

COLLECTIVE BARGAINING AND SOCIAL DIALOGUE  
TO **PROTECT WORKERS' HEALTH**  
**AND SAFETY** AT WORK  
**AGAINST HEAT**  
**AND HEAT WAVES**

Adaptation to **heat** and  
climate change at work.



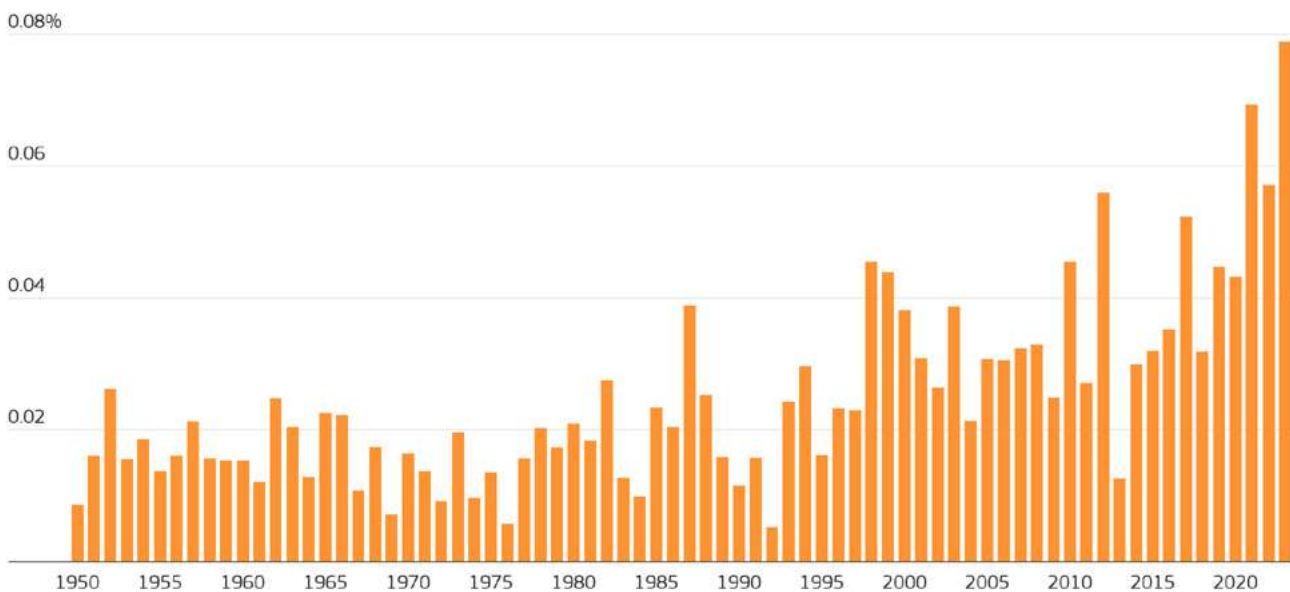
Collective bargaining and social dialogue in Europe to protect workers' health  
and safety, welfare and productivity against heat and heat waves

MAY 2024

# HEAT AT WORK

The frequency and intensity of extremely high ambient temperature episodes, commonly referred to as **heatwaves**, are increasing, reaching historic levels globally due to climate change and CO<sub>2</sub> emissions into the atmosphere. 2023 was the second-warmest year on record for Europe (1.02°C–1.12°C above average) and as a result, the year saw a record number of days with “extreme heat stress” above 46°C UTCI (see Figure 1). The three warmest years on record for Europe have all occurred since 2020 (1). The Intergovernmental Panel on Climate Change (IPCC) warns that it is more likely than not that we will exceed the +1.5°C horizon established in international agreements before the end of the decade [2].

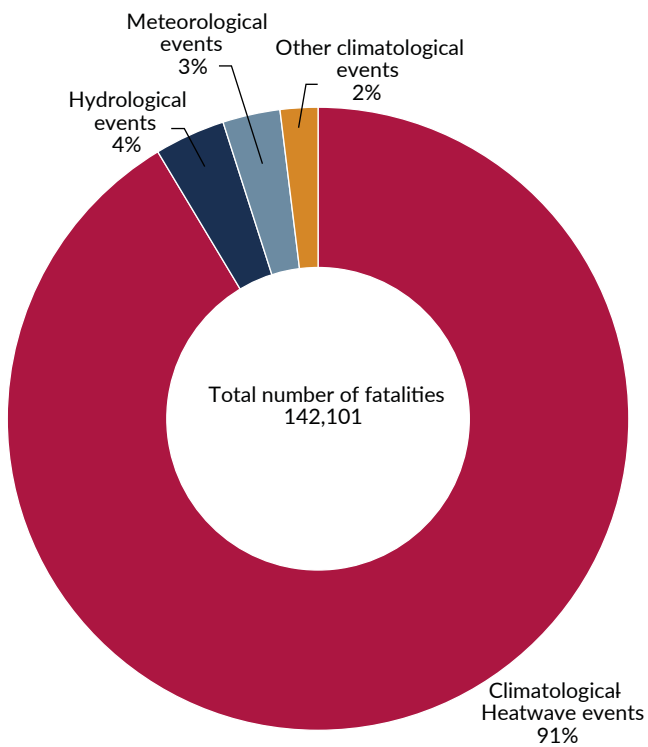
**Figure 1. Percentage of days with ‘extreme heat stress’ (UTCI exceeding 46°C), for European land, for each year between 1950 and 2023. Source: [1]**



Heatwaves cause the largest number of deaths among climate change-related events in Europe [3]. It is almost impossible to overstate the impact these changes are having on the health of the working population. Each year, almost 23 million occupational injuries, nearly 19,000 fatalities, and over 2 million disability-adjusted life years (**DALYs**) are directly linked to exposure to excessive heat at work [4]. During heat events, there is a clear rise in work-related injuries by all causes, such as burns, wounds, lacerations, amputations, as well as heat illnesses [5-7]. The overall risk of occupational injuries increased by 1% for each 1°C increase in temperature above reference values and 17.4% during heatwaves [5]. Around 15% of workers typically working under heat stress experience acute kidney injury or kidney disease [8].

