



Irrigation Without Drinking Water: Urban Migration, Gendered Water Inequities, and Health and Nutrition Impacts in Southern Peru



Jorge L. Cañari-Casaño¹, Hilary Creed-Kanashiro¹, Krysty Meza¹, Lesli Hoey², Emily Treleaven³, Andrew D Jones⁴.

1. Instituto de Investigación Nutricional, Lima, Perú. 2. Taubman College, Urban and Regional Planning Program, University of Michigan, Ann Arbor, MI, United States. 3. Institute for Social Research, University of Michigan, Ann Arbor, MI, United States. 4. School of Public Health, University of Michigan, Ann Arbor, MI, United States.

Introduction

Rapid Urban Growth and Water Inequity

- Rapid rural-to-urban migration is reshaping intermediate cities across the Global South.
- Infrastructure expansion often lags behind demographic growth.
- Majes, Southern Peru:
 - Uninhabited desert in the 1980s
 - 200,000 residents by 2025
- Growth driven by agricultural expansion and migrant labor

Research Question

- How are structural water inequities produced and reproduced?
- What are the implications for:
 - Enteric disease?
 - Dietary practices?
 - Gendered labor burdens?



Results

Territorial Stratification of Water Access

- Central areas: continuous piped supply
- Nearby settlements: 2 hours every 13 days
- 30 peri-urban settlements: weekly tanker delivery
- 90% of agricultural households lack potable water
- Water quality monitoring is limited to formal urban zones

Structural Drivers

- Informal urban expansion
- Infrastructure lagging behind demographic growth
- Prioritization of agricultural water use
- Fragmented, male-dominated governance

Gendered Burden

- Women disproportionately manage treatment, storage, and rationing under intermittent supply, reporting:
 - Chronic stress
 - Increased unpaid labor
 - Responsibility for preventing child illness

Health and Nutrition Impacts

Participant-reported:

- Recurrent gastrointestinal illness
- Diarrhea and skin conditions in children

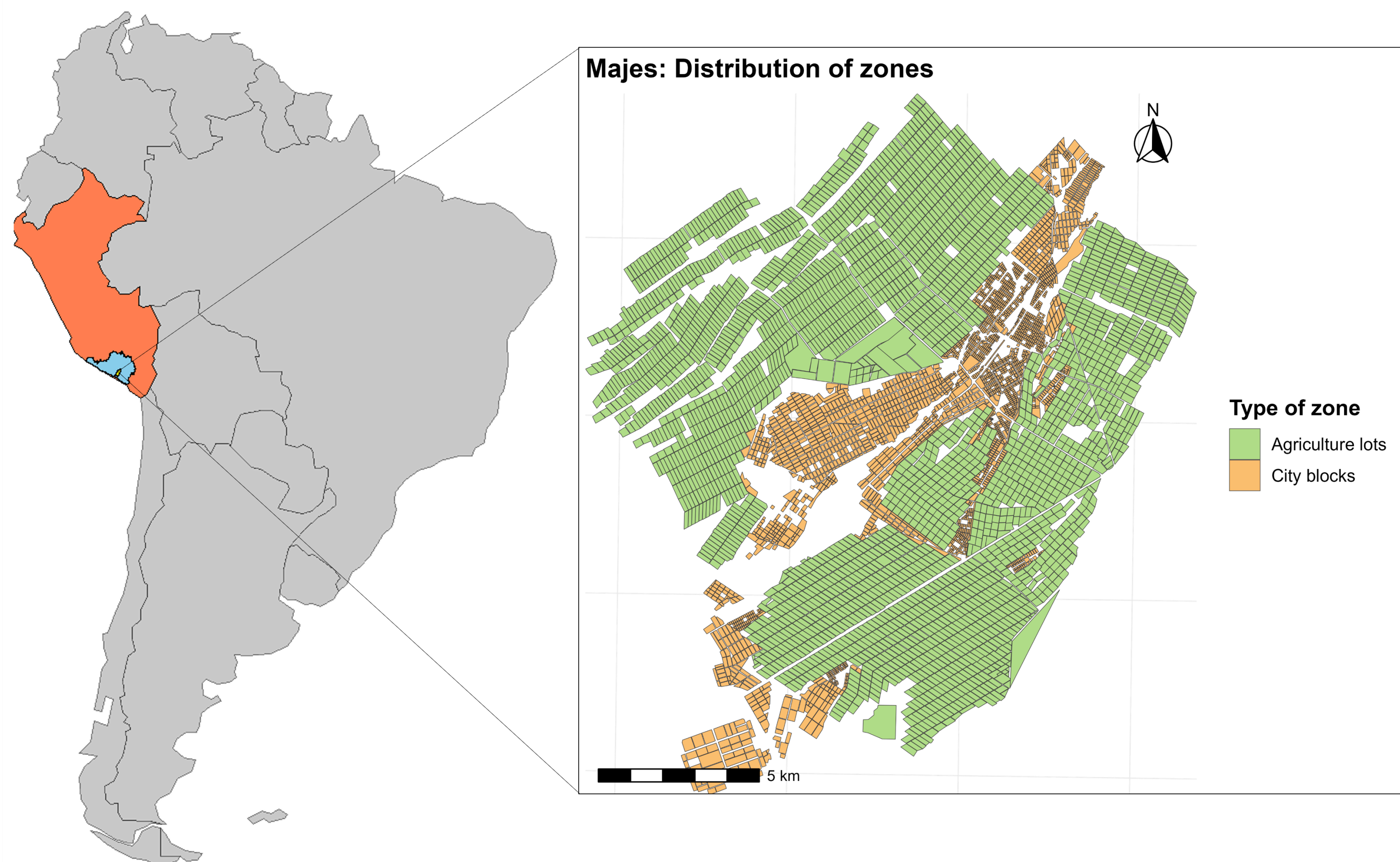
District incidence (2023–2025):

