



Public Health  
England

Protecting and improving the nation's health

# Health impacts of hot weather

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# Outline

- Health Impacts of hot weather
- The Heatwave Plan for England
- Heat Health Watch System
- Observed health impacts
- National Adaptation Programme
- Resources

# Health impacts of heat

*Heat syncope* – dizziness and fainting, due to dehydration, vasodilation, cardiovascular disease and certain medications

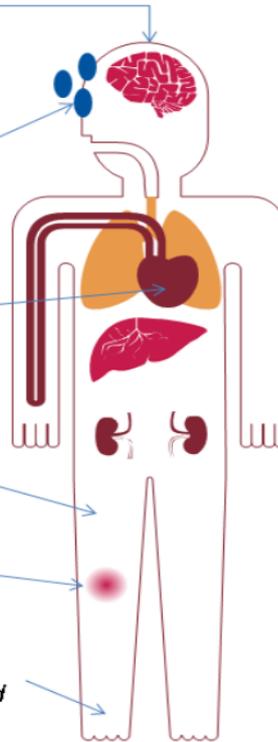
Excessive sweating can deplete fluid and salts

When blood temperature rises, the body stimulates sweat glands, dilates blood vessels and increases the heart rate

*Heat cramps* – caused by dehydration and loss of electrolytes, often following exercise

Increased blood flow to the skin cools the body by radiating heat, leading to heat rash (small, red itchy papules)

*Heat oedema* – mainly in the ankles, due to vasodilation and retention of fluid



## Health effects of heat

*The main causes of illness and death during a heatwave are respiratory and cardiovascular diseases. Additionally, there are specific heat-related illnesses including:*

### Heat Exhaustion

- Nausea or irritability
- Dizziness
- Muscle Cramps or weakness
- Feeling faint
- Headache
- Fatigue
- Heavy sweating
- High body temperature

### Heatstroke

- Hot, dry skin or profuse sweating
- Confusion
- Loss of consciousness
- Seizures
- Very high body temperature

# At-risk groups

**EVERYBODY** can be affected by high temperatures, but there are certain factors that increase an individual's risk during a heatwave. These include:

- **older age:** especially those over 75 years old, or those living on their own and who are socially isolated, or those living in a care home
- **chronic and severe illness:** including heart or lung conditions, diabetes, renal insufficiency, Parkinson's disease or severe mental illness
- **inability to adapt behaviour to keep cool:** babies and the very young, having a disability, being bed bound, consuming too much alcohol, having Alzheimer's disease
- **environmental factors and overexposure:** living in a top floor flat, being homeless, activities or jobs that are in hot places or outdoors and include high levels of physical exertion

# Heatwave Plan for England



## [Beat the heat: staying safe in hot weather \(leaflet\)](#)

Ref: PHE publications gateway number: 2016071  
PDF, 417KB, 8 pages

This file may not be suitable for users of assistive technology. [Request an accessible format.](#)



## [Beat the heat \(poster\)](#)

Ref: PHE publications gateway number: 2016071  
PDF, 298KB, 1 page

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## [Beat the heat: keep cool at home \(checklist\)](#)