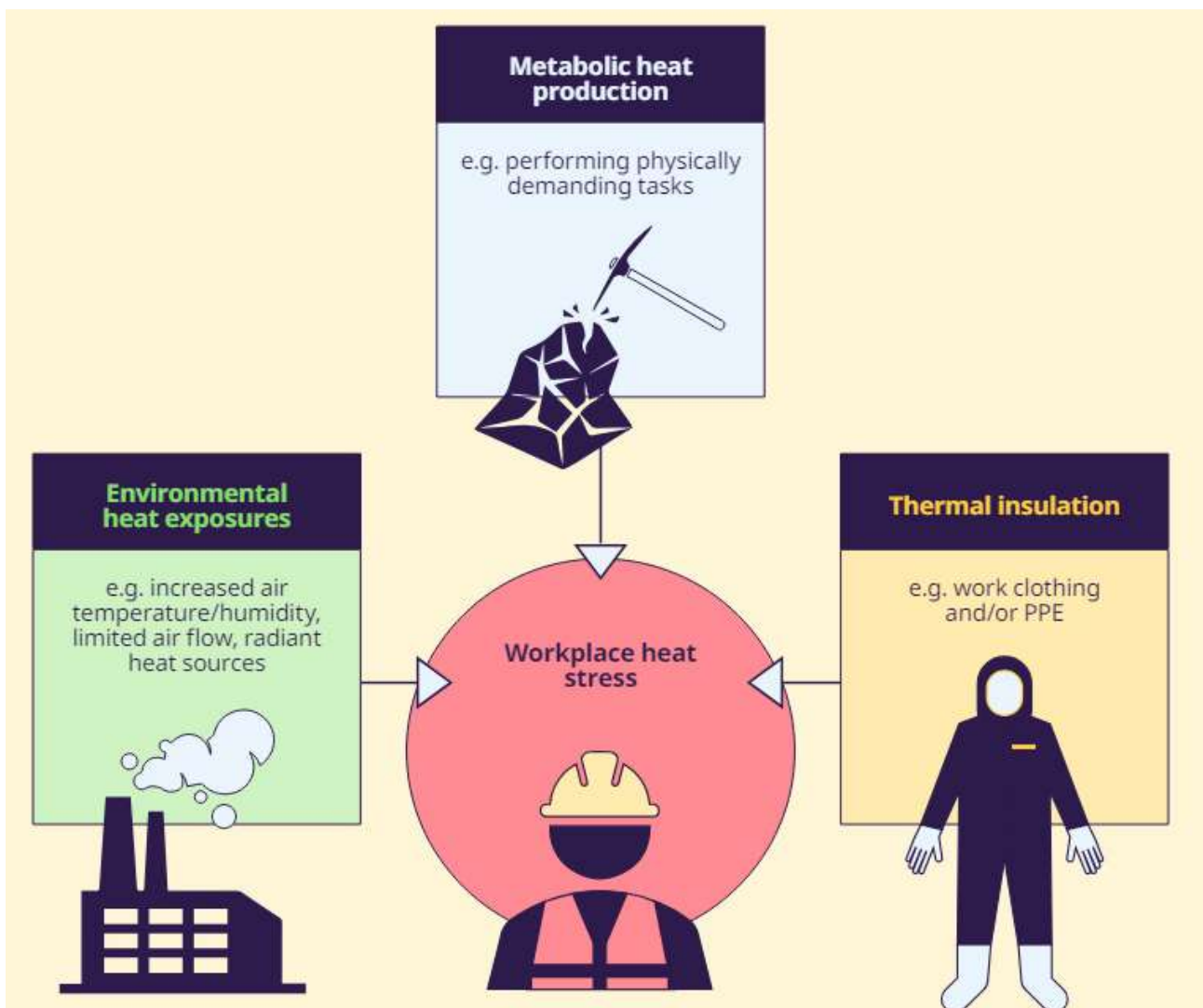
*Heat is the biggest killer among all climate change-related events*

**Figure 2. Fatalities associated with natural disasters and catastrophes in EEA member countries in the period 1980-2020 based on CATDAT. Source: [3]**



Millions of workers are highly exposed to **heat stress** all over the world and thus they must be considered a risk group in governmental heat and health plans. Many of them work in outdoor jobs that involve intense physical activity. Informal and low-paid jobs, disproportionally carried out by immigrants and women, are also the most vulnerable to heat because they usually lack adequate protective measures at work and they have fewer means to cope with the heat outside of work (poorly insulated housing and without air-conditioning, which means less rest, poorer recovery, etc.) [9]. This contributes decisively to increasing health inequalities among the population. Aggravating factors such as the aging of the European population or the concentration of populations in urban environments prone to “**heat islands**” lead to increased health risks in Europe.

