UK Health Security Agency

NHS

Heatwave plan for England

Protecting health and reducing harm from severe heat and heatwaves

Local Government Association

Met Office

Contents

Excecutive summary

The Heatwave Plan for England is a guide to protect the population from heat-related harm to health. The aims of the plan are to prepare, alert and prevent the major avoidable effects on health during periods of severe heat in England.

It recommends a series of steps to reduce the risks to health from prolonged exposure to severe heat for:

- the NHS, local authorities, social care, and other public agencies
- professionals working with people at risk
- individuals, local communities and voluntary groups

The plan was first published in 2004, following the devastating pan-European heatwave in 2003. This plan builds on many years of experience of developing and improving the ability of the health sector and its partners to deal with significant periods of hot weather.

The Heatwave Plan for England was significantly re-shaped in 2012. Updates were made to reflect the changes in the health care and public health landscape, to align the heatwave plan more closely with its sister Cold Weather Plan for England and to link planning for severe heat with the Public Health Outcomes Framework.

The plan continues to be underpinned by a system of heatwave alerts, developed in collaboration with the Met Office. It describes the heat-health alert system which operates in England from 1 June to 15 September each year. During this period, the Met Office may forecast heatwaves, as defined by the forecasts of day and night-time temperatures and their duration.

The heat-health alert system comprises of 5 main levels (Levels 0 to 4); this ranges from long-term planning for severe heat up to a major emergency response. Each alert level should trigger a series of appropriate actions which are described in detailed in this Heatwave Plan.

This plan is a good practice guide and the actions described are illustrative and can be used to adapt local heatwave plans. It is a collaborative plan supported by NHS England to protect and promote the health of the population. There are 3 key messages we recommend:

1. All local organisations should consider this document and satisfy themselves that the suggested actions and heat-health alerts are understood across the system and that local plans are adapted as appropriate to the local context.

2. NHS and local authority commissioners, together with multi-agency local resilience forums (LRFs) and Local Health Resilience Partnerships (LHRPs), should satisfy themselves that the distribution of heat-health alerts will reach those that need to take action.

3. NHS and local authority commissioners, together with multi-agency LRFs, should satisfy themselves that providers and stakeholders take appropriate actions according to the heat-health alert levels.

Note

The NHS is currently working on updating their missions and procedures of operations before and during heat-health alerts This document will be amended in accordance with the latest modifications. Please ensure you have the latest version.

Chapter 1. The importance of this plan

There is strong evidence that heatwaves can lead to death; this is covered in more detail in Section 5. These heat-related deaths are in excess to the baseline rates of mortality during these periods of heat. ‘Excess deaths’ is a term used in epidemiology and public health that refers to the number of deaths from all causes during a crisis that would occur above and beyond those expected under ‘normal’ conditions.

Excessive exposure to high temperatures can be fatal and the evidence for the risks to health from heatwaves is extensive. During the summer heatwave that occurred in northern France in August 2003, there were unprecedentedly high day and night-time temperatures for a period of 3 weeks resulted in 15,000 excess deaths; the vast majority of these were among older people aged 65 and above. In England during the same period which lasted from 4 to 13 August 2003, there were over 2,000 excess deaths compared to the previous 5 years during the same period. Following the 2003 heatwave, the first Heatwave Plan for England was published in 2004.

There have been other subsequent significant heatwaves in England. For example, in 2006, there were approximately 680 excess deaths, and in 2009 there were approximately 300 excess summer deaths. The total all-cause excess mortality estimated from the 3 heatwaves in the Summer of 2020 was 2,556 deaths. The number of deaths observed during this period likely to reflect the combined impacts of the heatwave and several other factors. This includes those related to the coronavirus (COVID-19) pandemic though the exact nature of these impacts still requires further exploration.

The rise in mortality due to hot weather occurs very sharply, usually within one or 2 days of temperatures rising. As a result, by the time heatwaves begins, the window of opportunity for effective action is very short, therefore advanced planning and preparedness is essential. We know that effective action, taken early, can reduce the health impacts of exposure to excessive heat. Most of these are simple preventive measures that need to be planned in advance of a heatwave in order to be effective.

The aim of this plan is to raise public awareness of the dangers of excessive heat to health. This is to ensure that health, social care, voluntary and community organisations and wider civic society is prepared and able to deal with a heatwave to protect the most vulnerable.

Making the case: the impact of heat on health – now and in the future

The focus of the plan is on the actions that can be taken. Supporting material can be found in the document, Making the case: the impact of heat on health – now and in the future.

The Heatwave Plan of England is also supported by a series of Information Guides published online which aim to provide an authoritative source of additional information about the effects of severe hot weather on health for:

- looking after yourself and others during hot weather (for individuals, families and carers)
- supporting vulnerable people before and during a heatwave: advice for health and social care professionals
- supporting vulnerable people before and during a heatwave: advice for care home managers and staff
- looking after children and those in early years settings during heatwaves: guidance for teachers and professionals

These supporting documents were updated to reflect the changing responsibilities as a result of the Health and Social Care Act (2012).

The Heatwave Plan – a plan to protect health from heat-related health impacts

The plan describes actions to be taken before and during periods of severe heat in England. It details what preparations both individuals and organisations can make to reduce health risks and includes specific measures to protect vulnerable groups.

The plan provides good practice and advice on how to respond and what actions to undertake once severe hot weather has been forecast. In addition, the plan also explains the responsibilities at national and local level for alerting people after a heatwave has been forecast, advising them how to respond and what to do during a heatwave.

Vulnerable groups include older people (65 years of age and above), the very young (under 5 years of age) and people with pre-existing medical conditions. In addition, also those whose health, housing or economic circumstances may put them at greater risk of harm from very hot weather. For example, some medications make the skin especially sensitive to sunlight caused by ultraviolet rays. (See Section 1.2 in the accompanying document, ‘Making the Case’, for more information).

The plan is also intended to mobilise individuals and communities to help to protect their neighbours, friends, relatives, and themselves against avoidable health problems during spells of hot weather. Broadcasting media and alerting agencies may also find this plan useful.

The plan focuses on the effects of severe hot weather on health and well-being, however, severe and extended heatwaves can also cause severe disruption to general services. For this reason, multi-agency LHRPs and Local Resilience Forums (LRFs) will have a critical role in

preparing and responding to heatwaves at a local level, working closely with Health and Wellbeing Boards on longer term strategic planning.

The heatwave plan and health and social care arrangements

The Department of Health & Social Care (DHSC) has responsibility for the strategic leadership of both health and social care systems. NHS England provides the national leadership for improving health care outcomes, directly commissions primary care services, some specialist services, and oversees Integrated Care Systems (ICSs). Directors of public health in local authorities are responsible for population health outcomes, supported by UKHSA, which provides national leadership and expert services to support public health.

Responsibility for preparing and publishing the Heatwave Plan for England has passed to UKHSA. UKHSA will seek to ensure that the heatwave plan is widely communicated using a variety of channels to ensure its distribution and dissemination. UKHSA provides advice to the public and health and social care professionals via the NHS website, Met Office, UKHSA and DHSC websites to prepare for imminent heatwaves. The NHS continues to provide reliable advice and guidance throughout the year on how to keep fit and well. It includes information on how to stay well in hot weather.

The heatwave plan builds on existing measures taken by DHSC, NHS and local authorities to protect individuals and communities from the effects of severe heatwaves and encourages community resilience. It outlines the key areas where public, independent sector, voluntary sector and health and social care organisations can work together to maintain and improve integrated arrangements for planning and response in order to deliver the best outcomes possible during a heatwave during the summer. It is the responsibility of each local area to ensure that preparedness and response plans are drawn up and tested.

At local level emergency planning arrangements run by local government and the NHS are brought together in the Local Resilience Forum (LRF), which has many years of experience with heatwave plans and heat-health alert system. LHRPs have been established to bring together the local health sector organisations to support in strategic planning.

Health and Wellbeing Boards act as forums for commissioners across the NHS, social care and public health systems and are responsible for joint strategic needs assessments and Health and Wellbeing Strategies to inform commissioning. Engagement of these boards in the long-term strategic preparation for heatwaves and other aspects related to climate change adaptation is critical to reduce the risks and harness opportunities to improve health. Councillors, especially those with a portfolio of responsibility for health, have an important role in the strategic overview as well as leading on community engagement and decision-making roles.

The core elements of the plan

The heatwave plan is a guide to support the coordination of plans and information for dealing with severe hot weather. It builds the experience in England, on expert advice from the WHO and the EuroHEAT project (Section 4 of companion document 'Making the case') in developing other national heatwave plans.

Strategic planning

The climate is changing and the current analysis in the national UK climate change risk assessment suggests that summers will progressively get hotter (see 'Making the case'), therefore long-term planning is essential for the following:

- to protect people and infrastructure from the effects of severe hot weather and thus reduce excess summer morbidity and mortality through coordinated long-term planning between agencies
- to adapt and reduce the impact of climate change, including 'greening the built environment', building design (for example, increasing shading around and insulation of buildings), increasing energy efficiency (for example, reducing carbon emissions) and transport policies by long-term multi-agency planning

We strongly recommend that this is considered by Health and Wellbeing Boards and included in joint strategic needs assessments (JSNAs) and joint health and wellbeing strategies, in order to inform commissioning of the appropriate measures to mitigate the health impacts of heatwaves and hot weather.

