Public Health England

Extreme Events and Public Health

Ishani Kar-Purkayastha, Centre for Radiation, Chemicals and Environmental Hazards

South West Clinical Senate Council Meeting
28/11/2019

Public Health England

Making the case for Health

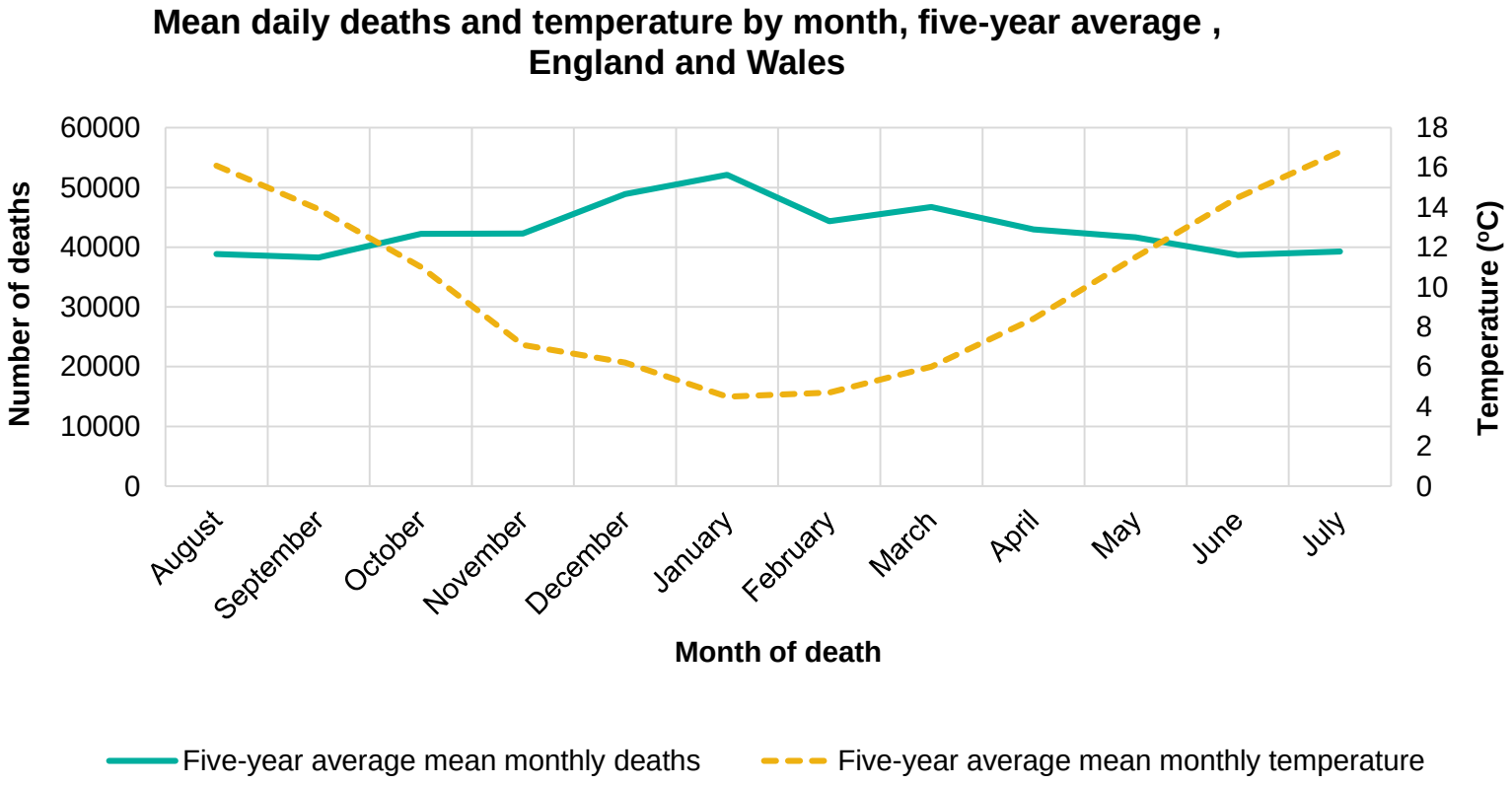
Public Health England

Cold Weather

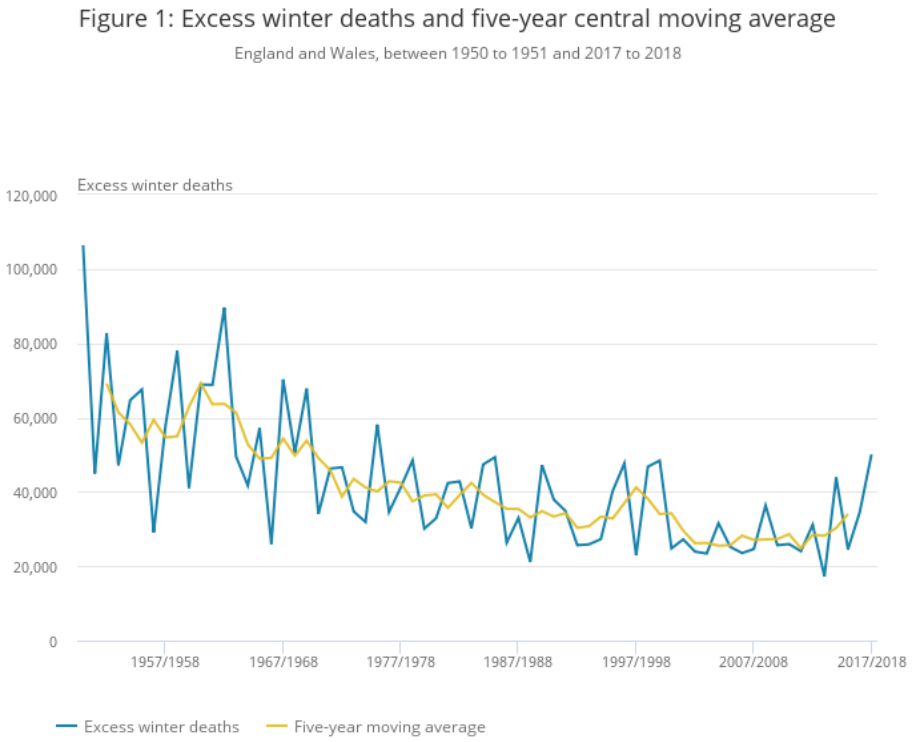
Public Health England

Deaths over the year

- More people die in the winter than in the summer
- Deaths tends to peak in January, commonly the coldest month of the year in England and Wales