Ref: PHE publications gateway number: 2016071  
PDF, 193KB, 2 pages

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# Heat-health Watch alerts

Figure 2.1: Heatwave Alert levels

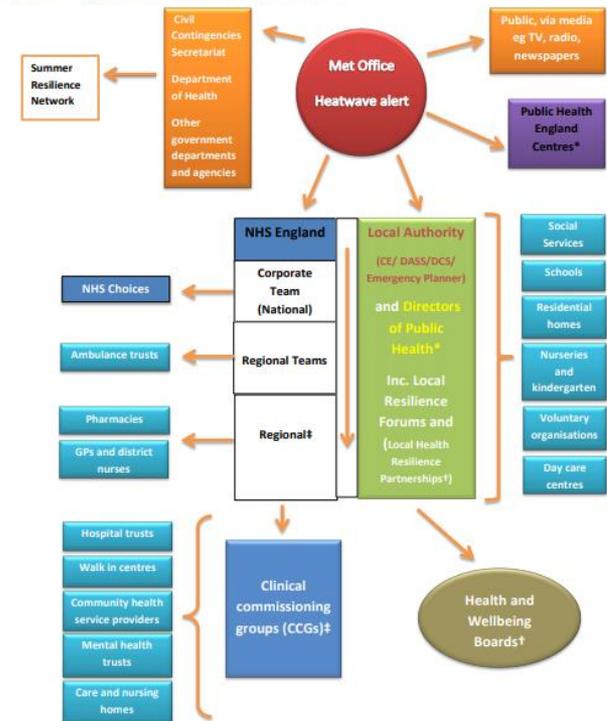
Level 0	<b>Long-term planning</b> <i>All year</i>
Level 1	<b>Heatwave and Summer preparedness programme</b> <i>1 June – 15 September</i>
Level 2	<b>Heatwave is forecast – Alert and readiness</b> <i>60% risk of heatwave in the next 2–3 days</i>
Level 3	<b>Heatwave Action</b> <i>Temperature reached in one or more Met Office National Severe Weather Warning Service regions</i>
Level 4	<b>Major incident – Emergency response</b> <i>Central Government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health</i>

## LOCAL Threshold temperatures

Threshold maximum day and night temperatures defined by the Met Office National Severe Weather Warning Service (NSWWS) region are set out below.

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

Figure 2.4: Typical cascade of heatwave alerts



# PHE's role in response to HIW

## **Scientific and technical advice regarding:**

- health effects
- vulnerable groups
- interventions

## **Public-facing health advice, accessible to a wide-range of individuals, diverse in delivery, but consistent in content.**

- written (leaflets/booklets/posters)
- traditional (press releases/interviews)
- social media

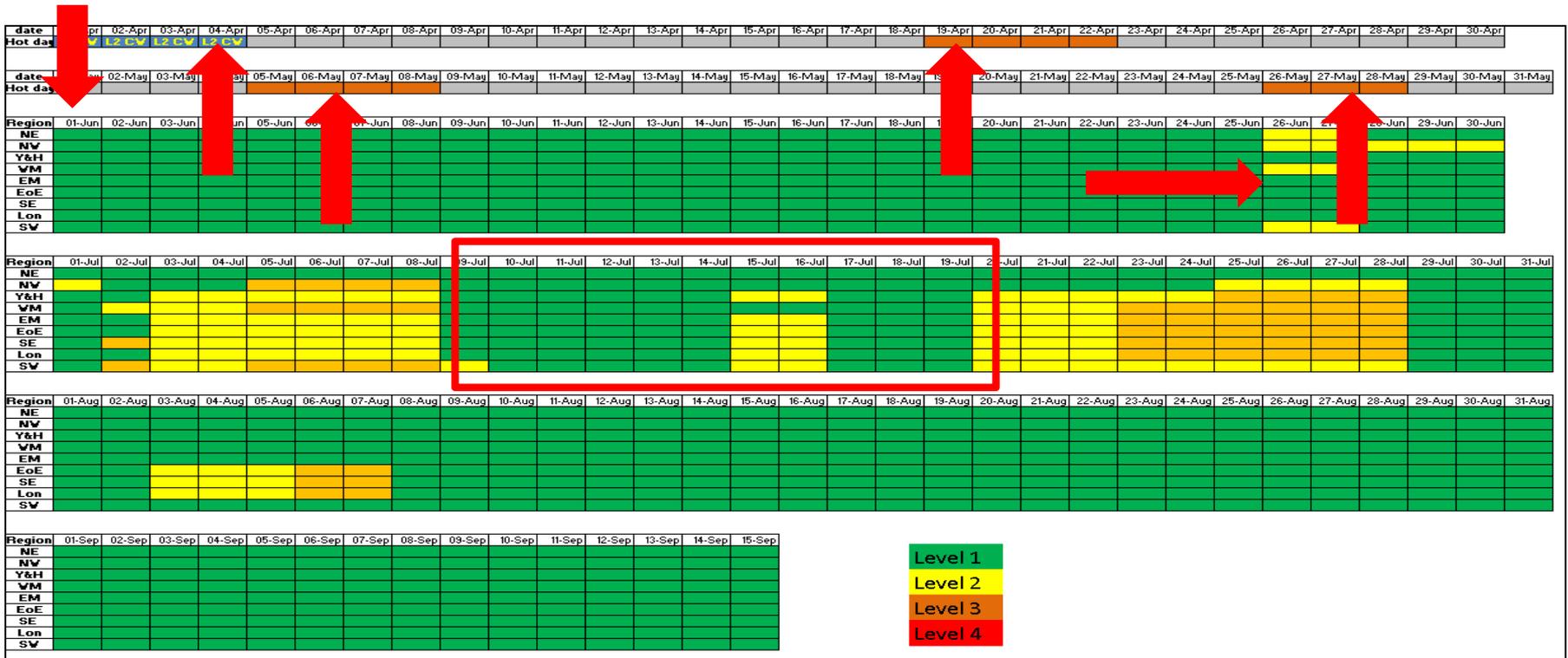
## **Surveillance and evaluation of health impacts**

