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Adapting to extreme events and the role of the Adverse Weather and Health Plan

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UKHSA Centre for Climate and Health Security

21st June 2023 - **OFFICIAL**



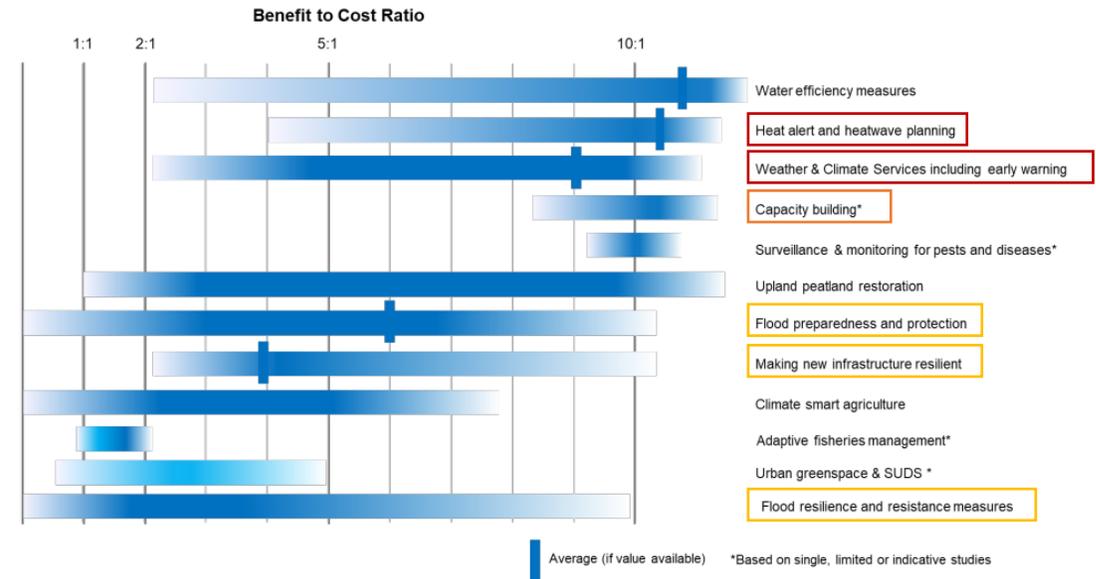
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Context

CCRA3 Technical Report



[CCRA3 Chapter 5 \(ukclimaterisk.org\)](https://ukclimaterisk.org)



Notes: Figure shows the indicative benefit:cost ratios and ranges for a number of adaptation measures. It is based on the evidence review undertaken in the CCRA3 Valuation study, which was co-funded by the EU's Horizon 2020 RTD COACCH project (CO-designing the Assessment of Climate Change costs). Vertical bars show where an average BCR is available, either from multiple studies or reviews. It is stressed that BCRs of adaptation measures are highly site- and context-specific and there is future uncertainty about the scale of climate change: actual BCRs will depend on these factors.

[Monetary-Valuation-of-Risks-and-Opportunities-in-CCRA3.pdf \(ukclimaterisk.org\)](https://ukclimaterisk.org)

CCRA3 Technical Report

Table 39 The total economic costs of heat-related mortality from climate change and socio-economic change in the UK. £Million/year. 2020 prices, from estimates of Hajat et al., 2014. Note does not include current adaptation. Medium values.

Value of a Prevented Fatality (VPF)	Central estimates of £Million / year - total			
Time period	2000-2009	2020s	2050s	2080s
heat- present day	4,115			
heat projection - climate only		6,007	11,068	17,651
heat projection - climate and population growth/age		6,839	14,674	26,134
Sensitivity VPF with 2% uplift				
Central estimates of £Million / year				
heat- present day	4115			
heat projection - climate only		8,412	23,029	66,523
heat projection - climate and population growth/age		9,576	30,532	98,497
Sensitivity VOLY (1 year)				
Central estimates of £Million / year				
heat- present day	128			
heat projection - climate only		187	345	550
heat projection - climate and population growth/age		213	458	815
Sensitivity VOLY (1 year) with 2% uplift				
Central estimates of £Million / year				
heat- present day	128			
heat projection - climate only		262	718	2,074
heat projection - climate and population growth/age		299	952	3,072

Table 45 The marginal economic costs of cold related mortality UK. Increase over baseline. 2019 prices and value. Central estimate. Based on estimates from Hajat et al, 2014.

Value of a Prevented Fatality	Central estimates of £Million / year		
Time period	2020s	2050s	2080s
cold projection - climate and population growth	-2,989	+ 2,107	+ 10,218
Sensitivity Value of Life year Lost (1 year)			
cold projection - climate and population growth	-93	+66	+ 319
VPF With 2% uplift			
cold projection - climate and population growth	-4,185	+ 4,385	+ 38,509
QALY With 2% uplift			
cold projection - climate and population growth	-131	+137	+ 1,201

National Adaptation Programme



Department
for Environment
Food & Rural Affairs

The National Adaptation Programme
and the Third Strategy for Climate
Adaptation Reporting

Making the country resilient to a changing climate

July 2018



UKHSA is committed under the National Adaptation Programme (NAP) to develop a single adverse weather and health plan for England by 2023. Building on the existing Heatwave and Cold Weather Plans for England, this will include updated guidance on hot and cold weather, drought, flooding and thunderstorm asthma to inform action across the health system and local communities and reduce the health impacts of adverse weather.

[National Adaptation Programme \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

National Adaptation Programme

<p>Flooding and coastal change risks to communities, businesses and Infrastructure (Ch3, Ch4 Ch5, Ch6)</p>	<p>MORE ACTION NEEDED</p>
<p>Risks to health, well-being and productivity from high temperatures (Ch5, Ch6)</p>	
<p>Risk of shortages in the public water supply, and for agriculture, energy generation and industry (Ch3, Ch4, Ch5, Ch6)</p>	
<p>Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity (Ch3)</p>	
<p>Risks to domestic and international food production and trade (Ch3, Ch6, Ch7)</p>	
<p>New and emerging pests and diseases, and Invasive non-native species, affecting people, plants and animals (Ch3, Ch5, Ch7)</p>	<p>RESEARCH PRIORITY</p>
<p>NOW -----> RISK MAGNITUDE -----> FUTURE LOW MEDIUM HIGH</p>	

[National Adaptation Programme \(publishing.service.gov.uk\)](http://publishing.service.gov.uk)

National Risk Register



National Risk Register 2020 edition



National Risk Register 2020 - GOV.UK (www.gov.uk)

Impact (of the reasonable worst case scenario using the impact indicators below)	Level E		7 25*			
	Level D	34*	12 13 29			
	Level C	18 28 33* 36*	14 19 21 26* 27* 38	2 3 6* 15 16 17 20		
	Level B	30	24	35*	4 5 9* 10* 11* 23 32* 37	1
	Level A			8* 22	31	
		< 1 in 500	1 to 5 in 500	5 to 25 in 500	25 to 125 in 500	> 125 in 500

Likelihood

(of the reasonable worst case scenario of the risk occurring in the next year)

*Risk not plotted in the 2017 NRR | *COVID-19 is not included in the risk matrix and is therefore not included in these risks

Malicious Attacks

1. Attacks on publicly accessible locations
2. Attacks on infrastructure
3. Attacks on transport
4. Cyber attacks
5. Smaller scale CBRN attacks
6. Medium scale CBRN attacks
7. Larger scale CBRN attacks
8. Undermining the democratic process*

Serious and Organised Crime

9. Serious and organised crime – vulnerabilities*
10. Serious and organised crime – prosperity*
11. Serious and organised crime – commodities*

Environmental Hazards

12. Coastal flooding
13. River flooding
14. Surface water flooding
15. Storms
16. Low temperatures
17. Heatwaves
18. Droughts

19. Severe space weather
20. Volcanic eruptions
21. Poor air quality
22. Earthquakes
23. Environmental disasters overseas
24. Wildfires

