

High heat and climate change at work

Report for the United Workers Union

EXECUTIVE SUMMARY



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Climate Justice Research Centre,
University of Technology Sydney

About this report

This report outlines findings from the 2020-2021 research project into heat stress and climate change, involving members of the United Workers Union (UWU). The project involved a national survey and interviews with UWU members, officials and staff. The project was jointly funded by the UWU and the University of Technology Sydney (UTS), and independently conducted by researchers at the UTS Climate Justice Research Centre.

About the authors

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More information about the UTS Climate Justice Research Centre's work on climate change impacts for workers is available on our website, toohottowork.org.

Introduction

The 2021 report from the Intergovernmental Panel on Climate Change (IPCC) stresses that climate change is ‘already affecting every inhabited region across the globe [and] contributing to many observed changes in weather and climate extremes’¹. It states that each ‘of the last four decades has been successively warmer than any decade that preceded it since 1850’². We are currently experiencing higher temperatures on average, more hot days, higher humidity, longer heatwaves, concurrent heatwaves and droughts, more frequent and intense bushfires, and compound flooding in some locations³. The impacts of these changes can push the physical capacity of workers beyond what is safe.

Heat from rising temperatures has been identified as a major threat to safe and decent working conditions, with workers increasingly compromised during the hottest months of the year⁴. Almost half of the global population are now exposed to high heat episodes, including more than one billion workers⁵. Where high heat is not managed appropriately the consequences include serious illness, adverse pregnancy outcomes, negative mental health impacts, and death. At the global level, a third of all heat-related deaths worldwide between 1991 and 2018 can be attributed to human-induced climate change⁶.

Extreme weather changes also impact productivity and employment and will do so on an increasing basis. The International Labor Organisation (ILO) reported that without action to arrest the problem, ‘uncontrolled climate impacts will cause damage to infrastructure, disrupt business activity, and destroy jobs and livelihoods on an unprecedented scale’^{7,8}. Based on ‘a

¹ IPCC (2021) ‘Summary for Policymakers’, in *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press: Cambridge, p 12.

<https://www.ipcc.ch/report/ar6/wg1/#SPM>

² IPCC 2021, p 5.

³ IPCC 2021, p 11.

⁴ IPCC (2018) ‘Impacts of 1.5°C Global Warming on Natural and Human Systems’, in IPCC, *Global Warming of 1.5°C*. <https://www.ipcc.ch/sr15/>

⁵ Ebi, Kristie L et al. (2021) ‘Hot Weather and Heat Extremes: Health Risks’, *The Lancet*, 398: 10301, pp 698 - 708. [https://doi.org/10.1016/S0140-6736\(21\)01208-3](https://doi.org/10.1016/S0140-6736(21)01208-3)

⁶ Vicedo-Cabrera, A M et al. (2021) ‘The Burden of Heat-related Mortality Attributable to Recent Human-induced Climate Change’, *Nature Climate Change*, 11, pp 492–500. <https://www.nature.com/articles/s41558-021-01058-x>

⁷ ILO (2020) ‘The Role of the ILO in Addressing Climate Change and a Just Transition for All’, Report from the Policy Development Section, Employment and Social Protection Segment, to the Governing Body, 338th Session, 12–26 March 2020, Geneva, GB.338/POL/1.

https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_736774.pdf. Viewed 16 August 2021.

⁸ See also: ILO (2019) *Working on a Warmer Planet: The Impact of Heat Stress on Labour Productivity and Decent Work*, Geneva. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_711919.pdf.

global temperature rise of 1.5°C by the end of the twenty-first century, and also on labour force trends', the ILO projects that in 2030 '2.2 per cent of total working hours worldwide will be lost to high temperatures — a productivity loss equivalent to 80 million full-time jobs'⁹.

Occupational health problems will increase unless action is taken to abate climate change, as there is greater risk for workers associated with higher degrees of global warming. However, health experts argue excess deaths and many health risks arising from heat stress are preventable with appropriate heat action plans¹⁰. Of course, mitigating the unfolding impacts of climate change in the workplace is not enough. Reducing emissions to halt the progression of climate change is critical, and many unions in Australia and abroad are calling for a well-planned industry transition, one which would support their members' rights to decent work. Of course, mitigating the unfolding impacts of climate change is not enough. Unions have a role in campaigning to act on the causes of climate change in the interests of their members and humanity at large.

It is important to recognise that workplace heat is not simply or only a matter of the weather. High heat and its attendant risks are also related to a number of other factors, including: the nature of the industry and job; the working environment and conditions; the presence or absence of heat management policies in the workplace; and a worker's ability to take measures to mitigate the impacts of high heat (worker agency). The ability to manage heat and its associated risks is also highly individualised, and related to a person's level of physical fitness, whether they have medical conditions, how acclimated to the prevailing heat they are, and whether they have had training and can recognise signs of heat stress.

Many members who were interviewed and surveyed as part of this project work in environments lacking ventilation and adequate cooling controls. They are also required to work at rates of production which are incompatible with some of the most fundamental heat management strategies, such as taking rest breaks and slowing down. Hotter, longer, and more frequent heat waves threaten to exacerbate this already precarious situation.

Recent tragic deaths of workers have underscored the seriousness of heat-related work. In August 2021 the Coroners Court of Queensland published findings from their investigation into the 2017 death of Oliver Caramin, a Belgian national who worked as a fruit picker.¹¹ Mr Caramin died of multiple organ failure, due to or as a consequence of heat stroke, after working at a 'moderate' rate of work in 40°C heat (32°C in the shade), with 'inadequate' protection from the sun. The Office of Industrial Relations (OIR) found that there was pressure 'placed on the workers to continue picking and packing pumpkins notwithstanding a number of workers raising

⁹ ILO 2019, p 13.

¹⁰ Ebi et al 2021.

¹¹ https://www.courts.qld.gov.au/_data/assets/pdf_file/0008/691775/nif-caramin-o-20210820.pdf

concerns about the environmental conditions on the day¹². No shade was made available to Mr Caramin or his co-workers, adequate training was not provided, and there was no risk assessment or safe work procedure. The OIR found that ‘the employer’s failure to adequately assess the environmental conditions ... was a significant contributing factor to Mr Caramin’s death’¹³.

Unfortunately these conditions — a lack of shade, inadequate training, the absence of proper heat management policies or procedures, and productivity pressures — are familiar to many workers, including those who have contributed to this report.

What is heat stress?

‘Heat stress’ refers to heat received in excess of the level which a body can tolerate without some physiological impairment. As the ILO describes:

Above a certain threshold of heat stress, the body’s internal regulation mechanisms are no longer capable of maintaining body temperature at a level required for normal functioning. As a result, there is an increased risk of discomfort, of limitations in physical functions and capabilities, and ultimately also of injuries and heat-related illnesses¹⁴.

In extreme heat, workers may become severely dehydrated, nauseous, dizzy, fatigued, irritable and stressed. Workers labouring in high heat may also be more prone to lapses in concentration, and may suffer from reduced decision-making abilities, leading to accidents. They may also develop potentially fatal heat illnesses, such as heatstroke.

Heat impacts workers at even moderate temperatures, and there is reduced labour productivity above 24–26°C, but once temperatures rise to ‘33–34°C, a worker operating at moderate work intensity loses 50 percent of his or her work capacity’¹⁵.

While all workers are affected, certain groups of workers are particularly at risk. These are:

- Outdoor workers, especially those who are weather exposed and involve physical exertion. This includes workers in agriculture, construction, emergency repair work, transport, and tourism.
- Workers who labour inside in poor climate-controlled environments, or where the nature of their work is heat exposed. This includes manufacturing workers, workers in schools

¹² Section 15.ii. https://www.courts.qld.gov.au/_data/assets/pdf_file/0008/691775/nif-caramin-o-20210820.pdf

¹³ Section 15.iv. https://www.courts.qld.gov.au/_data/assets/pdf_file/0008/691775/nif-caramin-o-20210820.pdf

¹⁴ ILO 2019, p 17.

¹⁵ ILO 2019, p 13.

without air conditioning such as cleaners and teacher's aides, and workers in industries like home care (who move between various mostly enclosed environments, from client's homes to the outdoors and into very hot cars).

- Workers who move between different climates as part of their work, such as moving between extreme heat and cold, such as in food preparation and warehouses.
- Workers whose roles expose them to situational extreme heat, such as emergency personnel and firefighters.

A recent investigation of workplace accidents in California, examining injury claims in the largest compensation system in the United States, found that hotter temperatures caused increased workplace injuries significantly. This was the case in 'both outdoor and indoor settings (e.g. manufacturing, warehousing), and for injury types ostensibly unrelated to temperature (e.g. falling from heights), with the 'risks [being] substantially larger for men versus women; for younger versus older workers; and for workers at the lower end of the income distribution'¹⁶. In a similar Australian study across Melbourne, Perth and Brisbane, researchers found that the 'relationship between injury and ambient temperature appears to be variable depending on location and climate' but that in general 'work-related injuries and illnesses appear to be more common at higher temperatures than lower temperatures'¹⁷.

Workers who are less secure, temporary workers, piece workers, on-demand workers, and migrant workers, are just some of the groups who are at greater risk. The level of organisation of workers in an industry, or a workplace, also appears correlated to an employee's experience of heat stress. Older workers, those experiencing menopause, and those who have health conditions, can also struggle in hotter weather. High heat also impacts work in less direct ways, such as through poor sleep during a heat wave which can make it harder to work safely the next day. Similarly, poor sleep or working in extreme heat can impact cognitive function and make the drive to and from work more dangerous.

There is limited — although, thankfully, growing — qualitative research on how people experience heat stress in Australian workplaces.¹⁸ This study of UWU members is an important step in developing a detailed picture of the impacts and problems of heat stress for workers,

¹⁶ Park, R Jisung, Nora Pankratz, A Patrick Behrer (2021) *Temperature, Workplace Safety, and Labor Market Inequality*, IZA Institute of Labor Economics, Discussion Paper No 14560. <http://ftp.iza.org/dp14560.pdf>.

¹⁷ Varghese, Blesson M et al. (2019) Geographical Variation in Risk of Work-related Injuries and Illnesses Associated with Ambient Temperatures: A Multi-city Case-crossover Study in Australia, 2005–2016, *Science of the Total Environment*, 687, pp 898-906.

¹⁸ For instance, see: Williams, Susan et al. (2020) 'Workers' Health and Safety in the Heat: Current Practice in Australian Workplaces', *Policy and Practice in Health and Safety*, 18:2, 67-79. See also: Carter, Sarah et al. (2020) 'The Impact of Perceived Heat Stress Symptoms on Work-related Tasks and Social Factors: A Cross-sectional Survey of Australia's Monsoonal North', *Applied Ergonomics*, 82, 1-8.

especially those working indoors. There is a need to build on this project in several ways, and we discuss how this might be done at the end of the report.

Summary of findings

This report outlines findings of a research project into how UWU members across Australia experience and contend with high heat conditions at work, and their views on climate change and its impact on workers. Members also told us about the experience of the 2019-2020 bushfires in their workplace, and the impact of COVID-19 for managing high heat.

The UWU members who participated in this project work as teacher's aides, machine operators, warehouse workers, home carers, cleaners, firefighters, market researchers, veterinary nurses, horticulturalists, chefs, early childhood educators, paramedics, security and custodial workers, and more.

These members experience high heat in several ways. Most work indoors, but many without adequate cooling controls, in unventilated spaces, or near heat-generating equipment and machinery. Some work outside, where they are exposed directly to the elements. Other members work across many different indoor environments, such as clients' homes, with no control over the climate of these workplaces.

Exposure to heat in the workplace is not just a matter of daily temperature forecasts. Humidity levels, cooling controls, ventilation, sun protection, and the level of physical exertion required in a job are all relevant factors contributing to an individual's experience of heat. The ability of workers to rearrange or delay work tasks, take extra breaks, pace themselves, and stop work also determines how they experience and can manage high heat conditions.

Working environment and conditions

'Mainly there's not much ventilation. This is the biggest problem at work ... there's nothing exhausting the hot air out ...'.

- Most members surveyed work indoors only or outdoors less than 30% of the time. Only 15% of workers spend 70% or more of their time outdoors.
- Members generally feel heat most when outside, but for many there are certain indoor locations that involve challenging levels of heat.
- A third of members are regularly lifting loads of 10kg or more, adding another factor to managing high heat. Some members lift heavy loads over 40kg.
- Many members report existing cooling controls in their workplaces do not work properly, are broken, are ineffective in high temperatures, or are available only for customers and not staff.

Impacts of heat on UWU members

'... it's quite terrible. ... you drink way more water, so you're forced off the line, which puts pressure on you to work harder, which makes you sweat more and then tires you out. Essentially, it's just an all-round lose situation because you're hot, overheated, stressed and incredibly sweaty'.

- On hot days 58.1% of members say heat affects them 'quite a bit' or 'very much'. Less than 10% of members are only affected 'slightly' or 'not at all'.
- In the twelve-month period prior to the survey, 20.2% of members were unable to work at some point due to high heat. This included through having work cancelled, a work stoppage, or members' taking sick leave.
- Productivity demands impacting heat management, such as the inability to slow down or take breaks, are a common problem across industries.
- When exposed to heat at work members say they have experienced: fatigue (77.6%); headache (59.9%); poor concentration (50.1%); and nausea and dizziness (36.8%). These are all common symptoms of heat stress.
- Several workers described how they sometimes 'stopped sweating' or lost their appetites, common symptoms of heat-related illness.
- Workers described experiencing or witnessing a range of serious incidents at work, including passing out, seizures, stress, hospitalisation, and fatalities.

Responding to heat stress at work

'Like they've got a lot of stuff in writing saying if it's an extreme day, we'll rotate people, and everyone will get an extra five-minute break each hour. But that's rubbish. It just doesn't happen. You know, they say you can do it, but we just haven't got the manpower to be able to do that ...'.

- Members routinely take actions to protect their health and safety in high heat conditions. This includes through drinking more water and making use of personal protective equipment (PPE) such as hats, sunscreen, and ice vests.
- Although some employers provide cold water, ice blocks and PPE, many do not. Workers interviewed say they often have to bring their own supplies to work.
- Workers whose jobs are externally 'paced', for example by an inflexible roster or by the speed of machines, find it difficult or impossible to slow down or take additional breaks to hydrate and recover in high heat.
- For a number of workers the inability to take more frequent breaks in high heat conditions is related to inadequate staffing.

- Over half of members had never been issued with warnings, advice or information on high heat and heat stress.
- Almost half of members surveyed were unaware if there was a policy or procedure for managing heat stress and high heat in their workplaces.
- In workplaces that have heat policies, some members say it is impossible to get management to act in accordance with them.
- Only 2.4% of members had taken workplace action regarding heat stress issues. Of this group a third were successful and two thirds were unsuccessful.

COVID-19: Complications for heat stress

‘... wearing [a] plastic apron, face mask, eye protection and gloves makes me sweat profusely, causing dehydration, fatigue and headaches. It is impossible to work without a higher risk of causing an injury and [I] cannot perform at an efficient level of competence’.

- Over a third of members (37.5%) report they had to make changes at work due to COVID-19 regulations, and that these changes affected their management of the heat.
- The most common problem was increased heat stress associated with PPE, including the use of gowns, aprons, gloves, goggles, face masks, shields, and balaclavas.
- Other problems from PPE changes due to COVID-19 included exhaustion, excessive sweating, skin rashes, and difficulty breathing. New forms of PPE also made it difficult to handle equipment and perform tasks safely for some, such as sweating under gloves when operating machinery.
- High heat was also compounded by other COVID-19 changes, with:
 - altered, staggered or extended shift times requiring work to be completed in the hotter parts of the day.
 - reduced access to indoor and air-conditioned spaces due to social distancing.
 - higher workloads and the failure of management to bring on additional staff to cope.
 - performing new tasks in the hottest parts of the day, such as extra cleaning or managing contactless pick up and drop off of children.

Bushfires: Lack of preparation, lack of action

‘A lot of people had to wear masks. It was hot and there was one person who had to be taken off in the ambulance cos they couldn't really breathe. It was really bad ...’.

- Members advised there were insufficient procedures in place to deal with the smoke and ash emergency during the 2019-2020 bushfires, and insufficient OHS action taken by employers once the crisis was unfolding.

Climate change: Growing impacts at work

'I think so. I think we're incredibly lucky because of that La Niña thing this year. I think we've got some horrendous summers to cope with in the future. Yeah, I'm concerned about it for sure.'

- 56.2% of surveyed members thought climate change was impacting people's working conditions, 33.8% thought it was not, and 10% were unsure.
- In all states and territories 50% or more of members felt climate change was impacting people's working conditions.
- Younger members (under 30) were more likely to say that climate change was impacting people's working conditions, with almost 80% saying this was the case. There was no difference based on gender.
- Members in chemical manufacturing, professional and technical services, educational services, and agriculture were amongst those most likely to say climate change is impacting working conditions.
- Members in food services and repair and maintenance were amongst those least likely to say climate change was impacting working conditions.

Recommendations

In line with expert international medical advice, including in the August 2021 special research series on heat and health published by *The Lancet*, ‘all countries, local communities, and institutions need to adopt effective heat health action plans tailored to local conditions’ based on the scientific evidence that ‘the health dimensions of heat can no longer be overlooked’¹⁹.

1. The Commonwealth and state and territory governments must urgently review the management of current and likely future impacts of climate change for workers. This must include addressing increasing heat and providing regulatory frameworks for strong protection in relation to heat stress and bushfire smoke. Workers, and their representative organisations, must be centrally involved in this process.
2. The Commonwealth and state and territory governments should convene sector-by-sector meetings – that include workers and their representative organisations – to work through the climate impacts particular to each sector and formulate sector specific regulatory frameworks.

Current OHS and industrial frameworks are inadequate to the task of dealing with the impacts of climate change and high heat. Current frameworks are also inadequately enforced.

3. The Commonwealth government must abolish restrictions on bargaining content within the industrial relations system, such that it is clear workers have the unambiguous right to bargain around climate change and its impacts in the workplace.
4. Employers are already required to provide adequate resourcing for at-risk workers, such as high standard personal protective equipment (PPE), adequate hydration while at work, regular breaks, acclimatisation protocols, and sufficient personnel to ensure workers can be relieved for recovery time in situations where they cannot stop work (such as emergencies). This is not occurring. Greater government oversight and enforcement are needed to ensure compliance.
5. Greater resources must be provided to unions and employers to train staff, including health and safety representatives, to ensure workers and employers understand their rights and legal duties in relation to heat stress.
6. Governments need to establish clear and accessible occupational health and safety pathways around heat stress and other impacts from climate change, which empower workers to take mitigating action without fear of reprisal.

¹⁹ The Lancet (2021) ‘Health in a World of Extreme Heat’, *The Lancet*, 398:10301, p 641.

The conditions of a person's employment, their health, and their relative vulnerability, fundamentally shape their experience of heat stress.

7. Any review of national and state-based framework to protect workers from heat stress must address its impact on vulnerable workers, including workers with minimal rights and agency in the workplace.
8. Workers in casual, labour hire, on-demand and temporary migrant working arrangements must be afforded greater protections to ensure health and safety and fair income maintenance in periods when they need to work more slowly or take breaks.

There is a pressing need for further research on the OHS impacts of workplace heat and other forms of extreme weather, as well as current union activity in relation to the climate crisis.

9. A national, diverse industry study should be conducted, mapping current and likely future problems encountered by workers in attempting to manage the impacts of extreme weather changes being driven by climate change.
10. Further research is needed on workers' experiences of heat at work, their perceptions of climate change, and how the extreme weather impacts of climate change on workers might inform organising strategies.