**Figure 3. Factors that increase heat-stress risks. Source: [4]**





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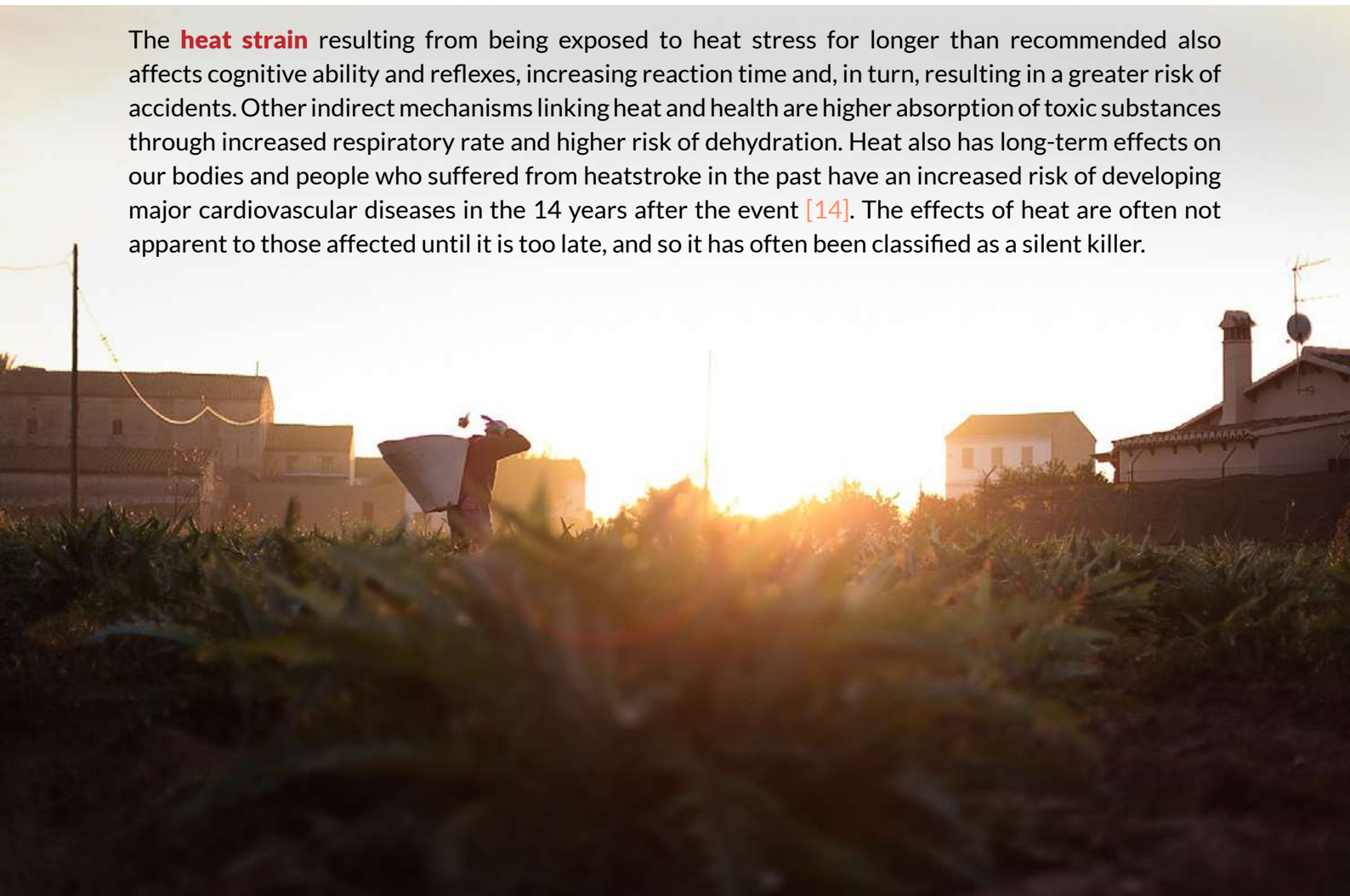
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# HEAT EFFECTS ON WORKERS' HEALTH

Maintaining a core body temperature of around 37°C is essential for continued normal body function. Achieving this body temperature equilibrium requires a constant exchange of heat between the body and the environment [10]. When exposure to environmental heat plus a lack of protective measures causes the internal body temperature of the worker to rise above 40.6°C (“heatstroke”), the risk of organ damage, loss of consciousness, and, ultimately, death increases sharply [11]. In this state, the human body is no longer able to regulate the internal temperature itself and vital organs fail, which can lead to death.

Heat stroke is not the only condition described in the scientific literature to be caused by exposure to excessive heat, several other disorders are known to have heat as its main cause (see Table 1 for further detail). Heat triggers several physiological mechanisms (inflammation, cytotoxicity, ischemia, disseminated intravascular coagulation, rhabdomyolysis) able to damage vital organs of the human body such as the brain, heart, kidneys, liver, intestines, lungs, or pancreas to varying degrees [12]. Heat aggravates respiratory, renal, and cardiovascular pathologies, causes premature births and lower birth weights, alters mental state, and provokes systemic conditions associated with an altered thermoregulation process (fever, chills, nausea, dizziness, confusion), etc. [13].

The **heat strain** resulting from being exposed to heat stress for longer than recommended also affects cognitive ability and reflexes, increasing reaction time and, in turn, resulting in a greater risk of accidents. Other indirect mechanisms linking heat and health are higher absorption of toxic substances through increased respiratory rate and higher risk of dehydration. Heat also has long-term effects on our bodies and people who suffered from heatstroke in the past have an increased risk of developing major cardiovascular diseases in the 14 years after the event [14]. The effects of heat are often not apparent to those affected until it is too late, and so it has often been classified as a silent killer.