Alert systems (advance warning and advice over the summer)

A heat-health alert system operates from 1 June to 15 September and is based on the Met Office forecasts and data. Depending on the level of alert a response will be triggered to communicate the risk to the NHS, government, and public health systems. Advice and information for the public and health and social care professionals, particularly those working with at-risk groups. This includes both general preparation for hot weather and more specific advice when a severe heatwave has been forecast.

Heatwave and summer preparedness

In addition to the heat-health alert system the following elements also need to be in place:

An agreed lead body at local or sub-national level to co-ordinate multi-agency collaboration and to direct the response. For example, NHS England in collaboration with Integrated Care Boards (ICBs) to ensure that local providers of NHS commissioned services have the capacity and capability to deliver their functions as laid out in this plan. NHS England will be responsible for ensuring these providers meet the targets and arrangements agreed.

Local NHS, public health and social care organisations will oversee:

- action to reduce indoor heat exposure (medium and short term)
- particular care for vulnerable groups
- preparedness of the health and social care system
- staff training and planning

Communicating with the public

Working with the media to provide timely advice to the public, both before and during a heatwave:

- the Civil Contingencies Act 2004 provides a duty on category 1 responders to warn and inform the public before, during and after an emergency
- there should be a local heat-related health information plan specifying what is communicated, to whom, when and why
- this should raise awareness of how excessive exposure to severe heat affects health and what preventive action the public can take, both throughout the year and during the heatwaves to stay cool
- attention given to ensuring that key public health messages reach vulnerable groups and those who care for them (for example, caregivers of the chronically ill, parents of infants) in a suitable and timely way

Working with service providers

The following is required:

- advise hospitals and care, residential and nursing homes to provide cool areas and monitor indoor temperatures to reduce the risk of heat-related illness and death in the most vulnerable populations
- helping GPs, district nurses and social workers to identify vulnerable patients and clients on their practice lists by providing them with heatwave information and a good practice guide
- ensuring that health and social care organisations and voluntary groups implement measures to protect people in their care and reduce heat-related illness and death in those most at-risk groups
- recommending health visitors and school nurses provide advice to parents, childcare providers, schools and young people regarding behaviours to protect health during hot weather (for example, increasing fluid intake, reducing excessive sun exposure, avoiding diving into cold water)
- working with registered providers of housing to encourage wardens/caretakers to keep an eye out for vulnerable tenants during heatwaves and to consider measures to promote environmental cooling such as tree planting on their estates and the design of buildings
- supporting staff to remain fit and well during spells of hot weather

Engaging the community

The following is required:

- providing extra help, where possible, to care for those most at risk, including isolated older people and those with a serious illness or disability. This could come from local authorities, health and social care services, the voluntary sector, communities and faith groups, families and others. This is determined locally as part of the person's individual care plan and will be based on existing relationships between statutory and voluntary bodies
- additional help to ensure that people are claiming their entitlements to benefits should be signposted

Monitoring and evaluation

Real-time surveillance and evaluation is required – such as that provided by UKHSA (see Chapter 5).

Chapter 2. The heat-health alert service

A heat-health alert system will operate in England from 1 June to 15 September each year. During this period, the et Office may forecast heatwaves, as defined by forecasts of day and night-time temperatures and their duration.

The heat-health alert system comprises 5 main levels (Levels 0 to 4) outlined in Figure 2.1 and described in further detail below.

Level 0 is year-round long-term planning, so that longer term actions (such as those linked to spatial planning and housing) are taken to reduce the harm to health of severe heat when it occurs. Level 1 encourages organisations to plan for the summer while Levels 2 to 3 are based on threshold day and night-time temperatures as defined by the Met Office. These vary from region to region, but the average threshold temperature is 30°C during the day and 15°C overnight.

Level 4 is a judgement at national level made as a result of a cross-government assessment of the weather conditions and occurs when the impacts of heat extend beyond the health sector. Details of individual regional thresholds are given in Annexe 1. Annexe 2 shows the core messages to be broadcast as official UKHSA warnings alongside national and regional weather forecasts at different heatwave alert levels. They may be expanded or otherwise refined in discussion with broadcasters and weather presenters.

While heat-health alert system is in operation, UKHSA will routinely monitor outputs from real-time syndromic surveillance systems. UKHSA will also produce 3 key mortality outputs for heatwave monitoring in the event of a heatwave and share these as internal reports to DHSC. Further detailed information on these outputs in line with the heat health levels can be found in Chapter 5.

Level 0: Long-term planning to reduce risk from heatwaves

Long-term planning includes year-round joint working to reduce the impact of climate change and ensure maximum adaptation to reduce harm from heatwaves. This involves influencing urban planning to keep housing, workplaces, transport systems and the built environment cool and energy efficient. Long-term heatwave planning is a key consideration highlighted in the second National Adaptation Programme (NAP), which sets out actions to address the risks identified in the UK Climate Change Risk Assessment.

Level 1: Heatwave and summer preparedness

The heatwave plan will remain at Level 1 unless a higher alert is triggered during the summer. During the summer months, social and healthcare services need to ensure that awareness and background preparedness are maintained by implementing the measures set out in the heatwave plan.

Level 2: Alert and readiness

Level 2 is triggered as soon as the Met Office forecasts that there is a 60 per cent chance of temperatures being high enough on at least 2 consecutive days to have significant effects on health. This will normally occur 2 to 3 days before the event is expected. As death rates rise soon after temperature increases, with many deaths occurring in the first 2 days, this is an important stage to ensure readiness and swift action to reduce harm from a potential heatwave.

Level 3: Heatwave action

Level 3 is triggered as soon as the Met Office confirms that threshold temperatures have been reached in any one region or more. This stage requires specific actions targeted at high-risk groups.

Level 4: Emergency response

Level 4 is reached when a heatwave is so severe and/or prolonged that its effects extend outside health and social care system, such as power or water shortages, and/or where the integrity of health and social care systems is threatened. At this level, illness and death may occur among the fit and healthy, and not just in high-risk groups, and will require a multi-sector response at national and regional levels.

The decision to go to a Level 4 is made at national level and will be taken following considerations of a cross-government assessment of the weather conditions, coordinated by the Civil Contingencies Secretariat (Cabinet Office).

Figure 2.1: Heatwave alert levels

Level	
0	**Year-round planning** All year
1	**Heatwave and summer preparedness and action programme** 1 June to 15 September
2	**Heatwave is forecast – Alert and readiness** 60% or greater risk of heatwave in the next 2 to 3 days
3	**Heatwave action** Temperature reached in one or more Met Office National Severe Weather Warning Service regions
4	**Major incident – Emergency response** Central Government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health.

Met Office heatwave warnings

Heatwave warnings will:

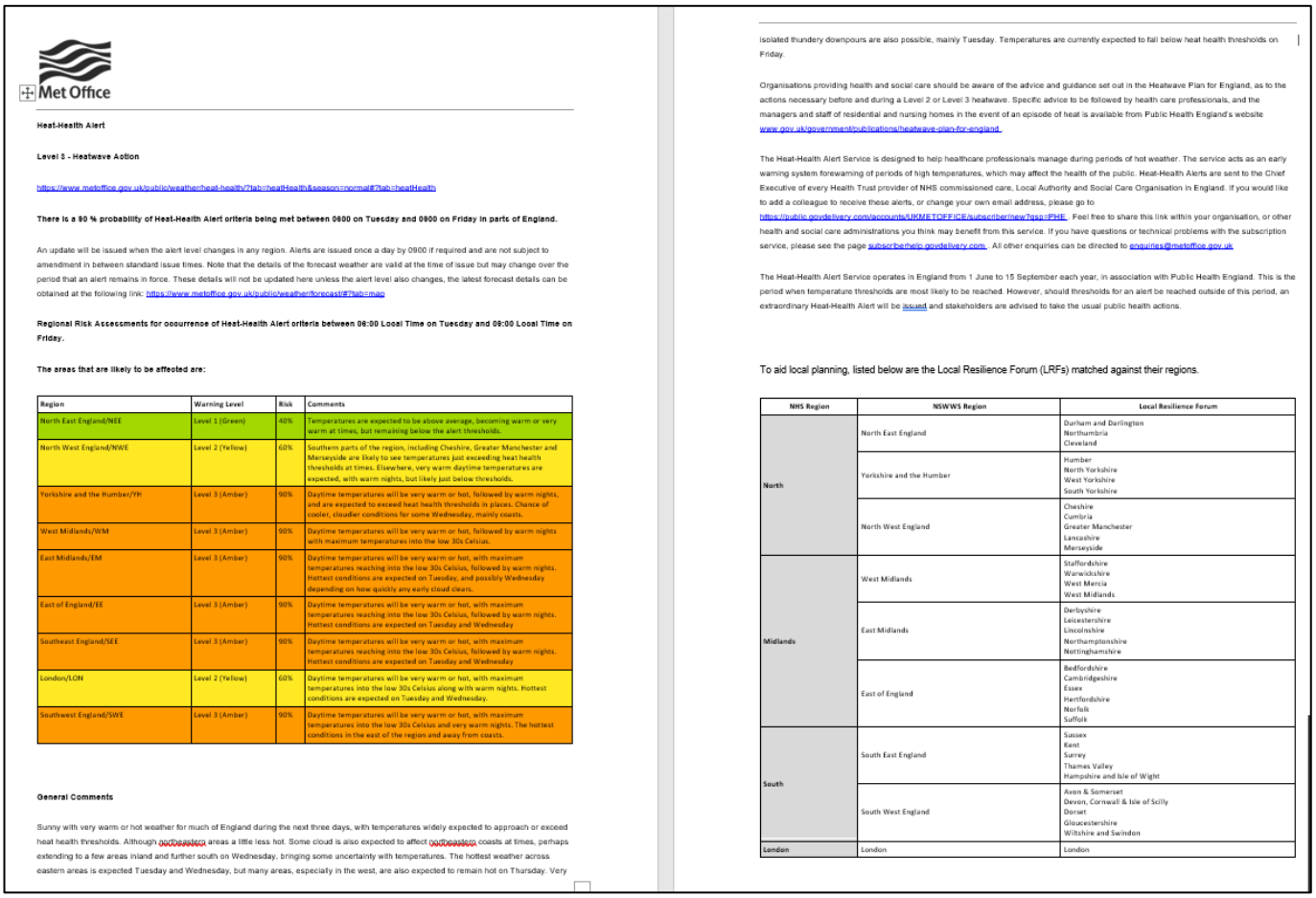
- be colour-coded to indicate more easily the National Severe Weather Warning Service (NSWWS) regions affected by a change from one Heatwave Warning level to another (for example, from Level 2 to Level 3) – this will help responders to clarify what actions in turn need to be taken
- published and sent by the Met Office at 09:00 rather than 10:00 to aid planners
- indicate which local resilience forum (LRF) is situated within the NSWWS region, in order to help responders
- include a link to Met Office and weather pattern maps
- use social media (for example, Twitter/Facebook). The alerts are already backed up by tweets, linking to the alert webpage through the Met Office twitter feed. Individuals can subscribe to this feed by following @metoffice