Human and Animal Health

25. Pandemics*
26. High consequence infectious disease outbreaks*
27. Antimicrobial resistance*
28. Animal diseases

Major Accidents

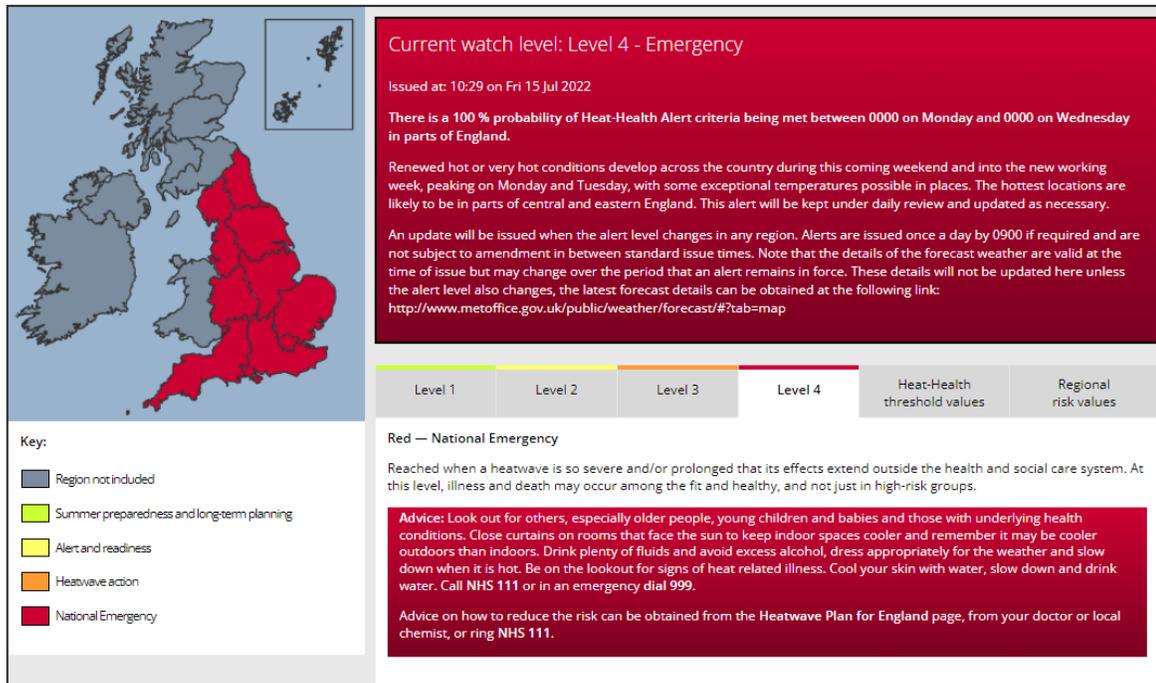
29. Widespread electricity failures
30. Major transport accidents
31. System failures
32. Commercial failures*
33. Systematic financial crisis*
34. Industrial accidents – nuclear*
35. Industrial accidents – non nuclear*
36. Major fires*

Societal Risks

37. Industrial action
38. Widespread public disorder

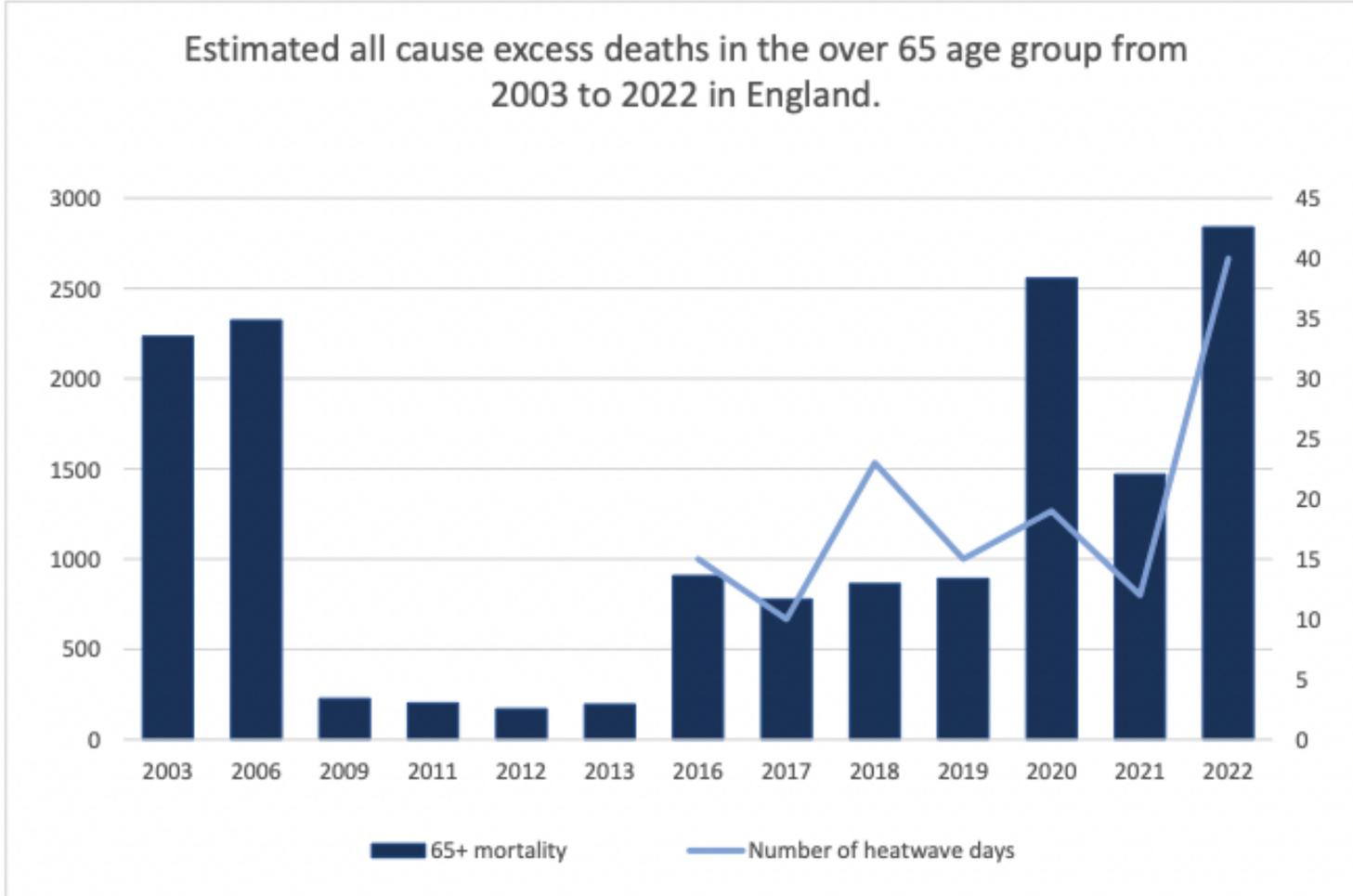
Summer 2022

Heat-Health Alert



- HHA Level 4 – Emergency
 - All England
 - Monday 18th July 00:00 to Tuesday 19th July 23:59
- Risk of Compound and Cascading Events
 - COVID -19 hospital admissions
 - increased pressure of health services
 - ambulance call outs