**Table 1. Heat-related illnesses from less to more severe. Source: [13]**

<b>Disorders or illnesses</b>	<b>Signs, symptoms, and mechanisms</b>
<b>Heat rash</b>	Causes small papules (red spots) and itching, usually on areas such as the face, neck, upper chest, under the chest, groin, etc. It is associated with intense sweating, very common in hot and humid climates.
<b>Heat oedema</b>	Swelling of the lower extremities, generally in the ankles; appears at the start of the hot season.
<b>Heat syncope or fainting</b>	Manifests itself in a short spell of loss of consciousness or dizziness. Usually affects people who have been on their feet for long periods without moving or who have stood up suddenly from sitting or lying down, generally during the first days of exposure to heat.
<b>Heat cramps</b>	Painful muscle spasms which are usually experienced in the legs, arms or abdomen, generally at the end of an extended period of exercise. Can be related to dehydration, loss of electrolytes and muscular fatigue.
<b>Heat exhaustion</b>	Mild to moderate illness characterized by the inability to maintain heart rate, intense thirst, weakness, discomfort, anxiety, dizziness, fainting and headache. Core temperature may be normal, subnormal or slightly elevated (below 39 °C). The pulse is irregular, with postural hypotension and rapid, shallow breathing. There is no alteration of the mental state. Usually appears as a result of exposure to high levels of environmental heat or vigorous physical activity, sometimes associated with dehydration and/or loss of electrolytes.
<b>Heat stroke</b>	Very serious illness: the body is unable to control its temperature; the temperature increases and can rapidly reach 40°C and continue to rise. The main symptoms are heat, dryness and red skin, rapid pulse, intense headache, confusion and loss of consciousness. There may be nausea, hypotension and increased respiratory rate. The body suffers a generalised inflammatory response, which comes with very varied clinical symptoms, resulting in injuries to internal organs (liver, kidney, etc.) and tissues (intestines and muscles). At its most severe, which can occur rapidly, in addition to the above-mentioned injuries there is profound dysfunction of the central nervous system. When the process is not stopped (which requires hospitalisation), fatalities occur.

# WORKPLACE ADAPTATION

In our society, the working population is an indispensable agent for carrying out the material transformations necessary to adapt to climate change and curb its most harmful consequences. Protecting their lives is therefore a priority to save society as a whole from the most traumatic effects of climate change. This necessarily involves adapting their workplaces by implementing a series of preventive and protective measures that make the physiological needs of the human body compatible with increasingly severe and pressing climatic demands. From this point of view, adaptations in occupational safety and health are as urgent and necessary as mitigation strategies. The magnitude of the problem humanity is currently facing with heatwaves requires a more ambitious adaptation of workplaces (in terms of prevention and health protection) than is currently the case in order to meet the climate challenge.





### **General preventive and protective measures against heat stress**

1. Each company should draft a **heat action plan** to determine at any given time whether environmental conditions increase exposure to heat stress with specific OHS protective measures (in addition to the usual ones) for each risk level and activated automatically when that level is reached.
2. The plan must be agreed upon between employers and employees to be effectively applied by all parties and to operate according to EU Framework Directive 89/391/EEC.
3. The plan must be active all year round, not only during heat waves.
4. Set an occupational exposure limit (OEL) based on a technically validated methodology such as the Wet Bulb Globe Temperature (WBGT), if not already in national legislation.
5. Monitor the level of heat exposure based on a technically validated methodology. Take into account ambient heat, humidity, physical effort levels, and clothing/PPEs.
6. Establish the persons responsible for compliance with the plan and setting the hazard level of the environmental conditions each day following the method agreed upon in the plan. They will inform the workers of the expected risk level and the corresponding adaptation of the work plan.
7. Establish those responsible for organizing first aid in situations of acute danger when all other heat prevention measures fail.
8. Make workers aware of the risks of working in heat and train them to recognize early warnings of heat-related health problems.
9. Regularly update the action plan based on practical experience or in case of new scientific knowledge.
10. Acclimatization processes must be established for new employees or those who join the company after a period of inactivity (due to sick leave, vacations, or others). Special attention should be paid to pregnant workers and people who are particularly sensitive due to their physical condition or medical treatment.



## Preventive concrete heat-stress measures following the hierarchy of control (STOP Approach)

<b>S</b> ubstitution	<ul style="list-style-type: none"> <li>• Stop/don't start work when, after having implemented the corresponding protection measures, heat exposure is still above the OEL.</li> <li>• Minimise work during periods of (extreme) heat.</li> <li>• Arrange financial compensation schemes for employers/employees in case of 'unworkable' heat.</li> </ul>
<b>T</b> echnical measures	<ul style="list-style-type: none"> <li>• Climate-resilient design of workplace and rest areas (sanitary, canteens, duty staff rooms, etc.).</li> <li>• Air conditioning/climate system.</li> <li>• Ventilation.</li> <li>• Workplace adaptability (use of shading etc), also for outdoor work environments.</li> </ul>
<b>O</b> rganisational measures	<ul style="list-style-type: none"> <li>• Take the weather forecast into account.</li> <li>• Adaptation of work schedule.</li> <li>• Job rotation.</li> <li>• Extra (drinking) breaks, in a cool environment.</li> <li>• Use of monitoring devices (in visible places) so workers can monitor their own exposure to ambient heat.</li> <li>• Buddy systems.</li> <li>• A right for workers to interrupt work without repercussions.</li> <li>• Medical surveillance by occupational physicians.</li> <li>• First-aid measures and emergency plans.</li> </ul>
<b>P</b> ersonal protection	<ul style="list-style-type: none"> <li>• Sunblock (cream).</li> <li>• Protective clothing, using clear-cut, evidence-based specifications.</li> <li>• Use of hats or caps (with or without neck flaps).</li> <li>• Supply of drinks or other forms of rehydration.</li> <li>• Wristbands to monitor heat strain and receive early warning if either heat is above the OEL or there are symptoms that may indicate the onset of heat-related problems.</li> </ul>