- acute
- academic research to improve future response

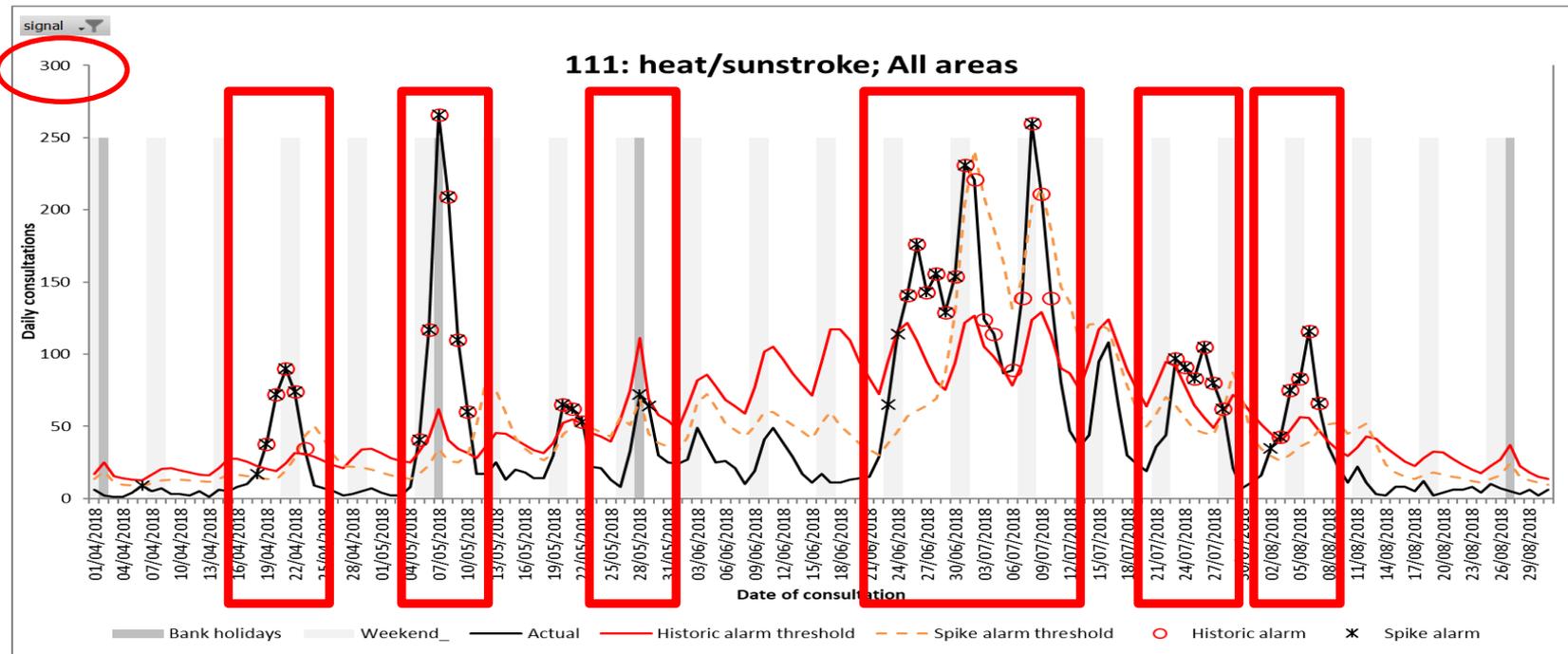
## **Business continuity**

- ensure other health protection functions are maintained

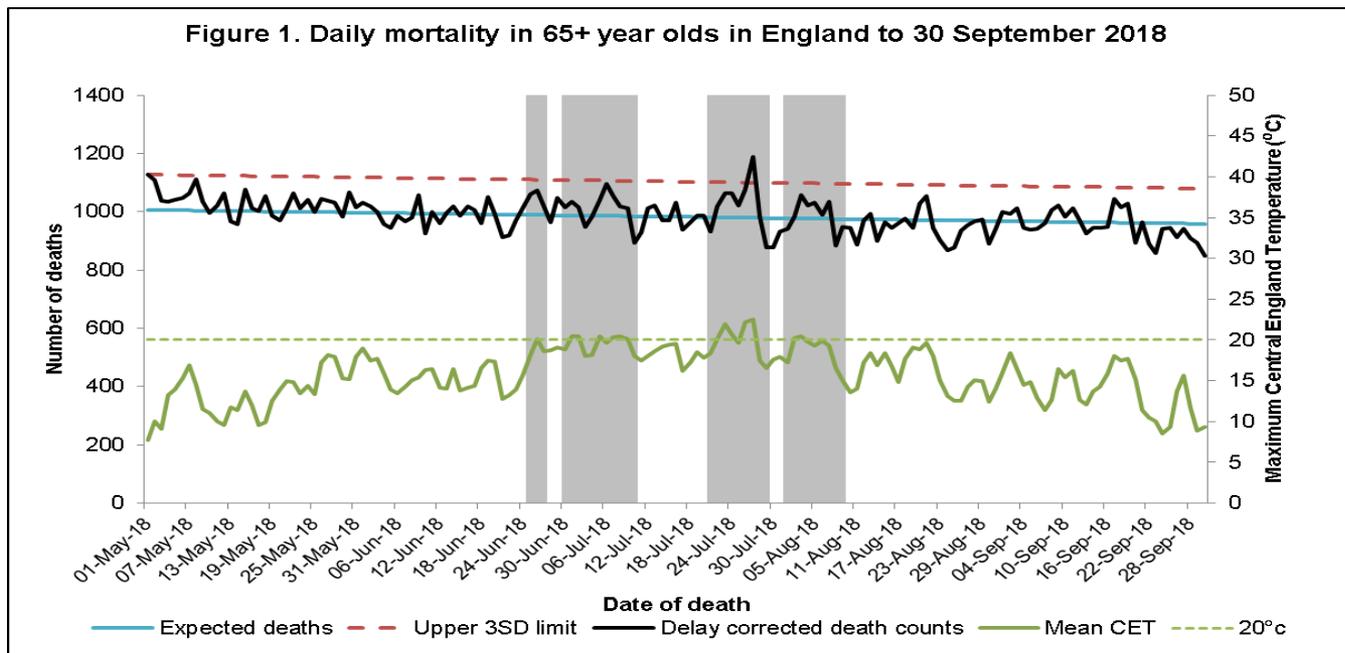
# 2018 Heat Health Watch alerts



# Syndromic Surveillance



# PHE mortality report



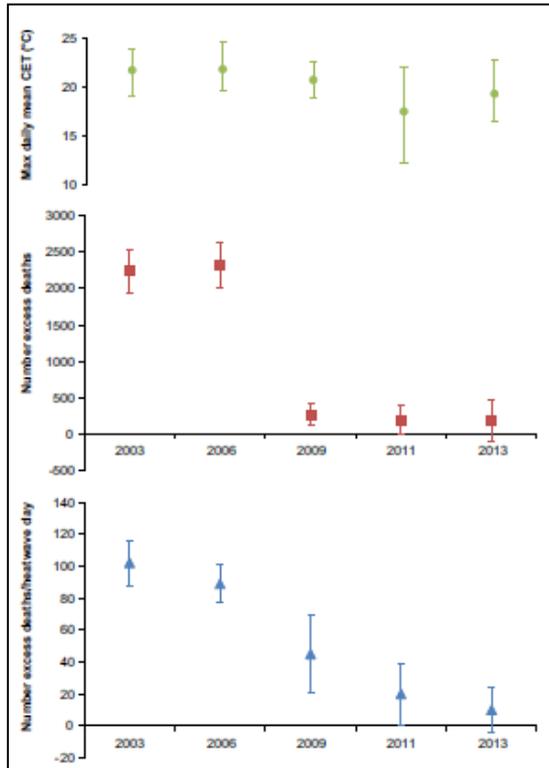
\*heatwave days are highlighted in grey

# PHE mortality report

Region	Excess number of deaths by age group (95% confidence interval)							
	Heatwave 1 (25 June to 27 June)		Heatwave 2 (30 June to 10 July)		Heatwave 3 (21 to 29 July)		Heatwave 4 (01 to 09 August)	
	0-64 year olds	65+ year olds	0-64 year olds	65+ year olds	0-64 year olds	65+ year olds	0-64 year olds	65+ year olds