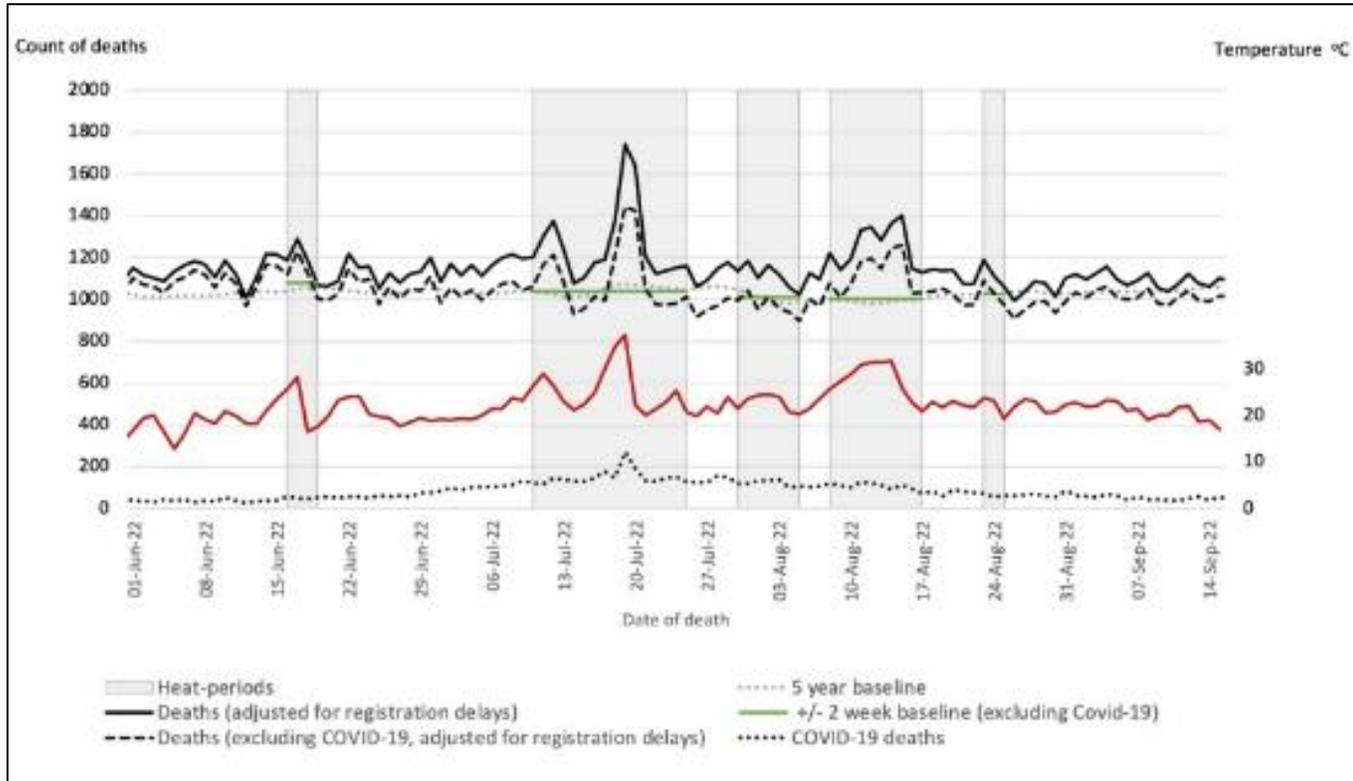
Summer 2022 heat mortality



- Increasing trend in number of heatwaves each season – longer, hotter and more frequent
- Last three years in the top 4 since introduction of Heatwave Plan for England
- Final 2022 report published end of May. Results presented by:
 - Region
 - Age

Summer 2022 heat mortality

Daily all-cause excess mortality in the 65 years and over group during the Heat-Health Alerting season 2022 (1 June to 15 September) in England

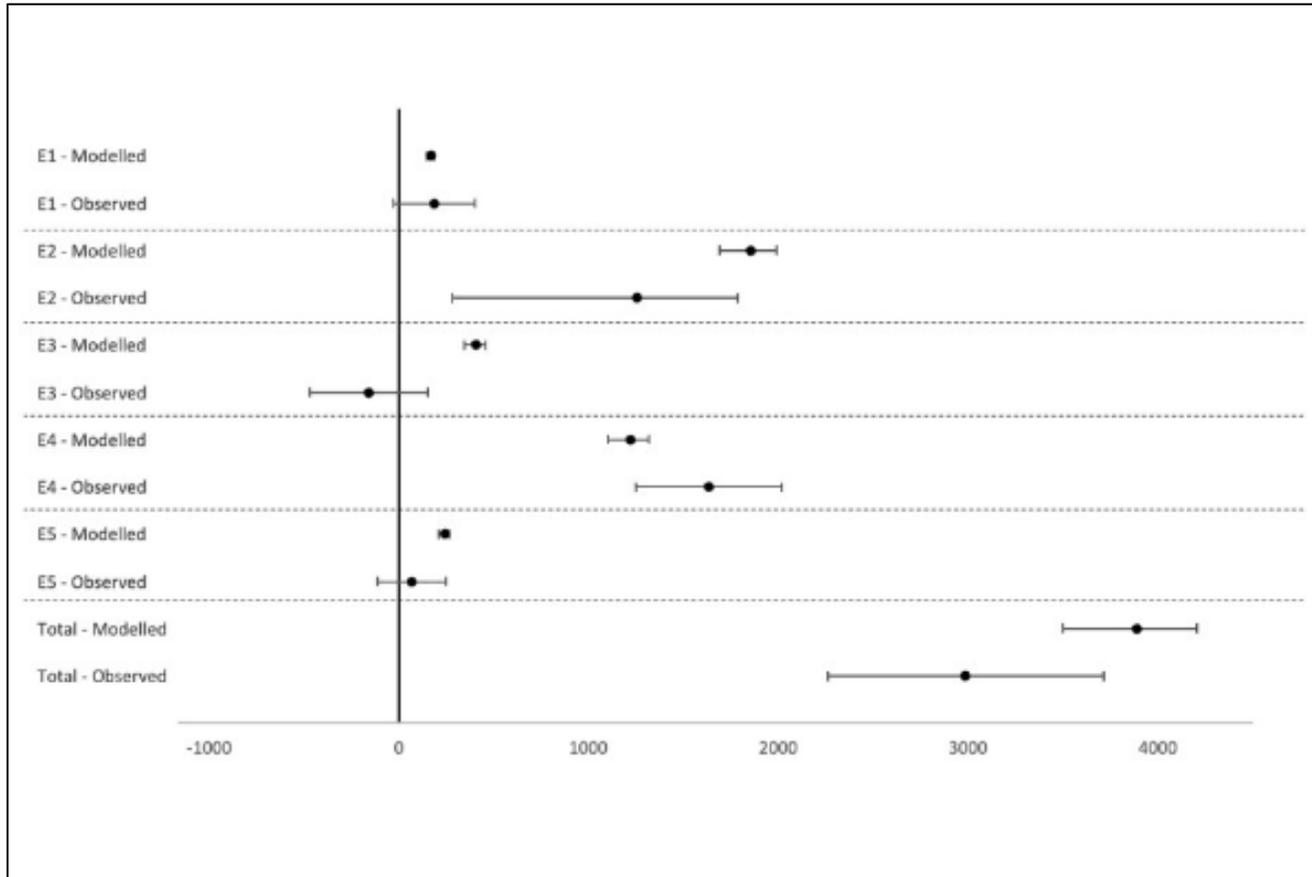


- Heat episodes are defined as any day on which a Level 3 HHA was issued in at least one region or the mean central England temperature (CET) was at least 20°C.
- 2022 observed the highest heat mortality since the introduction of the Heatwave Plan for England and the HHA system in 2004 with 2,985 excess deaths observed

Reference: [Heat mortality monitoring report: 2022 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/112112/Heat_mortality_monitoring_report_2022.pdf)

Summer 2022 heat mortality

Comparison of total all-cause excess mortality estimates using observed deaths and modelled excess all-cause mortality by heat episode and total estimate across all episodes in England summer 2022



- Increased communications to the public and professionals may have led to increased action
- Plausible that prolonged exposure of the population to higher temperatures and clear public messaging could have resulted in subtle behaviour changes
- People may have already started to adapt their behaviours to prevent illness

Reference: [Heat mortality monitoring report: 2022 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/107222/heat-mortality-monitoring-report-2022.pdf)



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Adverse Weather and Health Plan

Programme of Work

Why do we need an Adverse Weather & Health Plan (AWHP)?

- [2nd National Adaptation Programme \(NAP2\)](#) and [UKHSA Remit Letter](#) commitment
- Ambitious plan which seeks to protect individuals and communities from the health effects of adverse weather and to build community resilience

Key Differences between the AWHP and previous plans

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Heatwave plan for England

Protecting health and reducing harm from severe heat and heatwaves



Local
Government
Association

Met Office

UK Health
Security
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NHS

The Cold Weather Plan for England

Protecting health and reducing harm from cold weather



Local
Government
Association

Met Office



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Adverse Weather and Health Plan