# NEGOTIATION

Adaptation of workplaces does not happen in a vacuum. The participation of workers in OHS is shielded by EU framework Directive 89/391/EEC (Art. 12) and the ILO Convention 155 (Art. 4, 5, 29, 20) [15]. **Collective bargaining** and **social dialogue** are basic tools for improving safety culture as “they build trust between workers and management, and, in turn, cooperation in the workplace fosters the improvement of working conditions and the working environment” [16]. This means that workers are expected to take an active role in the prevention of risks and the protection of their own safety and health at work [17]. Both social dialogue and OHS are part of a just climate transition [18].

As in other areas of OHS, workers’ participation boosts work adaptation to climate change and protects workers against the effects of high temperatures. Well-designed, binding heat protocols and heat action plans are essential tools for translating collective bargaining into heat protection measures agreed upon between workers and employers at company or industry level.

Social dialogue can also result in legal regulations between trade unions and employers’ associations. Nevertheless, the reality is that the prevention of heat risks is still not a priority in collective agreements and general regulations: although a certain amount of progress has been made, it is still insufficient.

To correct this imbalance, social players and legislators have to consider that an adaptation of both the legal regulations and the organizations and workplaces themselves must be:

- Specific about the high temperatures produced by climate change;
- Ambitious enough to match the scale of the problem, and;
- Based on scientific evidence and workers’ localized knowledge according to their own practical experience and daily perceptions.



# The working population as an active subject of its own safety

The **ADAPTHEAT** is a European research project led by May 1st Foundation (CCOO) and supported by five other international partners (MASZSZ, FDV, ELINYAE, VU) whose main objective is to study the challenges related to the prevention of heat-related risks in the field of work and industrial labor relations. The ultimate aim of ADAPTHEAT is to promote the health and safety of workers by reducing the risks arising from exposure to excessive heat during their working day, even in the presence of extreme weather conditions such as heatwaves. To do so, the ADAPTHEAT project has addressed a comprehensive review of the situation in five EU countries (Spain, Italy, Greece, the Netherlands and Hungary), analysing the incidence and recent evolution of the problem, the legal and institutional framework of each country in relation to OHS (heat-related and collective bargaining) and warning systems, together with 11 exemplary case studies in which collective bargaining on heat has been translated into protective measures.

**Table 2. Countries and industries analysed in the ADAPTHEAT project.**

Country	Case Study 1	Case Study 2
Spain	Water management	Construction
Italy	Agriculture	Logistics
Greece	Food industry	Shipbuilding
Netherlands	Agriculture	Construction
Hungary	Agriculture	Education / Administrative Services



**Table 3. Occupational exposure limit values in the five ADAPTHEAT countries.**

### **Spain**

In enclosed workspaces, the temperature must be between 17 and 27°C for sedentary work and between 14 and 25°C for light work (Annex III of Royal Decree 486/1997). The recent RD 4/2023 introduced additional measures, including the restriction of certain tasks during extreme weather and altering work conditions if hot weather alerts are issued, ensuring that salary is not reduced if work is interrupted. The new regulation extends these latter protections to outdoor workers, and establishes that thermal risk assessment should consider job characteristics as well as workers' personal or health conditions.

### **Hungary**

Thresholds for indoor work are set at 31°C for light work, 29°C for moderate work and 27°C for heavy work. When ambient air temperature is equal to or within 1°C of the upper limits, workers may only work a full shift after a one-week period of gradual acclimatization (joint decree on the minimum level of occupational safety and health requirements for workplaces [SzCsM-EüM] 3/2002 (II. 8.), Section 7).

### **Netherlands**

Dutch OHS legislation does not contain a threshold value or occupational exposure limit relating to work in heat. The Dutch legislation is characterized by very general stipulations: in article 6.1 of the Working Conditions Decree, it is stated that "Taking into account the nature of the activities carried out by the employees and the physical load resulting from them, the temperature at the workplace should not cause damage to the health of the employees". Until 2013, reference was made to ISO7243, but the relevant public 'policy rule' was abolished in 2012. Since then, employers and trade unions have to negotiate a threshold value in either an OHS catalogue or a collective labour agreement. Only a very limited number of catalogues refer to relevant ISO-standards.

Also, a limited number of collective labour agreements mention some sort of threshold value, but these are based on air temperature only (which is not science based). However, these threshold values are used only in the context of the Unworkable Weather Regulation, which seeks to guarantee salaries for workers in case they cannot work due to 'extreme weather'. All relevant labour agreements use different threshold values, which is not in line with the notion of equal protection. Furthermore, the thresholds are rather high (often higher than 35°C, or a differing stretch of 'consecutive days' over 27°C). This is particularly high in the Netherlands, which has a rather humid form of heat. The threshold does not take into consideration the physical exertion of the work.

## Greece

The circular 52903/26-05-2023 on heat strain, calculation of the workers' heat strain using the WBGT index method is provided. For very high workload the higher action value is 29,8°C WBGT that is reduced according the PPEs and the acclimatization. Nevertheless, this circular is not mandatory.