Figure 2.2: Met Office service and notifications

Service	Purpose	Distribution	Timing
Heatwave warning	To provide early warning of high temperatures. The alert levels have been set with thresholds known to cause ill health from severe hot weather. They are to help ensure that healthcare staff and resources are fully prepared for hot weather periods that might impact on health and to raise awareness for those individuals who are more vulnerable to hot weather conditions.	Email	Alert issued as soon as agreed threshold has been reached and when there is a change in alert level. Issued between 1 June and 15 September
Heatwave planning advice	To provide advice throughout the summer period relating to high temperatures.	Email	Twice a week (9am each Monday and Friday from 1 June to 15 September)
National Severe Weather Warning Service (NSWWS)	To provide warnings of severe or hazardous weather that has the potential to cause danger to life or widespread disruption. These warnings are issued to: • the public, to prompt consideration of actions they may need to take • emergency responders, to trigger their plans to protect the public from impacts in advance of an event, and to help them recover from any impacts after the event	Email, web, SMS, TV, radio	When required
General weather forecasts	To enable the public to make informed decisions about their day to day activities	Web, TV, radio	Every day

Figure 2.2 summarises the Met Office service and notifications. A dummy alert for illustration purposes is given in Figure 2.3, and Figure 2.4 illustrates how heatwave alert messages should be cascaded by email throughout the local community and nationally as appropriate. LRFs, LHRPs, and health and social care organisations will want to develop this into a specific cascade system that is appropriate for their local area.

Figure 2.3: Example of a heat-health alert



Met Office

Heat-Health Alert

Level 3 - Heatwave Action

https://www.metoffice.gov.uk/public/weather/heat-health/?lat=heatHealth&season=normal#?lat=heatHealth

There is a 90 % probability of Heat-Health Alert criteria being met between 0600 on Tuesday and 0900 on Friday in parts of England.

An update will be issued when the alert level changes in any region. Alerts are issued once a day by 0900 if required and are not subject to amendment in between standard issue times. Note that the details of the forecast weather are valid at the time of issue but may change over the period that an alert remains in force. These details will not be updated here unless the alert level also changes, the latest forecast details can be obtained at the following link: https://www.metoffice.gov.uk/public/weather/forecast/#?lat=map

Regional Risk Assessments for occurrence of Heat-Health Alert criteria between 08:00 Local Time on Tuesday and 09:00 Local Time on Friday.

The areas that are likely to be affected are:

Region	Warning Level	Risk	Comments
North East England/NEE	Level 1 (Green)	40%	Temperatures are expected to be above average, becoming warm or very warm at times, but remaining below the alert thresholds.
North West England/NWE	Level 2 (Yellow)	60%	Southern parts of the region, including Cheshire, Greater Manchester and Merseyside are likely to see temperatures just exceeding heat health thresholds at times. Elsewhere, very warm daytime temperatures are expected, with warm nights, but likely just below thresholds.
Yorkshire and the Humber/YH	Level 3 (Amber)	90%	Daytime temperatures will be very warm or hot, followed by warm nights, and are expected to exceed heat health thresholds in places. Chance of cooler, cloudier conditions for some Wednesday, mainly coasts.
West Midlands/WM	Level 3 (Amber)	90%	Daytime temperatures will be very warm or hot, followed by warm nights with maximum temperatures into the low 30s Celsius.
East Midlands/EM	Level 3 (Amber)	90%	Daytime temperatures will be very warm or hot, with maximum temperatures reaching into the low 30s Celsius, followed by warm nights. Hottest conditions are expected on Tuesday, and possibly Wednesday depending on how quickly any early cloud clears.
East of England/EE	Level 3 (Amber)	90%	Daytime temperatures will be very warm or hot, with maximum temperatures reaching into the low 30s Celsius, followed by warm nights. Hottest conditions are expected on Tuesday and Wednesday
Southeast England/SEE	Level 3 (Amber)	90%	Daytime temperatures will be very warm or hot, with maximum temperatures reaching into the low 30s Celsius, followed by warm nights. Hottest conditions are expected on Tuesday and Wednesday
London/LON	Level 2 (Yellow)	60%	Daytime temperatures will be very warm or hot, with maximum temperatures into the low 30s Celsius along with warm nights. Hottest conditions are expected on Tuesday and Wednesday.
Southwest England/SWE	Level 3 (Amber)	90%	Daytime temperatures will be very warm or hot, with maximum temperatures into the low 30s Celsius and very warm nights. The hottest conditions in the east of the region and away from coasts.

General Comments

Sunny with very warm or hot weather for much of England during the next three days, with temperatures widely expected to approach or exceed heat health thresholds. Although southeastern areas a little less hot. Some cloud is also expected to affect southeastern coasts at times, perhaps extending to a few areas inland and further south on Wednesday, bringing some uncertainty with temperatures. The hottest weather across eastern areas is expected Tuesday and Wednesday, but many areas, especially in the west, are also expected to remain hot on Thursday. Very isolated thundery downpours are also possible, mainly Tuesday. Temperatures are currently expected to fall below heat health thresholds on Friday.

Organisations providing health and social care should be aware of the advice and guidance set out in the Heatwave Plan for England, as to the actions necessary before and during a Level 2 or Level 3 heatwave. Specific advice to be followed by health care professionals, and the managers and staff of residential and nursing homes in the event of an episode of heat is available from Public Health England's website www.gov.uk/government/publications/heatwave-plan-for-england .

