HERA

COUNTING THE COST OF HEAT: THE CASE FOR URGENT SOLUTIONS FOR CITIES

Deep-dive report series: Monterrey, Mexico

Heat in Monterrey has a high and rapidly rising human cost

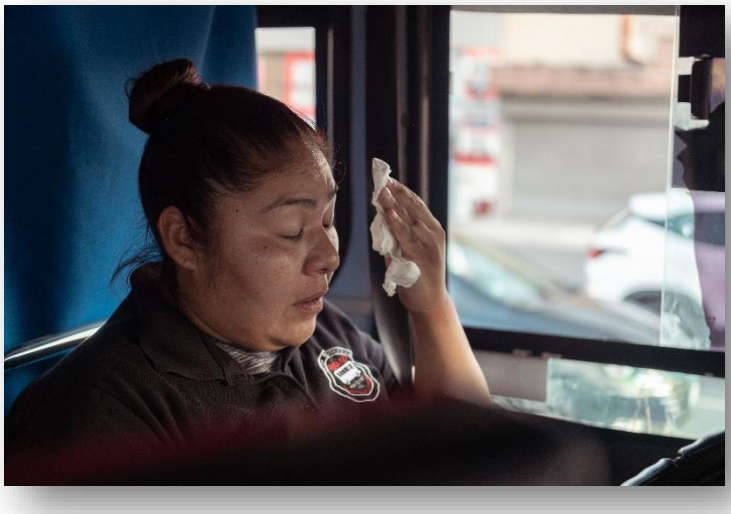
Monterrey is accustomed to hot, dry conditions, but recent years have seen a marked intensification in extreme heat events. In May 2024, a prolonged heatwave pushed temperatures to nearly 50°C (over 120°F), resulting in at least 125 deaths in the region.[1] Subsequent attribution studies have found this event to be 35 times more likely because of climate change.[2] Such heatwaves are projected to become far more frequent, with heatwave days in Monterrey projected to triple by 2050 under a business-as-usual warming scenario. These impacts are amplified by the city's built environment: Monterrey has relatively little green space, and the urban heat island effect pushes temperatures in the city center up to 5°C (9°F) hotter than surrounding areas.[2]

Monterrey illustrates the particular dangers posed by occupational heat exposure to people with underlying health conditions, a growing challenge as populations age, the burden of chronic diseases such as diabetes increase, and heatwaves intensify.

Sarahi's story: working through extreme heat with chronic illness

Sarahi Martinez, a bus driver in Monterrey, is exposed to stifling temperatures as she drives her route each day. Sitting directly behind the hot bus engine, Sarahi navigates the streets of Monterrey in a vehicle that is often overcrowded and without air conditioning, ever since it was banned during the Covid-19 pandemic.[3] These conditions leave her with little defense against the relentless heat in the summer months. "The heat can knock you down…you feel drained, irritable, and really thirsty," she says. Working 12-hour shifts in such conditions before returning home to care for two children, Sarahi – like many women in similar

[1] Le Monde (2024)
[2] Singh (2024)
[3] Charlie to add source



circumstances – faces an array of compounding challenges as heatwaves in Monterrey grow longer, more frequent, and more intense.

To make matters worse, Sarahi lives with diabetes and high blood pressure, making her especially vulnerable to heat-related illness. Both her diabetes and the diuretics prescribed to manage her blood pressure increase the risk of dehydration, which worsens during heatwaves as the body loses more water through sweat.[4] Sarahi once suffered heatstroke while driving and was hospitalized. “Suddenly blood just started coming out of my nose. Then my head hurt, my stomach hurt, I was so thirsty, I felt really weak. I barely finished my route because I couldn’t stop the bleeding,” she recalled. Though doctors stabilized her, the experience left her frightened. Her experience mirrors broader patterns across the city.

In the state of Nuevo León, nearly 13% of adults live with type 2 diabetes.[5] In an average year Monterrey records nearly 2,000 excess heat-related hospitalizations, a large share of which are driven by renal system complications associated with diabetes. Not all cases can be stabilized: our analysis shows that, in an average year, nearly 160 people in Monterrey die from heat-related causes. Without urgent adaptation, that number could rise nearly fivefold – to almost 800 deaths annually by 2050.