In 2023, after "Cleon" heat wave, a new Ministerial Decision Y.A. 65581/2023: "Emergency measures to deal with the heat strain of private sector workers during the heat wave phenomenon called "CLEON" was enacted that was mandatory. Heat strain was considered high when WBGT bioclimatic index value, was higher than 32.2 or the temperature was set to a value above 42°C and at the same time the value of the humidity index formed at least 14%, or the temperature was set to a value above 40°C and at the same time the value of the humidity index formed at least 20%.

Especially for work in a shipbuilding repair zone, the obligation of the above paragraph is still in service and it applies to temperature formed at a value above 38°C.

## Italy

Legislative Decree 81/2008 (annex IV) contains general regulatory provisions for the assessment of microclimate risks in different work environments, without indicating specific temperature parameters. These parameters are instead present in certain resolutions at regional level for indoor workers, and the recommendations focus on saying that temperatures must be between 21 and 23°C for activities that require little physical effort with a maximum humidity of between 40 and 60%. In the case of medium-intensity activities, the range is between 18 and 21°C, while it cannot exceed 24°C during the summer months. To calculate the risks of heatwaves for the health of outdoor workers, the reference is the Heat Index matrix, which is based on the air temperature in the shade and the relative air humidity. If all the prevention measures put in place by the employer are not sufficient and a heat alert has been issued (temperatures above 35°C for indoor workers, or lower for outdoor workers or those working in high levels of humidity), the employer can apply to the Cassa Integrazione Guadagni Ordinaria (CIGO) (INPS message No. 1856/2017) to suspend production and guarantee workers' salaries.

# CONCLUSIONS AND RECOMMENDATIONS

The comparative analysis of the information in the five European countries included in the ADAPTHEAT project led to the following conclusions and recommendations. These 13 conclusions and 12 recommendations can perfectly be applied to the 27-EU countries as a whole, given the diversity and representativeness of the countries included in the study.

## CONCLUSIONS

- 1. The issue of climate change and its effects is present in the political agenda and actions of the five countries analysed.** Far from being addressed solely from an environmental perspective, climate change policies and actions have begun to incorporate other dimensions, such as the impact on health.
- 2. Climate change has started to be addressed as a public health issue in all countries, but much less so as an occupational health issue.** Some agencies responsible for public health are beginning to recognise work as an area requiring specific protection from the effects of climate change, but this recognition has not yet materialised into significant proposals for action.





3. **Occupational health and safety (OHS) policies**, for their part, **have not offered a sufficient response to the challenges that climate change represents for workers' health so far**, even though all the countries analysed do pay some attention to regulating heat in the workplace. However, the research did show an increased awareness of the effects of heat exposure on workers' health.
4. Despite the existence of these turns for the better, this study also identified a number of **DIFFICULTIES**:
  - a. Existence of **insufficient or incomplete regulatory frameworks** in terms of protecting workers from the risks of heat.
  - b. **Lack of reliable and rigorous sources of information** that map the impact of heat on workers' health.
  - c. Existence of a **wide variety of the heat-risk measurement systems used** (some not based on scientific evidence). Many of these measurement systems are still based on air temperature, and on-site measurements are rare.
  - d. Many of the **prevention measures adopted are only intended for the summer months**, even though heatwaves are occurring more and more in other periods of the year.
  - e. **The OHS regulation on protection against heat exposure is not always guaranteed due to:**
    - **A lack of awareness** (of workers, employers, occupational hazards prevention experts) of the risks of heat;
    - **Companies' resistance** to applying preventive measures that entail an economic cost;
    - **Lack of resources** (or interest or priority) **on the part of the labour inspectorate** to monitor compliance with current regulations;
    - **The weakening of the presence and negotiating capacity of trade unions;**
    - **The atomization of the business fabric** and the preponderance of small companies (or, directly, self-employed workers).
5. There is a risk of **fragmentation and dispersion of OHS systems, endangering the equal right to health protection for all workers**. The size of the company and the sector in which it operates, the existence of previous mobilization processes on the part of workers, the strength of the trade union organizations present, the media coverage of occupational accidents linked to heat exposure, the existence of public aid to cover the cost of certain preventive measures, etc. strongly condition the adoption of protective measures by the company. Workers are thus faced with a scenario of great uncertainty as to whether or not employers may or may not implement heat protection measures, as well as the content of these measures.

6. **The right of workers to participate in the design, management and implementation of OHS policies, and the positive effects of such participation, is at least formally recognized in all the countries surveyed.** Transferring the responsibility for defining, in concrete and operational terms, the content and principles of OHS regulations to social dialogue would, in theory, make the system more flexible, adapting its content to the specific and changing needs of different sectors and companies (“tailor-made regulation”). Social dialogue and collective bargaining should therefore serve to develop clear mechanisms for protection against heat exposure to compensate for the lack of definition in both public health actions and OHS regulations. These objectives, however, are far from being achieved.
7. In all the countries analysed, we have noted complaints from trade unions and other workers’ representatives regarding unilateral intervention in OHS matters by companies and governments. **Many important policies and regulatory reforms are implemented without consulting the social partners or without promoting genuine negotiation processes.** Companies have also shown a clear preference for voluntary agreements with social partners, rejecting the incorporation of such content in collective agreements.
8. **The tendency to decentralize collective bargaining processes and establish non-binding social dialogue agreements is also present, to a greater or lesser extent, in all the countries analysed.** This leads **to significant inequalities in the protection of workers depending on the strength of trade union organizations (which is particularly detrimental to the most vulnerable groups).** Countries with a longstanding tradition of worker participation in industrial relations and which still have a strong trade union presence appear to have been able to reduce (but not prevent) the detrimental effects of these atomizing dynamics in Europe. Resilience has been much lower where the trade union fabric has been hardest hit and collective bargaining more decentralized and weakened.
9. In all the countries analysed, we were able to find examples of collective bargaining and social dialogue addressing the problem of heat exposure. However, we can conclude that their presence is still very limited and their content rather meagre. **Overall, collective bargaining and social dialogue have not been able to concretize and develop the generic principles of protection provided for in OHS regulations, although we have identified positive experiences where social dialogue has proven to be a useful instrument for the implementation of consensual mechanisms for protection against heat exposure.**

