Women and heat stress: A silent risk in the climate-exposed workforce

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As global temperatures rise, sex-specific vulnerabilities to extreme heat are emerging as a critical blind spot in occupational health policy. Luana Main and Lilia Convit explain

The world of work is heating up, literally. As global temperatures rise, extreme heat is rapidly becoming one of the most pressing challenges for workers worldwide. From agriculture to healthcare, millions of workers are increasingly exposed to dangerous temperatures, [1] a hazard that threatens both health and productivity. [2-4] Yet one dimension remains largely overlooked: the growing evidence that women face unique physiological and occupational vulnerabilities to heat stress.

Recent studies show that biological sex plays a meaningful role in how the body responds to heat. [5-7] This means that current workplace protections, often designed around male physiology, may not adequately safeguard half the workforce. As highlighted in earlier work on occupational heat stress, [8] the impacts of climate change on workers' health are already significant, and more inclusive approaches are urgently needed.

Physiological and cardiovascular differences that matter

Women and men respond to heat differently. When performing the same physical work, women often show a faster rise in core temperature and heart rate. [5, 6] Smaller body size, higher body fat percentages, lower aerobic fitness, and sweating can make it harder to dissipate heat effectively. [5, 6] Hormonal fluctuations, particularly during menstruation, pregnancy, and menopause, further influence how the body manages heat and blood flow. [9]

These differences become more pronounced with age. A 2024 review found that women aged 40-64 experience heat-related health risks comparable to older men, [10] largely due to age- and menopause-related declines in cardiovascular and thermoregulatory function. [10] After menopause, reduced skin blood flow and sweat response make it harder for the body to release heat, increasing the risk during physical work.

Heat exposure is not only uncomfortable, but it also strains the cardiovascular system, and it is linked to increased cardiovascular disease (CVD) risk. Evidence suggests that women may be more susceptible to heat-related CVD, [11, 12] particularly those with pre-existing conditions like hypertension or diabetes. These risks are often because early warning signs can differ between men and women, leading to diagnostic gaps and delayed intervention.

While these differences do not always translate to greater risk, sustained or extreme heat exposure, particularly in physically demanding roles, can push the body beyond its limit and become critical. With the global workforce aging and diversifying, [13, 14] the assumption that

heat stress is only a young man's issue is no longer tenable. [15, 16] Policies and workplace standards must evolve to protect all workers equally.

Gendered work patterns and exposure

Women increasing participation in high-risk industries adds another level of complexity. In agriculture and informal labour, especially across low- and middle-income countries, women often work without access to cooling infrastructure. [17] In healthcare and caregiving, protective clothing and poor ventilation raise indoor temperatures. [18] Even in manufacturing and service roles, cultural and organisational factors, as well as power dynamics, may limit women's access to hydration or rest breaks. [1] These occupational realities compound physiological and age-related differences, creating a perfect storm of vulnerability that current policies rarely address.

Standards that don't fit

Most occupational heat stress guidelines, including WBGT and ISO standards, were developed using data from young, healthy men. [19] As a result, they can underestimate risk for women and older adults. Protective measures, such as work-rest cycles or the design of personal protective equipment, often fail to reflect the diversity of today's workforce.

Heat mitigation strategies also seldom consider hormonal or age-related changes, [20] meaning that many women may unknowingly be working in unsafe conditions.

Building equity into heat resilience

Protecting all workers requires targeted action. Government and industry leaders must collect sex-disaggregated data on heat exposure and health outcomes, revise existing occupational heat stress standards to account for sex and age differences, and support inclusive personal protective equipment design and access to cooling interventions.

Further, funding dedicated research on female workers' heat vulnerability and embedding gender equity into national climate adaptation and occupational health strategies will help ensure policies keep pace with reality.

Extreme heat is not gender neutral. As climate change accelerates, ignoring sex-specific heat vulnerabilities risks deepening health inequities and undermining workforce resilience. Integrating sex-informed evidence into occupational health policy frameworks is not a scientific necessity; it is a matter of fairness, safety, and economic sustainability. No one should be left behind in the heat.

This article builds on the foundation established in Protection from occupational heat stress amid rising global temperatures (Main, 2025), extending the discussion to highlight sex-specific vulnerabilities and the urgent need for inclusive occupational heat policies.

Luana C. Main (2025), ‘Protection from occupational heat stress amid rising global temperatures’, Open

Access Government, October 2025, pp. 362–363. Available here.

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