Excess winter deaths in England

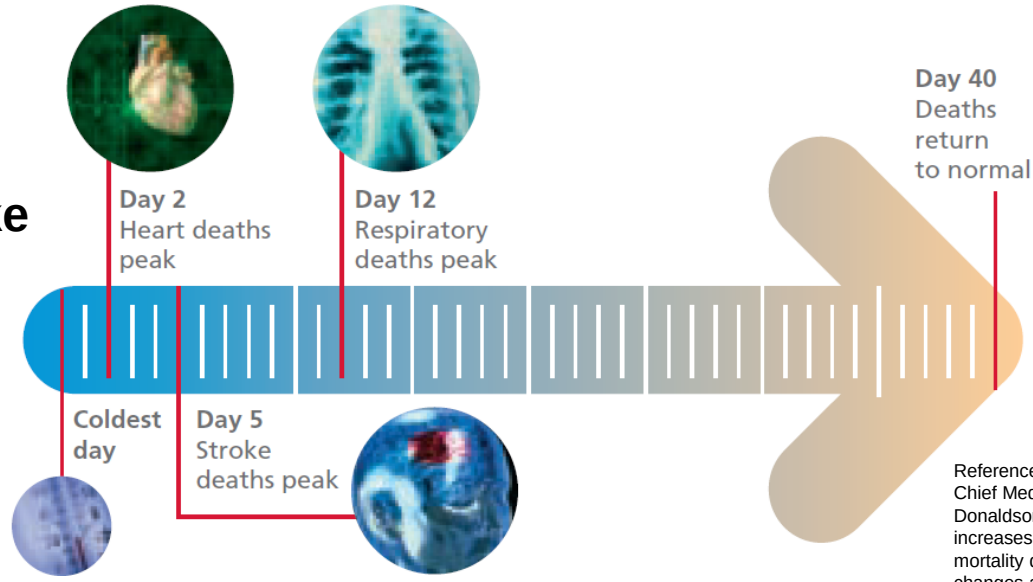


- EWD = winter deaths - average non-winter deaths
- 80% aged 75+ (but not only the very old)
- Large degree of fluctuation year on year
- Level has been falling since 1950s – however 2017/18 highest EWDs (50,100) since 1975/76

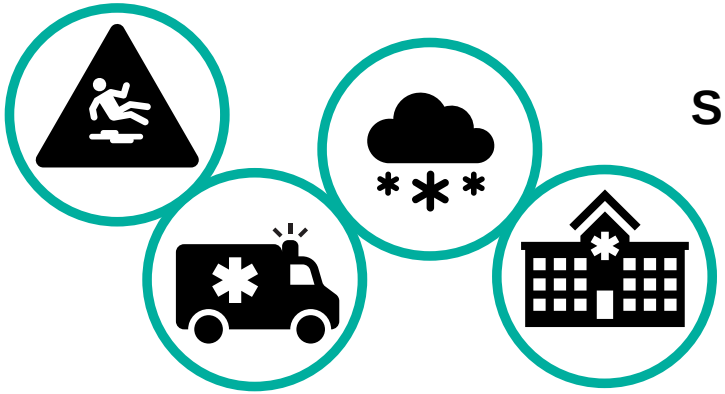
Public Health England

What happens during cold weather?

Deaths caused by **cardiovascular** conditions peak first followed by **stroke** and then **respiratory**.



Reference: 2009 Annual Report of the Chief Medical Officer. Original source: Donaldson GC, Keatinge WR. Early increases in ischaemic heart disease mortality dissociated from and later changes associated with respiratory mortality after cold weather in south east England. *J Epidemiol Community Health*. 1997 Dec;51(6):643-8.



Snow and ice also cause:

- disruption to service provision
- reduction in access to essential services
- increase the risk of falls and injuries