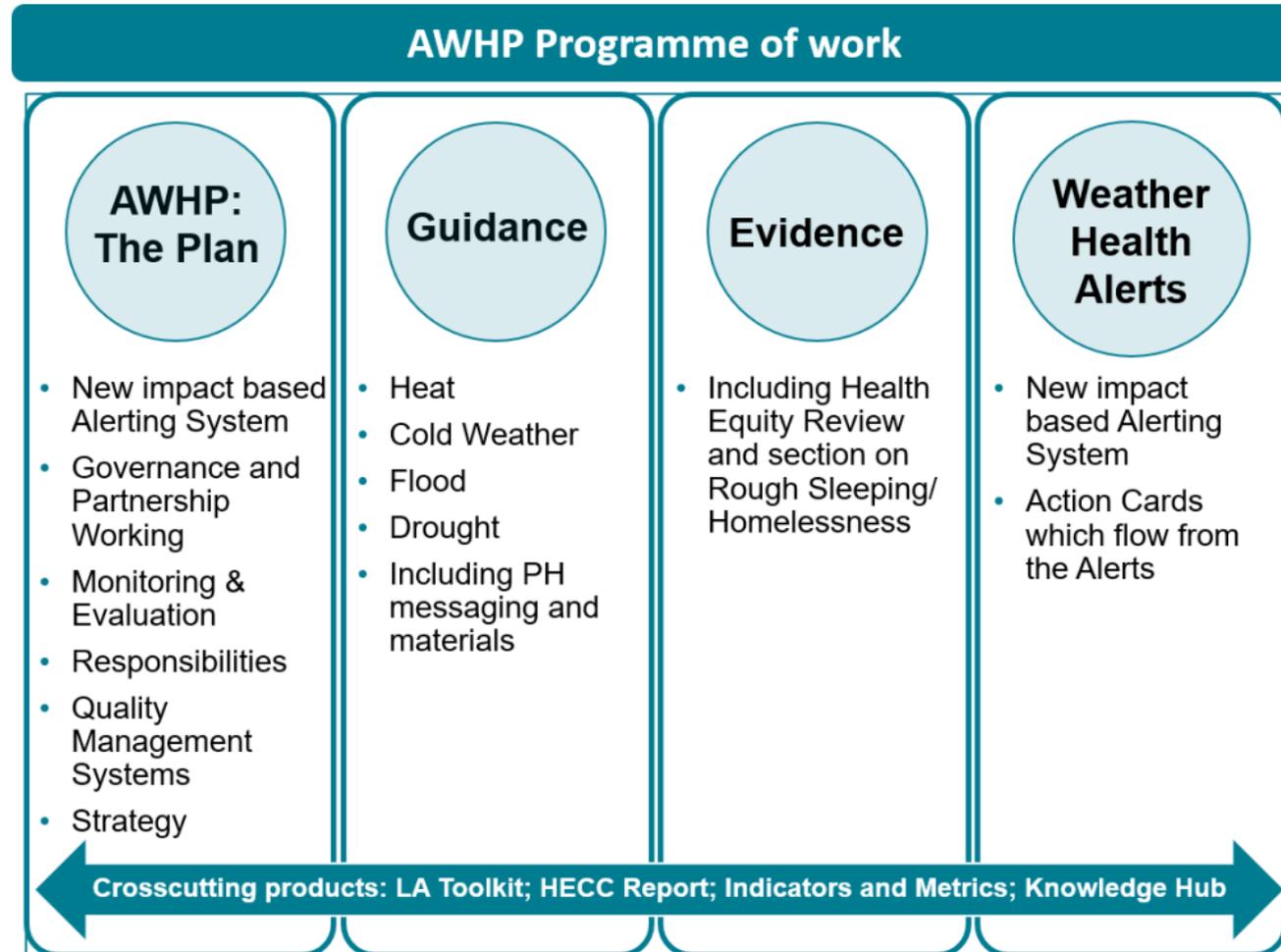
Protecting health from weather related harm

2023 to 2024

Key Differences between the AWHP and previous plans

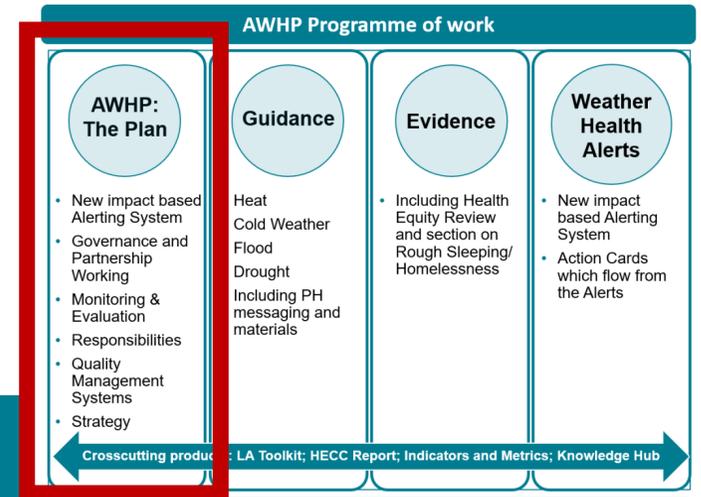
- The definition of a strategy and specific goals and objectives
- The establishment of a yearly operational timeline
- Definition of a more detailed monitoring and evaluation mechanisms
- The creation of a framework for the development of a quality management system
- The establishment of a formal annual review considering the previous year reports and the best evidence available
- The clarification of the different delivery groups that are currently working in tackling the impacts from adverse and extreme weather events on health
- A clearer focus on resilience, with clear direction and cross-sectoral action to protect health

Overview





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Adverse Weather and Health Plan

2023-2024

Structure

Executive Summary

Strategy

Governance

Plan Implementation

Appendices

Goals



- Prevent the increase in years of life lost due to adverse weather events
- Prevent mortality due to adverse weather events
- Prevent morbidity due to adverse weather events
- Reduce the use of healthcare services due to adverse weather events

Principles

International Organization for Standardization 7 quality management principles

- People focus (adapted from customer focus)
- Leadership
- Engagement of people
- Process approach
- Improvement
- Evidence-based decision making
- Relationship management

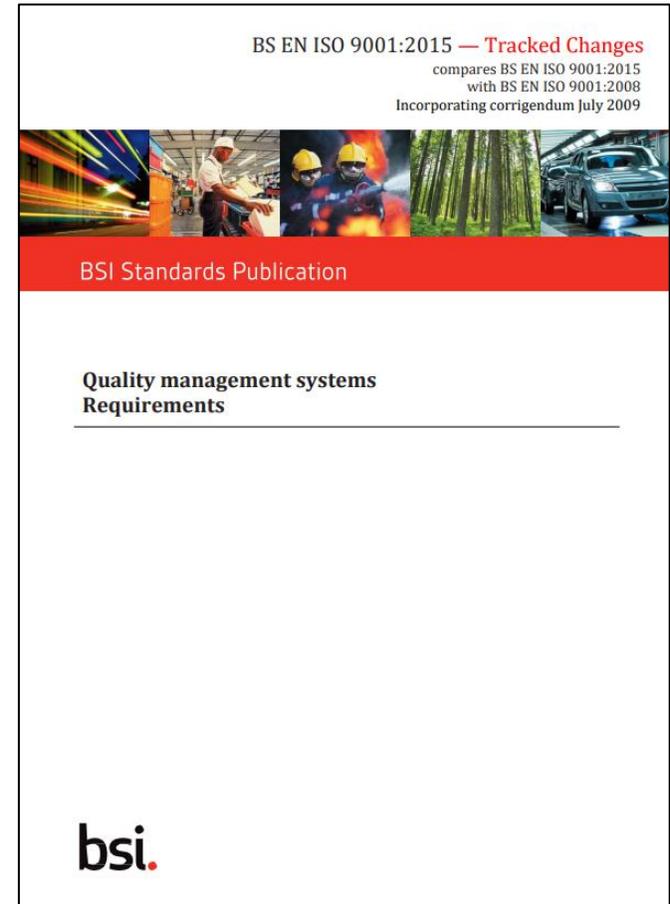


Image source: <https://knowledge.bsigroup.com/products/quality-management-systems-requirements-1/tracked-changes/preview>

Objectives and Action Areas



9 Objectives, in alignment with its 9 Action Areas

- Service Delivery
- Communication
- Capacity Building
- Risk Management
- Early Warning Systems
- Quality Assurance
- Organisational Arrangements
- Research and Data Analysis
- Policy Development

Delivery groups



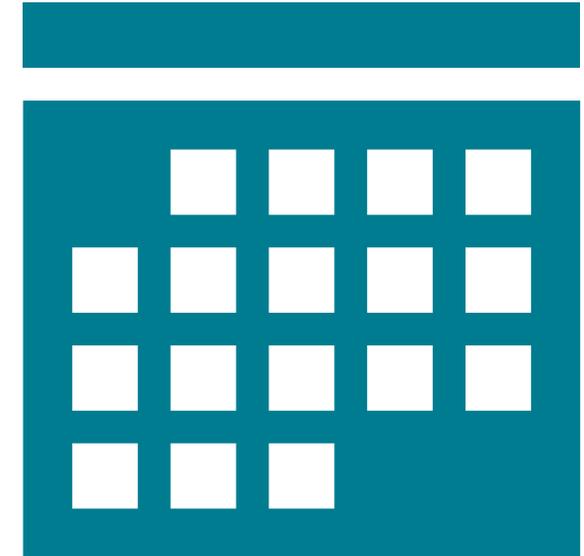
AWHP Appendix 1

- National Implementation
- Regional Implementation
- Local Implementation
- Other governmental departments, agencies, and regulators
- Academia, Societies and Professional Organisations
- Third Sector
- Private Sector

Timeline (Webinars)*

Save the date

- 07/09/2023 - Winter preparedness Webinar
- 19/10/2023 - Mid-year AWHP Webinar
- 26/10/2023 - Webinar – Flood and Health Guidance
- 29/02/2024 - AWHP 2024/25 Launch webinar
- 14/03/2024 - Summer 2024 preparedness Webinar



*The timeline may change due to other governmental priorities and may be updated throughout the year.