North East	-3 (-15 to 9)	25 (-4 to 54)	6 (-18 to 30)	2 (-54 to 58)	<b>21 (0 to 42)</b>	13 (-37 to 63)	19 (-2 to 40)	-33 (-83 to 17)
North West	-2 (-22 to 18)	36 (-11 to 83)	32 (-6 to 70)	30 (-60 to 120)	-5 (-40 to 30)	-33 (-115 to 49)	-6 (-41 to 29)	-51 (-133 to 31)
Yorkshire and the Humber	3 (-14 to 20)	18 (-22 to 58)	9 (-23 to 41)	-21 (-97 to 55)	1 (-28 to 30)	18 (-4 to 40)	3 (-26 to 32)	10 (-59 to 79)
East Midlands	4 (-11 to 19)	27 (-13 to 67)	17 (-12 to 46)	-30 (-106 to 46)	11 (-15 to 37)	52 (-17 to 121)	12 (-14 to 38)	6 (-63 to 75)
West Midlands	2 (-15 to 19)	<b>51 (5 to 97)</b>	1 (-32 to 34)	47 (-41 to 135)	-12 (-42 to 18)	14 (-65 to 93)	-5 (-35 to 25)	-3 (-82 to 76)
East of England	14 (-3 to 31)	-19 (-68 to 30)	-21 (-53 to 11)	-29 (-122 to 64)	11 (-18 to 40)	67 (-16 to 150)	9 (-20 to 38)	60 (-22 to 142)
London	-10 (-28 to 8)	8 (-32 to 48)	9 (-26 to 44)	<b>128 (51 to 205)</b>	30 (-2 to 62)	<b>165 (95 to 235)</b>	10 (-22 to 42)	<b>128 (58 to 198)</b>
South East	-1 (-34 to 32)	25 (-31 to 81)	11 (-51 to 73)	107 (-1 to 215)	-15 (-71 to 41)	86 (-11 to 183)	2 (-54 to 58)	9 (-88 to 106)
South West	14 (-2 to 30)	17 (-28 to 62)	7 (-23 to 37)	32 (-54 to 118)	2 (-25 to 29)	26 (-51 to 103)	19 (-8 to 46)	-22 (-99 to 55)
<b>England</b>	22 (-35 to 79)	<b>188 (51 to 325)</b>	71 (-39 to 181)	<b>266 (4 to 528)</b>	46 (-53 to 145)	<b>409 (172 to 646)</b>	61 (-38 to 160)	104 (-133 to 341)