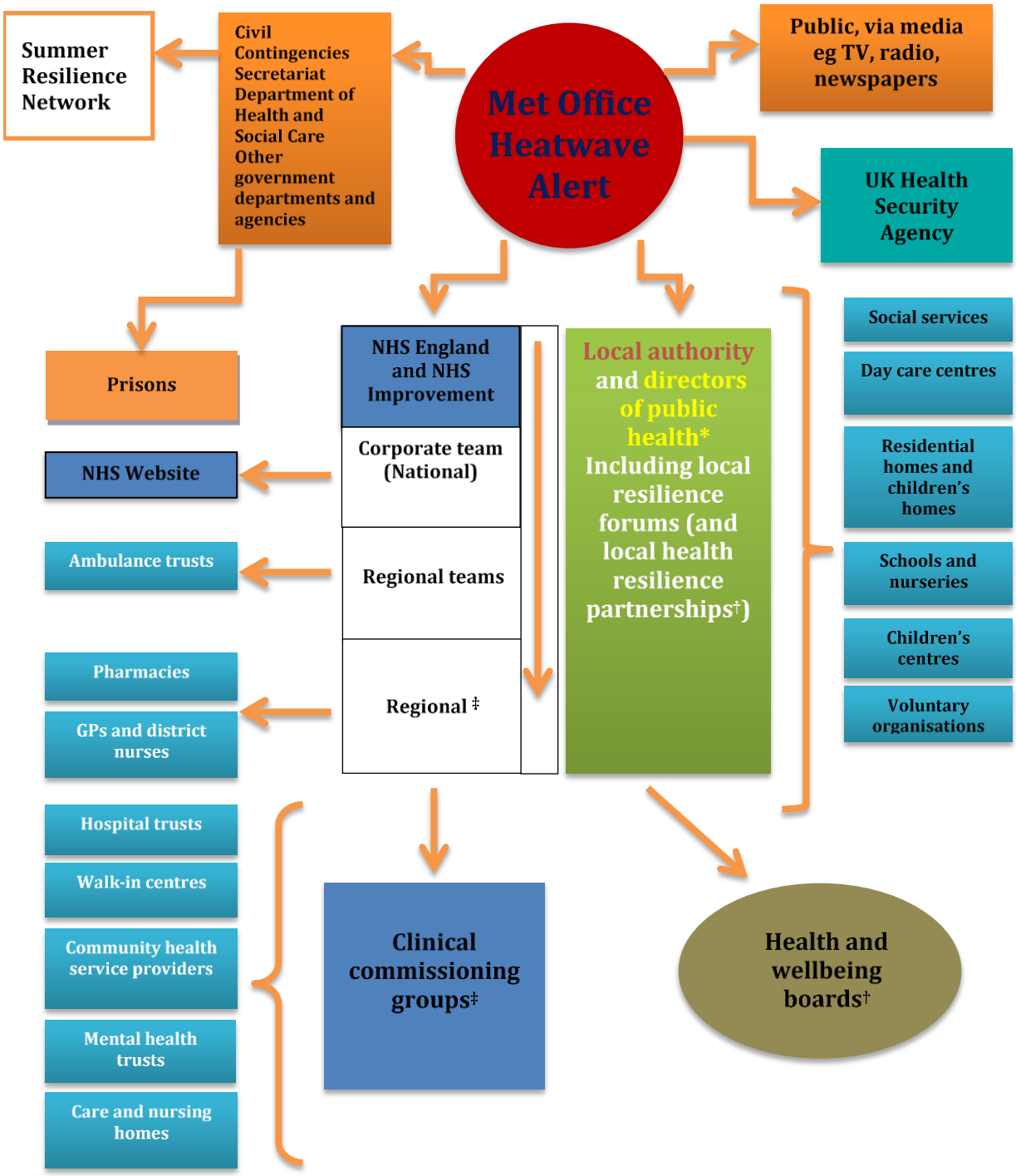
The Heat-Health Alert Service is designed to help healthcare professionals manage during periods of hot weather. The service acts as an early warning system forewarning of periods of high temperatures, which may affect the health of the public. Heat-Health Alerts are sent to the Chief Executive of every Health Trust provider of NHS commissioned care, Local Authority and Social Care Organisation in England. If you would like to add a colleague to receive these alerts, or change your own email address, please go to https://public.govdelivery.com/accounts/UKMETOFFICE/subscriber/new?qsp=PHE . Feel free to share this link within your organisation, or other health and social care administrations you think may benefit from this service. If you have questions or technical problems with the subscription service, please see the page subscriberhelp.govdelivery.com . All other enquiries can be directed to enquiries@metoffice.gov.uk

The Heat-Health Alert Service operates in England from 1 June to 15 September each year, in association with Public Health England. This is the period when temperature thresholds are most likely to be reached. However, should thresholds for an alert be reached outside of this period, an extraordinary Heat-Health Alert will be issued and stakeholders are advised to take the usual public health actions.

To aid local planning, listed below are the Local Resilience Forum (LRFs) matched against their regions.

NHS Region	NSWWS Region	Local Resilience Forum
North	North East England	Durham and Darlington Northumbria Cleveland
	Yorkshire and the Humber	Humber North Yorkshire West Yorkshire South Yorkshire
	North West England	Cheshire Cumbria Greater Manchester Lancashire Merseyside
Midlands	West Midlands	Staffordshire Warwickshire West Mercia West Midlands
	East Midlands	Derbyshire Leicestershire Lincolnshire Northamptonshire Nottinghamshire
	East of England	Bedfordshire Cambridgeshire Essex Hertfordshire Norfolk Suffolk
South	South East England	Sussex Kent Surrey Thames Valley Hampshire and Isle of Wight
	South West England	Avon & Somerset Devon, Cornwall & Isle of Scilly Dorset Gloucestershire Wiltshire and Swindon
London	London	London

Figure 2.4: Typical cascade of heatwave alerts



Notes:

† LHRPs and health and wellbeing boards are strategic and planning bodies but may wish to be included in local alert cascades.

‡ NHS England Regional teams and CCGs should work collaboratively to ensure that between them they have a cascade mechanism for heat-health alerts to all providers of NHS funded services both in business as usual hours and the out of hours period in their area.

* UKHSA would be expected to liaise with directors of public health to offer support, but formal alerting would be expected through usual local authority channels.

Text description of typical cascade of heatwave alerts flowchart

The Met Office Heatwave Alert is sent to the Civil Contengency Secretariat (CCS), the Department of Health and Social Care (DHSC) and others departments and agencies, UK Heath Security Agency (UKHSA), the public via media, NHS England and NHS Improvement, Local Authorities and directors of public health (including local residence forums and local health resilience partnerships).

Once alerted, the CCS and DHSC notify the Summer Resilience Network, and send a notification to the prisons.

Once alerted, NHS England and NHS Improvement act at several levels:

- national team update the NHS website
- regional team notify the ambulance trusts, pharmacies, GP and district nurses – they also inform the CCGs, who action the:
    - hospital trusts
    - walk-in centres
    - community health service providers
    - mental health trusts
    - care and nursing homes

Once alerted, the local authority and directors of public health notify the social services, the day care centres, the residential homes and children's homes, the schools and nurseries, the children's centres and the voluntary organisations. They also inform the health and wellbeing boards.

Chapter 3. Summary of heatwave plan levels and actions

A heatwave alert should trigger a series of actions by different organisations and professionals as well as the public. The tables that follow will summarise the actions that should be taken by the different organisations and groups in order to respond to prepare and respond to an alert.

Using the action tables

The actions outlined in the tables are illustrative. Local areas should consider these as guides when developing local heatwave preparedness arrangements. The Heatwave Plan for England is a broad framework and local areas need to tailor these suggestions to their local needs and ensure that these fit with wider local arrangements.

The tables emphasise the importance of joint working across agencies including the voluntary and community sector, and highlight one of the aims of the plan, which is to ensure that there is an integrated response to severe heat events across sectors. Local areas will need to consider those actions indicated in the tables which will need to be taken jointly across organisations and sectors.

Local organisations are asked to consider the action tables and to recast the suggested actions in ways that are most appropriate for them. NHS, local authorities, LHRPs and LRFs should assure that the heatwave plans are in place for the coming summer as part of wider preparedness and response to extreme climate events. Chapter 6 highlights the overarching next steps which NHS and local authorities should take to ensure that the heatwave alerts are being disseminated and acted upon at a local level.

1. The actions for each alert level are not intended to be an ‘all or none’ situation – staff and organisations should develop action plans which make sense to them using these as a broad template; staff should also exercise professional judgement in a ‘clinical’ setting with a patient or client and respond appropriately to that patient’s needs.
2. Staff should be much more aware of the effects of severe heat on health and when they notice a client or patient at risk of overheating, for example, from living in a home that is too hot, that they know what immediate actions to take to ensure safety and that there are clear guidelines for them to make other necessary arrangements (for example, addressing housing issues) in the immediate and longer term.
3. A system-wide approach should be taken to assessing the nature of the problem and addressing these across organisations locally that makes most effective and efficient use of resources – local areas may also wish to refer to an earlier DHSC toolkit How to reduce the risk of seasonal excess deaths systematically in vulnerable older people at population level. This is designed to help local communities to take a systematic approach to reduce the risk of seasonal excess deaths in older people.

NHS England and UKHSA have sub-national arrangements and will work with local providers of NHS commissioned care and local authorities which will include liaison, communication, coordination and response during emergency events.

In 2012, the Royal College of General Practitioners published a factsheet based on the Heatwave Plan to provide advice for GPs and their teams.

Commissioners of health and social care (all settings) and local authority directors of public health

Level 0. Year-round planning

Also see Making the Case: the impact of heat on health – now and in the future for more detail.

Working with partner agencies, incorporate into JSNA's/HWS's long term plans to prepare and mitigate the impact of heatwaves, including:

- how to identify and improve the resilience of those individuals and communities most at risk
- ensuring that a local, joined-up programme is in place covering:
  - housing (including loft and wall insulation and other plans to reduce internal energy use and heat production)
  - environmental action: for example, increase trees and green spaces; external shading; reflective paint; water features
  - other infrastructure changes, for example, porous pavements
- engaging the community and voluntary sector to support development of local community emergency plans
- making progress on relevant Public Health Outcomes Framework indicators

Level 1. Heatwave and summer preparedness programme: 1 June to 15 September

During the programme:

- work with partner agencies, providers and businesses to coordinate heatwave plans, ensuring vulnerable and marginalised groups are appropriately supported
- work with partners and staff on risk reduction awareness (for example, key public health messages), using a variety of methods to maximise dissemination
- ensure care homes and hospitals are aware of the heatwave plan and are engaged in preparing for heatwaves
- continue to engage the community and voluntary sector to support communities to help those most at risk
- ensure other institutional establishments (for example, prisons, schools) are aware of heatwave guidance
- ensure organisers of large events take account of possible heat risks

Level 2. Heatwave is forecast – alert and readiness

60% risk of heatwave in the next 2 to 3 days:

- communicate public media messages – especially to 'hard to reach' vulnerable groups
- communicate alerts to staff and make sure that they are aware of heatwave plans
- implement business continuity

- increase advice to health and social care workers working in community, care homes and hospitals

Level 3. Heatwave action

Temperature reached in one or more Met Office NSWWS regions:

- media alerts about keeping cool
- support organisations to reduce unnecessary travel
- review safety of public events
- mobilise community and voluntary support

Level 4. Major incident – emergency response

Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health.