Monitoring and Evaluation

Monitoring (AWHP Appendix 5)

- Establish a monitoring mechanism
- Use of current routine data
- Develop and publish a real-time monitoring platform

Evaluation

- Annual review of the plan
- Development of a short mid-year report



**SUSTAINABLE
DEVELOPMENT
GOALS**

Sustainability

- Total economic costs of heat-related mortality - approximately £6.4 billion pounds per year
- Benefit to Cost Ratio and Return of investment - range from 2:1 to 10:1
- By 2025, a cost effectiveness chapter will be added to the plan's annual report

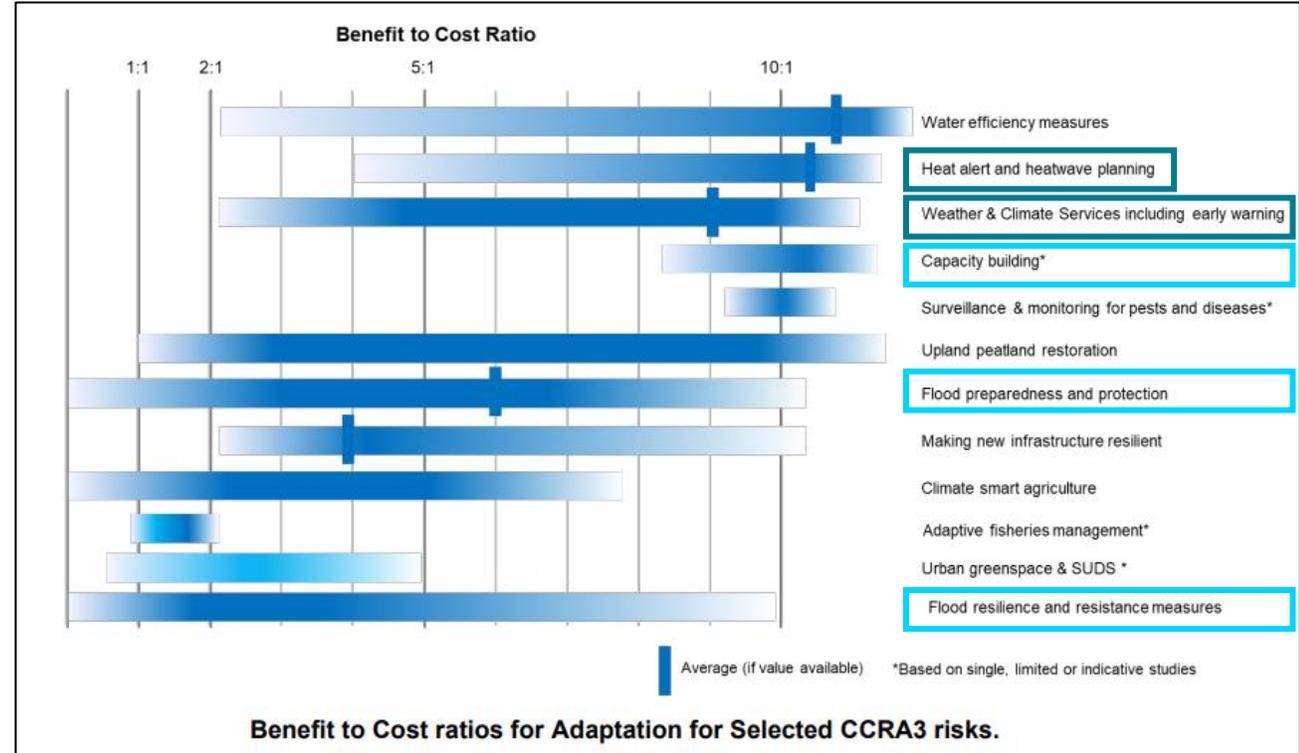
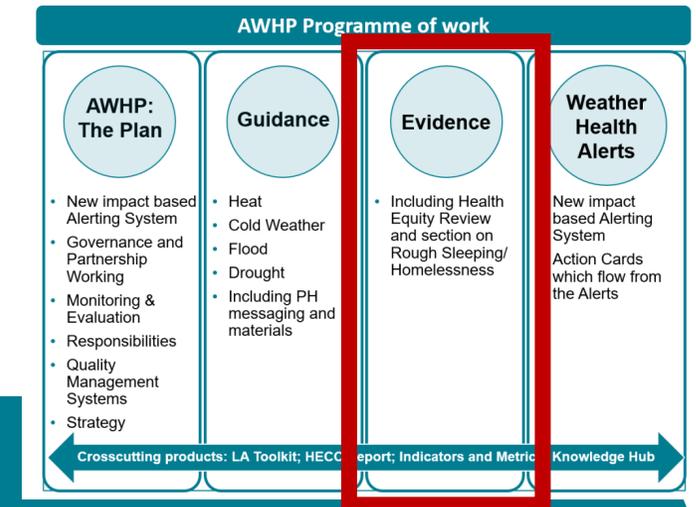


Image source: <https://www.ukclimaterisk.org/wp-content/uploads/2021/06/Monetary-Valuation-of-Risks-and-Opportunities-in-CCRA3.pdf>



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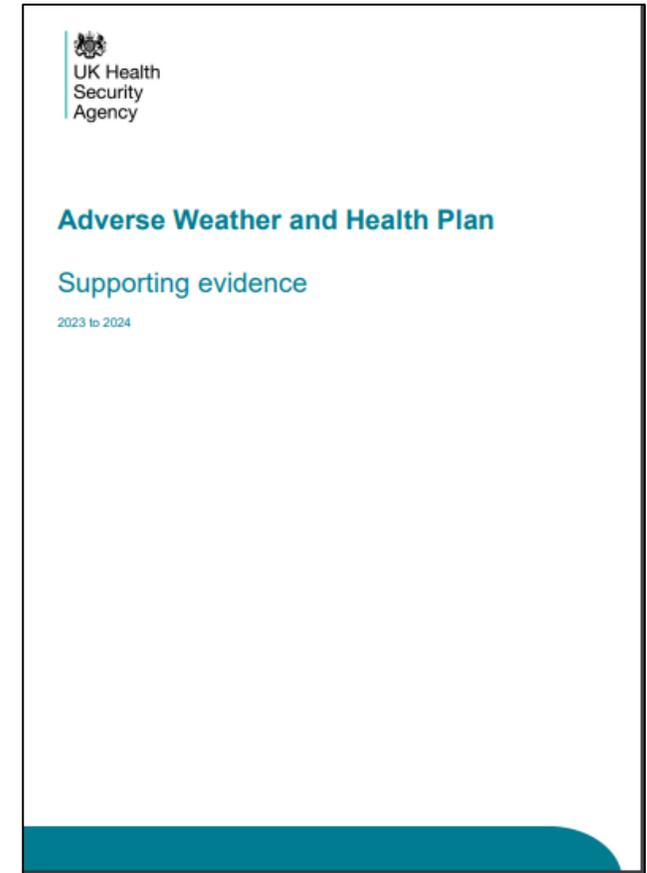
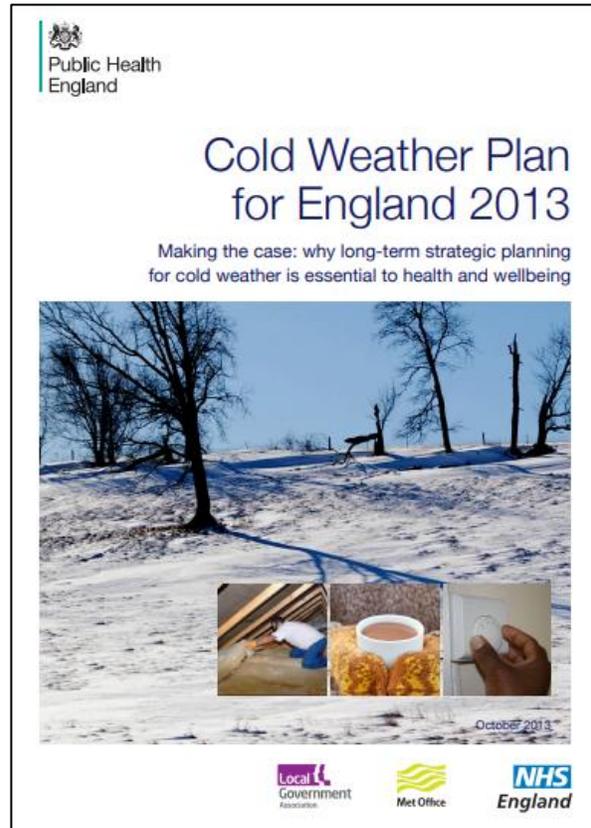