\* Statistically significant values are marked in bold

# Excess deaths in 65+ yr old cohort



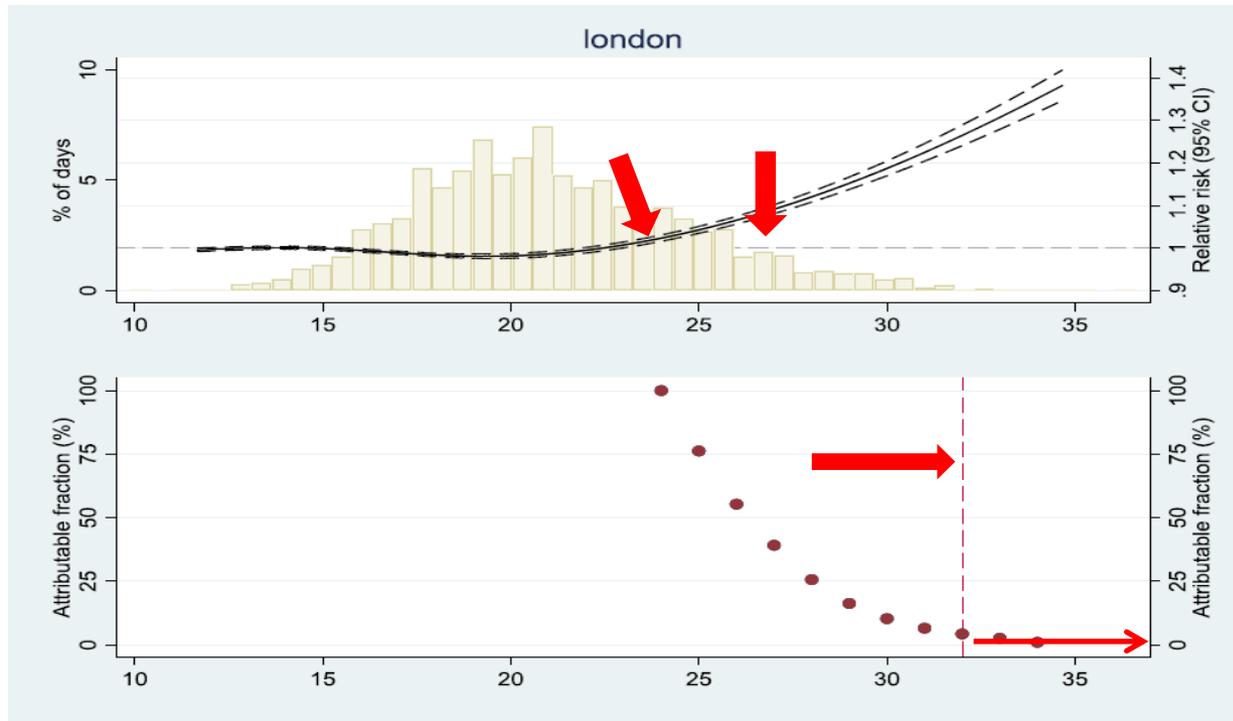
**Green** – Central England Temperature – average temp over HW period

**Red** – number of excess deaths in 65+ year olds during HW period

**Blue** – number of deaths on HW days in 65+ year olds

Green et al Mortality during the 2013 heatwave in England – How did it compare to previous heatwaves? A retrospective observational study. Environmental Research 2016

# Heat-attributable deaths



Source: PIRU Evaluation of the implementation and health-related impacts of the Heatwave Plan for England (DRAFT) Final report (2019)

# UK Climate Change Risk Assessment



# National Adaptation Programme

2<sup>nd</sup> National Adaptation Programme (NAP#2) published June 2018

PHE deliverable:

- Develop a **single adverse weather and health plan**, bringing together and improving existing guidance with an aim to **mainstream action** within the health system and local communities, reduce health risks associated with adverse weather and address the health risks identified in CCRA2.

# NAP2 implementation

Aim: Develop a single adverse weather and health plan

- Bring existing plans together
- Heatwave, cold, flooding (core) & drought, thunderstorm asthma
- Year round alert system for hot and cold weather

Objectives:

- Engage wider PHE workforce with climate change adaptation
- Mainstream climate change adaptation activities across PHE
- Extend focus from emergency planning to strategic planning and prevention
- Ensure resources are developed/co-produced with end users, both internal and external

# Resources available

## Professional:

- [Heatwave Plan for England](#)
- [Heatwave Plan for England: easy read version](#)
- [Making the case: the impact of heat on health – now and in the future](#)
- [Advice for health and social care professionals: supporting vulnerable people before and during a heatwave](#)
- [Advice for care home managers and staff: supporting vulnerable people before and during a heatwave](#)
- [Looking after children and those in early years settings during heatwaves: guidance for teachers and professionals](#)
- [Beat the heat: keep care home residents safe and well](#)

## Public

- [Beat the heat: staying safe in hot weather \(leaflet\)](#)
- [Beat the heat \(poster\)](#)

# Questions?

- All resources are available on gov.uk Heatwave Plan for England collections page
- **Qualitative research project** evaluating impacts across the NHS as a result of the hot weather of 2018 – looking for participants to be interviewed. Get in touch if interested!

[extremeevents@phe.gov.uk](mailto:extremeevents@phe.gov.uk)