**10. The suspension of work during high heat exposure is rare.** For different reasons, companies and workers (especially those in more precarious and vulnerable positions) are often opposed to their application. **Companies are reluctant to adopt preventive measures against heat exposure temperatures that entail economic cost.** Stoppage of work entails an economic cost for the company if the legislation obliges it to maintain wages (in addition to the risk of financial penalties for failure to meet deadlines). **From the workers' perspective, the legislation does not guarantee that they will continue to receive their wages** (or when we are dealing with workers in an irregular situation, with workers hired via a temping agency or (bogus) self-employed workers, suspending work means that their income is stopped). In the absence of mutualized "solidarity" mechanisms that prevent the individual employer or worker from bearing the financial cost of their implementation, such as compensation by social security mechanisms or other means to compensate employers, the implementation of this type of measures risks being hampered.

**11. The contents and measures to combat heat, as promoted by traditional collective bargaining, apart from being quite exceptional, have been modest in their scope.** In this sense, companies opt for protocols with a certain degree of flexibility in their application (avoiding, for example, the definition of clearly defined heat thresholds that could lead to an automatic suspension of activities).



**12. The difficulty of incorporating content in collective agreements that goes beyond the usual collective bargaining topics (wages and working time) has led the social partners to explore other instruments in social dialogue,** such as generic heat action plans, heat protocols, etc. These initiatives have had positive effects, but they also have important limitations.

- a. The **generic heat action plans in Spain** have made it possible to establish a series of procedures and actions to combat heat in companies in a (mostly) negotiated manner with workers' representatives. These procedures have made it possible to put in place more precise action measures, defining maximum temperature thresholds that would give rise to different types of action. These actions have included both individual and organizational measures. Some of these plans have a sectoral application and could serve as a basis for the development of collective agreements with content related to heatwaves. However, **the main limitation of these plans lies in their weak implementation and the fact that they are voluntary.**
- b. **The Dutch OSH catalogues are a kind of code of good practice negotiated by social partners at sectoral level and validated by the Labour Inspectorate.** These codes of good practice seek to define specific, clear, and coherent protection measures to compensate for the excessive generality of OSH regulations and the risk of fragmentation of workers' health and safety protection systems. But like the generic action plans, the OSH catalogues also face significant limitations. First, their impact on companies is lower than expected or hoped for. Second, their content is of varying quality, and often incomplete or not very concrete. Finally, as far as the measures proposed are concerned, the emphasis is placed mostly on individual protection measures, with much less importance given to organizational or technical preventive measures. **The OSH catalogues** may serve to raise awareness of heat risks and to establish a negotiation agenda focused on this issue, but **in practice, they seldom serve to define clear, coherent, and detailed preventive or protection measures.**

13. Finally, the analysis carried out has confirmed **the importance of having clear and detailed protection norms and legal standards that are mandatory for companies, norms and standards whose validity or application does not depend on the correlation of forces between the social partners and their willingness to reach agreements in the social dialogue.** In addition, centralizing legal protection standards would likely lead to less transaction costs, and add to the notion of equal legal protection. Clear-cut legal standards, particularly a science-based occupational exposure limit, would also be useful from the perspective of legal certainty. However, the experience of the five countries analysed also suggests that the existence of adequate regulations is not a sufficient guarantee of protection if not accompanied by the capacity to ensure that the regulations are effectively applied by companies (which is not always the case). The monitoring and control role of trade union organizations, as well as the action of the labour inspectorate and other bodies are, in this respect, essential to ensure that workers are properly protected against heat waves.



## RECOMMENDATIONS

- 1. Recognise workers as a specific risk group** in national strategies and action plans against the health effects of climate change, designing measures specifically adapted to their particular needs and circumstances (e.g. prevention at source usually involves changes in work organization and this does not depend on them).
- 2. Increase the production of evidence-based scientific knowledge on the impact of high temperatures on workers' health and safety.** Put in place robust monitoring systems that provide reliable and up-to-date statistics to assess the effectiveness of the measures adopted, as well as to adequately monitor the groups and situations at greatest risk.