Emergency response – continue actions as per Level 3 unless advised to the contrary.

Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health and if requiring coordinated multi-agency

High-risk groups

Community: over 75, female, living on own and isolated, severe physical or mental illness; urban areas, south-facing top flat; alcohol and/or drug dependency, homeless, babies and young children, multiple medications and over-exertion.

Care home or hospital: over 75, female, frail, severe physical or mental illness; multiple medications; babies and young children (hospitals).

* Because Level 2 is based on a prediction, there may be jumps between levels. Following Level 3, wait until temperatures cool to Level 1 before stopping Level 3 actions.

** Level 4: A decision to issue a Level 4 alert at national level will be taken in light of a cross-government assessment of the weather conditions, coordinated by the Civil Contingencies Secretariat.

Providers – health and social care staff in all settings (community, hospitals and care homes)

Level 0. Year-round planning

Also see Making the Case: the impact of heat on health – now and in the future for more detail.

Professional staff (all settings):

- develop systems to identify and improve resilience of high-risk individuals
- request a housing health and safety rating system assessment from environmental health for clients at particular risk
- encourage cycling or walking where possible to reduce heat levels and poor air quality in urban areas

Care homes and hospitals:

- work with commissioners to develop longer term plans to prepare for heatwaves
- make environmental improvements to provide a safe environment for clients in the event of a heatwave
- prepare business continuity plans to cover the event of a heatwave (for example, storage of medicines, computer resilience and so on)
- work with partners and staff to raise awareness of the impacts of severe heat and on risk reduction awareness (key public health messages)

Level 1. Heatwave and summer preparedness programme: 1 June to 15 September

Professional staff (all settings):

- identify high-risk individuals on your caseload and raise awareness of heat illnesses and their prevention among clients and carers (see key public health messages)
- include risk in care records and consider whether changes might be necessary to care plans in the event of a heatwave (for example, initiating daily visits by formal or informal care givers for those living alone)

Care homes and hospitals:

- ensure business continuity plans are in place and implement as required; ensure appropriate contact details are provided to local authority or NHS emergency planning officers to facilitate transfer of emergency information
- identify or create cool rooms or areas (able to be maintained below 26°C)
- install thermometers where vulnerable individuals spend

Level 2. Heatwave is forecast – alert and readiness

60% risk of heatwave in the next 2 to 3 days.

Professional staff (all settings):

- check high-risk people have visitor or phone call arrangements in place
- reconfirm key public health
- messages to clients
- check client's room temperature if visiting

Care homes and hospitals:

- check indoor temperatures are recorded regularly during the hottest periods for all areas where patients reside
- ensure cool areas are below 26°C
- review and prioritise high-risk people
- ensure sufficient cold water and ice
- consider weighing clients regularly to identify dehydration and rescheduling physio to cooler hours
- communicate alerts to staff and make sure that they are aware of heatwave plans
- ensure sufficient staffing
- implement business continuity

Level 3. Heatwave action

Temperature reached in one or more Met Office NSWWS regions.

Professional staff (all settings):

- visit or phone high-risk people
- reconfirm key public health
- messages to clients
- advise carers to contact GP if concerns regarding health

Care homes and hospitals:

- activate plans to maintain business continuity – including a possible surge in demand
- check indoor temperatures are recorded regularly during the hottest periods for all areas where patients reside
- ensure staff can help and advise clients including access to cool rooms, close monitoring of vulnerable individuals, reducing internal temperatures through shading, turning off unnecessary lights/equipment, cooling building at night, ensuring discharge planning takes home temperatures and support into account

Level 4. Major incident – emergency response

Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health.

Emergency response – continue actions as per Level 3 unless advised to the contrary.

Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health and if requiring coordinated multi-agency response

High-risk groups

Community: Over 75, female, living on own and isolated, severe physical or mental illness; urban areas, south-facing top flat; alcohol and/or drug dependency, homeless, babies and young children, multiple medications and over-exertion.

Care home or hospital: over 75, female, frail, severe physical or mental illness; multiple medications; babies and young children (hospitals).

* Because Level 2 is based on a prediction, there may be jumps between levels. Following Level 3, wait until temperatures cool to Level 1 before stopping Level 3 actions.

** Level 4: A decision to issue a Level 4 alert at national level will be taken in light of a cross-government assessment of the weather conditions, coordinated by the Civil Contingencies Secretariat.

Community and voluntary sector and individuals

Level 0. Year-round planning

Also see ‘Making the Case: the impact of heat on health – now and in the future’ for more detail.

Community groups:

- develop a community emergency plan to identify and support vulnerable neighbours in event of a heatwave
- assess the impact a heatwave might have on the provision and use of usual community venues
- support those at-risk to make sure they are receiving the benefits they are entitled to

Individuals:

- make environmental improvements inside and outside the house which reduce internal energy and heat
- install loft and wall insulation
- identify cool areas in the house to use in the event of a heatwave
- of on medications, ensure that these can be stored at safe levels in a heatwave

Level 1. Heatwave and summer preparedness programme: 1 June to 15 September

Community groups:

- further develop community emergency plan
- support the provision of good information about health risks especially with those vulnerable groups and individuals (see key public health messages)

Individuals:

- find good information about health risks and key public health messages to stay healthy during spells of severe heat (see key public health messages)
- look out for vulnerable neighbours

Level 2. Heatwave is forecast – alert and readiness

60% risk of heatwave in the next 2 to 3 days.

Community groups:

- keep an eye on people you know to be at risk
- stay tuned into the weather forecast and keep stocked with food and medications
- check ambient room temperatures

Individuals:

- stay tuned into the weather forecast
- check ambient room temperatures – especially those rooms where disabled or high risk individuals spend most of their time
- keep an eye on people you know to be at risk – ensure they have access to plenty of cool liquids
- look out for vulnerable neighbours

Level 3. Heatwave action

Temperature reached in one or more Met Office NSWWS regions.

Community groups:

- activate community emergency plan
- check those you know are at risk

Individuals:

- follow key public health messages
- check those you know are at risk

Level 4. Major incident – emergency response

Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health.

Emergency response – continue actions as per Level 3 unless advised to the contrary.

Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health and if requiring coordinated multi-agency response.

High-risk groups

Community: Over 75, female, living on own and isolated, severe physical or mental illness; urban areas, south-facing top flat; alcohol and/or drug dependency, homeless, babies and young children, multiple medications and over-exertion.

Care home or hospital: over 75, female, frail, severe physical or mental illness; multiple medications; babies and young children (hospitals).

*Because Level 2 is based on a prediction, there may be jumps between levels. Following Level 3, wait until temperatures cool to Level 1 before stopping Level 3 actions.

** Level 4: A decision to issue a Level 4 alert at national level will be taken in light of a cross-government assessment of the weather conditions, coordinated by the Civil Contingencies Secretariat.

National level: NHS England, UKHSA, DHSC, Met Office, other government departments

Level 0. Year-round planning

The Cabinet Office will take the lead on coordinating and working across government to prepare for severe heatwave and other associated extreme climate events - individual government departments will work with their partners on such preparations.

National implementation of the National Adaptation Programme will continue, improving protection from severe weather events.

DHSC, UKHSA and NHS England will look to improve monitoring and analysis of heat-related illness and deaths and evaluate the heatwave plan.

UKHSA and NHS England will issue general advice to the public and professionals and work closely with the NHS, other government departments (OGDs) and other national organisations that produce advice on staying healthy and ensuring service continuity during periods of prolonged severe heatwaves.

Level 1. Heatwave and summer preparedness programme: 1 June to 15 September

Preparations are the overall responsibility of UKHSA in collaboration with the Met Office and NHS England, DHSC and local bodies.

UKHSA and NHS England will make advice available to the public and professionals.

NHS England will ensure national guidance is cascaded to local services, and identify organisations most vulnerable to heatwaves.

Heat-health watch alerts will be sent by the Met Office to the agreed list of organisations and Category 1 responders as noted in Figure 2.4 – UKHSA and NHS England will cascade the alerts to sub-national units within their organisations.

DHSC will liaise with Cabinet Office and OGDs to ensure agreed responses are mobilised as required and Ministry of Housing, Communities and Local Government (MHCLG) will share info with local resilience forums.

UKHSA will routinely monitor syndromic and mortality surveillance.

Level 2. Heatwave is forecast – alert and readiness

60% risk of heatwave in the next 2 to 3 days:

- a Level 2 alert will be sent by the Met Office to the agreed list of organisations and Category 1 responders as noted in Figure 2.4
- central government departments, which should then cascade the information through their own stakeholder networks and front-line communication systems
- DHSC will ensure OGDs, particularly MHCLG's Resilience and Emergencies Division are aware of the change in alert level and brief ministers as appropriate
- UKHSA will make advice available to the public and professionals in affected regions via NHS Choices, NHS England, DHSC (GovNet), and Met Office websites
- NHS England will hold health services to account for taking appropriate actions to prepare for a heatwave
- UKHSA will continue to monitor syndromic and mortality surveillance

Level 3. Heatwave action

Temperature reached in one or more Met Office NSWWS regions:

- as per Level 2 arrangements
- Met Office will continue to monitor and forecast temperatures in each area, including the likely duration of the period of the heatwave, the likely temperatures to be expected and the probability of other regions exceeding the Level 3 threshold
- NHS England will assemble mutual aid when requested by local services
- UKHSA will continue to monitor syndromic and mortality surveillance and produce a weekly report for inclusion within a weekly UKHSA heatwave output

Level 4. Major incident – emergency response

Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health.

