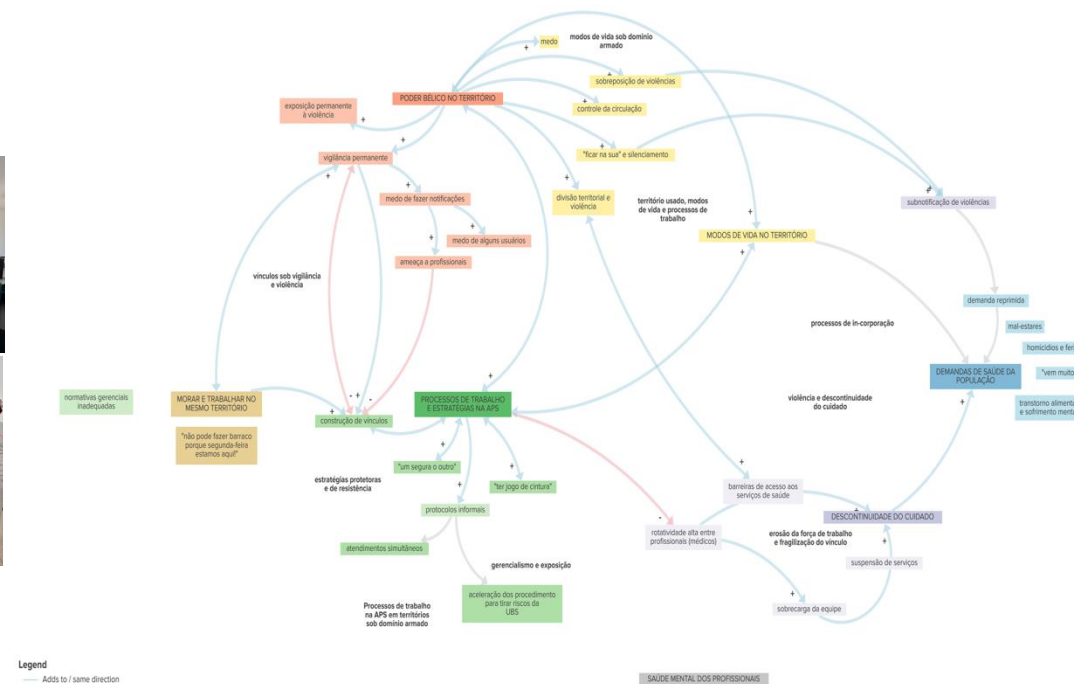
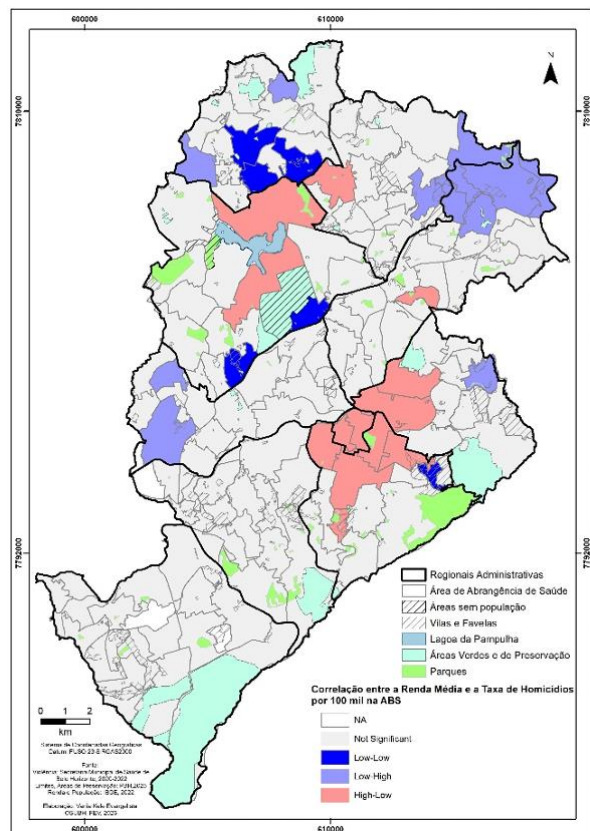
Household density: 2.6 inh/hh  
(1.9–3.5)



- From CBSD:
  - Racial segregation is inversely superimposed with household density and directly related to lower household income.

# Ultra-local data: from city averages to actionable territory – MapIO & Segregation Project

Average income (BRL) and homicide rate by health unit catchment area (2022-2024)



**Ultra-local data are useful when they sharpen targeting, interpretation and action.**

# From science to city action: Belo Horizonte Heat Protocol (2026)

## RESEARCH

Neighbourhood-scale heat mortality and social, built and natural modifiers.