Adverse Weather and Health Plan

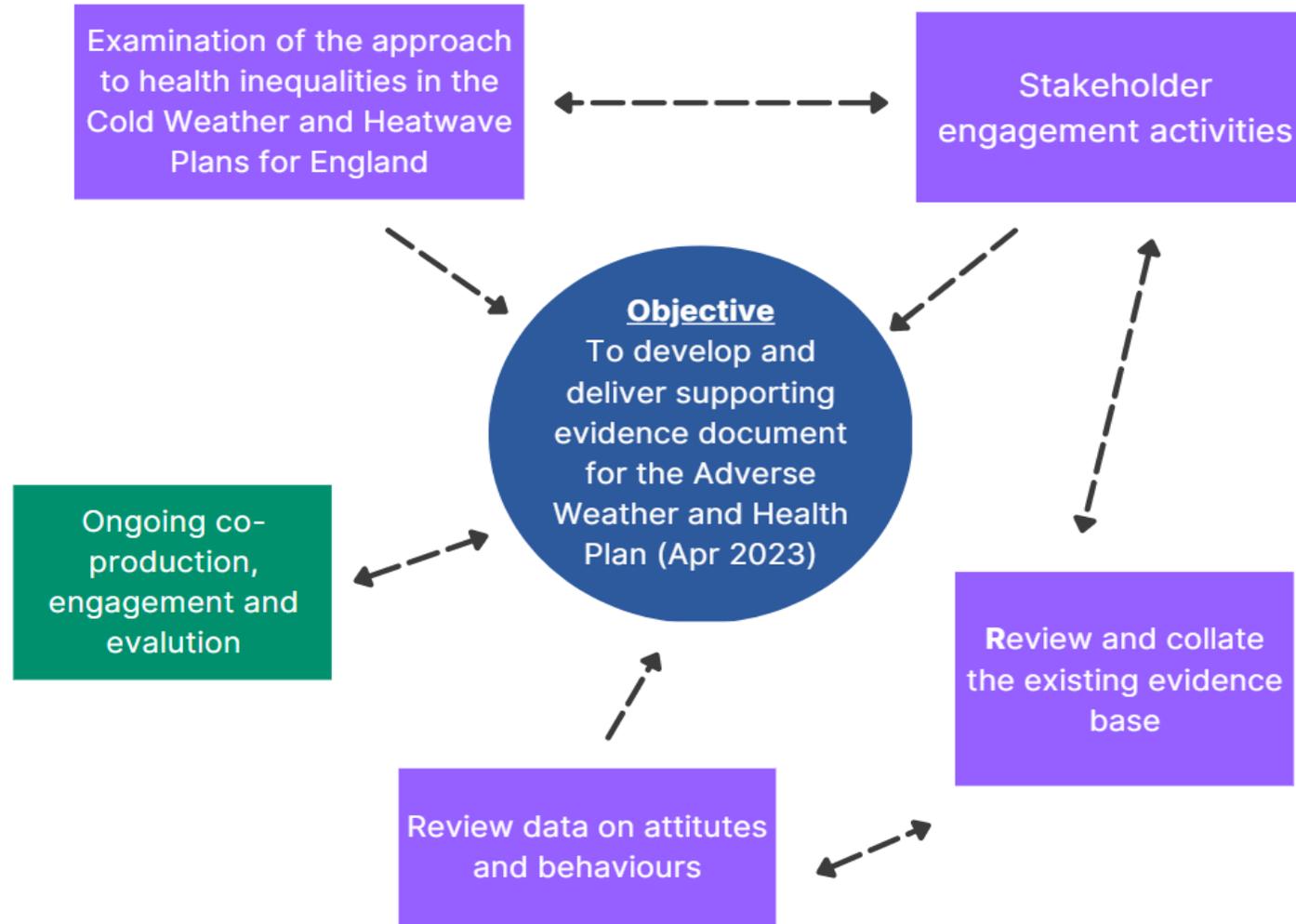
Supporting Evidence

2023-24

Introduction – what is the AWHP Supporting Evidence document?



Methodology – what have we done?

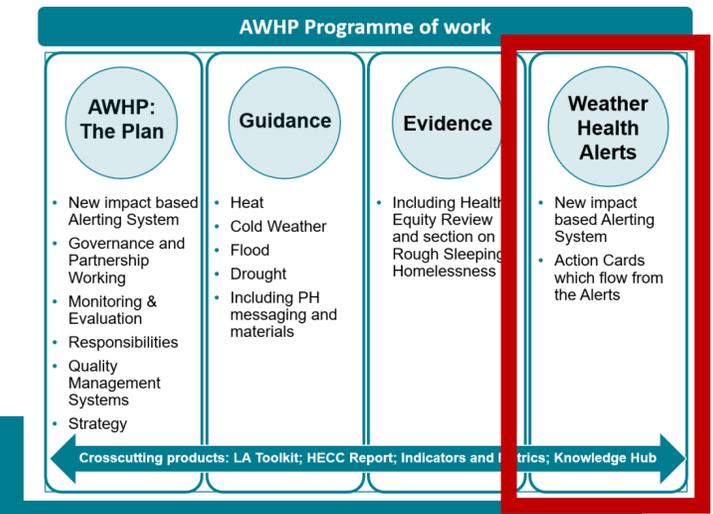


Structure and what's new

- 1. Introduction**
2. Health effects of adverse weather
- 3. Populations at risk from adverse weather events**
- 4. Addressing health inequalities**
- 5. Recommendations mapping**
6. Further information

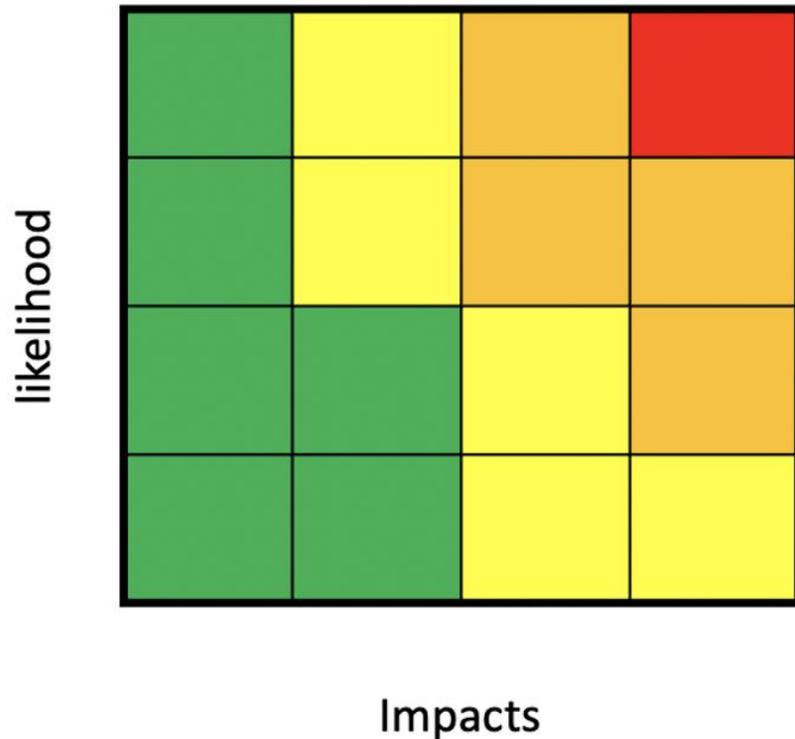


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Weather-Health Alerting System