Level 4 alert issued at national level in light of cross-Government assessment of the weather conditions, coordinated by the Civil Contingencies Secretariat based in the Cabinet Office. Implementation of emergency response response arrangements by central government.

Response likely to involve:

- national government departments
- executive agencies
- public sector, including health sector
- voluntary sector

UKHSA will continue to monitor syndromic and mortality surveillance and produce a weekly report for inclusion within a daily UKHSA heatwave output.

High-risk groups

Community: Over 75, female, living on own and isolated, severe physical or mental illness; urban areas, south-facing top flat; alcohol and/or drug dependency, homeless, babies and young children, multiple medications and over-exertion.

Care home or hospital: over 75, female, frail, severe physical or mental illness; multiple medications; babies and young children (hospitals).

* Because Level 2 is based on a prediction, there may be jumps between levels. Following Level 3, wait until temperatures cool to Level 1 before stopping Level 3 actions.

** Level 4: A decision to issue a Level 4 alert at national level will be taken in light of a cross-government assessment of the weather conditions, coordinated by the Civil Contingencies Secretariat.

Key public health messages

Stay out of the heat:

- keep out of the sun between 11am and 3pm
- if you have to go out in the heat, walk in the shade, apply sunscreen and wear a hat and light scarf
- avoid extreme physical exertion
- wear light, loose-fitting cotton clothes

Cool yourself down:

- have plenty of cold drinks, and avoid excess alcohol, caffeine and hot drinks
- eat cold foods, particularly salads and fruit with a high-water content
- take a cool shower, bath or body wash
- sprinkle water over the skin or clothing, or keep a damp cloth on the back of your neck

Keep your environment cool:

- keeping your living space cool is especially important for infants, the elderly or those with chronic health conditions or who can't look after themselves
- place a thermometer in your main living room and bedroom to keep a check on the temperature
- keep windows that are exposed to the sun closed during the day, and open windows at night when the temperature has dropped
- close curtains that receive morning or afternoon sun, however, care should be taken with metal blinds and dark curtains, as these can absorb heat – consider replacing or putting reflective material in-between them and the window space
- turn off non-essential lights and electrical equipment – they generate heat
- keep indoor plants and bowls of water in the house as evaporation helps cool the air
- if possible, move into a cooler room, especially for sleeping
- electric fans may provide some relief, if temperatures are below 35°C¥

The above messages are adapted from the World Health Organization's Europe public health advice on preventing health effects of heat.

¥ NOTE: Use of fans: at temperatures above 35°C fans may not prevent heat related illness. Additionally fans can cause excess dehydration (Cochrane Review). The advice is to place the fan at a certain distance from people, not aiming it directly on the body and to have regular drinks. This is especially important in the case of sick people confined to bed.

Longer-term:

- consider putting up external shading outside windows
- use pale, reflective external paints
- have your loft and cavity walls insulated – this keeps the heat in when it is cold and out when it is hot
- grow trees and leafy plants near windows to act as natural air-conditioners (see 'Making the Case')

Look out for others:

- keep an eye on isolated, elderly, ill or very young people and make sure they are able to keep cool
- ensure that babies, children or elderly people are not left alone in stationary cars
- check on elderly or sick neighbours, family or friends every day during a heatwave
- be alert and call a doctor or social services if someone is unwell or further help is needed

If you have a health problem:

- keep medicines below 25°C or in the refrigerator (read the storage instructions on the packaging)
- seek medical advice if you are suffering from a chronic medical condition or taking multiple medications

If you or others feel unwell:

- try to get help if you feel dizzy, weak, anxious or have intense thirst and headache; move to a cool place as soon as possible and measure your body temperature
- drink some water or fruit juice to rehydrate
- rest immediately in a cool place if you have painful muscular spasms (particularly in the legs, arms or abdomen, in many cases after sustained exercise during very hot weather), and drink oral rehydration solutions containing electrolytes
- medical attention is needed if heat cramps last more than one hour
- consult your doctor if you feel unusual symptoms or if symptoms persist

Guidance for those looking after schoolchildren and those in early years settings during heatwaves

Outdoors:

- on very hot days (that is, where temperatures are in excess of 30°C) children should not take part in vigorous physical activity
- children playing outdoors should be encouraged to stay in the shade as much as possible
- loose, light-coloured clothing should be worn to help children keep cool and hats of a closed construction with wide brims should be worn to avoid sunburn
- thin clothing or suncream should be used to protect skin if children are playing or taking lessons outdoors for more than 20 minutes
- children must be provided with plenty of cool water and encouraged to drink more than usual when conditions are hot
- the temperature of water supplied from the cold tap is adequate for this purpose

Indoors:

- windows and other ventilation openings should be opened during the cool of early morning or preferably overnight to allow stored heat to escape from the building – it is important to be safe check insurance conditions and the need for security if windows are to be left open overnight
- windows and other ventilation openings should not be closed, but their openings reduced when the outdoor air becomes warmer than the air indoors – this should help keep rooms cool whilst allowing adequate ventilation
- use outdoor sun awnings if available, or indoor blinds, but do not let solar shading devices block ventilation openings or windows
- keep the use of electric lighting to a minimum during heatwaves
- all electrical equipment, including computers, monitors and printers should be switched off when not in use and should not be left in ‘standby mode’ – electrical equipment, when left on, or in ‘standby’ mode generates heat

Which children are likely to be most affected by high temperatures?

Children’s susceptibility to high temperatures varies; those who are overweight or who are taking medication may be at increased risk of adverse effects. Children under 4 years of age are also at increased risk.

Some children with disabilities or complex health needs may be more susceptible to temperature extremes. The school nurse, community health practitioner, family health visitor or the child’s specialist health professional may be able to advise on the particular needs of the individual child. Schools need to provide for children’s individual needs. Support staff should be made aware of the risks and how to manage them.

Further information is available on UKHSA guidance Looking after children and those in early years settings during heatwaves: for teachers and professionals.

Other considerations for summer preparedness

Heatwaves and large public events

Summer is a time for people to get outside and enjoy themselves. Large scale public events, such as music and arts festivals, sports events and national celebrations are held up all over the UK every summer providing enjoyment to millions of people.

Local agencies are generally well equipped to plan and deal with such events. There is tried and tested guidance, especially from the Health and Safety Executive 'Events Safety Guide' (see Annexe 3). However, the effects of excessive heat and sun exposure are sometimes not highlighted enough.

Large public events increase exposure to heat and direct sunlight and can make organisational responses more difficult. Individual behaviours often change (for example, people may be reluctant to use the toilet facilities due to the long queues and so purposely reduce fluid intake). At many large events, people get into a good position to see the event and then reduce fluid intake and heat avoidance behaviours so as not to lose their spot. This can lead to heat-related illness, dehydration and/or collapse.

Ramadan

Many members of the Muslim community may be fasting during the daylight hours in the month of Ramadan. All local areas should familiarise themselves with the dates of Ramadan each year and build appropriate actions into their local plans if it falls during the summer months. During hot weather, dehydration is a common and serious risk.

Guidance has been produced to help ensure that members of the Muslim community have a safe and healthy Ramadan: Ramadan Health Guide, produced : A guide to healthy fasting produced in association with the NHS.

Chapter 4. Anticipated impacts for other sectors during a Level 4 heatwave

Declaring a Level 4 alert indicates a major incident. The government will decide whether to go to Level 4 when there is a very severe heatwave which will last for a considerable period of time and will also affect transport, food, water, energy supplies, businesses and health and social care services.

The decision to issue a Level 4 alert is made at national level and will be taken in view of a cross-government assessment of the weather conditions, coordinated by the Civil Contingencies Secretariat (Cabinet Office). A Level 4 alert is not triggered automatically by a greater than 4-day period of severe hot weather.

In the event of a major incident being declared, all existing emergency policies and procedures will apply. All Level 3 responsibilities will continue.

Heatwave – cross-government response

The decision to issue a Level 4 alert at national level will be actioned after a cross-government assessment is carried out and coordinated by the Civil Contingencies Secretariat.

- in undertaking this assessment, the Civil Contingencies Secretariat would consult with a range of interested departments/agencies, including DHSC emergency planning functions, the Met Office, the Department for Transport, the Ministry of Housing, Communities and Local Government and others as required.
- in line with its approach to all major national incidents, in the event of a Level 4 emergency being declared, the Cabinet Office will nominate a lead government department to coordinate the central government response machinery as necessary. This is most likely to be the Department of Health & Social Care as a prolonged heatwave would primarily be a public health issue.
- UKHSA will continue to monitor routine surveillance systems for any increases in heat-related morbidity or mortality. For further details on output frequency see Chapter 5.
- while other issues are likely to arise as part of any heatwave emergency, such as power failures and transport disruption, these would be dealt with by the departments concerned as part of a coordinated response unless they became the overriding concern, in which case the overall central government department lead may transfer responsibility.
- response arrangements will need to be necessarily flexible, in order to adapt to the nature of the challenge and other circumstances at the time while applying good practice, including lessons learnt from previous emergencies.