3. **Establish unified national or regional heat risk alert systems that are specific** (as localized as possible), **reliable and developed in accordance with existing scientific evidence** on heat physiology, and thus not limited, for example, to measuring air temperature, but rather include humidity and activity (as a proxy for level of physical effort).
4. **Develop a specific European Directive on work and heat** that complements Directives 89/391/EEC and the 89/654/EEC, in which rules and standards are precisely established and enforceable for all Member States, starting with the definition of an Occupational Exposure Limit that is clear and consistent with the available scientific evidence and methodologies for measuring the risk of occupational heat exposure, e.g. the WBGT (ISO 7243) [19].
5. **Include the mandatory establishment of heat action plans and protocols negotiated with workers' representatives in the new "Occupational Heat Directive"**. These plans should provide for the automatic application of various protective and preventive measures (of a technical, organizational, and individual nature, including the possibility of work stoppage) depending on the severity of the situation and the alert level reached (see the section on Workplace Adaptation). These measures should be defined at least at sectoral level and then adapted to the specific nature of the workstations, the nature of the activity to be carried out, and the personal and health characteristics of the worker.
6. **Work stoppage due to the risk of exposure to heat should not, under any circumstances, entail any financial loss for the worker** (regardless of their employment status: temporary, permanent, self-employed, etc.), nor any other type of penalty (such as the obligation to make up the hours not worked for this reason). To facilitate the application of this type of measure, it would be advisable to establish mutualized systems that prevent the individual employer from having to bear the full economic cost of the suspension of work, especially in small companies.
7. **Enforce the measures taken against the risk of exposure to heat throughout the year and not only in the summer months.**
8. **Strengthen** the resources (human, financial, sanctioning, etc.) available to **the labour inspectorate, and incorporate protection against the risk of exposure to high temperatures and heat among their priorities.**

- 9. Strengthen the participation of workers (at European, national, sectoral and company levels) in the definition and implementation of policies on prevention and protection against heat and high temperatures.** It is imperative to strengthen spaces and mechanisms for social dialogue in OHS. The participation of workers and their representatives in the definition of prevention plans and measures, including those against heat, is not only a legal imperative (Framework Directive 89/391), but has also proven to be the most effective way of guaranteeing the health and well-being of workers [20][15], and is thus advocated by the ILO [16] and EU-OSHA [17]. In short, hazards assessment and the identification of prevention solutions must be based on the participation of workers and trade union representatives in the form of clear-cut and formal shared procedures to support their active involvement.
- 10. Set in motion institutional mechanisms to ensure that smaller companies/workplaces and those with more difficulties to negotiate and implement effective heat preventive measures comply with regulations:** detailed collective agreements, letters, inspections, collaborative innovative actions such as bipartite workplace visits, etc. Continuous collaboration between social agents remains useful to enforce the agreed negotiated measures.
- 11. Develop campaigns to raise the awareness of the risks of excessive heat among workers, companies and other relevant players in the working world** (trade unions, employers' associations, labour inspectorates, occupational physicians, experts in occupational hazards prevention, etc.). These campaigns must be designed (and then evaluated) according to scientific evidence to make them as effective as possible. Similarly, it is imperative to provide up-to-date training on the prevention of heat-related hazards for workers and employers, including identification of heat-related symptoms and emergencies.
- 12. Strengthen collaboration with the scientific community involved in research on Heat and OHS in all its domains** (social, organizational, industrial, engineering, physiological, biomedical, etc.) and stages of prevention.



# GLOSSARY

**Collective Bargaining:** refers to “all negotiations which take place between an employer, a group of employers or one or more employers’ organizations, on the one hand, and one or more workers’ organizations, on the other, for: (a) determining working conditions and terms of employment; and/or (b) regulating relations between employers and workers; and/or (c) regulating relations between employers or their organizations and a workers’ organization or workers’ organizations”. This definition comes from Article 2 of the ILO Collective Bargaining Convention, 1981 (No. 154). Collective bargaining is concerned with bipartite relations.

**Heat Action Plan or Heat Protocol:** a set of procedures agreed between the company and its workers to determine at any given time whether environmental conditions increase exposure to heat stress, creating a level of risk that makes it necessary to take measures in addition to those already in place to protect health and safety.

**Heat Stress:** the net heat load to which a worker may be exposed from the combined contributions of metabolic heat, environmental factors, (i.e. air temperature, humidity, air movement, and radiant heat), and clothing requirements. A mild or moderate heat stress may cause discomfort and may adversely affect performance and safety, but it is not harmful to health. As heat stress approaches human tolerance limits, the risk of heat-related disorders increases.

**Heat Strain:** the overall physiological response resulting from heat stress. The physiological responses are dedicated to dissipating excess heat from the body. The risk and severity of excessive heat strain will vary widely among people, even under identical heat stress conditions.

**Heatwave:** the World Meteorological Organization and the IPCC define a heat wave as “a period of abnormally and uncomfortably hot weather” [11].

**Social Dialogue:** all types of negotiation, consultation or simple exchange of information between, or among, representatives of governments, employers and workers on issues of common interest relating to economic and social policy.

**Universal Thermal Climate Index (UTCI):** a thermal sensation index calculated from the combination of air temperature, humidity, ventilation and radiation. By applying a set of values of those variables to human heat balance models, the index provides what would be the equivalent temperature a human would feel in a reference environment defined by standard values of those same variables. It therefore expresses the thermal stress level on a human body, given a set of atmospheric conditions.

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### **Claudia Narocki. In memoriam**



The ADAPTHEAT project was conceived, prepared and led in its first months by our colleague Claudia Narocki, an employee of the 1° de Mayo Foundation, and previously of ISTAS, for more than 25 years.

Claudia Narocki, an expert and activist in occupational health, passionate about the subject and deeply committed to its aims, was one of the first researchers in Europe to draw the attention of the world of prevention and trade unions to the risks of climate change and high temperatures for the health of workers, especially workers in the most precarious situations.

She designed the project, its activities, its products and, above all, the composition of the consortium and the supporting experts.

For health reasons, since the beginning of 2023 she has been unable to continue at the helm, but thanks to the excellent original design of the project and the working party involved, we have been able to move forward without her along the path she marked out for us.

We want to publicly express that Claudia is still the soul of ADAPTHEAT, and that without her work and passion, none of our results would exist.

## **ADAPTHEAT**

Collaborators:



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