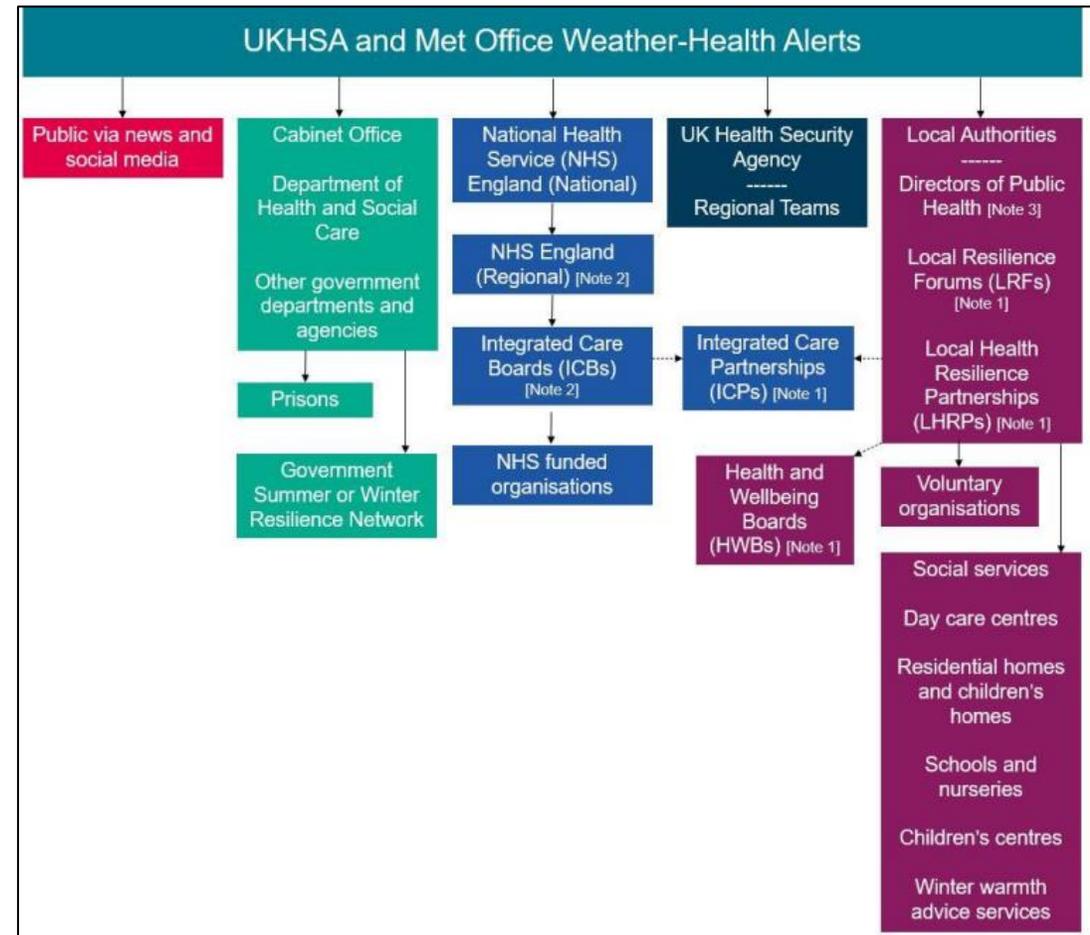
Weather-Health Alerting System



- Transitioning to impact-based alerting from summer 2023
- Heat-health alert (HHA) operates from 1 June to 30 September and the cold-health alert (CHA) operates from 1 November to 30 March.
- Improved flexibility within the alerts to provide information on expected impacts as a result of the weather conditions
- Aligned with NSWWS Extreme Heat Warnings
- Moving away from HHA Levels (0-4)

Heat-Health Alerts

- AWHP Appendix 6
- Heat-Health Alerts will be operated by UKHSA in partnership with the Met Office
- **To receive the new alerts you must have registered at:**
<https://forms.office.com/e/Bw6mjea6qa>



Weather-Health Alerting System Dashboard

UK Health Security Agency

There is a Yellow alert in the following regions: EM, WM, SE, SW, EoE, Lon, YH and is in effect between 23/06/2023 at 09:00:00 and 26/06/2023 at 09:00:00

Weather-Health Alerts
Heat-Health Alerts

There are currently no amber alerts

Met Office

There are currently no red alerts

NW= North West NE = North East YH = Yorkshire and The Humber WM = West Midlands EM = East Midlands EoE = East of England SE = South East Lon = London SW = South West

Weather-Health Alerts

Search

United Kingdom

Ireland

Wales

Cardiff

London

Netherlands

Belgium

mapbox

Advice and information from the UKHSA:

- User guide to use of impact based Heat-Health Alerts system

UKHSA Action Cards

- Heat-Health Alert Action card for the voluntary and community sector
- Heat-Health Alert Action card for commissioners
- Heat-Health Alert Action card for providers
- Heat-Health Alert Action card for national government

Further Advice and guidance

- UKHSA Advise Weather and Health Plan and supporting evidence
- Hot weather and Health: supporting vulnerable people
- Find the latest weather forecasts and warnings
- Met Office National Severe Weather Warnings Service
- Flood Alerts and Warnings

To aid local planning, Local Resilience Forum (LRFs) and their regions can be found here: [Guidance - Local Resilience Forums: Contact Details](#).

Expected Impacts

Significant impacts are possible across the health and social care sector due to the high temperatures, including: observed increase in mortality across the population likely, particularly in the 65+ age group or those with health conditions, but impacts may also be seen in younger age groups; increased demand for remote health care services likely; internal temperatures in care settings (hospitals and care homes) may exceed recommended threshold for clinical risk assessment; impact on ability of services to be delivered due to heat effects on workforce possible and many indoor environments likely to be overheating, risk to vulnerable people living independently in community as well as in care settings.

National Weather Overview

Recent warm daytime temperatures are expected to rise further from Friday, with night-time temperatures also becoming warm and feeling humid. The focus of the very warm temperatures will initially be across East Midlands, East of England, Southeast and London, but becoming widespread across most regions on Saturday. The main exceptions will be the far northeast and the northern parts of northwest, which may see cloud and rain moving east, and also the far southwest due to fresher winds. Cloudier weather follows Sunday with the chance of heavy, thundery showers, however very warm temperatures are expected to persist for many. The hottest temperatures are expected to be across the East of England, ...

Other Useful Information

- A new dedicated dashboard is available on gov.uk from 01 June 2023 - <https://www.gov.uk/guidance/weather-health-alerting-system>
- Provide national situational awareness on current alerting status
- Provide regional assessment of expected impacts

Heat-Health Alert



General Overview - Severe impacts are expected across the health and social care sector due to the high temperatures, including: increased risk of mortality across the whole population with significant mortality observed in older age groups; significant increased demand on all health and social care services; impact on ability of services to be delivered due to heat effects on workforce; indoor environments likely to be hot making provision of care challenging and national critical infrastructure failures – generators, power outages etc.

RED Heat-Health Alert - (Emergency) has been issued for the following regions: East Midlands, West Midlands, North East, North West, South East, South West, Yorkshire and The Humber, East of England, London and is in effect between 18/07/2023 at 00:00 and 19/07/2023 at 00:00.



Overview of weather conditions

The latest forecast details are available via the Met Office: [Find a forecast](#)

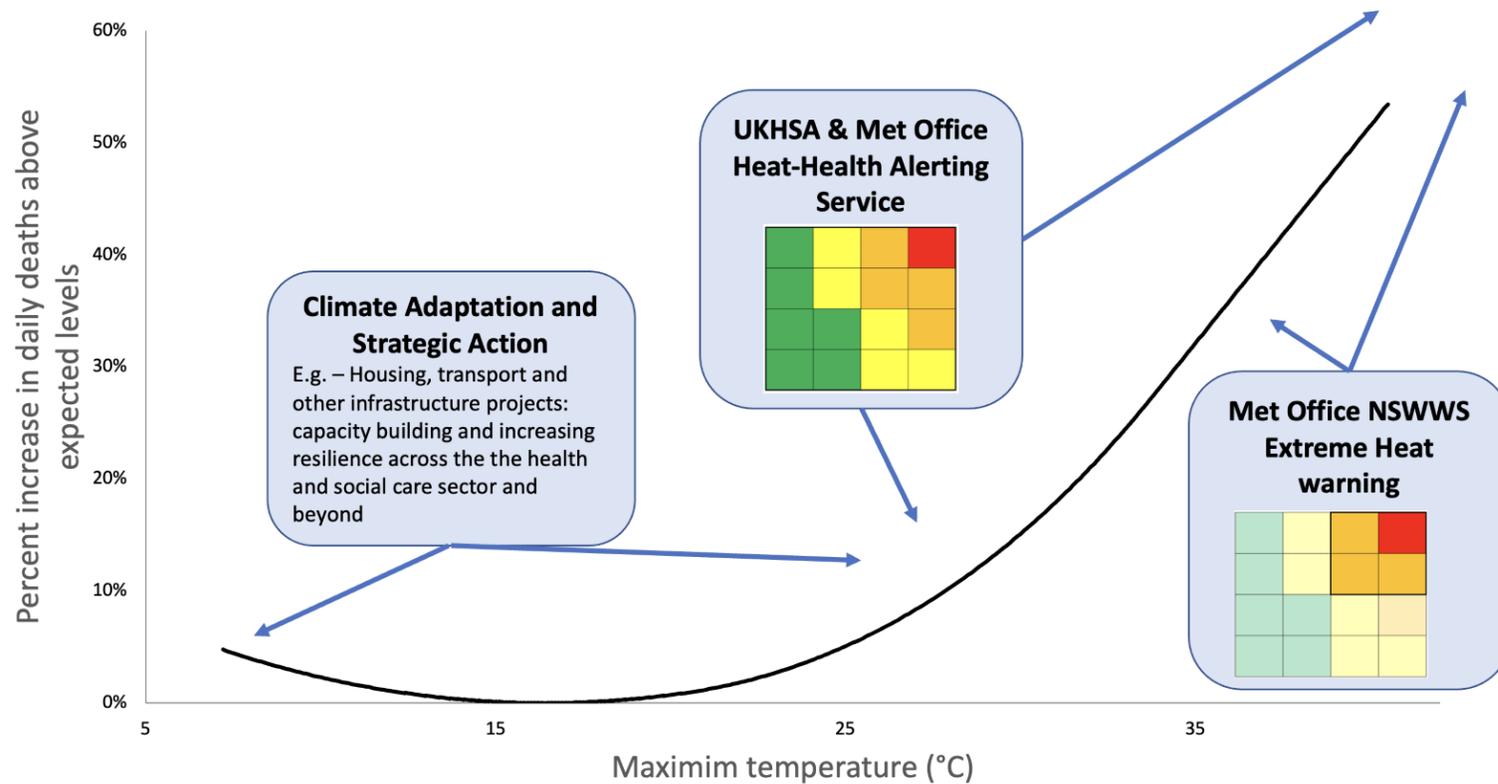
	4	8	13	16
	3	7	12	15
	2	6	10	14
	1	5	9	11
Likelihood				
				Impact

Risk Matrix

Heat-Health impact risk scores have been derived between UKHSA and the Met Office for each region and are provided in the below table. Users are advised to refer the regional risk score to the matrix.