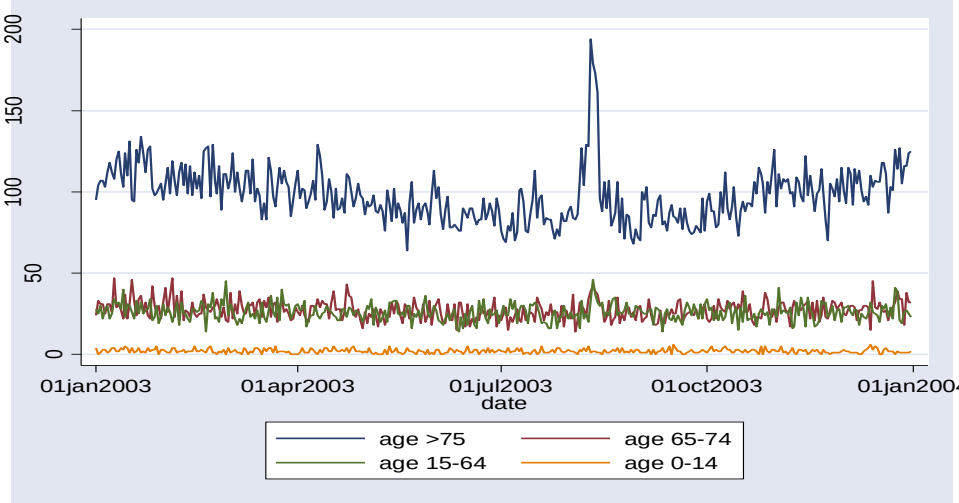
Public Health England

Heat

Public Health England

Health Impacts: Heat

Summer 2003 - 30,000 deaths in Europe; 15,000 deaths in France



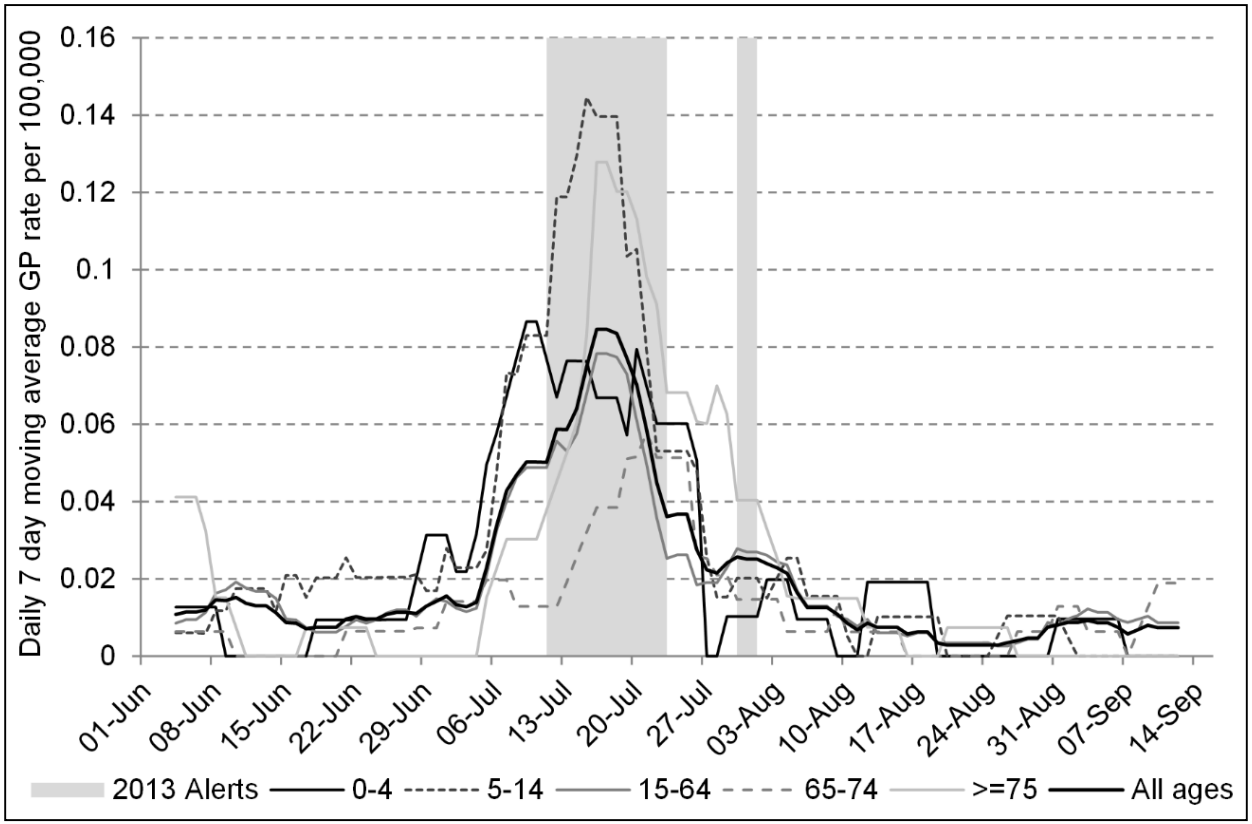
Statistically significant excess mortality estimates over heatwave periods, England

	Year									
Age group	2003	2006	2009	2010	2011	2012	2013	2016	2017	2018
<65 years	301	366	-	-	103	-	-	-	-	-
65+ years	2234	2323	272	-	202	170	-	908	778	863
Overall Cumulative Excess	2535	2689	272	-	305	170	-	908	778	863

Public Health England

Syndromic surveillance

GP in hours daily heat/sun stroke consultations (7 day moving average) by age group 1 June to 15 Sept 2013.

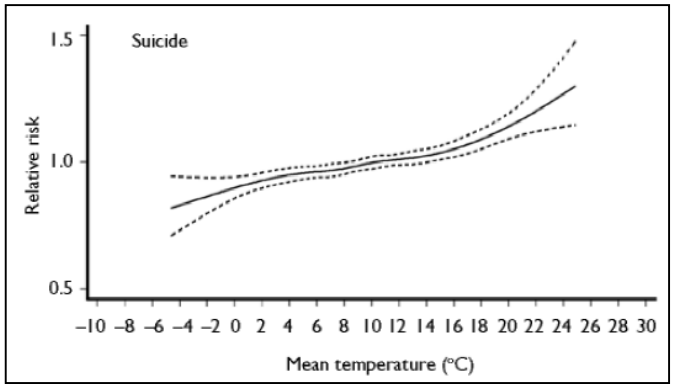


Source: Smith S, Elliot AJ, Hajat S *et al*. Estimating the burden of heat/sun stroke in England during the 2013 summer heatwave using syndromic surveillance. *J Epidemiol Comm Health (in press)* 2016

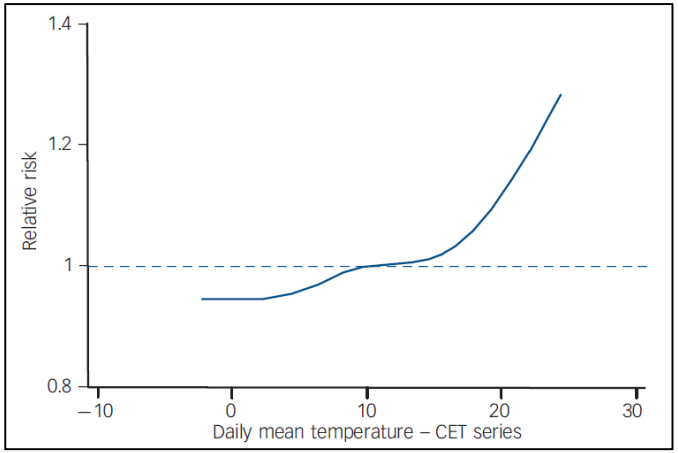
Public Health England

Mental health and high temperatures

Relationship between suicide and temperature in England and Wales (Page et al, 2007)



Relationship of risk of death and temperature in patients with psychosis, dementia and substance misuse in England (Page et al, 2012)



- Significant gaps exist in our understanding of the impact of heat on mental health
- The strongest evidence exists for an increased risk of suicide in high temperatures
- Risk of hospital admission for mental illness increases in high temperatures
- Weak evidence exists of increased all-cause mortality in those with mental illness
- Evidence of worsening of symptoms of mental illness with heat is mixed

Public Health England

Flooding

Public Health England

Health impacts of flooding

Direct health effects

Associated with flood water and its debris:

- **Drowning** (walking or driving through flood water)
- **Physical trauma** (concealed or displaced objects; electrocution, fire)
- **Skin & gut infections** from contaminated flood water

Longer-term health effects

Occur as a consequence of flooding:

- **Mental health impacts** (secondary stressors)
- **Carbon monoxide poisoning**
- **Respiratory disease** from mould & damp
- **Rodent-borne disease**
- **Other health effects** such as heart attacks

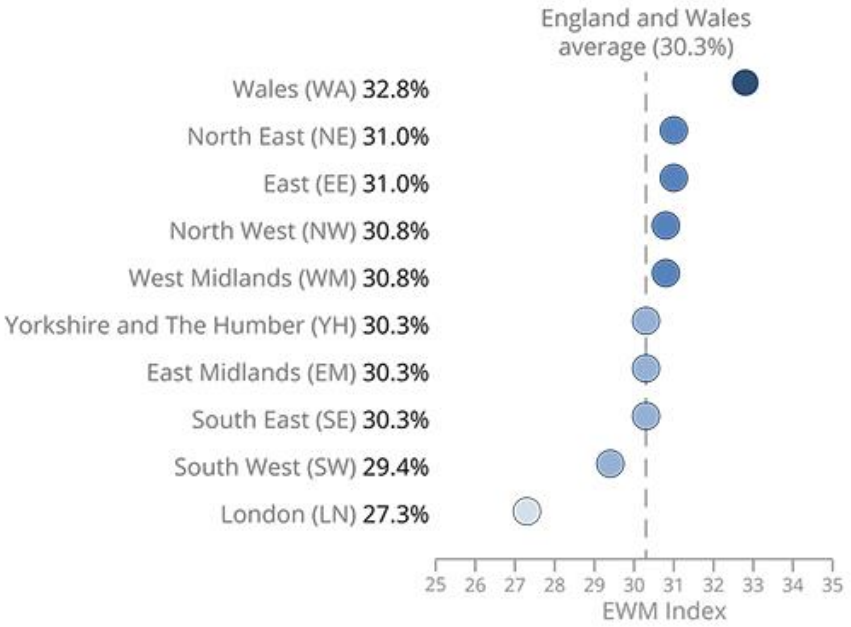
Public Health England

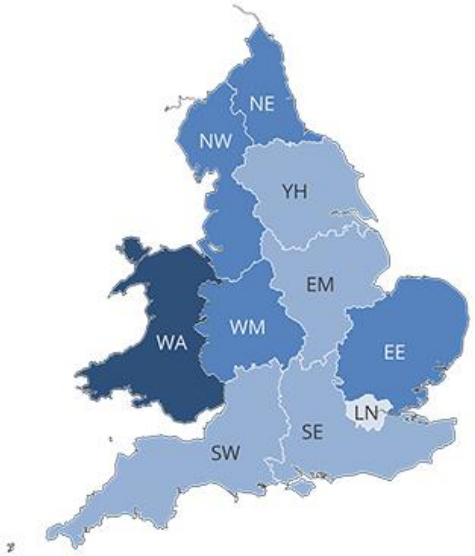
Not just the weather

Public Health England

Which regions were most affected?

- Wales experienced the highest EWM index in 2017/18
- The North East, North West, West Midlands, and East of England also experienced a higher EWM index than the rest of the country





Public Health England

Excess Winter Mortality – UK vs Europe

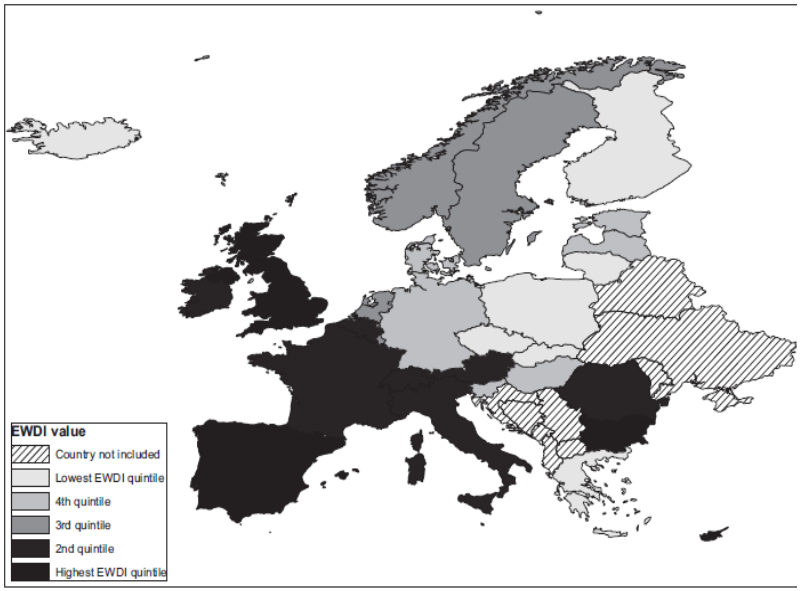
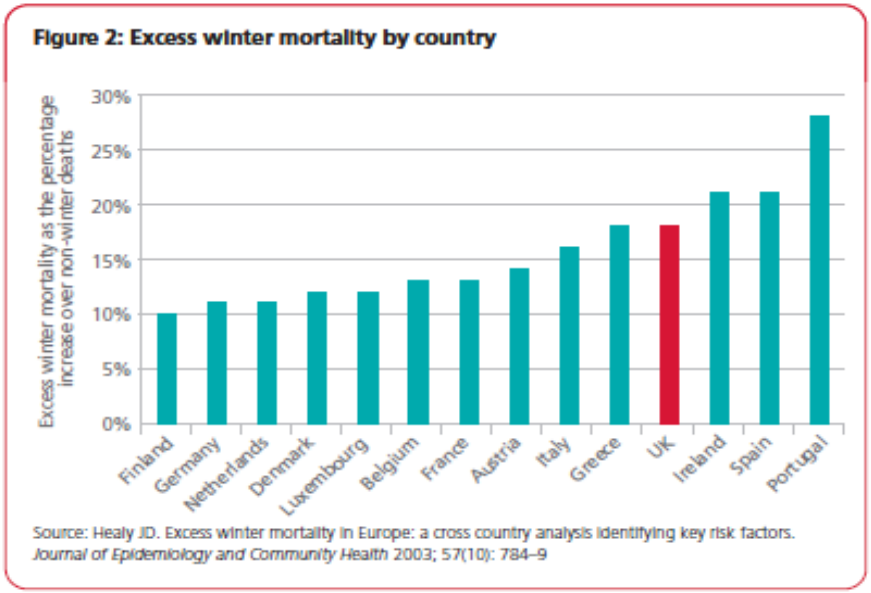


Figure 1 Map of 9-year country-level EWDI in 31 European countries, grouped by quintiles of equal count.

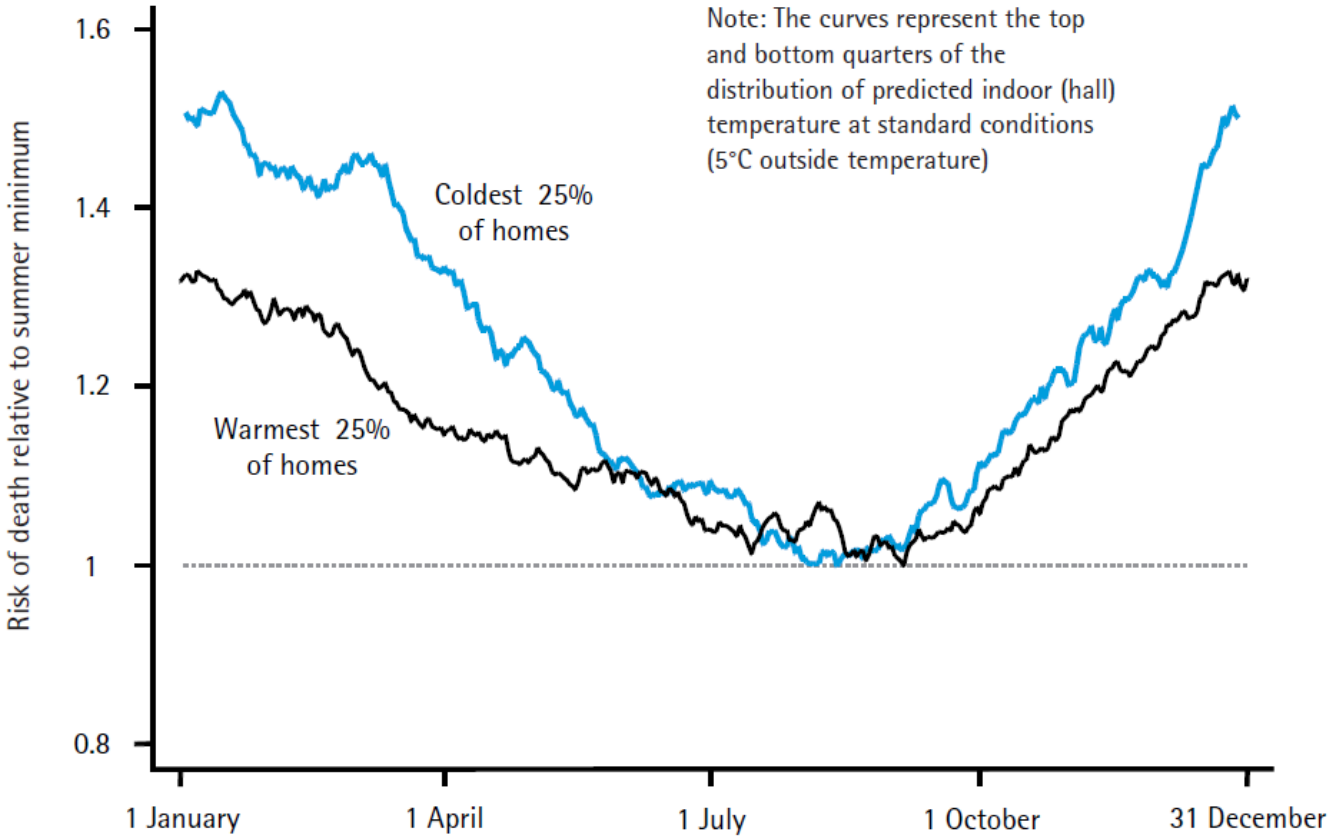


- Almost twice the rate of excess deaths of colder countries such as Finland
- Reasons thought to be building design and differences in institutional and individual behaviour – better adapted?
- Multiagency action is required to address wider determinants of health, such as socioeconomic inequalities, fuel poverty and housing energy efficiency

Public Health England

Contribution of cold homes to mortality

Figure 6: Seasonal fluctuation in mortality in cold and warm homes



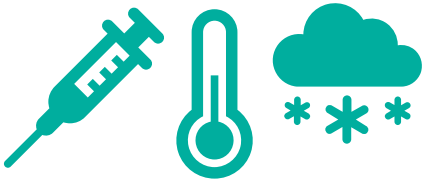
Cold comfort: The social and environmental determinants of excess winter deaths in England, 1986-96, Wilkinson et al

Public Health England

Who is affected?

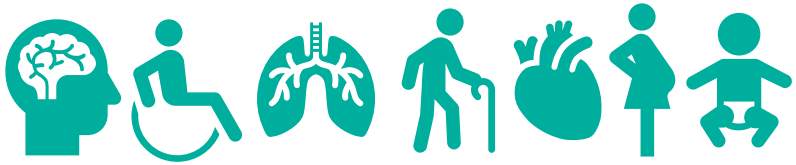
- Whilst the burden of EWDs is primarily seen in older age groups, EWDs are seen **across the life course**
- EWDs represent an important **health inequality** and many are **preventable**
- There are a number of factors which contribute to EWDs:

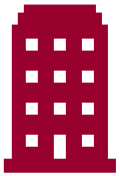
Attitudes to cold and associated behaviours



Seasonal factors: weather, flu

Individual vulnerability to health effects of cold





Household income

Housing and economic factors

Cost of fuel

Energy efficiency of the home

Public Health England

Flooding: Secondary Stressors

- Economic
- Difficulties with compensation/Insurance
- Problems with recovery and rebuilding homes
- Loss of physical possessions or resources
- Health
  - New or continuing health concerns or conditions
  - Lack of access to healthcare
  - Lack of access to psychosocial care
  - Lack of access to prescription medication
- Education and Schooling
- The media
- Familial worry
- Leisure and recreation
- Changes in the view of the world or oneself

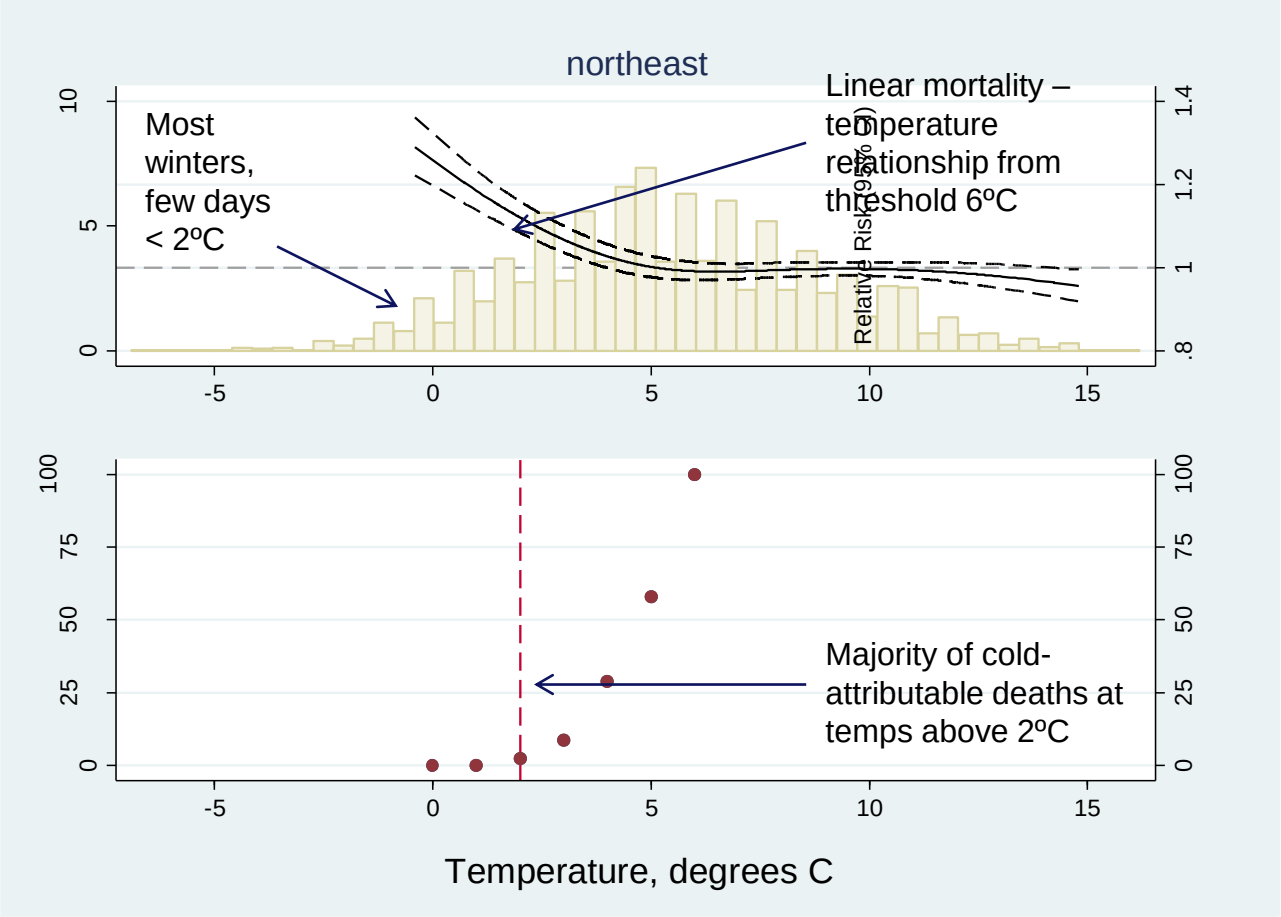
Lock S, Rubin GJ, Murray V, Rogers MB, Amlôt R, Williams R. Secondary Stressors and Extreme Events and Disasters: A Systematic Review of Primary Research from 2010-2011. PLOS Currents Disasters. 2012 Oct 29 [last modified: 2012 Nov 27].

Public Health England

Not just the extremes

Public Health England

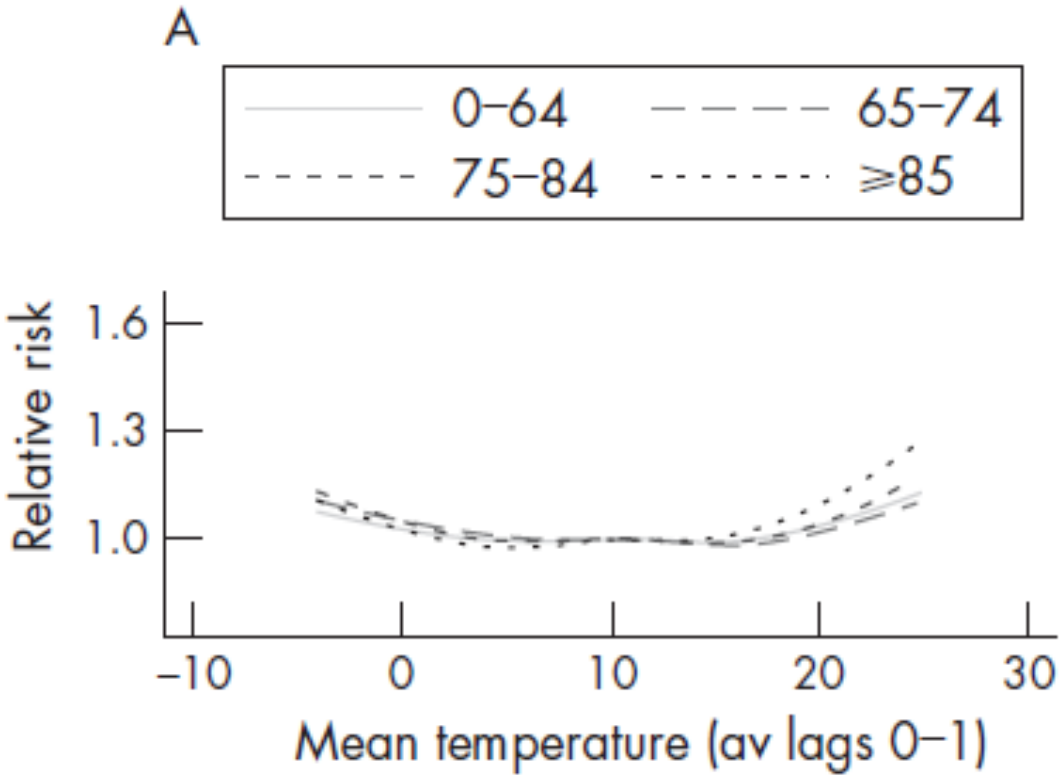
Risk curve for all cause mortality for the North East (October-March) and the attributable fractions at different temperature thresholds



Hajat et al, Public Health 2016

Public Health England

Heat effects increase with extremes, but not restricted to them….



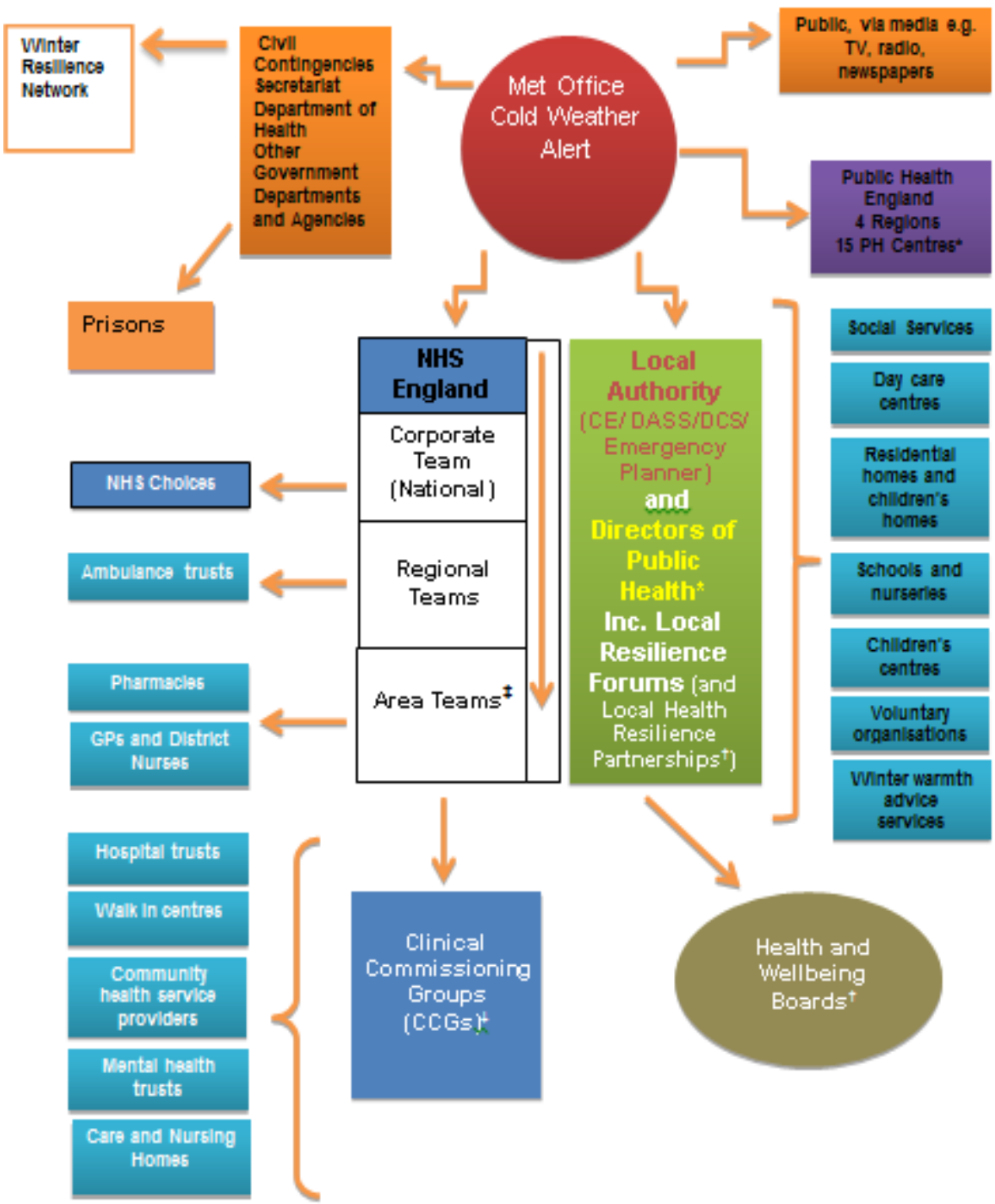
Hajat et al, Heat-related and cold-related deaths in England and Wales: who is at risk? Occup Environ Med 2007;64:93–100