Beyond hospitalizations, extreme heat tests a person’s patience – and takes a toll on their mental health. Sarahi describes feeling easily frustrated, snapping at her partner, or finding her job overwhelming. “More than anything,” she says, “heat irritates me a lot. Really, really irritates me.” Research supports her experience: A global meta-analysis found a 9.7% rise in mental health-related hospital admissions during heatwaves, and that every 1°C increase in daily temperature is associated with a 1.7% increase in deaths by suicide.[6]

[4] Kenny et al. (2015)
[5] Seiglie et al. (2024)
[6] Lawrance et al. (2023)

The heat takes a toll not only on Sarahi's health but also on her finances. As she puts it, "What you earn, you lose because of the heat." On the hottest days, nearly 30% of her daily wages go toward staying hydrated – buying water, lemons, and electrolytes to fend off exhaustion. When she was hospitalized with heatstroke, the costs mounted further: she paid for her medications and medical care out of pocket and lost additional income while she recovered. Sarahi relies on her job to support her family, yet the conditions are becoming increasingly punishing. "I'm not used to working this hard in the heat," she admits, "but there's no choice. I have to work."

> "What you earn, you lose because of the heat."

Sarahi's story is representative of a growing city-wide risk from heat, which threatens its development. Heat- and humidity-related labor productivity losses in Monterrey already lead to economic losses worth 0.9% of output a year – without adaptation, this could rise to 1.5% of output by 2050.7 Lower economic output leads to reduced tax receipts and reduces public funding available for health, infrastructure, and development spending. Household-level investment is also affected – losses from extreme heat reduces the amount women in Monterrey invest in their family by $100 each year, which can have long-term impacts on children.

Building resilience in Monterrey begins with heat planning and worker protection

Monterrey is in the early stages of building resilience to extreme heat but has taken important steps to address the growing threat. The city has not yet adopted a dedicated Heat Action Plan, but is developing a broader Climate Action Plan and a city-wide resilience strategy through the Resilient Cities Network.[8,9] Other stakeholders are also advancing adaptation measures, including the Monterrey Institute of Technology and Higher Education, which is implementing a campus regeneration plan that incorporates heat-reducing features such as underground parking to cut surface temperatures, compact development to limit parking demand, shaded public spaces, and road designs that promote natural airflow.[10]

[7] Atlantic Council
[8] Have Your Say Monterrey (2025)
[9] Have Your Say Monterrey (2025)
[10] Sasaki (2025)

To safeguard residents – particularly women like Sarahi who face compounding health and economic risks of working in hot conditions – Monterrey could prioritize two foundational steps:

As part of its resilience strategy, Monterrey can establish a comprehensive Heat Action and Response Plan as a first line of defense. Such a plan would map the specific heat risks faced by vulnerable groups, design early warning systems and emergency response measures (particularly increasing healthcare capacity during heatwaves), and identify long-term strategies to reduce exposure – such as expanding green space and cool infrastructure. The plan could include actions targeted to Moneterrey's most vulnerable residents – including women. For example, Surat's heat action plan is explicitly gender integrated. It incorporated a vulnerability survey that highlighted the differential impacts of extreme heat on women, and included targeted measures in response, such as gender-specific guidance on treating heat-related illness.11 This analysis suggests that every dollar spent on Heat Action Plans in Monterrey could generate $24 in health and economic benefits.12

As Sarahi notes, her exposure to extreme heat occurs primarily in the workplace. Monterrey has a high share of active work, such as manufacturing, where heat can sap productivity and increase the risk of accidents.[13] Implementing and enforcing labor protections – particularly for those without air-conditioning, such as public transport drivers and manufacturing workers – could substantially alleviate these problems. Measures could include permitting air conditioning in buses, shortening routes or shifts during heatwaves, ensuring regular breaks, and guaranteeing access to cold water. Such measures have been found to reduce heat-related illnesses and mortality among workers elsewhere. For example, compliance with Thailand's occupational heat exposure standards were found to protect 80% of workers from heat-related illness[14], while heat standards in California were found to reduce mortality among outdoor workers by as much as 43%.[15] Without such safeguards, women like Sarahi face ongoing threats to their health and income. This analysis suggests that every dollar spent on labor protections generates over $8 in health and economic benefits.

Monterrey shows how extreme heat becomes especially lethal when chronic illness and occupational exposure intersect. Sarahi's experience illustrates how heat exacerbates health risks, drains incomes, and

[11] India: Climate adaptive and gender integrated heat wave action plan of Surat City
[12] This is based on full implementation of all critical elements of a Heat Action Plan: Early warning system, community awareness-raising, and healthcare surge capacity during heat events.
[13] Atlantic Council
[14] Phanprasit et al. (2021)
[15] Dean and McCallum (2025)

strains mental wellbeing – effects that ripple through families and public systems. As heatwaves grow more frequent and severe, these challenges will intensify unless protective measures are strengthened. By embedding heat planning into urban governance and enforcing labor protections in high-exposure occupations, Monterrey can reduce preventable illness and death while safeguarding the livelihoods of women who keep the city moving.

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We build resilience to extreme heat

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