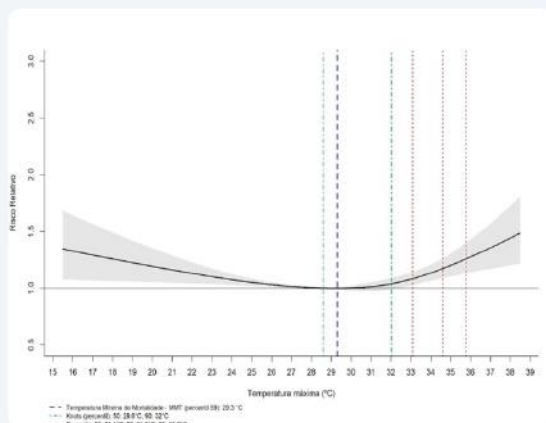
## PARTICIPATORY

Align evidence with local needs, capacities and vulnerable groups.

## ACTION

Translate thermal thresholds into alert levels and municipal response.

### Mean Mortality Temperature (MMT)



### Heat Alert Levels in Belo Horizonte

| Level   | Criteria for the alert level |                  | Classification     | Health risk |
|---------|------------------------------|------------------|--------------------|-------------|
|         | Tmax                         | Consecutive days |                    |             |
| Initial | 29.3°C - 31.9°C              | -                | attention          | very low    |
| Alert 1 | 32°C - 33.1°C                | 3 days           | low-intensity heat | low         |
| Alert 2 | 33.2°C - 34.6°C              | 3 days           | moderate heat      | moderate    |
| Alert 3 | 34.7°C - 35.8°C              | 3 days           | intense heat       | high        |
| Alert 4 | > 35.8°C                     | 2 days           | extreme heat       | very high   |

**Example of “data to decision”: epidemiologic thresholds → operational alert categories → city protocol.**

Ultra-local data are useful when they sharpen targeting, interpretation and action.

## Ultra-local data: from city averages to actionable territory – Climate Change Governance

Belo Horizonte: institutionalising the link between evidence and municipal action

### LEGAL MANDATE

Municipal climate and disaster-risk policies anchor health protection in public decisions.

### INSTITUTIONAL CAPACITY

The Climate Change Coordination (COEMC) links health, civil defence and urban sectors through defined responsibilities and decision flows.

### OPERATIONAL INSTRUMENTS

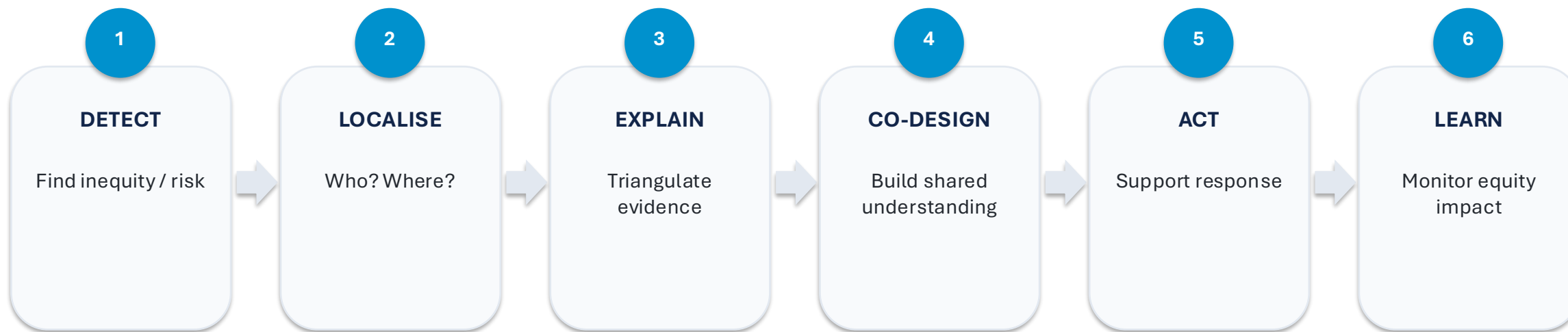
The Heat Protocol connects local risk thresholds to alert levels. Sectoral procedures and a unified contingency plan are under development.

### HEALTH SURVEILLANCE AND EQUITY

Strengthen climate-sensitive surveillance, prioritise vulnerable territories and use monitoring to refine responses.

**Climate adaptation requires permanent governance that connects evidence to implementation.**

# The OSUBH data-to-decision operating model



- Our experience in Belo Horizonte has taught us that better data are necessary, but they are not sufficient.
- The real transformation occurs when local evidence is combined with community knowledge, intersectoral collaboration, and political commitment.
- Cities do not simply need more dashboards.
- They need the **capacity to translate evidence into decisions, decisions into action, and action into greater health equity.**

***Measure the city. Listen to the territory. Act with communities.***

Learn more of OSUBH at:



# THANK YOU

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Learn more about OSUBH and its initiatives in our institutional video:

