Understanding the impact of heat on construction sites

From awareness levels to on-site practices

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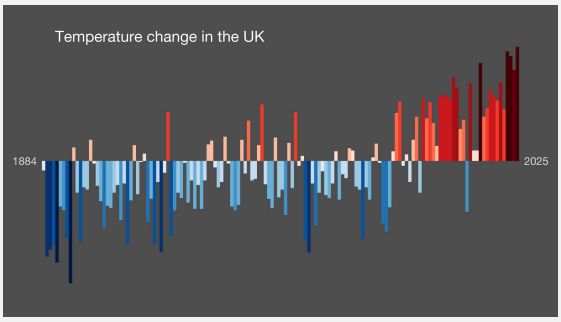
Introduction

The United Kingdom is experiencing a sustained rise in average temperatures due to global warming, alongside an increasing frequency of record-breaking temperature events and more frequent, longer-lasting heatwaves.

Whilst everybody is at risk of experiencing the health effects of heat, there are certain factors that increase an individual's risk, including: older age; chronic and severe illness; inability to adapt behaviour to keep cool; environmental factors; and overexposure (UK Health Security Agency, 2022). Construction site personnel are considered a vulnerable group at risk of heat stress during hot weather. On-site professionals, and particularly operatives, are directly exposed to outdoor temperatures whilst performing intense physical activity during long working hours, with limited ability to adapt their personal protective equipment (PPE) and difficult access to shade and water.

Exposure to higher temperatures for longer and more frequent periods may put workers under higher heat strain, leading to physiological and psychological health conditions, an increased number of injuries and accidents, and lower productivity. Heat-related illnesses and their symptoms include fatigue, fainting, nausea, heat cramps, dehydration, respiratory distress, cardiovascular disease, heat stroke and even death.



Graphics and lead scientist: Ed Hawkins, National Centre for Atmospheric Science, University of Reading.

Unfortunately, avoiding heat exposure is generally not possible for construction site personnel, who must continue their activities, mostly outdoors, in order to maintain project productivity. However, the adverse health effects of heat on construction site personnel could be preventable through effective and economically viable heat coping strategies.

The Health and Safety Executive (HSE) and other occupational regulators worldwide, such as the Occupational Safety and Health Administration in the United States (OSHA) or the Australian Institute of Occupational Hygienists (AIOH), have developed heat stress management guidelines and technical manuals. For example, the HSE encourages UK employers "to be responsible and take proactive safety

measures" (HSE, 2023), but these do not expand beyond informal best practices, not all are suitable for construction sites, and their adoption relies on the employers' awareness of the problem, willingness to act, and their best judgement.

Although construction employers would generally agree that protecting the health and wellbeing of their construction site personnel is the most important reason for combating heat-related illnesses, the development and implementation of heat-related policies are still in their infancy. This requires further efforts in raising awareness amongst managers and operatives, and a common approach to heat prevention across the UK construction industry.

This report is part of a broader research study led by the School of the Built Environment at the University of Reading, focused on understanding UK construction organisations' preparedness for adapting to the increasing effects of heat exposure on construction operatives.

This report seeks to understand:

- **Perceived impact on health and wellbeing**: How do operatives and managers perceive the impact of heat exposure on their (and colleagues') physical and mental health, as well as other aspects of their work, social and personal life?
- **Knowledge gap**: Do construction operatives and managers have an understanding of heat-related illnesses? Would they be able to spot the symptoms and act on them?
- **Actions gap**: What heat coping strategies are being adopted on-site? Are they effective?
- **Impact on project performance**: Does heat have an effect on project performance? What challenges do managers face when implementing heat-related preventive measures?

Background

Heat stress

The human body can detect and respond to excessive heat through a process called thermoregulation. This system works to keep the internal body temperature stable (around 37.5°C). However, problems occur when heat exposure becomes too intense, and these natural cooling mechanisms can no longer keep up.

Heat stress occurs when the body's way of controlling its internal temperature starts to fail (HSE, 2024). In other words, it is the state in which excess heat is stored in a worker's body, which, if not released to the environment, increases internal body temperature, leading to potential health risks and reduced productivity" (Flouris et al., 2024).

Heat-related illnesses

Heat oedema: Characterised by fluid retention in the body, causing swelling, usually in the hands, ankles, and legs.

Heat rash: Small red blisters that can form over a large area of skin due to excessive sweating. It occurs when skin pores become clogged and trap sweat, causing red bumps and even tingling and itching.

Heat cramps: Sharp muscle pain caused by a salt imbalance due to intense sweating. Salt can accumulate in the body if the water lost through excessive sweating is not replaced.

Dehydration and electrolyte loss: Loss of water and electrolytes through sweating. Symptoms include

A typical heat stress situation on a construction site would involve:

1. The environmental conditions are high in temperature and humidity;
2. The operative is wearing the required personal protective equipment on the construction site and their body begins to sweat;
3. The sweating rate is restricted by the characteristics of the PPE materials and the ambient humidity;
4. Body heat increases due to intense physical activity and the difficulty in dissipating heat through PPE, increasing the body temperature;
5. To reduce body temperature, the body reacts by increasing the sweat rate, causing dehydration;
6. The worker does not have easy access to water, or their intestinal system cannot absorb enough water to keep them hydrated;
7. The heart rate also increases, causing heat stress;
8. Without taking quick action, the worker may suffer heat syncope, heat exhaustion, or heat stroke.

gastrointestinal problems and muscle cramps.

Heat syncope: Characterised by loss of consciousness or fainting. When a person stands for long periods of time, exposed to the sun and intense heat, a drop in blood pressure can occur with decreased blood flow to the brain.

Heat exhaustion: This occurs when dehydration persists for a period of time. Symptoms include loss of work capacity, decreased psychomotor skills, nausea, weakness, fainting, visual disturbances, headache, diarrhoea, muscle cramps, palpitations, numbness in the hands and feet, all accompanied by intense thirst. People suffering from heat exhaustion have cold, pale, and clammy skin.

Rhabdomyolysis: Condition that causes muscles to break down, which leads to muscle death. When this happens, toxic components of the muscle fibres enter the circulation system and kidneys. This can cause kidney damage. Common signs and symptoms are weak muscles, muscle stiffness, muscle pain and a change in urine colour.

Heat tetany: Condition in which there is hyperventilation and heat stress. Symptoms may include hyperventilation, respiratory problems, numbness or tingling, or muscle spasms.

Heat stroke: This is the most serious condition as it can lead to death due to the collapse of multiple organs, such as the kidneys, liver, pancreas, etc. It is a life-threatening emergency that must be treated in a hospital immediately. It is characterised by a high internal body temperature above 40.5°C, hot and dry skin due to lack of sweating, confusion, delirium, seizures, and even coma.

Other long-term health problems (chronic diseases), such as damage to the heart, kidneys, and liver, chronic heat exhaustion, sleep disorders, and temporary infertility have also been associated with prolonged heat exposure, however additional studies are needed to determine the extent of the impact (NIOSH, 2017; WHO, 2025).

Several research studies worldwide have highlighted the negative impact of exposure to high temperatures on the health and well-being of construction workers. Of note are the studies by Acharya et al. (2018), Moda et al. (2019), Varghese et al. (2020), Wuersch et al. (2023), and Fuertes & Khatabakhshrad (2024).

Other heat-related impacts

Impact on mental health: Studies on the effects of climate change on health have highlighted the negative impact that exposure to extreme heat has on people's mental health (Charlson et al., 2021; Crane et al., 2022). In the construction sector, as the temperature increases, workers may experience increased irritability and anger. They may also feel more confused and have difficulties concentrating or performing mental tasks. Excessive heat can also produce or aggravate pre-existing problems of emotional stress, anxiety, and depression, resulting in low mood among workers, lower productivity, and absenteeism in the workplace (Jia et al., 2016; Karthick et al., 2022).

Impact on occupational risks: According to the International Labour Organization (ILO) (Flouris et al., 2024), in 2020, there were approximately 22.85 million non-fatal work-related injuries, 18,970 deaths, and 2.09 million disability-adjusted life years (DALYs) lost worldwide due to excessive heat exposure. Whilst the data is not disaggregated by industry sectors, studies in the construction sector have acknowledged the association of heat exposure and on-site accidents in countries such as Hong Kong, Australia, and the USA (Rowlinson & Jia, 2015; Rameezdeen & Elmualim, 2017; Dumrak et al., 2013; Gubernot et al., 2015; Calkins et al., 2019).

Preventive measures

Occupational health and safety bodies worldwide (OSHA, HSE, NIOSH and CCOHS) recommend various preventive measures to reduce the risk of heat stress amongst workers generally. Suggested measures to be used on construction sites include:

Engineering measures:

Designated rest areas: Equipped and designated rest areas so workers can cool down and hydrate. These spaces can be created by: Taking advantage of shaded areas; Installing structures such as tents and marquees to create shaded areas; Providing the construction site with enclosed, air-conditioned spaces; Installing rest stations equipped with fans and/or misting systems.

Portable ventilation or cooling systems: Provide areas where workers are most at risk of heat stress, due to the type of activity or environmental factors, with fans or portable air conditioning units.

Adapted personal protective equipment (PPE): Wearing appropriate clothing influences how the body manages heat and, at the same time, protects it from the sun's harmful rays. Possible PPE adaptations include: Lightweight, breathable, and light-coloured clothing to reflect heat rather than absorb it; Safety helmets with ventilation openings and (preferably) white, as the temperature under the helmet increases depending on the colour of the helmet (Honeywell, 2019). Using neck protectors to protect from direct sunlight; Clothing with built-in UV protection to reduce the risk of

sunburn; Cooling vests (auxiliary ice vests, circulating water-cooled garments, and circulating compressed air-cooled garments) to help reduce body temperature, preferably to be used during breaks as their design can make construction workers' tasks more difficult.

Management measures:

Reduce heat exposure time: Schedule tasks most susceptible to prolonged exposure to high temperatures during the coolest part of the day, or schedule these tasks on alternate rather than successive days; Modify work/rest schedules to allow for more rest time by increasing the length of breaks or the number of breaks allowed. There are studies with recommended rest times and frequencies for workers in the construction sector. For example, Yi and Chan (2013) suggest taking a 15-minute break after working continuously for 60 minutes at a wet-bulb globe temperature (WBGT) of 29.7°C; Increase the number of workers per task and create a rotation system to reduce each individual's exposure time; Allow work interruptions when a worker feels discomfort due to heat; Limit or suspend the working day in the event of extreme heat.

Reduce the physical workload:
Mechanize the physical aspects of the job whenever possible, introducing mechanical means and equipment, and/or reducing the weight of the loads; Increase the number of workers per task and create a rotation system to distribute each individual's workload; Allow workers to regulate their own work pace and take breaks when necessary, distributing the task load over a longer period of time.

Improve workers' heat tolerance: Through a heat adaptation process, the human body's ability to tolerate working in hot conditions can be significantly increased. Recommended heat acclimatisation actions include (NIOSH, 2016): New workers should be limited to 20% of their time in heat on the first day and no more than 20% more time each subsequent day for the first 7-14 days of employment. Unacclimatised workers should be closely monitored for the first 14 days or until fully acclimatised; Experienced workers should limit their heat exposure to 50% on the first day, 60% on the second day, and 80% on the third day. From the fourth day onwards, full-time work is permitted in hot conditions. It should be recognised that acclimatisation can be lost in just a few days off work, and therefore, workers returning to work after vacation or prolonged absence should also follow the acclimatisation strategy.

Promote hydration: It is important to encourage workers to hydrate throughout their workday and provide the site with a sufficient supply of water (preferably fresh). Some recommendations include: Workers exposed to heat for less than 2 hours and performing moderate work activities should drink 1 cup of water every 15 to 20 minutes, or a minimum of 1 Litre every hour in short intervals (NIOSH, 2016); Provide fresh water (not cold or room temperature) to make it more palatable; Provide adequate and convenient restroom facilities so that workers do not avoid hydrating due to frequent bathroom visits; There are no conclusive studies on the hydrating benefits of drinking energy drinks, electrolyte drinks, or sugary drinks.

Heat Stress Prevention Training Programme: A heat stress training programme must be implemented for workers, supervisors, and H&S professionals working in hot environments. The training programme should include information on heat-related illnesses, how to identify their symptoms, and how to respond if medical attention is needed. It should also include good prevention practices to avoid heat stress, including hydration, acclimatisation, and the use of technical solutions.

Heat Intolerance Screening: It is advisable to identify individuals who may be more vulnerable to heat exposure in order to control or limit their exposure or adopt additional protective measures. The factors that influence a person's risk of heat stress are described in Flouris et al. (2024).

Heat Alert Program: Design and implement a heat alert program that includes procedures to follow in the event of predicted high heat levels. NIOSH (2016) suggests the content of an heat alert program. Although this is designed for indoor work environments, many aspects can also be used or modified for outdoor work environments, such as in construction.

Methodology of the survey

Methodology

Researchers from the School of the Built Environment at the University of Reading conducted a survey-based study to understand how increasing temperatures in the UK climate are perceived and managed amongst operatives and managers on UK construction sites. Two different surveys were designed to gather the views of operatives and managers.

UK-based medium and large contractors participated in the study. The data was collected between April and September 2025. The surveys were distributed through a variety of mailing lists internal to the organisations and promoted amongst site operatives during site inductions.

We received a total of 307 responses: the operatives survey received 106 responses, and the managers survey received 201 responses.

The study received ethical approval from the Ethics Committee of the School of the Built Environment at the University of Reading in January 2025.

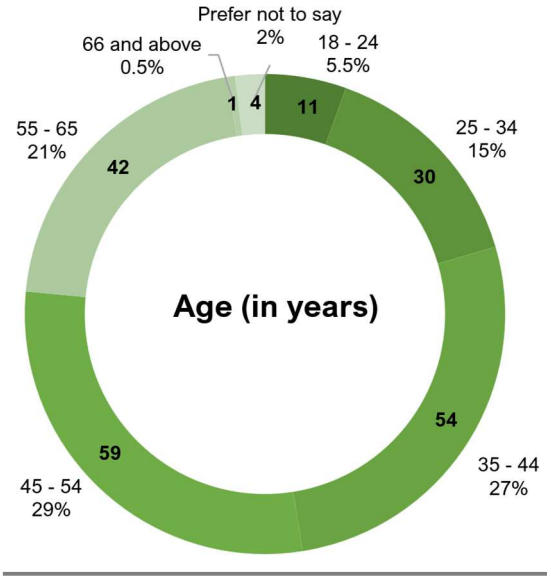
The surveys contained 23-25 questions, including a mix of multiple choice and Likert scale questions. They were grouped in seven sections: 1. Perception of hot temperatures in the UK and adaptation efforts; 2. Perceived impact of hot temperatures on wellbeing; 3. Knowledge of illnesses caused by heat and their symptoms; 4. Heat adaptation methods (operative-led and employer-led); 5. Impact of heat on project performance and challenges; 6. Sources of information to select heat adaptation measures; 7. Demographics and professional background.

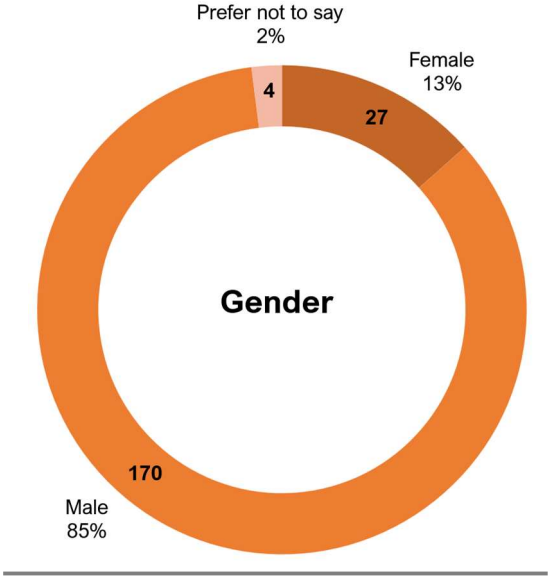
Descriptive statistics (N, %) were used to analyse the responses. Please note that the sample size for each question might vary by 1 or 2 responses, as a small number of survey responses were incomplete.

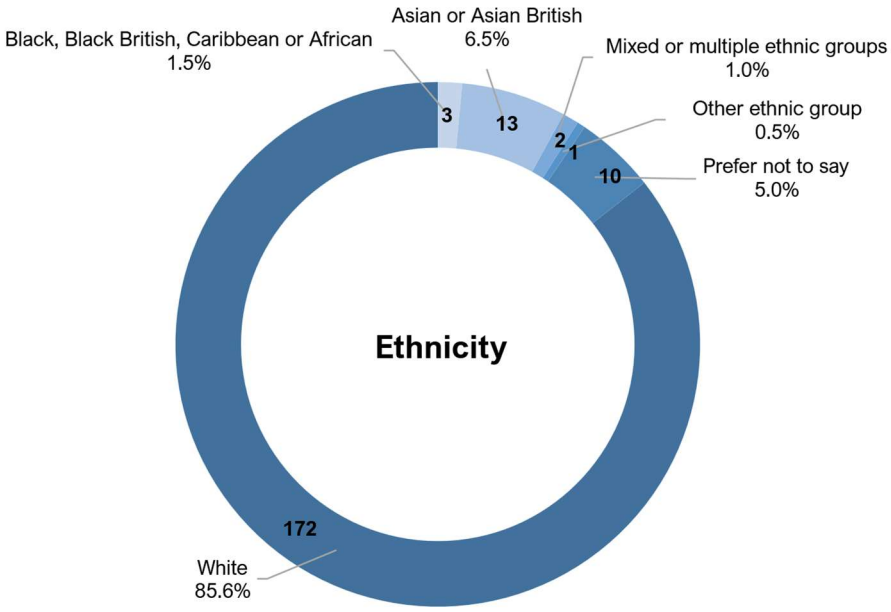
Demographics

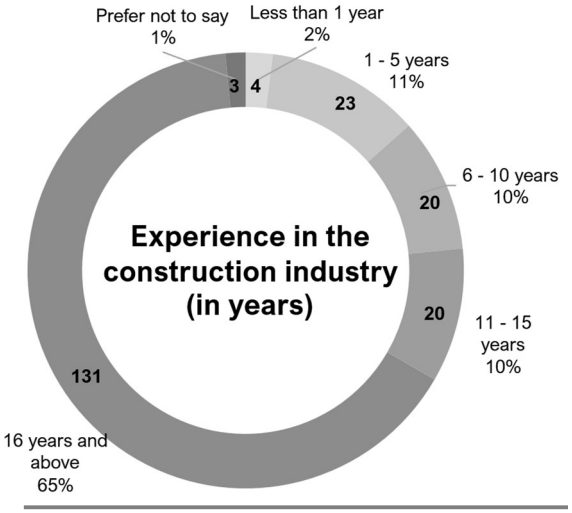
Summary of demographics: Managers

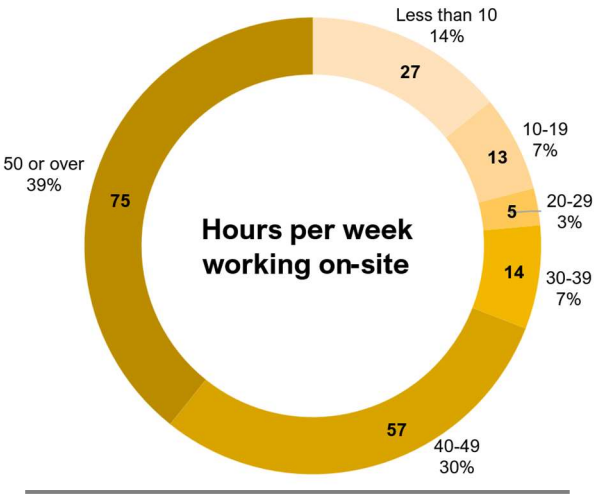
- The majority of the managers were male (85%), aged 35-54 years old (56%), and from a white ethnicity group (85.6%).
- More than half of the respondents were project managers and site managers (52%), with more than 16 years of experience in the industry (65%). The majority spent more than 40 hours per week working on-site (69%).
- Managers were located widely across the UK. A small proportion were situated in Ireland (10%).

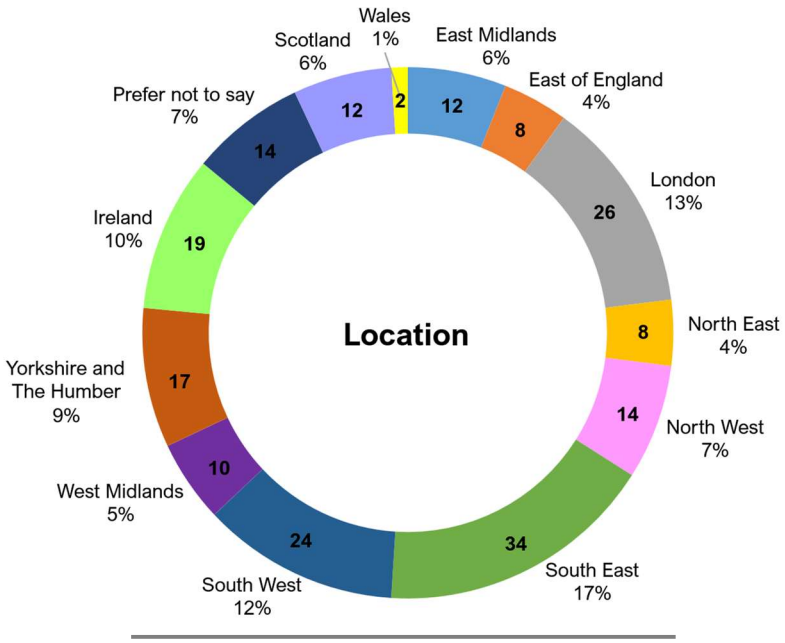


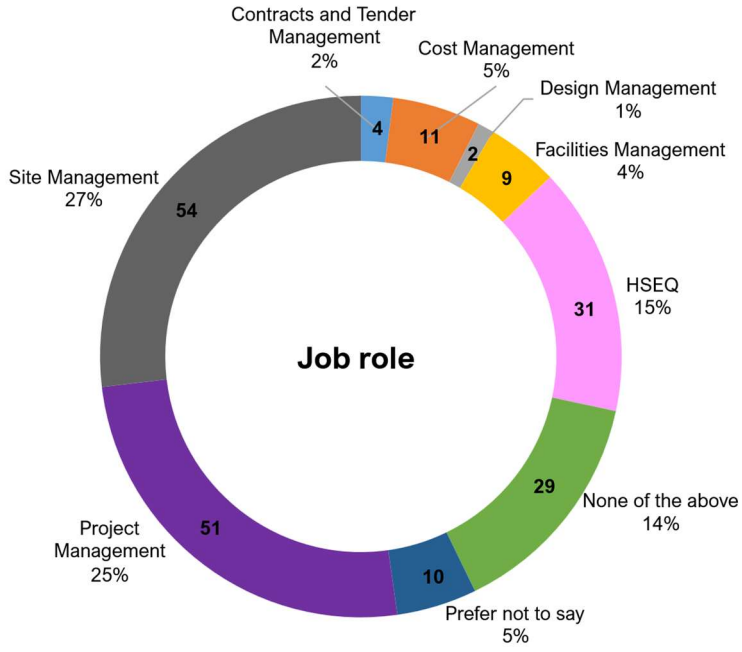





Experience in the construction industry (in years)
Prefer not to say 1%
Less than 1 year 2%
1 - 5 years 11%
6 - 10 years 10%
11 - 15 years 10%
16 years and above 65%
3
4
23
20
20
131

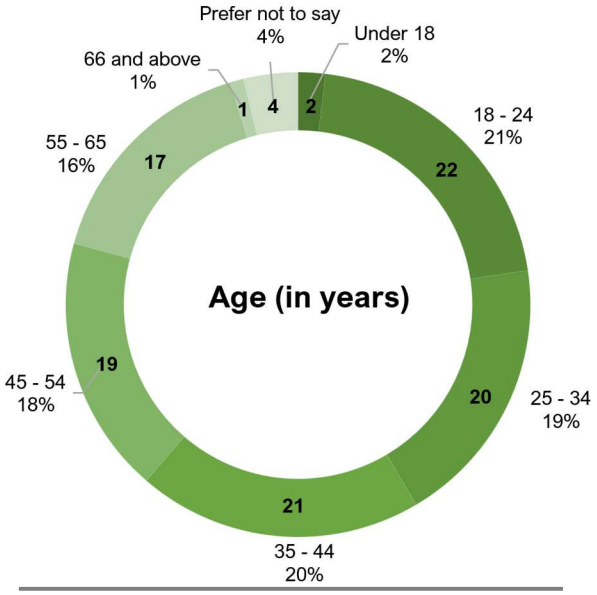

Hours per week working on-site
Less than 10 14%
10-19 7%
20-29 3%
30-39 7%
40-49 30%
50 or over 39%
27
13
5
14
57
75

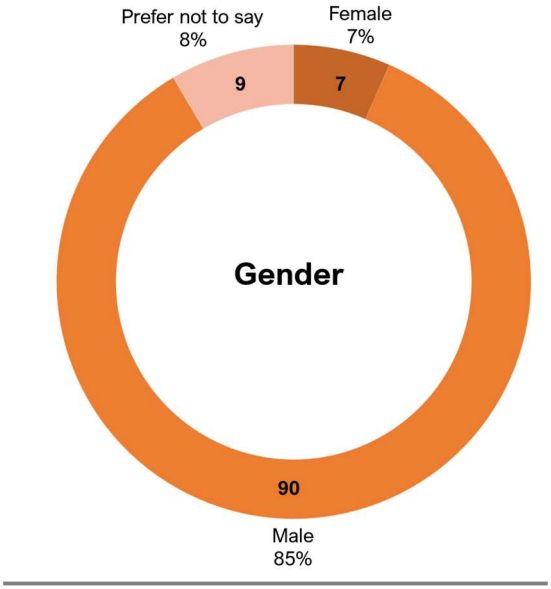

Location
Wales 1%
Scotland 6%
East Midlands 6%
East of England 4%
London 13%
North East 4%
North West 7%
South East 17%
South West 12%
West Midlands 5%
Yorkshire and The Humber 9%
Ireland 10%
Prefer not to say 7%
2
12
12
8
26
8
14
34
24
10
17
19
14

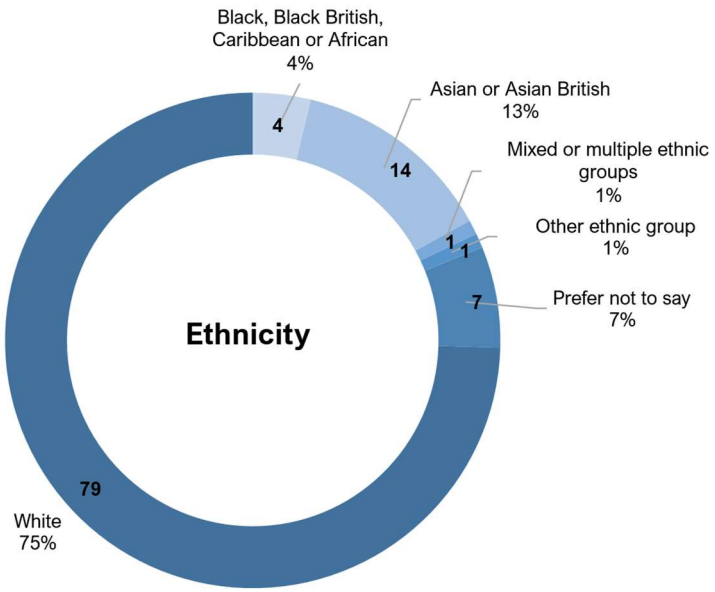

Job role
Contracts and Tender Management 2%
Cost Management 5%
Design Management 1%
Facilities Management 4%
HSEQ 15%
None of the above 14%
Prefer not to say 5%
Project Management 25%
Site Management 27%
4
11
2
9
31
29
10
51
54

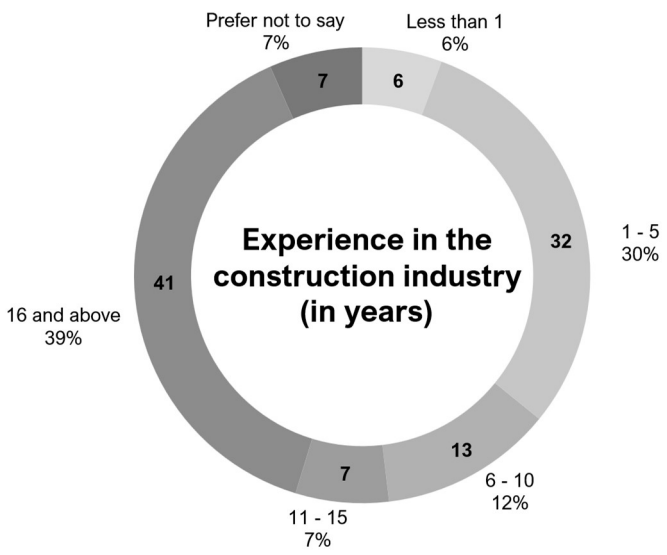
Summary of demographics: Operatives

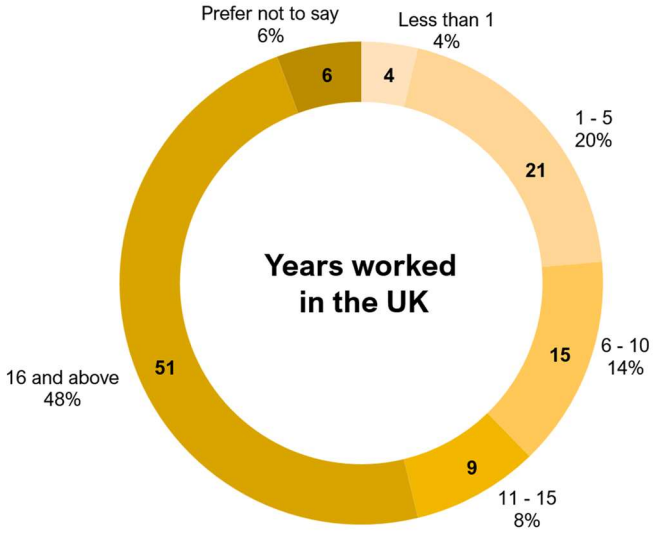
- The majority of the operatives were male (85%), with a good spread of age groups. More operatives were represented in the younger age groups (less than 35 years old, 42%), compared to the managers survey (20.5%).
- More than one third of the respondents were skilled trades (42%), followed by supervisors (13%). Compared to the managers, only 39% of the operatives had more than 16 years of experience in the industry, with 36% being newer to the industry with 5 or less years of experience. Nearly half of them (48%) had worked in the UK for more than 16 years, but nearly a quarter (24%) had done so for five or less years.
- Respondents were located widely across the UK.

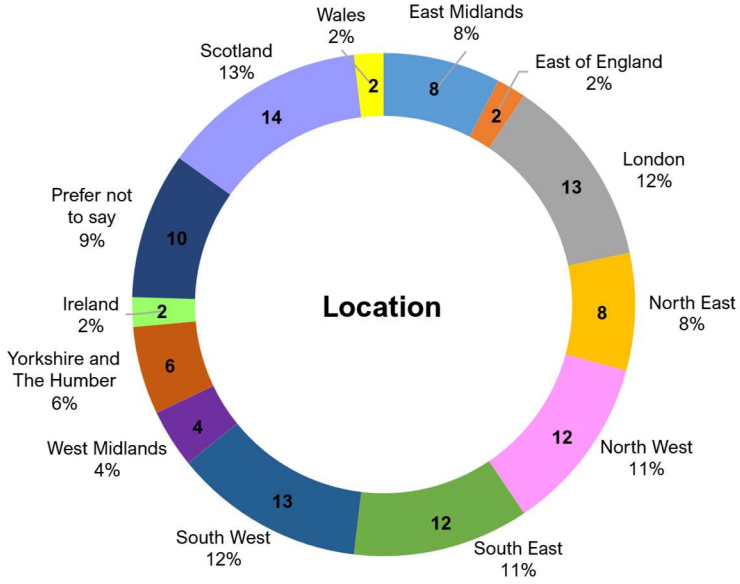


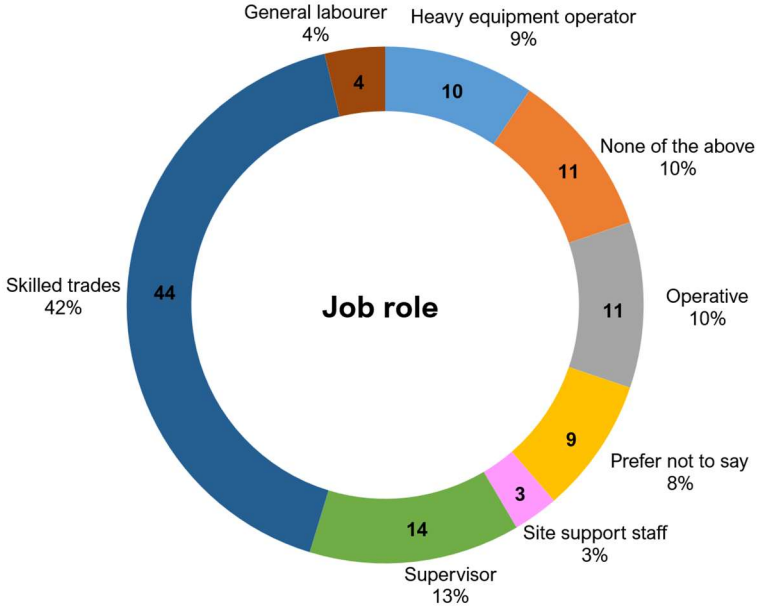





Experience in the construction industry (in years)
Prefer not to say 7%
7
Less than 1 6%
6
1 - 5 30%
32
6 - 10 12%
13
11 - 15 7%
7
16 and above 39%
41


Years worked in the UK
Prefer not to say 6%
6
Less than 1 4%
4
1 - 5 20%
21
6 - 10 14%
15
11 - 15 8%
9
16 and above 48%
51


Location
Wales 2%
2
East Midlands 8%
8
East of England 2%
2
London 12%
13
North East 8%
8
North West 11%
12
South East 11%
12
South West 12%
13
West Midlands 4%
4
Yorkshire and The Humber 6%
6
Ireland 2%
2
Prefer not to say 9%
10
Scotland 13%
14

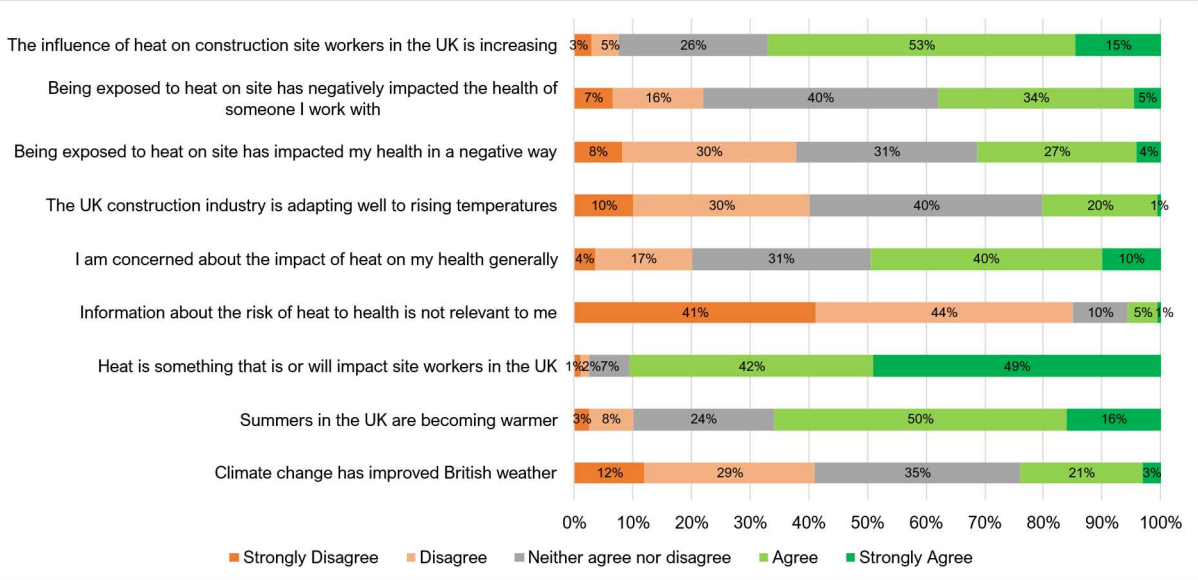

Job role
General labourer 4%
4
Heavy equipment operator 9%
10
None of the above 10%
11
Operative 10%
11
Prefer not to say 8%
9
Site support staff 3%
3
Supervisor 13%
14
Skilled trades 42%
44

Results

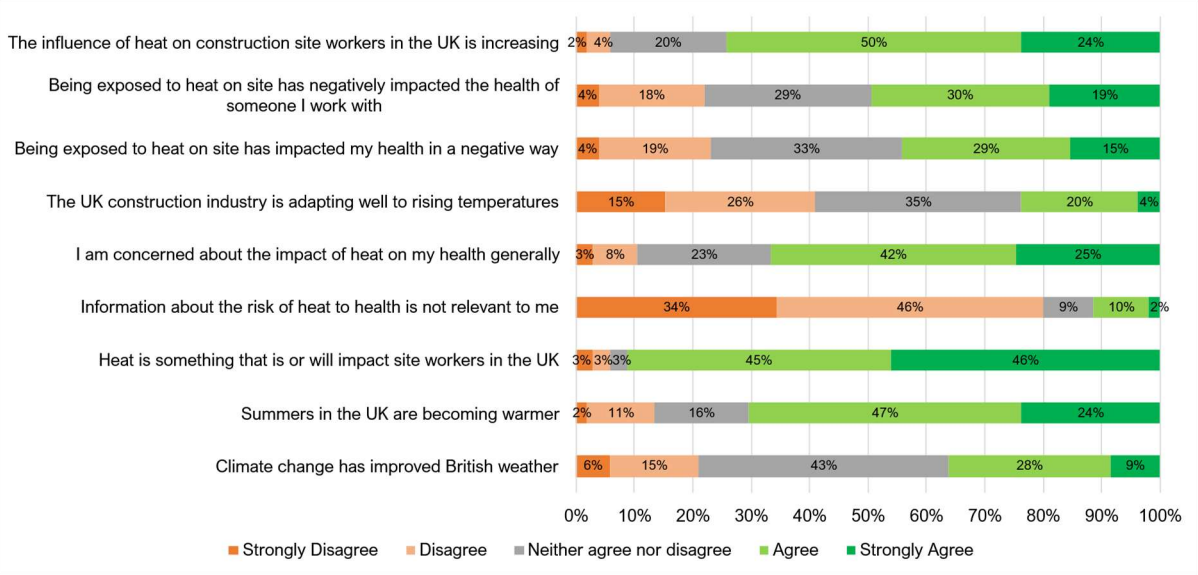
Perception of hot temperatures in the UK and adaptation efforts

Questions aimed at gathering thoughts and experiences related to working in hot temperature conditions, as well as the ability of the construction sites to adapt to increasing environmental heat.

Managers: Agreement/Disagreement with the statements



Operatives: Agreement/Disagreement with the statements



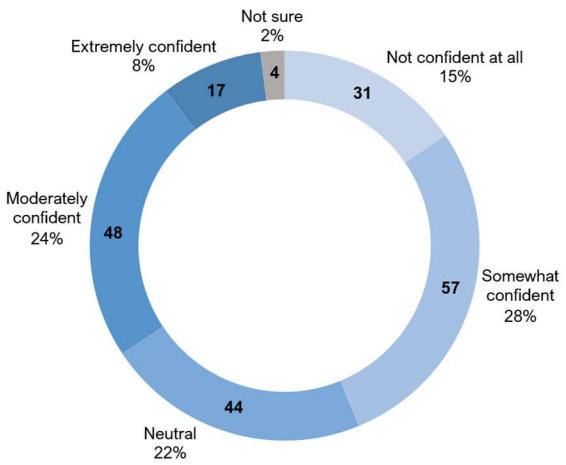
Comparison managers-operatives: Agreement/Disagreement with the statements

	Managers				Operatives			
	Disagreement		Agreement		Disagreement		Agreement	
	N	%	N	%	N	%	N	%
Climate change has improved British weather	82	41%	48	24%	22	21%	38	36%
Summers in the UK are becoming warmer	20	10%	132	**66%**	14	13%	74	**70%**
Heat is something that is or will impact site workers in the UK	5	3%	181	**91%**	6	6%	95	**91%**
Information about the risk of heat to health is not relevant to me	169	**85%**	11	6%	84	**80%**	12	11%
I am concerned about the impact of heat on my health generally	40	20%	99	**50%**	11	10%	70	**67%**
The UK construction industry is adapting well to rising temperatures	80	40%	40	20%	43	41%	25	24%
Being exposed to heat on site has impacted my health in a negative way	75	38%	62	31%	24	23%	46	44%
Being exposed to heat on site has negatively impacted the health of someone I work with	44	22%	76	38%	23	22%	52	**50%**
The influence of heat on construction site workers in the UK is increasing	15	8%	134	**67%**	6	6%	78	**74%**

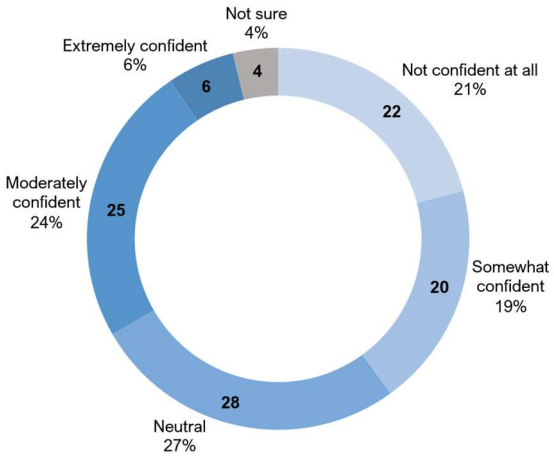
Note: Figures in bold indicate the option selected by the majority of the respondents (equal or more to 50%).

Managers and operatives: Level of confidence that UK construction sites will successfully adapt to rising temperatures in the next 5-10 years.

Managers



Operatives

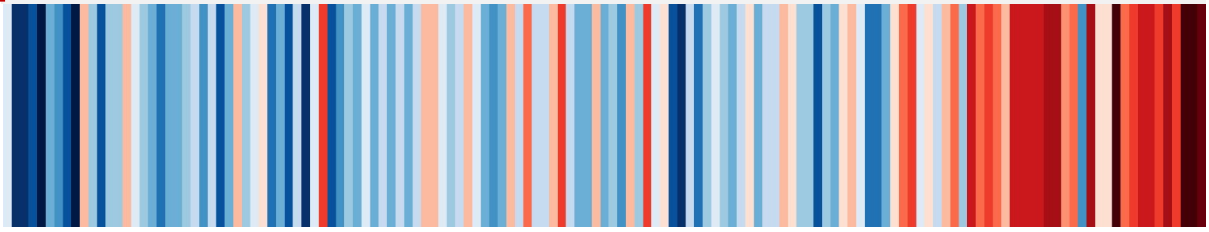


Comparison managers-operatives: Level of confidence that UK construction sites will successfully adapt to rising temperatures in the next 5-10 years.

	Managers		Operatives	
	N	%	N	%
Not confident at all	31	15%	22	21%
Somewhat confident	57	28%	20	19%
Neutral	44	22%	28	27%
Moderately confident	48	24%	25	24%
Extremely confident	17	8%	6	6%
Not sure	4	2%	4	4%

Key findings: Perception of heat in the UK and industry adaptation efforts

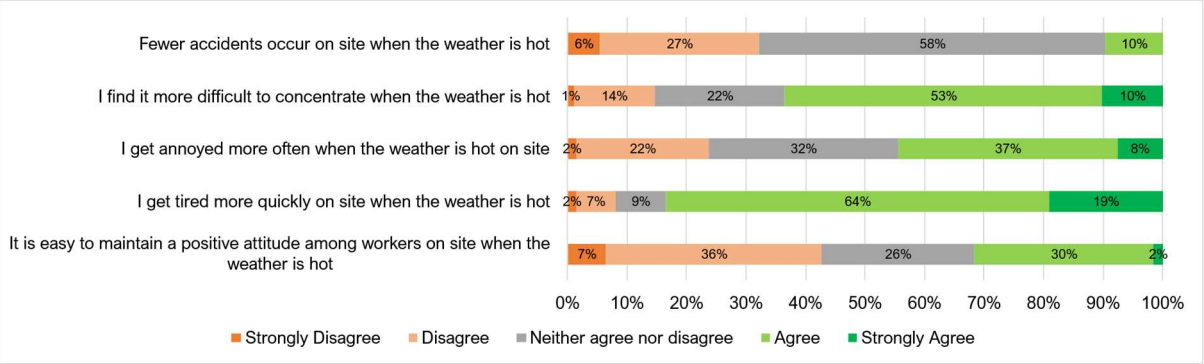
- **The sector clearly recognises heat as a growing and real risk**. There is very strong consensus (90%+) that heat is already impacting UK construction workers, with the majority of respondents (67-74%) agreeing that this is an increasing problem, as the UK summers are becoming warmer.
- **The impact of heat on health is evident**. More than half of respondents express concern about the impact of heat on their health, indicating moderate-to-high personal risk awareness. More than two thirds of the operatives (67%) admit being worried about their health whilst being exposed to heat, and nearly half of them indicate that their health or the health of someone they work with has already been negatively affected.
- **The impact of heat on health is widely seen as relevant**, with the large majority (80%+) suggesting that heat risk information is applicable to them personally.
- **Insufficient heat adaptation efforts**. There is a low to moderate confidence amongst managers and operatives that the UK construction sites will successfully adapt to rising temperatures in the next 5-10 years. Only ~20-25% agree that the industry is currently adapting well to heat.
- Compared with managers, operatives report greater concern about the health effects of rising temperatures and experience a more significant negative impact, while expressing lower confidence in the sector's current heat adaptation practices.



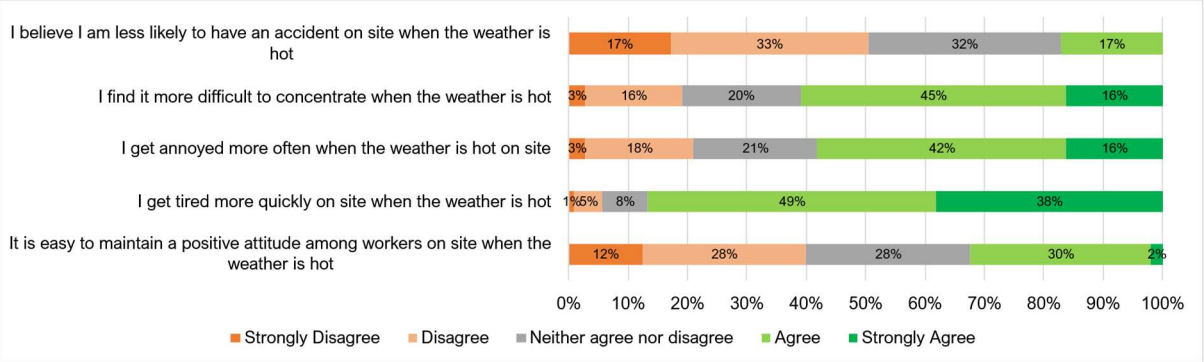
Perceived impact of heat on wellbeing and performance

Questions aimed at understanding how hot temperatures might impact managers and operatives personally while working on-site.

Managers: Agreement/Disagreement with the statements



Operatives: Agreement/Disagreement with the statements

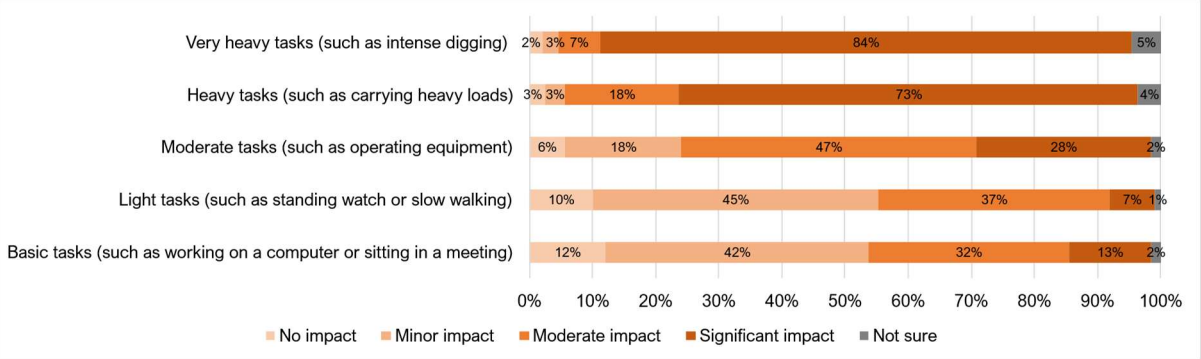


Comparison managers-operatives: Agreement/Disagreement with statements

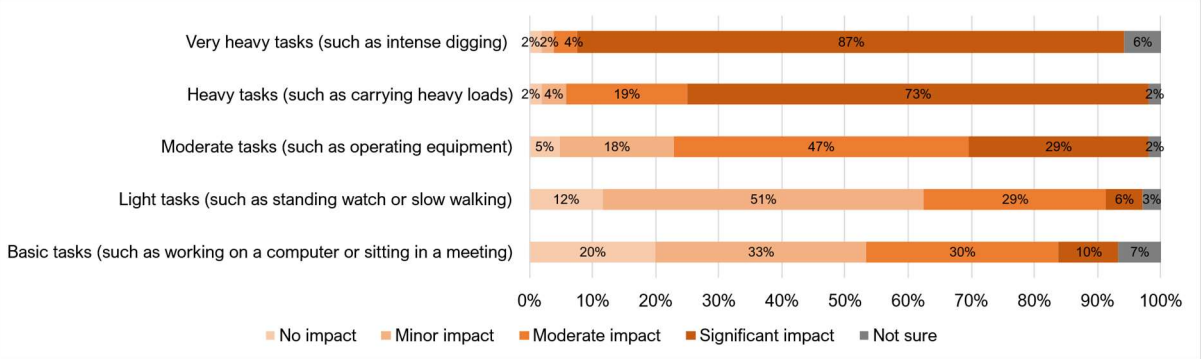
	Managers				Operatives			
	Disagreement		Agreement		Disagreement		Agreement	
	N	%	N	%	N	%	N	%
It is easy to maintain a positive attitude among workers on site when the weather is hot	85	43%	63	32%	42	40%	34	32%
I get tired more quickly on site when the weather is hot	16	8%	166	**83%**	6	6%	91	**87%**
I get annoyed more often when the weather is hot on site	47	24%	88	44%	22	21%	61	**58%**
I find it more difficult to concentrate when the weather is hot	29	15%	125	**63%**	20	19%	64	**61%**
Fewer accidents occur on site when the weather is hot	64	32%	19	10%				
I believe I am less likely to have an accident on site when the weather is hot					53	**50%**	18	17%

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Managers: Perceived impact that heat has on the difficulty of completing a task



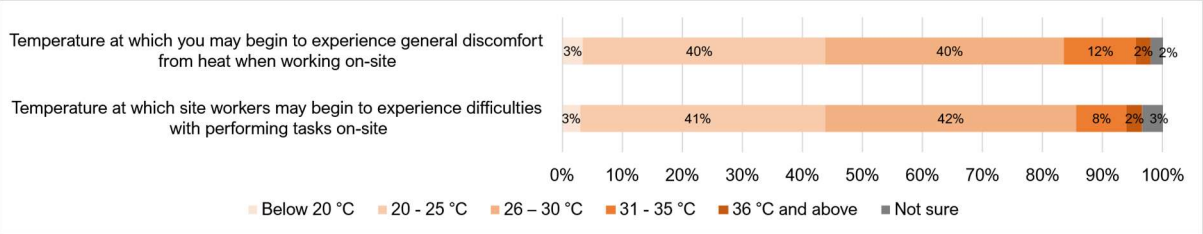
Operatives: Perceived impact that heat has on the difficulty of completing a task



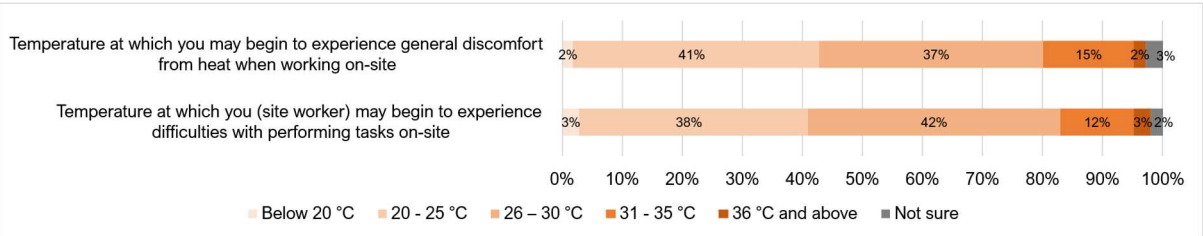
Comparison managers-operatives: Perceived impact that heat has on the difficulty of completing a task (Significant Impact scores only)

	Managers		Operatives	
	N	%	N	%
Basic tasks (such as working on a computer or sitting in a meeting)	26	13%	10	10%
Light tasks (such as standing watch or slow walking)	14	7%	6	6%
Moderate tasks (such as operating equipment)	54	28%	30	29%
Heavy tasks (such as carrying heavy loads)	144	73%	76	73%
Very heavy tasks (such as intense digging)	166	84%	91	87%

Managers: Temperature at which general discomfort from heat and difficulties with performing tasks are experienced



Operatives: Temperature at which general discomfort from heat and difficulties with performing tasks are experienced



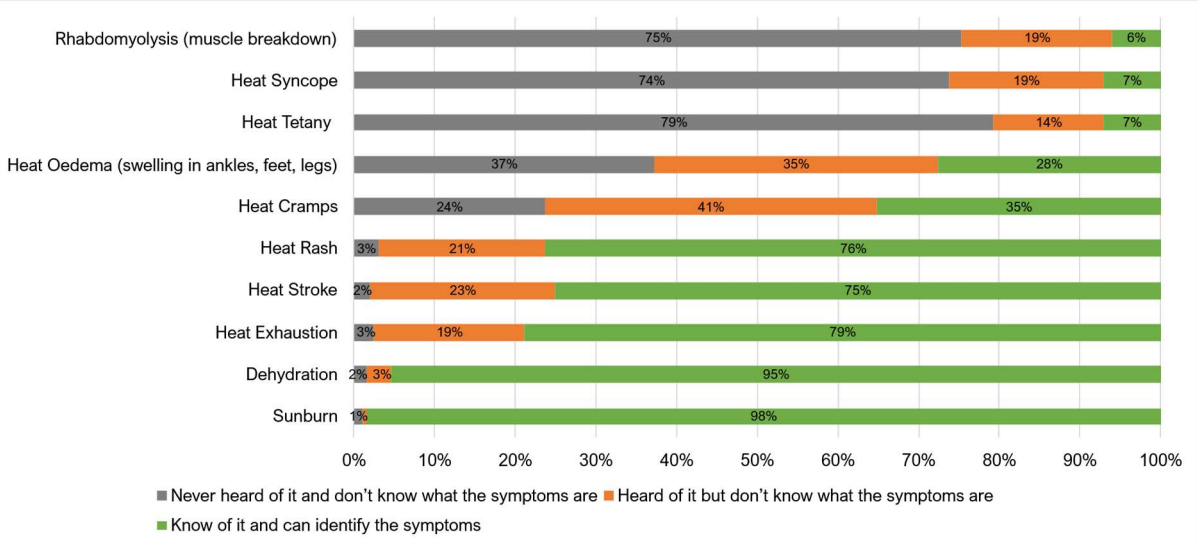
Key findings: Perceived impact of hot temperatures on wellbeing and performance

- **Increased fatigue is a major concern**. Managers and operatives strongly agree (83%+) that they become tired more quickly when exposed to heat.
- **Heat exposure reduces concentration significantly**. Two thirds of managers and operatives agree that heat makes it more difficult to focus while working on site, indicating potential effects on productivity and safety.
- **Heat negatively affects operatives' mood and on-site morale**. Over half of the operatives (58%) agreed that they become annoyed more often in heat. Managers and operatives (40%+) also indicated that it is not easy to maintain a positive attitude among workers on site when the weather is hot.
- **The perceived effect of heat on safety accidents is not certain**. Managers and operatives generally disagreed (30-50%) that workers are less likely to have an accident when the weather is hot.
- **Heat significantly impacts task performance**. Managers and operatives agreed that heat significantly increases the difficulty of completing physically demanding work, particularly very heavy and heavy tasks.
- **Wellbeing and productivity are affected under moderately warm conditions**. General discomfort and task performance difficulties begin at 20-25°C temperature range for over 40% of the operatives and managers.

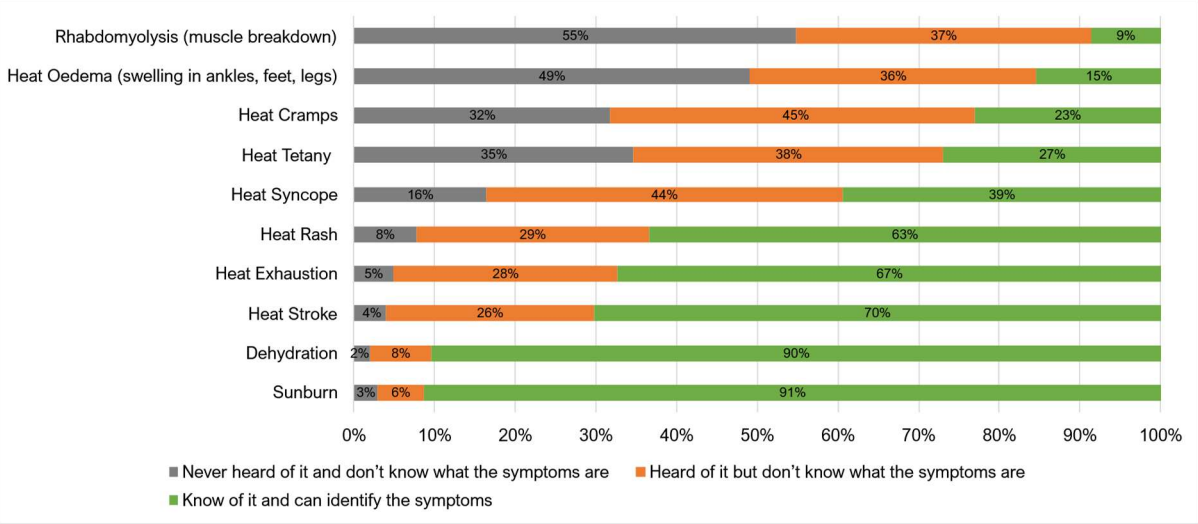
Knowledge of illnesses caused by heat and their symptoms

Questions aimed at understanding the level of knowledge amongst managers and operatives of heat-related illnesses and their contributing factors, as well as their ability to identify the symptoms and take appropriate action.

Managers: Knowledge of heat-related illnesses and ability to identify their symptoms



Operatives: Knowledge of heat-related illnesses and ability to identify their symptoms

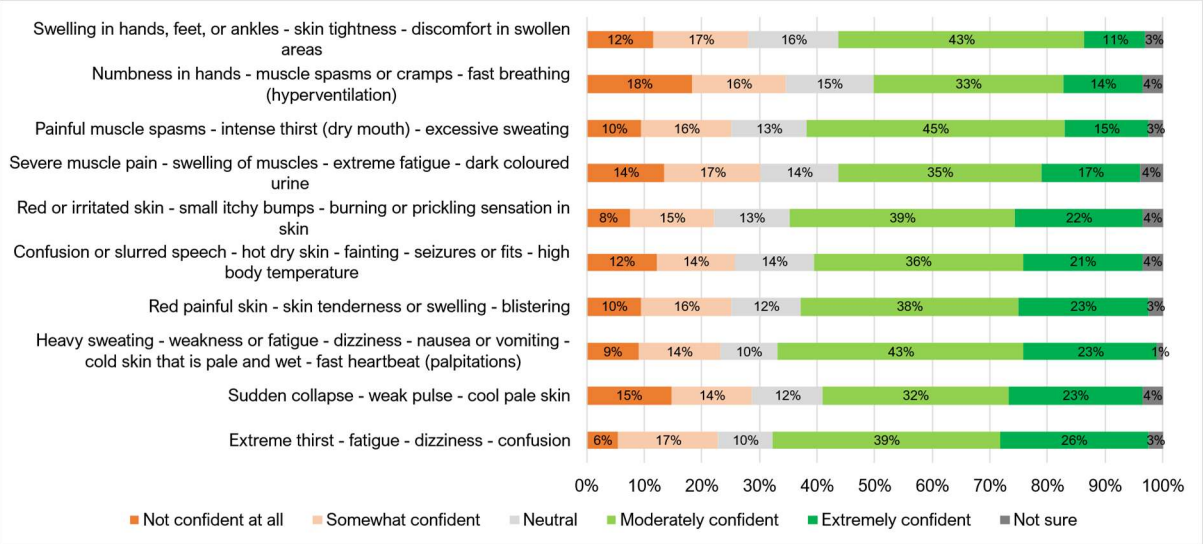


Comparison managers-operatives: Knowledge of heat-related illnesses and ability to identify their symptoms

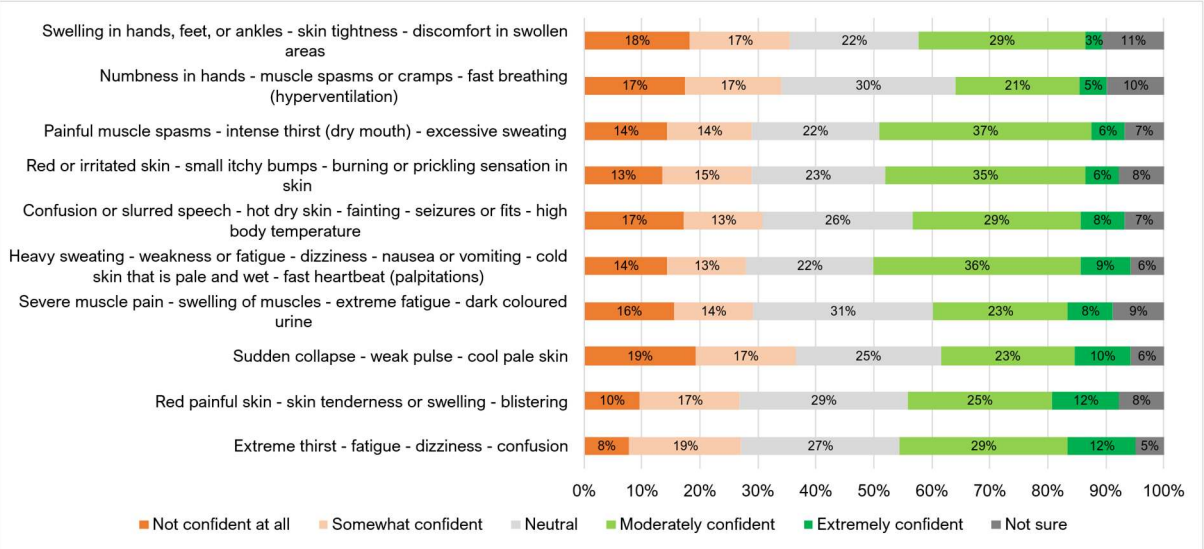
	Managers				Operatives			
	I don't know the symptoms		I can identify the symptoms		I don't know the symptoms		I can identify the symptoms	
	N	%	N	%	N	%	N	%
Sunburn	3	2%	195	**98%**	9	9%	95	**91%**
Dehydration	9	5%	188	**95%**	10	10%	94	**90%**
Heat Exhaustion	42	21%	157	**79%**	34	33%	70	**67%**
Heat Stroke	49	25%	148	**75%**	30	30%	71	**70%**
Heat Rash	47	24%	151	**76%**	38	37%	66	**63%**
Heat Cramps	129	**65%**	70	35%	80	**77%**	24	23%
Heat Oedema (swelling in ankles, feet, legs)	144	**72%**	55	28%	88	**85%**	16	15%
Heat Tetany	184	**93%**	14	7%	76	**73%**	28	27%
Heat Syncope	184	**93%**	14	7%	63	**61%**	41	39%
Rhabdomyolysis (muscle breakdown)	187	**94%**	12	6%	95	**91%**	9	9%

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Managers: Confidence level on the ability to take appropriate action if you or a colleague exhibited two or more symptoms from a single category whilst working on-site



Operatives: Confidence level on the ability to take appropriate action if you or a colleague exhibited two or more symptoms from a single category whilst working on-site

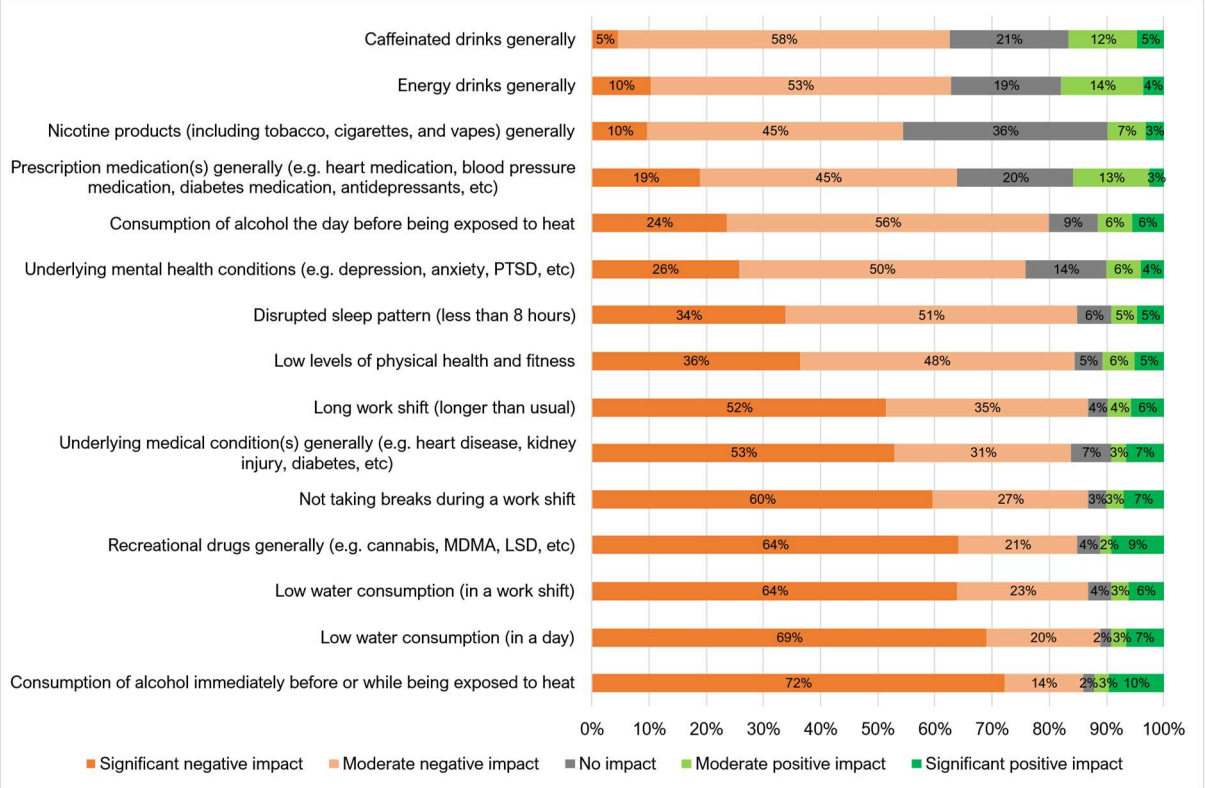


Comparison managers-operatives: Confidence level on the ability to take appropriate action if you or a colleague exhibited two or more symptoms from a single category whilst working on-site

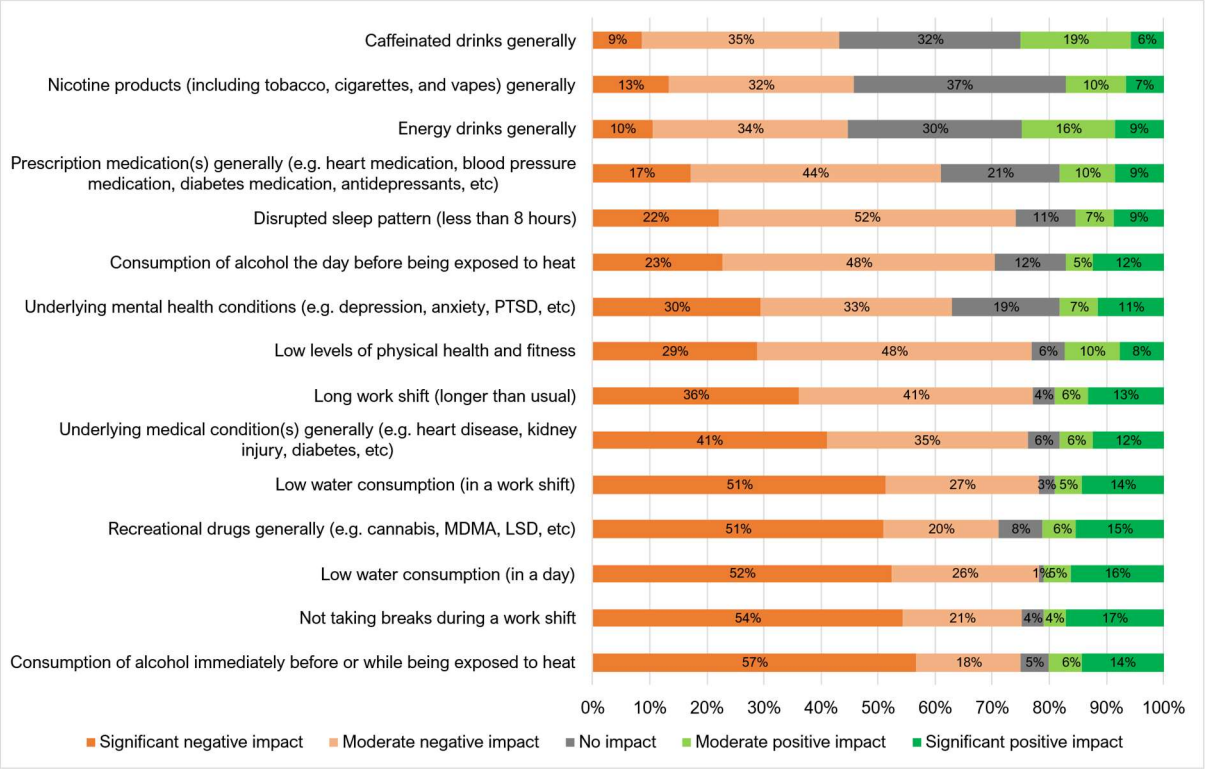
	Managers				Operatives			
	Somewhat/ Not confident		Extremely/ Moderate confident		Somewhat/ Not confident		Extremely/ Moderate confident	
	N	%	N	%	N	%	N	%
Extreme thirst - fatigue - dizziness - confusion	45	23%	129	**65%**	28	27%	42	41%
Sudden collapse - weak pulse - cool pale skin	57	29%	110	**56%**	38	37%	34	33%
Heavy sweating - weakness or fatigue - dizziness - nausea or vomiting - cold skin that is pale and wet - fast heartbeat (palpitations)	46	23%	131	**66%**	29	28%	46	44%
Red painful skin - skin tenderness or swelling - blistering	50	25%	120	**60%**	28	27%	38	37%
Confusion or slurred speech - hot dry skin - fainting - seizures or fits - high body temperature	51	26%	113	**57%**	32	31%	38	37%
Red or irritated skin - small itchy bumps - burning or prickling sensation in skin	44	22%	122	**61%**	30	29%	42	40%
Severe muscle pain - swelling of muscles - extreme fatigue - dark coloured urine	60	30%	104	**52%**	30	29%	32	31%
Painful muscle spasms - intense thirst (dry mouth) - excessive sweating	50	25%	118	**59%**	30	29%	44	42%
Numbness in hands - muscle spasms or cramps - fast breathing (hyperventilation)	68	35%	92	47%	35	34%	27	26%
Swelling in hands, feet, or ankles - skin tightness - discomfort in swollen areas	56	28%	106	**53%**	37	36%	33	32%

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Managers: Impact of factors on a person's ability to work under hot temperatures



Operatives: Impact of factors on a person's ability to work under hot temperatures



Comparison managers-operatives: Impact of factors on a person's ability to work under hot temperatures

	Managers						Operatives					
	Negative impact		No impact		Positive impact		Negative impact		No impact		Positive impact	
	N	%	N	%	N	%	N	%	N	%	N	%
Consumption of alcohol immediately before or while being exposed to heat	170	**86%**	4	2%	24	12%	78	**75%**	5	5%	21	20%
Low water consumption (in a day)	175	**89%**	4	2%	18	9%	82	**78%**	1	1%	22	21%
Low water consumption (in a work shift)	171	**87%**	8	4%	18	9%	82	**78%**	3	3%	20	19%
Recreational drugs generally (e.g. cannabis, MDMA, LSD, etc)	168	**85%**	8	4%	22	11%	74	**71%**	8	8%	22	21%
Not taking breaks during a work shift	172	**87%**	6	3%	20	10%	79	**75%**	4	4%	22	21%
Underlying mental health conditions (e.g. depression, anxiety, PTSD, etc)	151	**76%**	28	14%	20	10%	66	**63%**	20	19%	19	18%
Long work shift (longer than usual)	170	**87%**	7	4%	19	10%	81	**77%**	4	4%	20	19%
Low levels of physical health and fitness	167	**84%**	10	5%	21	11%	80	**77%**	6	6%	18	17%
Disrupted sleep pattern (less than 8 hours)	168	**85%**	12	6%	18	9%	77	**74%**	11	11%	16	15%
Underlying medical condition(s) generally (e.g. heart disease, kidney injury, diabetes, etc)	166	**84%**	14	7%	18	9%	80	**76%**	6	6%	19	18%
Consumption of alcohol the day before being exposed to heat	159	**80%**	17	9%	23	12%	74	**70%**	13	12%	18	17%
Prescription medication(s) generally (e.g. heart medication, blood pressure medication, diabetes medication, antidepressants, etc)	126	**64%**	40	20%	31	16%	64	**61%**	22	21%	19	18%
Nicotine products (including tobacco, cigarettes, and vapes) generally	106	**54%**	70	36%	19	10%	48	46%	39	37%	18	17%
Energy drinks generally	123	**63%**	38	19%	35	18%	47	45%	32	30%	26	25%
Caffeinated drinks generally	124	**63%**	41	21%	33	17%	45	43%	33	32%	26	25%

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Key findings: Knowledge of heat illnesses and their symptoms

Knowledge gap of heat-related illnesses and their symptoms

- Managers and operatives indicate having an understanding of the symptoms of common heat-related illnesses, particularly sunburn, dehydration, heat exhaustion, heat stroke, and heat rash.
- Symptom recognition is much lower for heat cramps, heat oedema, heat syncope, heat tetany, and rhabdomyolysis, indicating that these conditions may go unrecognised.
- Managers generally show greater symptom recognition than operatives for common heat illnesses. However, both groups exhibited important knowledge gaps regarding less common conditions.

Limited ability to take appropriate action when heat-related symptoms are observed, even those related to severe or life-threatening heat illnesses

- Only 57% of the managers and 37% of the operatives can confidently take appropriate action when someone is experiencing symptoms of heat stroke, a life-threatening condition that requires immediate emergency medical intervention.
- There is a significant group of managers (up to 48%) with limited ability to respond appropriately across most symptoms, even those related to severe heat illnesses such as heat exhaustion or rhabdomyolysis.
- Operatives showed notably lower confidence levels overall, with only 26-44% of the operatives being able to respond confidently when exhibiting heat-related symptoms. Even for more commonly recognised heat stress symptoms, operatives still show comparatively limited confidence.
- More targeted training is required, focusing on recognising heat-related symptoms and responding appropriately, rather than relying on general awareness training.

Impact of factors on a person's ability to work under hot temperatures

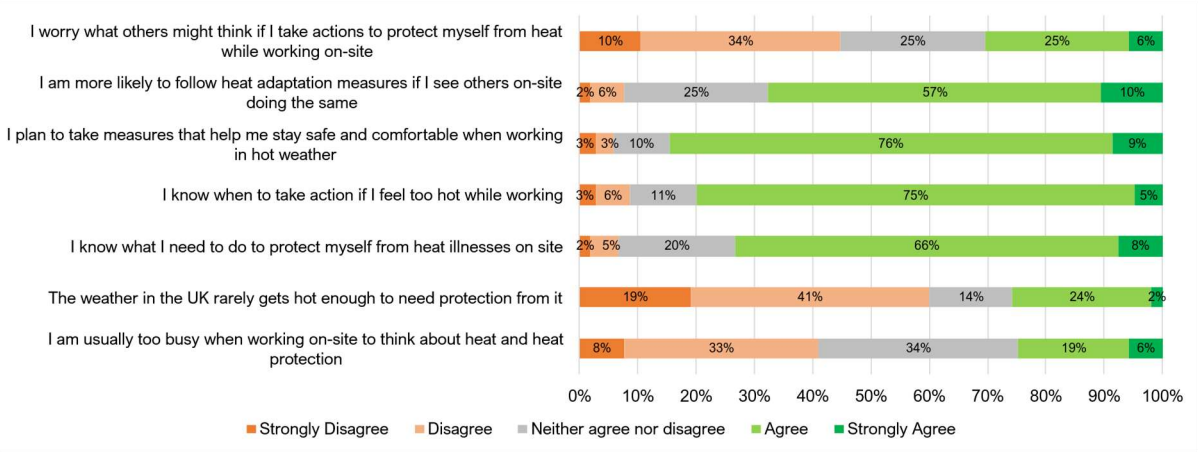
- Managers and operatives strongly agree that behaviours such as low water intake, alcohol and drugs consumption, not taking breaks, and long work shifts, have a negative effect on a person's ability to work under hot temperatures.
- Managers consistently show higher awareness of negative impacts compared with operatives across nearly all factors, indicating a generally stronger risk perception.
- The effects of prescription medication, nicotine products, caffeinated drinks, and energy drinks are less understood, particularly amongst operatives.

Heat adaptation methods

Questions aimed at exploring the heat adaptation measures adopted at the individual level (operative-led) and those provided by the employer (employer-led), and their perceived level of effectiveness.

Individual (operative-led) heat adaptation methods

Operatives: Agreement/disagreement on statements related to individual adaptation actions, based on personal experience

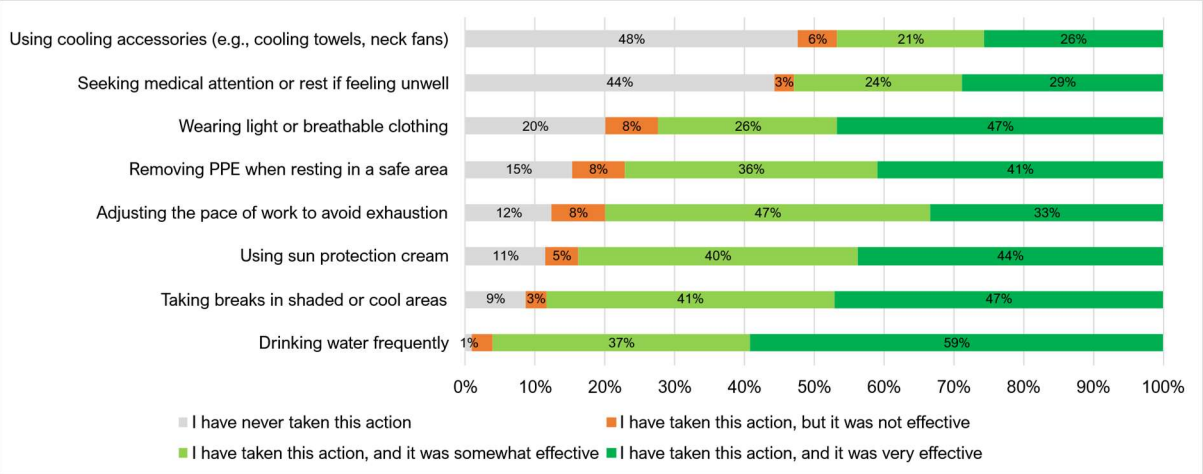


Summary table of Operatives: Agreement/disagreement on statements related to individual adaptation actions, based on personal experience

	Operatives			
	Disagreement		Agreement	
	N	%	N	%
I am usually too busy when working on-site to think about heat and heat protection	43	41%	26	25%
The weather in the UK rarely gets hot enough to need protection from it	63	**60%**	27	26%
I know what I need to do to protect myself from heat illnesses on site	7	7%	77	**73%**
I know when to take action if I feel too hot while working	9	9%	84	**80%**
I plan to take measures that help me stay safe and comfortable when working in hot weather	6	6%	88	**85%**
I am more likely to follow heat adaptation measures if I see others on-site doing the same	8	8%	71	**68%**
I worry what others might think if I take actions to protect myself from heat while working on-site	47	45%	32	30%

Note: Figures in bold suggest the option selected by the majority of the respondents (more or equal to 50%).

Operatives: Actions taken to protect yourself from heat while working on a construction site, and perceived effectiveness



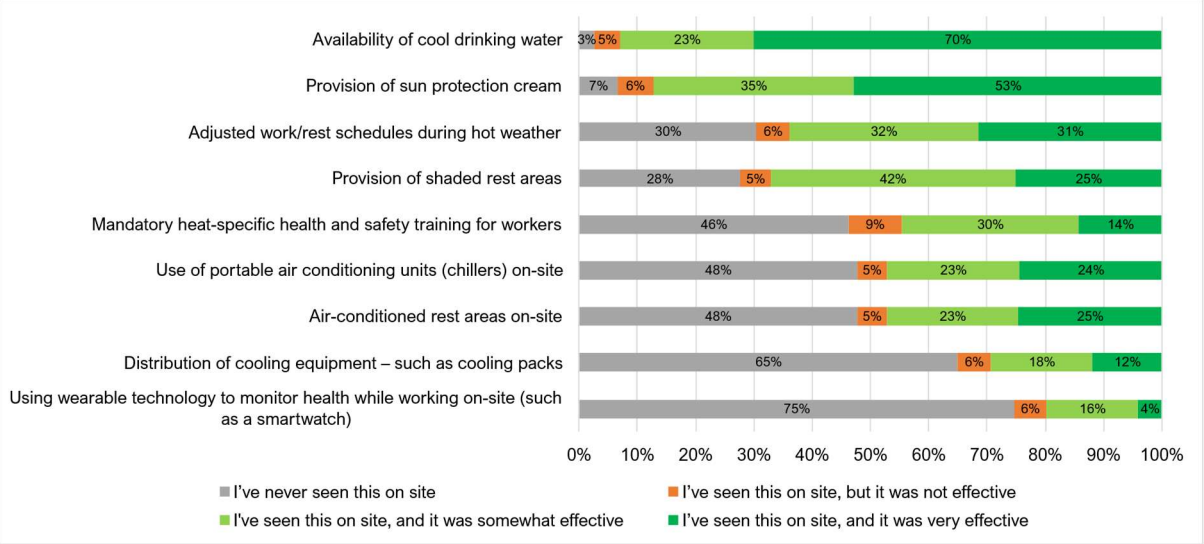
Summary table of Operatives: Actions taken to protect yourself from heat while working on a construction site, and perceived effectiveness

	Operatives					
	Never taken action		Non-effective action		Effective action	
	N	%	N	%	N	%
Drinking water frequently	1	1%	3	3%	99	**96%**
Taking breaks in shaded or cool areas	9	9%	3	3%	92	**88%**
Using sun protection cream	12	11%	5	5%	88	**84%**
Adjusting the pace of work to avoid exhaustion	13	12%	8	8%	84	**80%**
Removing PPE when resting in a safe area	16	15%	8	8%	81	**77%**
Wearing light or breathable clothing	21	20%	8	8%	76	**72%**
Seeking medical attention or rest if feeling unwell	46	44%	3	3%	55	**53%**
Using cooling accessories (e.g., cooling towels, neck fans)	50	48%	6	6%	49	47%

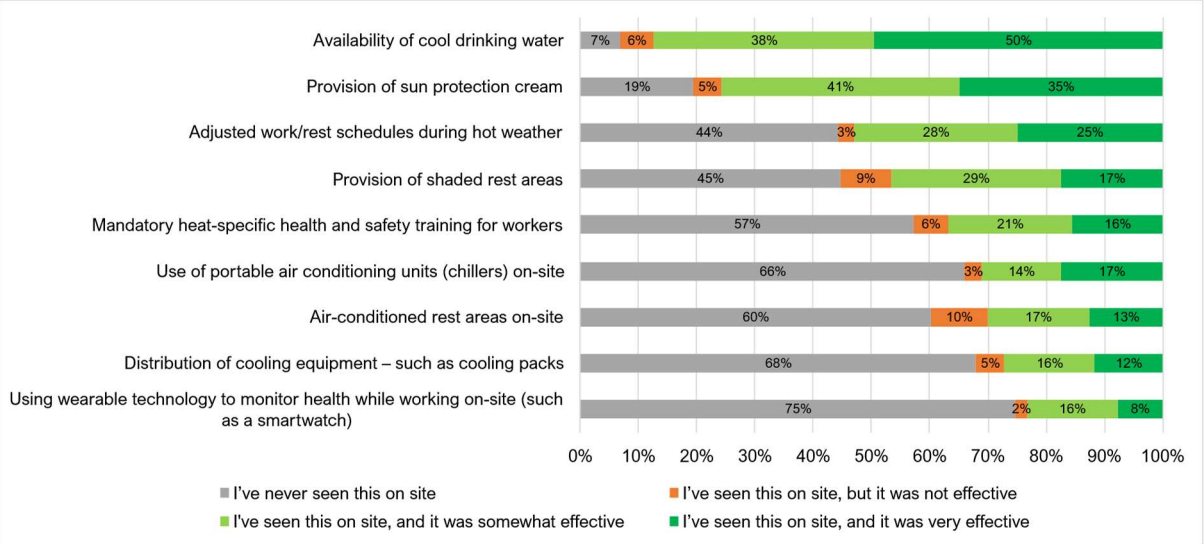
Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Employer-led heat adaptation methods

Managers: Employer-led heat adaptation methods observed on a construction site to protect workers from heat, and perceived effectiveness



Operatives: Employer-led heat adaptation methods observed on a construction site to protect workers from heat, and perceived effectiveness

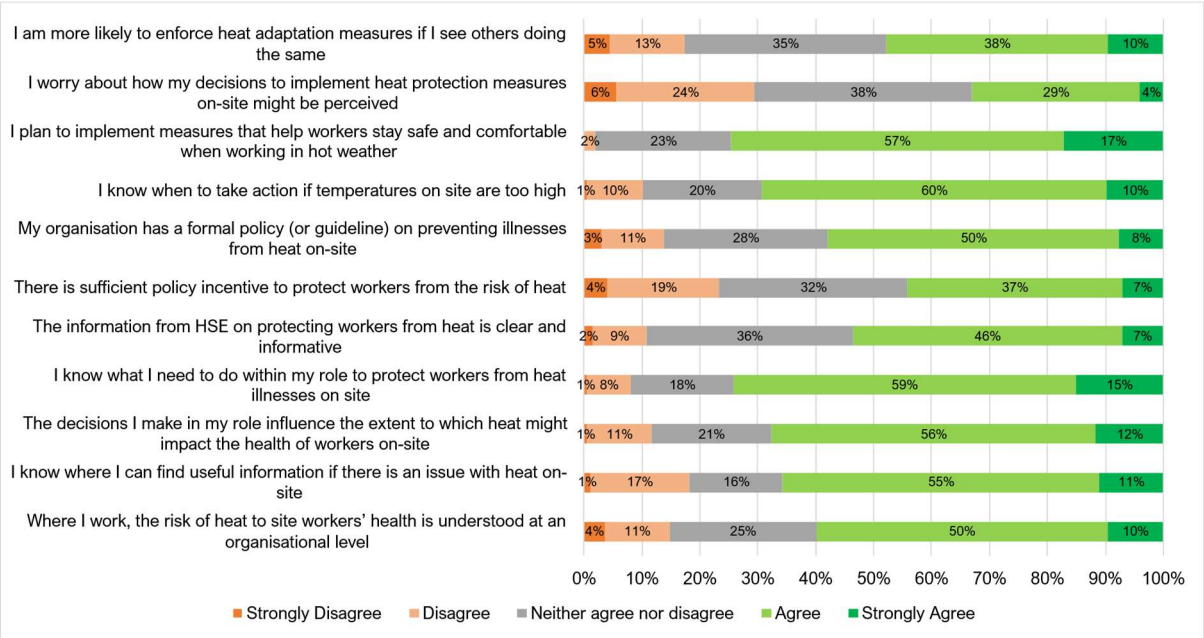


Comparison managers-operatives: Employer-led heat adaptation methods observed on a construction site to protect workers from heat, and perceived effectiveness

	Managers						Operatives					
	Never seen measure		Non-effective measure		Effective measure		Never seen measure		Non-effective measure		Effective measure	
	N	%	N	%	N	%	N	%	N	%	N	%
Using wearable technology to monitor health while working on-site (such as a smartwatch)	147	**75%**	11	6%	39	20%	77	**75%**	2	2%	24	23%
Distribution of cooling equipment – such as cooling packs	126	**65%**	11	6%	57	29%	70	**68%**	5	5%	28	27%
Mandatory heat-specific health and safety training for workers	91	46%	18	9%	88	45%	59	**57%**	6	6%	38	37%
Provision of shaded rest areas	54	28%	10	5%	131	**67%**	46	45%	9	9%	48	47%
Air-conditioned rest areas on-site	93	48%	10	5%	92	47%	62	**60%**	10	10%	31	30%
Use of portable air conditioning units (chillers) on-site	94	48%	10	5%	93	47%	68	**66%**	3	3%	32	31%
Adjusted work/rest schedules during hot weather	60	30%	11	6%	126	**64%**	46	44%	3	3%	55	**53%**
Provision of sun protection cream	13	7%	12	6%	172	**87%**	20	19%	5	5%	78	**76%**
Availability of cool drinking water	5	3%	9	5%	183	**93%**	7	7%	6	6%	90	**87%**

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Managers: Agreement/disagreement with statements related to employer-led adaptation methods

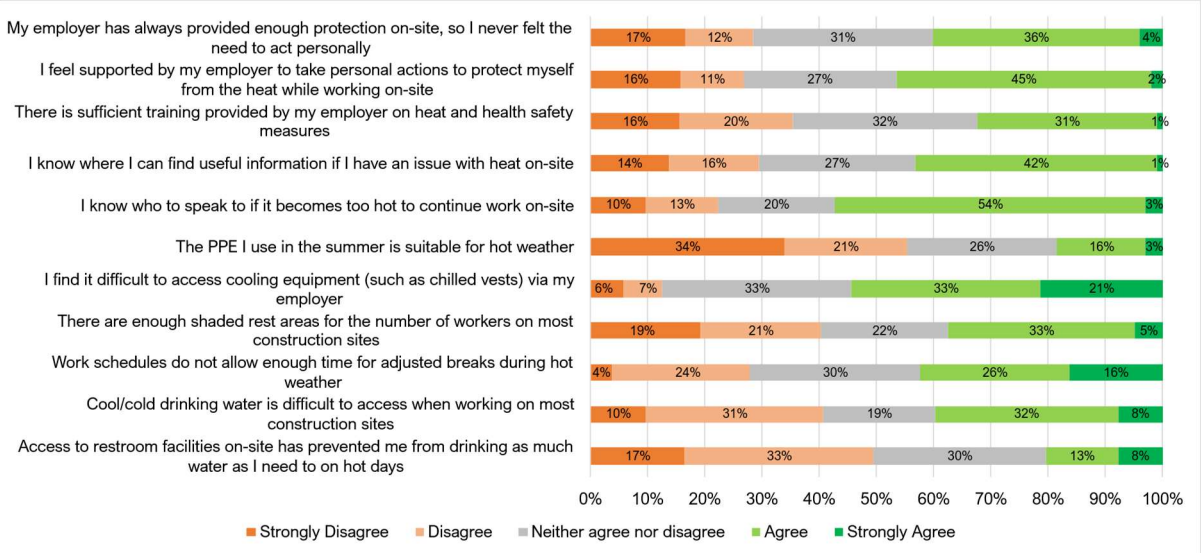


Summary table of Managers: Agreement/disagreement with statements related to employer-led adaptation methods

	Disagreement		Agreement	
	N	%	N	%
Where I work, the risk of heat to site workers' health is understood at an organisational level	29	15%	118	**60%**
I know where I can find useful information if there is an issue with heat on-site	36	18%	130	**66%**
The decisions I make in my role influence the extent to which heat might impact the health of workers on-site	23	12%	134	**68%**
I know what I need to do within my role to protect workers from heat illnesses on site	16	8%	147	**74%**
The information from HSE on protecting workers from heat is clear and informative	21	11%	105	**54%**
There is sufficient policy incentive to protect workers from the risk of heat	46	23%	87	44%
My organisation has a formal policy (or guideline) on preventing illnesses from heat on-site	27	14%	114	**58%**
I know when to take action if temperatures on site are too high	20	10%	136	**69%**
I plan to implement measures that help workers stay safe and comfortable when working in hot weather	4	2%	147	**75%**
I worry about how my decisions to implement heat protection measures on-site might be perceived	58	29%	65	33%
I am more likely to enforce heat adaptation measures if I see others doing the same	34	17%	94	48%

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Operatives: Agreement/disagreement with statements related to employer-led adaptation methods



Summary table of Operatives: Agreement/disagreement with statements related to employer-led adaptation methods

	Operatives			
	Disagreement		Agreement	
	N	%	N	%
Access to restroom facilities on-site has prevented me from drinking as much water as I need to on hot days	51	**50%**	21	20%
Cool/cold drinking water is difficult to access when working on most construction sites	42	41%	41	40%
Work schedules do not allow enough time for adjusted breaks during hot weather	29	28%	44	42%
There are enough shaded rest areas for the number of workers on most construction sites	42	40%	39	38%
I find it difficult to access cooling equipment (such as chilled vests) via my employer	13	13%	56	**54%**
The PPE I use in the summer is suitable for hot weather	57	**55%**	19	18%
I know who to speak to if it becomes too hot to continue work on-site	23	22%	59	**57%**
I know where I can find useful information if I have an issue with heat on-site	30	29%	44	43%
There is sufficient training provided by my employer on heat and health safety measures	36	35%	33	32%
I feel supported by my employer to take personal actions to protect myself from the heat while working on-site	27	27%	47	47%
My employer has always provided enough protection on-site, so I never felt the need to act personally	29	28%	41	40%

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

Key findings: Heat-related adaptation methods

Individual (operative-led) heat adaptation methods

- **Strong self-reported awareness and capability**. Most operatives (70%+) agree they know how to protect themselves from heat illness and when to take action.
- **High intention to act safely in hot conditions**. A large majority (85%) say they plan to take measures to stay safe and comfortable in hot weather, indicating strong stated commitment to heat adaptation behaviours on site.
- **Peer behaviour and site culture is an important driver**. 68% agree they are more likely to follow heat adaptation measures if they see others doing the same.
- **Some misconceptions and barriers remain**. While most responses are positive, notable proportions still reflect potential barriers, such as 26% agreeing that UK weather rarely gets hot enough to require protection, 30% worrying about what others think if they take heat protection actions, and 25% saying they are too busy on site to think about heat protection.

Key findings: Heat-related adaptation methods (Continued)

Individual (operative-led) heat adaptation methods (Continued)

- **Strong uptake of core preventive behaviours**. High proportions (80%+) of operatives report effective use of fundamental heat mitigation strategies such as hydration, taking breaks in shaded/cool areas, and adjusting work pace, when available on site.
- **Moderate adoption of PPE and clothing-related adaptations**. Measures such as removing PPE during safe rest periods and wearing light or breathable clothing are widely seen as effective but show slightly lower uptake, suggesting practical or site constraints may influence their adoption.
- **Lower engagement with seeking help and using specialist cooling measures**. Seeking medical attention or resting when unwell, as well as using cooling accessories, are less commonly adopted (44-48% reporting they have never used these actions). However, among those who do use them, these measures are recognised as effective.

Employer-led heat adaptation methods

- **Limited number of widely established and visible measures on site**. Provision of cool drinking water and sun protection cream are the only two effective measures commonly seen (80%+) on construction sites by managers and operatives. Measures such as adjusted work/rest schedules and shaded rest areas are generally seen as effective, but operatives report lower exposure to these controls (45% of the operatives have never seen this measure on site), suggesting uneven implementation or visibility across sites.
- **Advanced interventions show lower adoption**. Measures such as air-conditioned rest areas, portable air conditioning units, personal cooling equipment, and wearable health-monitoring technology are far less commonly observed, with around half or more respondents reporting they have never seen these in place.
- **Lack of mandatory heat-specific health and safety training for workers**. More than half of the workers (57%) report a lack of training, suggesting an uneven implementation or awareness across sites despite generally positive perceived effectiveness where it is in place.
- **Clear perception gap between managers and operatives**. Managers consistently report higher levels of exposure to heat adaptation measures and they perceive them as being more effective than the operatives themselves, particularly for shaded rest areas (67% vs 47%), adjusted work/rest schedules (64% vs 53%), and air-conditioned rest areas (47% vs 30%).

Key findings: Heat-related adaptation methods (Continued)

Managers' perceptions of employer-led adaptation methods

- **Strong sense of individual responsibility and intent to act**. Managers agree (74%+) that they understand their role when protecting workers from heat and plan to implement heat protection measures in hot weather.
- **Managers feel generally informed and empowered**. A majority of managers feel informed and empowered, with 66% knowing where to find heat-related information, 69% knowing when to take action, and 68% recognising that their decisions influence worker health outcomes.
- **Heat risk is acknowledged within the organisation but not fully embedded in formal policy**. While 60% of managers agree that heat risk is understood at an organisational level, more than 40% indicate not being aware or not having a formal policy in place in their organisation, suggesting that organisational awareness of heat risk does not always translate into formalised policy frameworks.
- **Heat management policy and guidance are insufficient**. While just over half of managers (54%) agree that HSE information on protecting workers from heat is clear and informative, fewer (44%) believe there is sufficient policy incentive to address heat risks.

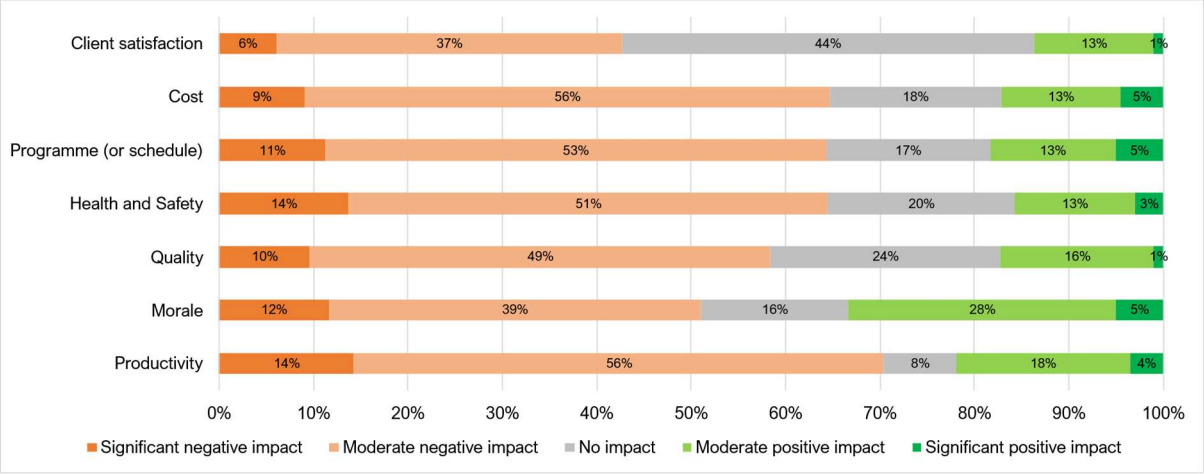
Operatives' perceptions of employer-led adaptation methods

- **Inconsistent access to basic heat controls and equipment**. Operatives have split views on access to cool drinking water and shaded rest areas, suggesting uneven provision across sites. A notable proportion (42%) agree that work schedules do not allow enough time for adjusted breaks in hot weather, and 54% report difficulty accessing cooling equipment.
- **Support mechanisms and communication are only partially effective**. While 57% know who to speak to if it becomes too hot to continue working, there is a substantial minority without clarity, and only 47% feel supported by their employer to take personal protective actions.
- **PPE not suitable for hot weather**. A minority (18%) of the operatives consider the PPE they use in the summer to be suitable for hot weather.
- **Perceptions of employer-provided heat management training are mixed**. More operatives consider current training provision to be insufficient (35%) than sufficient (32%), suggesting that training is not being delivered consistently across sites and may not be adequately meeting workers' needs.

Impact of heat on project performance and challenges

Questions aimed at understanding the impact that rising temperatures might have on aspects of project performance and management.

Managers: Impact of rising temperatures on aspects of a construction project

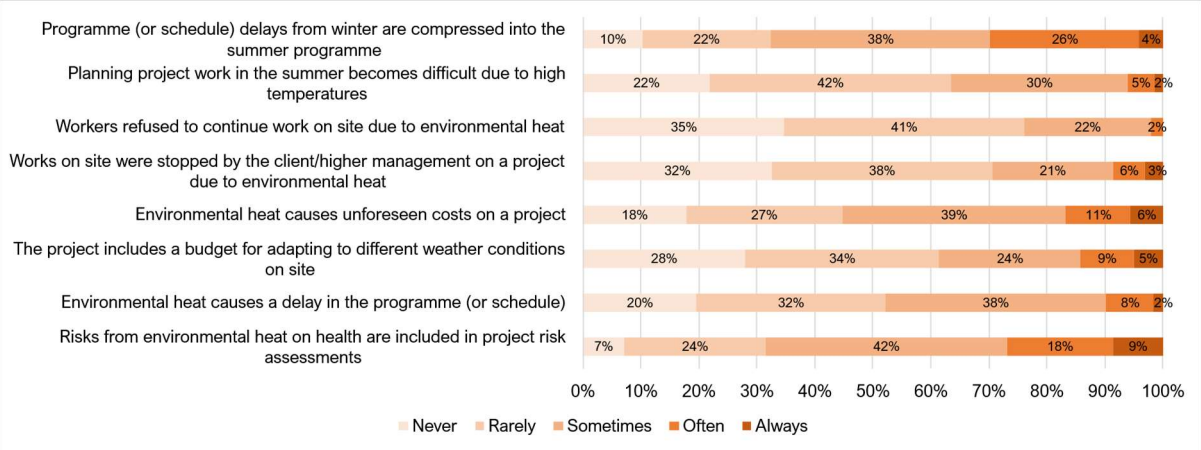


Summary table of Managers: Impact of rising temperatures on aspects of a construction project

	Managers					
	Negative impact		No impact		Positive impact	
	N	%	N	%	N	%
Productivity	138	**70%**	15	8%	43	22%
Morale	101	**51%**	31	16%	66	33%
Quality	115	**58%**	48	24%	34	17%
Health and Safety	127	**64%**	39	20%	31	16%
Programme (or schedule)	126	**64%**	34	17%	36	18%
Cost	128	**65%**	36	18%	34	17%
Client satisfaction	84	43%	86	44%	27	14%

Note: Figures in bold indicate the option selected by the majority of the respondents (more or equal to 50%).