The previous pages have highlighted the risks to public health from a heatwave. The risks to other important areas of life from 4 or more days where temperatures have reached threshold

values during the day and overnight are equally important and will have an impact on health and the ability of health services to respond. Anticipated risks and responses during a heatwave Level 4 and the wider risks, which have the potential to generate disruption at a national, regional and local level, include the following:

Transport infrastructure

Road surfaces are susceptible to melting under extreme or prolonged temperatures; however, as the surface temperature may not be dependent on the air temperature, melting is more likely to be as a result of direct sunlight.

Traffic congestion leading to delays on motorways or trunk roads has potentially serious consequences for those stranded in vehicles, particularly vulnerable people such as the elderly or young children.

The rail network will be susceptible to rails warping or buckling under extreme or prolonged temperatures and this will vary according to specific local factors including local geography and the maintenance status of the track. As a very approximate guide, staged preventative measures should be applied when air temperatures reach 22°C. The most extreme precautions would only cut in at air temperatures of 36°C (which is likely to give a railhead temperature of over 50°C).

Extreme temperatures on the London Underground Network could lead to a range of health and safety challenges. London Underground Network operations monitor Met Office weather forecasts, and if temperatures are forecast do not to fall below 24°C for 3 days running they will implement plans to deploy hot weather notices and bottled water supply, as well as measures to prevent track buckling.

Power supplies

At a time when energy companies traditionally maintain power stations for the winter by standing units down over the summer, rising temperatures increase the demand for supply due to the use of air-conditioning units and fans. The heat can reduce the power-carrying capacity of the system, as it is harder to cool conductors – this will restrict the ‘maintenance window’ available and could ultimately require greater redundancy on the system to permit maintenance.

The Office for Nuclear Regulation (ONR) requires all of its nuclear site licensees to demonstrate resilience against a broad range of external hazards in a safety case to ensure the continued safe and secure operation of their facilities. Such hazards include extremes of temperature, flooding, among others.

High temperatures are not expected to impact the UK’s nuclear reactors, as they are cooled by seawater, which has a stable temperature and is not influenced by short periods of hot weather. Generally, the rising temperatures lower power station efficiency.

Environmental pollution

Air quality

Smog typically accompanies heatwaves as this often occur during periods of limited dispersion and/or easterly continental air masses arriving in the UK. As a result, pollutants are less spread out or added to a higher background concentration which can lead to high concentrations of nitrogen dioxide and particulate matter. Heatwave conditions often lead to increased ozone levels following interactions of other pollutants with sunlight. Information on the latest pollution levels and the air quality forecast can be found at UK-Air (Defra).

Water quality

Prolonged sunshine can accelerate the growth of blue-green algae, which can cause problems for aquatic life, including fish, as well as toxic algal blooms, causing problems for public recreational water activities.

A prolonged heatwave may cause increased health and environmental problems, including odour, dust and vermin infestation, increasing public nuisance and complaint issues. Additional measures would be necessary to mitigate these problems, including more frequent refuse collections and enhanced pollution control measures at landfills and other waste treatment facilities.

The potential for wildfires

The risks of wildfire during a heatwave can be greater because the vegetation including grass, trees and bushes will be drier than usual. Smoke and other risks from wildfire can cause the closure of motorways and contributes to local and regional air pollution and air quality issues.

Animal welfare

During a heatwave:

- rising temperatures would require the increase of ventilation requirements for animals temporarily housed at farms, markets and slaughterhouses
- rising temperatures lead to changes in transport, markets and temporarily housed animal stocking densities
- delays on transport have the potential to lead to increased distress and suffering of animals and increase the number of deaths of animals in transit
- slaughterhouses' killing throughput may be affected due to reduced working hours at slaughterhouses and the transport of a lower number of animals
- there is the potential for an increase in the number of pet fatalities due to irresponsible owners leaving them in restricted enclosures with poor ventilation (for example, dogs in cars)

Water shortages

Water companies have plans in place to deal with failure in the supply of mains water or sewerage services. These plans are regularly reviewed and tested by the water companies and are independently certified every year.

In the event of a reduced mains supply, water companies would introduce water saving measures such as reducing water pressure or limiting 24/7 supply. In the event of a loss of mains supply, water companies are required to supply water by alternative means, such as in static tanks or bottled water. There is a requirement to provide no less than 10 litres per person per day, with special attention given to the needs of vulnerable people, hospitals and schools. Where an interruption to the piped water supply exceeds 5 days, the minimum requirement rises to 20 litres per person per day.

Strong demand during a heatwave has the potential to jeopardise the availability of water supplies, particularly in southern parts of the UK; this can lead to local hose-pipe restrictions if high temperatures persist.

Children's sector

Some schools have had to close classrooms where conditions are too hot. Please refer to UKHSA guidance, 'Looking after children and those in early years settings during heatwaves: guidance for teachers and professionals'.

Crops

During a heatwave:

- horticulture is very sensitive to rising temperatures – crops start to experience stress due to heat and water shortage and may die as a consequence
- crops may not be harvested at appropriate times and may be lost or quality and nutritional value of the crop may be reduced
- high temperatures may mean crops cannot be sown at appropriate times or require more water
- flowering and pollination may be affected, reducing fruit and grain yield
- it may become difficult to store crops such as potatoes at the appropriate temperature as machinery has to work harder

Chapter 5. Monitoring and surveillance

The public health outcomes framework: Level 0

The public health outcomes framework sets out desired outcomes and indicators to help us understand how well public health is being improved and protected. A number of indicators in the outcomes framework can be linked to long-term planning for severe heat and heatwaves (see companion document Making the Case). UKHSA will publish data on an online tool that allows local authorities to compare their achievements with other areas.

Real-time monitoring and surveillance: Levels 1 to 4

UKHSA, in collaboration with other agencies provides both information on excess mortality and morbidity due to heatwaves. Much of this is recorded in ‘real-time’ as possible to provide agencies with a source of intelligence on how health is affected by hot weather. The frequency of outputs at each heatwave level are given below:

Level 1

Heatwave and summer preparedness – UKHSA will routinely monitor outputs from real-time syndromic surveillance systems including calls to NHS 111, GP in and out of hours daily (weekdays only) consultations and emergency department attendances, for the impact of heat-related morbidity using a range of syndromic health indicators. Information on heat-related illness will be included in routine weekly surveillance reports published on the UKHSA website; these will provide a source of intelligence on how severe the effects are and how well services are responding to them. (UKHSA will continue to provide heatwave mortality surveillance, producing weekly excess all-cause mortality estimates based on Office of National Statistics (ONS) weekly data during the summer and publish outputs once a fortnight on the UKHSA website in the UKHSA mortality report).

Level 2

Alert and readiness – UKHSA will continue to monitor routine syndromic surveillance systems for any increases in heat-related illness including calls to NHS 111, GP in and out of hours daily (weekdays only) consultations and emergency department attendances. It will continue to provide information on heat-related illness in routine weekly surveillance reports. (UKHSA will continue to produce weekly excess all-cause mortality estimates based on weekly ONS data during the summer and publish outputs once a fortnight on the UKHSA website in the UKHSA mortality report). In addition, UKHSA will request release of daily deaths data and monitor daily increase in excess summer deaths based on available data. Daily monitoring will continue up until one week after the alert level has return to level 1.

Level 3

Heatwave action – UKHSA will continue to monitor any increases in heat-related illness reported in calls to NHS 111, GP in and out of hours daily (weekdays only) consultations and emergency department attendances and will produce an additional single weekly heat wave syndromic surveillance report, in addition to the routine weekly surveillance outputs, for incorporation into a weekly UKHSA heatwave output. This additional report will provide a source of intelligence on the severity of the heatwave with respect to health including information on the impact at regional level and within age groups. UKHSA will continue to monitor any increase in mortality based on available daily and weekly data.

Level 4

Emergency – UKHSA will continue to monitor any increases in heat-related illness reported in calls to NHS 111, GP in and out of hours consultations and emergency department attendances providing a daily (weekday only) syndromic surveillance report on heat-related illness in the community. Mortality will be monitored as per level 3.

Evaluation

UKHSA will work together with DHSC to prepare an annual review of the Heatwave Plan, which takes place each spring.

Chapter 6. Recommended next steps for the NHS and local authorities

The Heatwave plan for England is a good-practice document with recommendations for healthcare providers. Local authorities and their NHS partners should consider the actions in this plan and adapt them as appropriate to their local needs. Local authorities and the NHS should use the plan as a guide for wider heatwave planning and other climate change adaptation arrangements. Local teams from Integrated Care Boards, NHS England and UKHSA will support, advise, and help to coordinate these arrangements as required.

There are 3 key messages recommended for all local areas in the Heatwave plan for England:

1. All local authorities, NHS commissioners and their partner organisations should consider the suggested actions in the Heatwave plan for England and familiarise themselves with heatwave alert services. Local heatwave and climate change adaptation plans should be reviewed according with the recommendations in this plan.

2. NHS and local authority commissioners with LRFs should review and audit the distribution of the heatwave alerts across the local health and social care systems to ensure the alerts reach those that need to take appropriate actions immediately after issue. Figure 2.4 is an illustrative diagram showing a cascade of a heatwave alert message. Local areas need to adapt these to their specific situations and confirm the cascades systems are working appropriately. Particular care should be taken to ensure independent care homes, hospitals and healthcare providers are made aware of the plan and of the specific risks and advice for their patients, residents and staff.