- Users able to specify which regions they want alerts for
- Outline of alerts in place
- Mapping element for quick reference
- An outline of what impacts might be expected
- Brief overview of regional impact assessment
- Links to additional information, advice, guidance and action cards

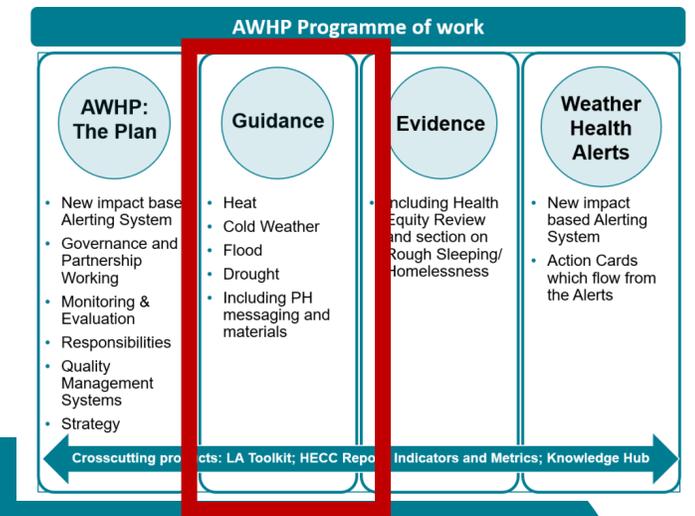
HHA and NSWWS – addressing heat risk



- Response to heatwaves only part of addressing heat risk. Long term adaptation actions still required
- HHAs and NSWWS work in alignment
- UKHSA and Met Office work in partnership to maximise impact of warnings across health and wider society



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Guidance

Hot weather and health guidance

- AWHP Appendix 2
- Hot weather and health: supporting vulnerable people:
- Hot Weather and Health Guidance for [Healthcare Professionals](#)
- Hot Weather and Health Guidance for [Care Home Managers and Social Care Staff](#)
- Hot Weather and Health Guidance for [Looking after children and early years settings](#)
- Hot Weather and Health Guidance for [Supporting people homeless and sleeping rough](#)
- Hot Weather and Health Guidance [for Organisers of Mass Gatherings](#)
- Hot Weather and Health Guidance for the Public: [Beat the Heat](#) (Guidance, home checklist and poster)
- Heat Health Alert [Action Cards](#)

Hot weather and health guidance

- AWHP Appendix 2
- Hot weather and health: supporting vulnerable people:
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- Hot Weather and Health Guidance for [Care Home Managers and Social Care Staff](#)
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- Heat Health Alert [Action Cards](#)

Hot weather and health guidance



Beat the heat

Plan ahead



Check the weather forecast and the news



Plan ahead to avoid the heat



Schedule activities to cooler times of the day

Keep yourself cool



Drink plenty of fluids and avoid excess alcohol



Wear sunscreen, a hat, and sunglasses



Cool your skin with water and slow down

Find somewhere cool



Close blinds and curtains during the day



Go indoors or outdoors, whichever feels cooler



Avoid closed spaces like stationary cars

Be safe



Be on the lookout for signs of heat related illness



Look after yourself and check in with others



Stay safe when swimming



Get help. Call NHS 111 or in an emergency 999

For more information go to: gov.uk/ukhsa/beat-the-heat

- Hot Weather and Health Guidance for the Public: [Beat the Heat](#)
 - [Beat the heat: staying safe in hot weather](#)
 - [Beat the heat: keep cool at home checklist](#)
 - [Beat the heat: poster](#)

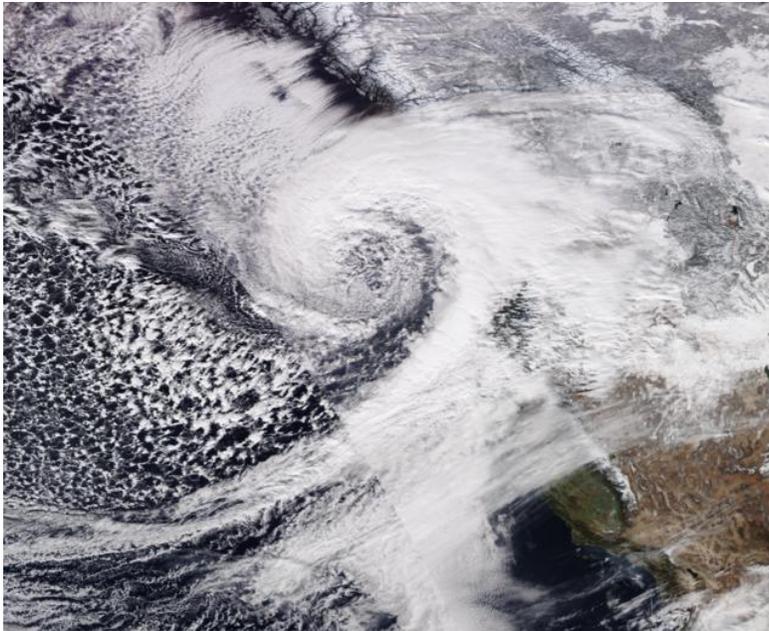
Health effects of droughts

- **Pathogenic transmission** from reduced quantity and quality of water and sanitation.
- **Dehydration** from hot weather. People with pre-existing conditions, older people, outdoor workers and athletes and the very young are at particular risk
- **Mental health impacts** from drought can be stressful, especially for those whose livelihoods or jobs rely on water
- **Respiratory problems** and poor air quality during droughts can increase the amount of dust and pollen in the environment, impacting those with existing respiratory conditions

Guidance: <https://www.gov.uk/guidance/public-health-impact-of-drought-advice-for-the-public>

Guidance for other hazards

- AWHP Appendix 3 - Cold weather guidance due Sept 23
- AWHP Appendix 4 - Flooding guidance due Oct 23



NASA Public Domain



D Dixon CC BY-SA 2.0

Communications material

UK Health Security Agency **HOT WEATHER**

The direct and indirect effects of hot weather

Increasing temperatures in excess of 25°C are associated with severe illness and excess heat-related deaths in vulnerable people. Higher temperatures can affect your health in different ways.

Direct effects     

- dehydration
- heat cramps
- heat rash
- dizziness and fainting
- heat exhaustion

Indirect effects   

- **Increased demand** on healthcare services
- **Power outages**, affecting homes and healthcare services
- **Impaired** concentration
- **Wildfires**, and by association smoke inhalation

 **heart attacks**

- **heatstroke**
- **increased risk** of lung illnesses and other diseases

UK Health Security Agency **HOT WEATHER**

Stay well in the heat

- 
Drink plenty of fluids
- 
Dress appropriately, stay in the shade
- 
Limit strenuous activity

#BeattheHeat #WeatherAware #Heatwave



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Past, Present and Future

Centre for Climate and Health Security

Achieving a step change in the health protection response to climate change

[Isabel Oliver](#) and [Lea Berrang Ford](#), 18 October 2022 - [Climate](#)



Climate and health security: Looking ahead to 2023

[Lea Berrang Ford](#), 8 February 2023 - [UKHSA science](#)



Links: [Achieving a step change in the health protection response to climate change - UK Health Security Agency \(blog.gov.uk\)](#) and [Climate and health security: Looking ahead to 2023 - UK Health Security Agency \(blog.gov.uk\)](#)



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Adapting to extreme events and the role of the Adverse Weather and Health Plan

Email: ExtremeEvents@ukhsa.gov.uk