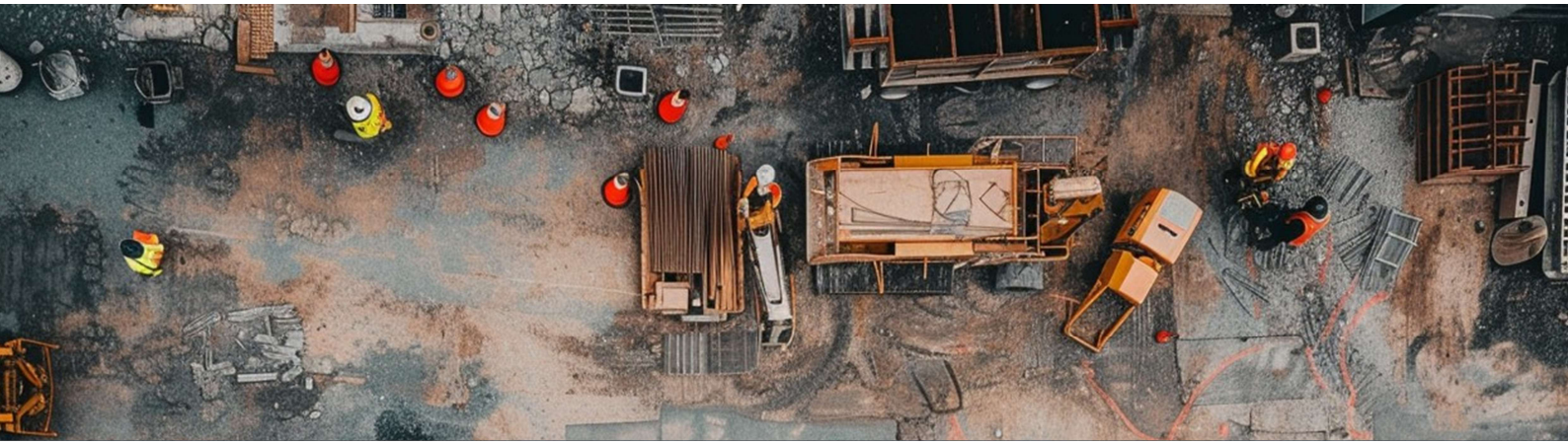
Managers: Frequency of events related to working under hot temperatures occurred in a project, based on personal experience



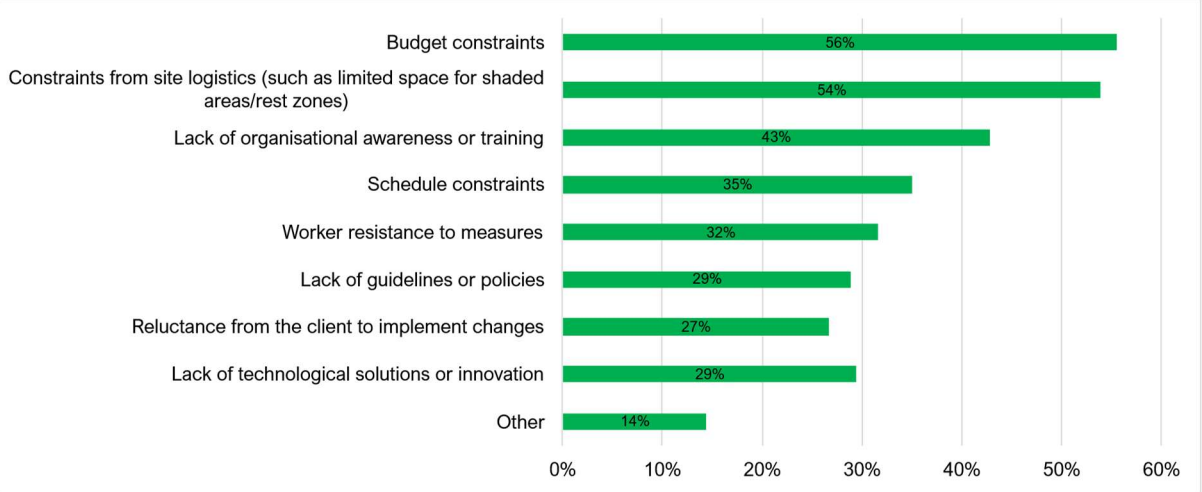
Summary table of Managers: Frequency of events related to working under hot temperatures occurred in a project, based on personal experience

	Managers			
	Never-Rarely		Always-Often-Sometimes	
	N	%	N	%
Risks from environmental heat on health are included in project risk assessments	62	31%	135	**69%**
Environmental heat causes a delay in the programme (or schedule)	101	**52%**	93	48%
The project includes a budget for adapting to different weather conditions on site	121	**61%**	76	39%
Environmental heat causes unforeseen costs on a project	88	45%	109	**55%**
Works on site were stopped by the client/higher management on a project due to environmental heat	139	**71%**	58	29%
Workers refused to continue work on site due to environmental heat	149	**76%**	47	24%
Planning project work in the summer becomes difficult due to high temperatures	125	**63%**	72	37%
Programme (or schedule) delays from winter are compressed into the summer programme	63	32%	132	**68%**

Note: Figures in bold suggest the option selected by the majority of the respondents (more or equal to 50%).



Managers: Challenges faced in implementing heat adaptation methods on-site



Key findings: Impact of heat on project performance and challenges

Impact of rising temperatures on aspects of a construction project and challenges

- **Heat seen as a significant risk to project delivery, not only a workers' welfare**. Productivity (70%), cost (65%), programme delivery (64%), and health and safety (64%) are considered to be the most negatively impacted aspects of a construction project under hot temperatures.
- **Site-specific characteristics, financial considerations, and heat awareness limit the adoption of heat adaptation measures across construction sites**. Managers consider that budget constraints (56%), site logistics limitations (54%), and lack of organisational awareness or training (43%) are the three most significant obstacles.

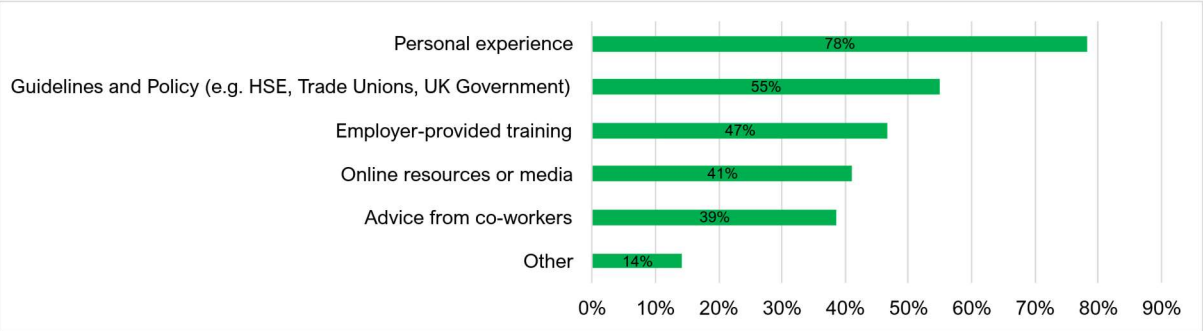
Frequency of events related to working under hot temperatures

- **Heat is being recognised within project management processes but not always matched by financial provision**. Whilst 69% of managers indicate that heat-related health risks are included in project risk assessments, 61% report a lack of a dedicated project budget for heat adaptation.
- **Heat is having a measurable impact on project delivery and costs**. Nearly half of managers (48%) report that heat causes programme delays, while 55% indicate that it results in unforeseen project costs.
- **Implications of wider scheduling challenges**. 68% of managers report that delays from winter are compressed into the summer programme, potentially increasing workers' heat exposure. Despite this, work stoppages due to heat remain relatively uncommon, with only 29% reporting works were stopped by the client/higher management, and 24% reporting workers refusing to continue work on site due to heat.

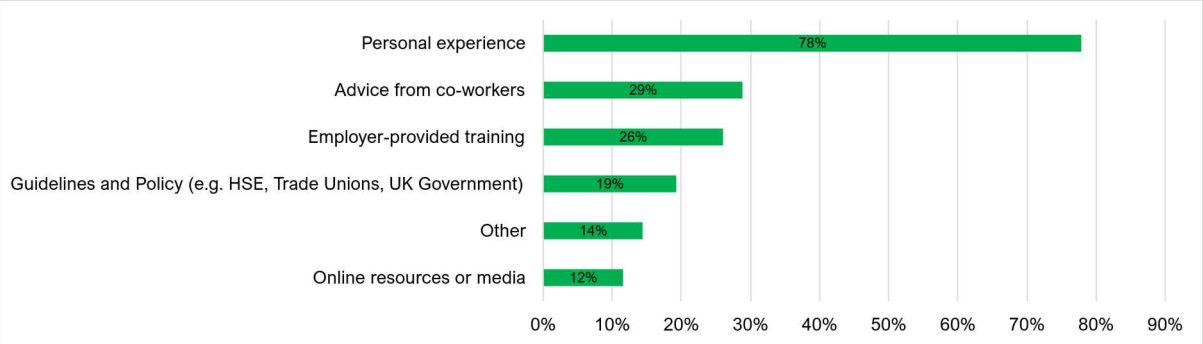
Sources of information to select heat adaptation measures

Questions aimed at understanding what sources of information managers and operatives use to inform the selection of suitable heat adaptation measures.

Managers: Sources of information to inform the selection and provision of measures to protect site workers from heat



Operatives: Sources of information to inform the selection and adoption of personal heat adaptation methods



Comparison managers-operatives: Source of information to inform the selection and provision of heat adaptation measures

	Managers		Operatives	
	N	%	N	%
Personal experience	154	**78%**	81	**78%**
Advice from co-workers	76	39%	30	29%
Employer-provided training	92	47%	27	26%
Guidelines and Policy (e.g. HSE, Trade Unions, UK Government)	108	**55%**	20	19%
Online resources or media	81	41%	12	12%
Other	28	14%	15	14%

Key findings: Sources of information to guide the selection of heat adaptation measures

- **Personal experience is the dominant source of information** across managers and operatives (cited by 78% of both groups), indicating that informal, experiential learning plays a central role in shaping heat adaptation practices across the sector.
- **Managers draw on a broader and more structured range of information sources than operatives**, particularly formal channels such as guidelines and policy (55% vs 19%), employer-provided training (47% vs 26%), and online resources (41% vs 12%), suggesting greater access to institutional and technical guidance among managers.
- **Operatives rely more heavily on informal workplace networks**, with co-worker advice being the second most used source of information (29% of operatives).

Key findings

Heat is no longer a future risk

The findings show that heat is widely recognised across the UK construction sector as a significant and growing occupational risk. Managers and operatives agree that rising temperatures are already affecting workers, with strong consensus that hotter summers will intensify these challenges. Heat should therefore no longer be viewed as a future concern but as a current operational issue requiring strategic attention.

Workforce health, wellbeing and performance are already being affected. Concerns are widespread, particularly among operatives, many of whom report direct experience of heat-related health impacts. Increased fatigue, reduced concentration, lower morale, and difficulty performing physically demanding tasks are consistently reported by both groups. Operatives also report greater exposure to negative effects than managers, highlighting the importance of incorporating frontline experience into risk management strategies.

Notably, impacts are reported even at 20–25°C, indicating that heat-related effects occur under increasingly common UK conditions.

Improving heat health literacy across the industry

The findings suggest that while awareness of heat-related health risks is relatively well established across the construction workforce, important gaps remain in both knowledge and response capability. Managers and operatives generally recognise common heat-related illnesses such as dehydration, heat exhaustion, heat stroke and sunburn, but awareness of less common conditions, including heat syncope, heat oedema and rhabdomyolysis, is considerably lower. As a result, some heat-related illnesses may go unrecognised or be identified too late for effective intervention.

The study also highlights a gap between recognising heat-related symptoms and knowing how to respond appropriately. Confidence in managing heat-related health incidents, particularly severe conditions such as heat stroke, is limited among both managers and operatives, with operatives reporting consistently lower confidence levels.

While respondents generally understand the impact of well-known risk factors such as dehydration, alcohol and drug use, insufficient rest breaks and long working hours, awareness of the potential effects of prescription medications, nicotine products and caffeinated or energy drinks is less developed.

Together, these findings indicate a need to strengthen heat health literacy across the industry through more targeted training that focuses not only on awareness, but also on symptom recognition, emergency response procedures and individual risk factors.

Strengthening the implementation of heat adaptation measures

The findings indicate that self reported awareness of heat adaptation measures is generally high across the construction workforce, with both managers and operatives indicating a strong understanding of the importance of protecting workers during hot weather. Operatives report high levels of confidence in their ability to recognise heat risks and take appropriate protective actions, while managers largely understand their role in implementing measures to safeguard workers. There is also strong willingness across both groups to adopt heat adaptation practices when required.

Many of the most established and widely adopted heat adaptation measures are relatively simple interventions, such as maintaining hydration, taking breaks in cool or shaded areas, and adjusting work pace. These measures are generally viewed as effective and are commonly used where available. Social influences also appear to play an important role, with workers more likely to adopt protective behaviours when they observe colleagues doing the same.

Despite this positive foundation, the findings highlight inconsistencies in the availability and implementation of heat adaptation measures across construction sites. While access to drinking water and sun protection is relatively common, other effective controls, including shaded rest areas, adjusted work schedules, cooling equipment and heat-specific training, are not consistently available. More advanced adaptation measures remain uncommon, and many operatives report limited access to equipment, support mechanisms and suitable working arrangements during hot weather.

A notable finding is the difference in perceptions between managers and operatives. Managers generally report greater availability and effectiveness of heat adaptation measures than operatives, suggesting that measures may not always be reaching workers as intended or may not be consistently implemented across sites. Similarly, while managers perceive organisational awareness of heat risk to be increasing, formal policies, training provision and practical support arrangements appear less established from the perspective of frontline workers.

Training gaps limit effective response

The findings show that while awareness of heat as a significant risk is widespread across the UK construction sector, important gaps remain in knowledge, confidence, and consistent practice. Although most managers and operatives report being able to identify common heat-related illnesses, understanding of less common conditions is limited, and confidence in responding appropriately to severe cases such as heat stroke is relatively low.

These findings are particularly concerning when considered alongside the fact that many workers and managers rely primarily on personal experience rather than formal training or structured guidance when deciding how to respond to heat-related risks. While experiential knowledge plays an important role, it does not consistently equip individuals to recognise all

symptoms or take the correct action in more serious situations.

In addition, reported access to heat-specific training and formal guidance is uneven across the sector, with operatives in particular highlighting gaps in training provision and support. This contributes to inconsistent understanding of when and how to act, especially in escalating or emergency scenarios.

Overall, the findings indicate a clear need for more consistent and practical heat-specific training across the industry. Strengthening training provision would help ensure that workers and managers are better equipped to recognise symptoms early, respond appropriately to heat-related illness, and reduce reliance on informal, experience-based decision-making.

Heat is emerging as a project delivery challenge

Beyond workforce welfare, heat is increasingly affecting project performance. Respondents identify productivity, cost, programme delivery, and health and safety as the most impacted areas. Nearly half of managers report heat-related delays, and more than half report unforeseen costs linked to hot weather.

Broader scheduling pressures may also amplify exposure, with winter delays often pushed into summer programmes, increasing pressure to maintain output in hotter conditions. Despite this, formal work stoppages remain uncommon, suggesting that work frequently continues under challenging conditions and raising questions about how safety and productivity are balanced.

Adapting to heat requires greater investment and industry commitment

While heat-related risks are increasingly being recognised within project management processes, adaptation efforts appear insufficient to address the scale of the challenge. Although most managers report that heat-related health risks are included within project risk assessments, the majority also report a lack of dedicated project budgets for heat adaptation measures.

Confidence in the industry's ability to adapt to rising temperatures remains low among both managers and operatives. Only a minority of respondents believe that the sector is currently adapting well to heat or will successfully adapt over the next decade. The study further identifies several barriers limiting adaptation across construction sites, with budget constraints, site logistics limitations, and insufficient organisational awareness and training identified as the most significant obstacles. These findings suggest that current adaptation efforts are not keeping pace with the growing risks associated with a warming climate.

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