3. NHS and local authority commissioners together with LRFs should seek assurance from organisations and key stakeholders on appropriate actions are taken detailed in heatwave alert messages. The actions recommended in Chapter 3 are based on the best evidence and practice available currently and are not intended to be prescriptive. Local areas should amend and adapt this guidance and procedures for staff and organisations in a way which is appropriate for the local situation. Professionals should use their judgement in any individual situation to ensure that best practice is used to protect the health of their patient or client.

Annexe 1. Key trigger temperatures

Figure 3.1 summarises the key trigger temperatures during a heatwave. Although excess seasonal deaths start to occur at approximately 25°C, for practical reasons the health heatwave alert system is based upon temperature thresholds where the odds ratio is above 1.15 to 1.2 (a 15% to 20% increased risk). The different trigger temperatures for local areas are summarised below with regional variations due to relative adaptation to heat, however, a significant proportion of excess summer deaths occur before the health heatwave alert is triggered, which emphasises the importance of long-term planning actions by local authorities and the health sector.

Figure 3.1: Trigger temperatures

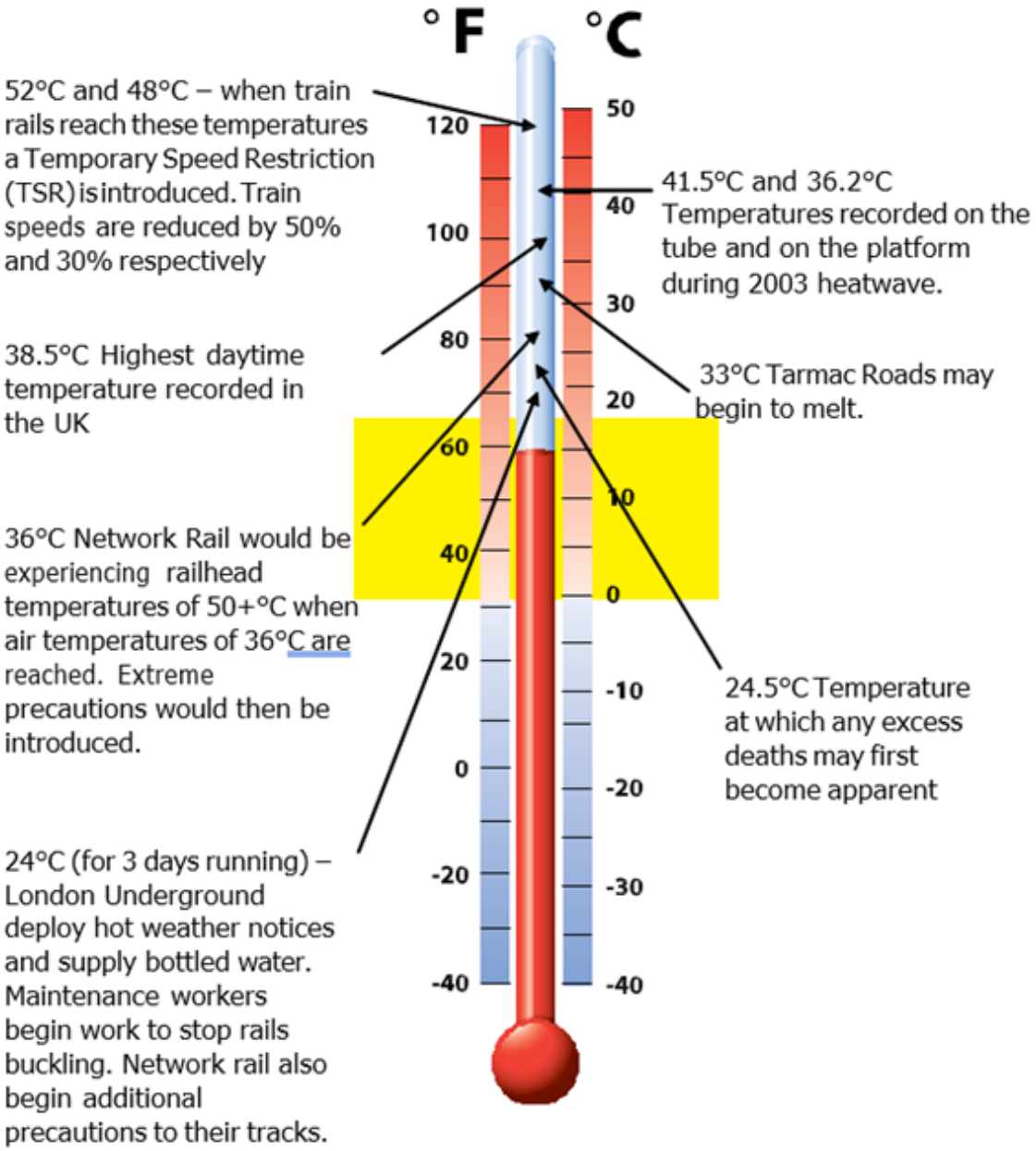


Figure 3.2: Local threshold temperatures

Threshold maximum day and night temperatures defined by the Met Office NSWWS region are set out below.

Maximum temperatures (°C)		
NSWWS Region	**Day**	**Night**
London	32	18
South East	31	16
South West	30	15
Eastern	30	15
West Midlands	30	15
East Midlands	30	15
North West	30	15
Yorkshire and Humber	29	15
North East	28	15

Annexe 2. Public Health Core Messages

These are the core messages to be broadcast as official UKHSA warnings alongside national and regional weather forecasts. They may be expanded or otherwise refined in discussion with broadcasters and weather presenters.

Level 1: summer preparedness and long-term planning

No warning required unless there is a 60% probability of the situation reaching Level 2 somewhere in the UK within the next 3 days, then something along the lines of:

> If this does turn out to be a heatwave, we'll try to give you as much warning as possible. But in the meantime, if you are worried about what to do, either for yourself or somebody you know who you think might be at risk, for advice go to the NHS website. Alternatively, ring NHS 111.

Level 2: alert and readiness

The Met Office, in conjunction with UKHSA, is issuing the following heatwave warning for [regions identified]:

> Heatwaves can be dangerous, especially for the very young or very old or those with chronic disease. Advice on how to reduce the risk either for yourself or somebody you know can be obtained from the NHS website, NHS 111 or from your local chemist.

Level 3 and 4: heatwave action/emergency

The Met Office, in conjunction with UKHSA, is issuing the following heatwave advice for [regions identified]:

> Stay out of the sun. Keep your home as cool as possible – shading windows and shutting them during the day may help. Open them when it is cooler at night. Keep drinking fluids. If there's anybody you know, for example an older person living on their own, who might be at special risk, make sure they know what to do.

Annexe 3. Heatwave advice and mass gatherings

The attached list provides a quick heat-health checklist that can be used when planning large scale public events (mass gatherings). This should be used in conjunction with other more detailed planning advice (for example, Health and Safety Executive's 'Events Safety Guide').

Heat-health risk	Actions to consider
Increased exposure to heat	• provide temporary shaded areas at event locations (umbrellas, tents) • reduce the need to queue (efficient check in, additional staffing, or staggered ticket entry) • provide a water spray/mist area/spraying (showers, garden hose) • make available a map of local public air-conditioned spaces where people can have respite from the heat (consider extending opening hours of these venues) • divert strenuous activities for cooler days or cooler periods of the day and provide an alternative, less strenuous program for hot days
Communication barriers	• prepare advice for tourists and distribute around hotels, money exchanges and transport hubs • produce and distribute heat-health advice printed onto free fans or caps (can be used to fan/protect against sun while containing information on protecting against and recognising heat-related illnesses, and provide emergency phone number in case of identified heat related illness) • inform your audience and/or your members about the health risks and possible preventive measures through digital screens/speakers/announcements
Reduced access to water	• distribute water bottles or temporary water dispensers • ensure an adequate supply of drinking water – on hot days it is advisable to provide free drinking water
Severe heat emergency	• consider moving date, location or cancel event in extreme heat alert (especially at a Level 4 alert) • ensure adequate immediate relief for people in emergency and ensure their transport to the first aid/health unit

Heat-health risk	Actions to consider
Medical needs	• remember that people with asthma, heart disease and/or other additional chronic conditions are additionally health sensitive to ozone and/or heat • keep in mind that alcohol and some (prescription) drugs can worsen effect of heat • ensure adequately trained personnel who notify authorities as soon as there are incidences of heat illness observed
Food needs	• provide water-rich foods such as salads, yogurt and ensure that food is kept cool to prevent contamination

Adapted using best practice advice from:

1. Lowe D, Ebi K, Forsberg B. 'Heatwave early warning systems and adaptation advice to reduce human health consequences of heatwaves.' International Journal of Environmental Research and Public Health 2011 : volume 8, pages 4,623 to 4,648
2. Plan Nacional de Actuaciones Preventivas de los Efectos del Exceso de temperaturas Sobre la Salud (Spain)
3. Plano De Contingência Para Ondas De Calor (Portugal).
4. Dianne Lowe (Personal Communication)
5. Outputs from discussions at Heatwave Seminar 2012

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References

A selection of key references can be found in section 4 of Making the Case: the impact of heat on health – now and in the future.

About the UK Health Security Agency

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