- Enteric infections: >1,990 per 100,000
- Parasitic infections: 907 → 1,649 per 100,000

Dietary adaptations:

- Less options to cook and prepare food.
- Reduced dietary diversity
- Greater reliance on processed beverages
- Changes in food's sensory characteristics are perceived.

Funding: Center for Global Health Equity, University of Michigan



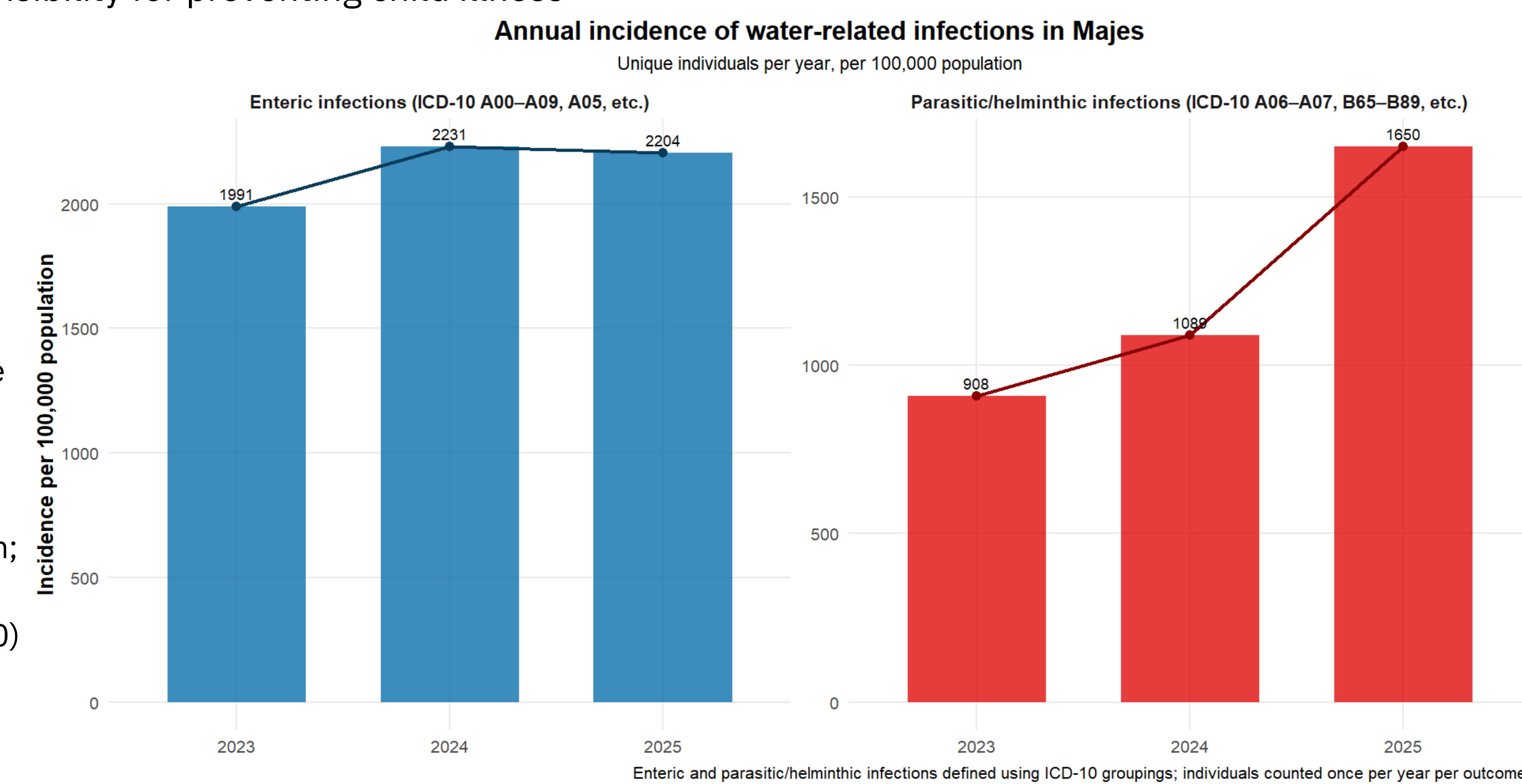
Methods

Study Design (2026)

- 5 Focus Groups (n=37)
- 27 In-depth Interviews
 - Residents
 - Migrant agricultural workers
 - Local authorities
 - Water management officials
- Ethnographic observation of household water use
- District health service records (2023–2025)

Analytical Framework

- Qualitative analysis: social determinants of health; gender analysis
- Estimation of enteric & parasitic infection (ICD-10) rates per 100,000 inhabitants
- Data Triangulation



Water insecurity in Majes reflects a health equity and public health crisis, driven by unplanned urban growth, disproportionately burdening women and worsening enteric disease.