Public Health England

Actions for Health

Public Health England

Cascade of Cold Weather Alerts

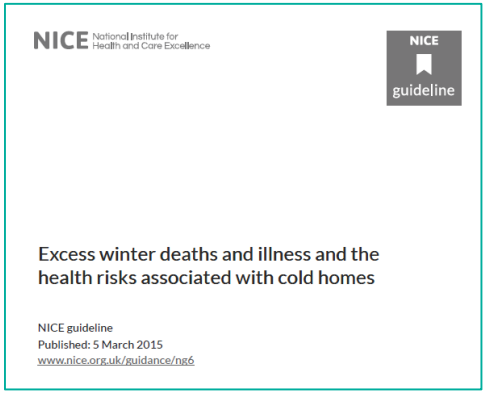


Preventing EWDs

The Cold Weather Plan for England recommends a series of steps to reduce the risks to health from cold weather for:

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

The NICE guidelines (NG6) for reducing the risk of death and ill health associated with living in a cold home aims to improve the health and wellbeing of people vulnerable to the cold, further detail is provided on the next slide.



What does this mean for the NHS?

The NICE guidelines provide some specific recommendations for the NHS which are summarised below. These cannot happen in isolation and require action by, and collaboration with, Local Authority and other stakeholders.

Health and Wellbeing Boards, CCGs, and wider NHS:

- Develop a strategy to address the health consequences of cold homes
- Provide a single-point-of contact health and housing referral service for people living in cold homes to provide tailored solutions
- Raise awareness among practitioners and the public about how to keep warm at home
- Train health and social care practitioners to help people whose homes may be too cold

Primary healthcare practitioners:

- Identify people at risk of ill health from living in a cold home*
- Make every contact count by assessing the heating needs of people who use primary health and home care services

Secondary healthcare practitioners:

- Identify people at risk of ill health from living in a cold home*
- Discharge vulnerable people from health or social care settings to a warm home

*advice on how to identify people at risk is provided in the NICE guidelines

Public Health England

Looking ahead…

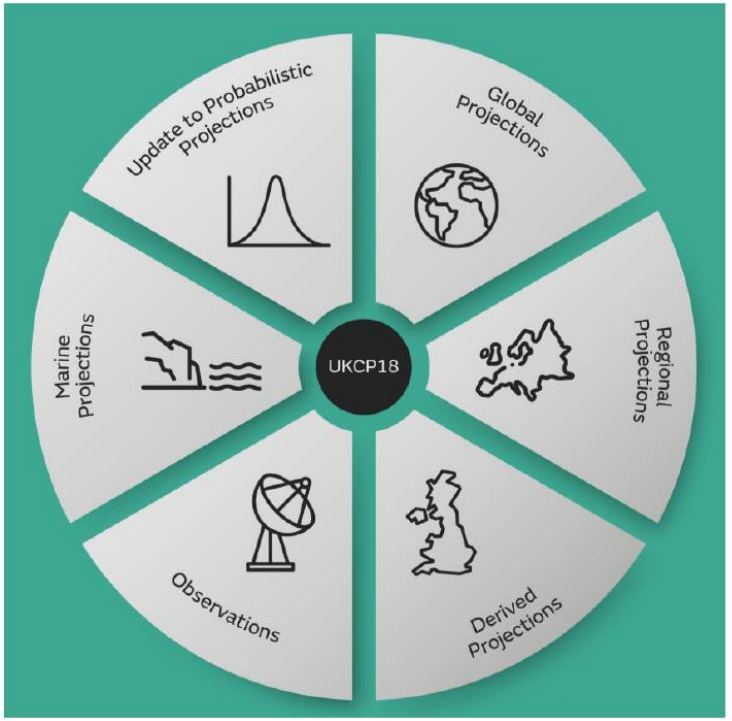
Public Health England

Future scenarios: UKCP 18

Met Office Hadley Centre

Headline result:

"a greater chance of warmer, wetter winters and hotter, drier summers"



Department for Environment Food & Rural Affairs | Department for Business, Energy & Industrial Strategy | Met Office Hadley Centre | Environment Agency

Working together on UK Climate Projections

www.metoffice.gov.uk

Public Health England

Adaptation AND mitigation

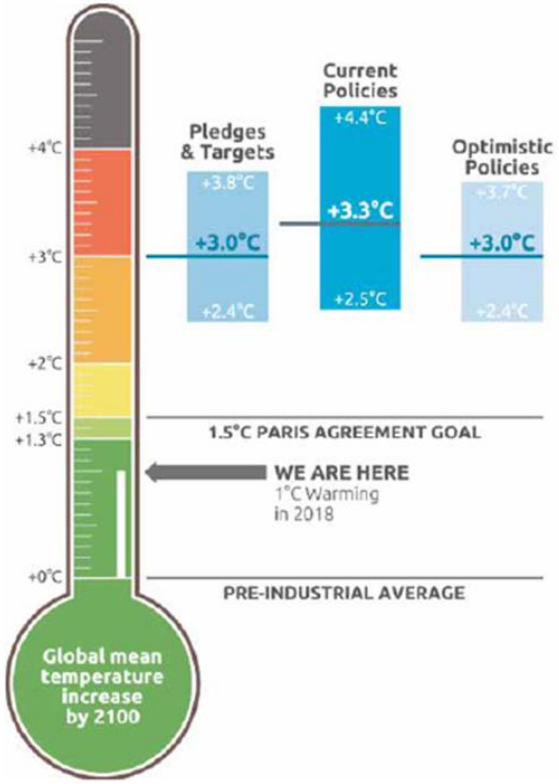


Fig 1. Projections of Global Temperature increase by 2100, Climate Action Tracker, 2018

'Adaptation is the only response available for the impacts that will occur over the next several decades before mitigation measures can have an effect.'

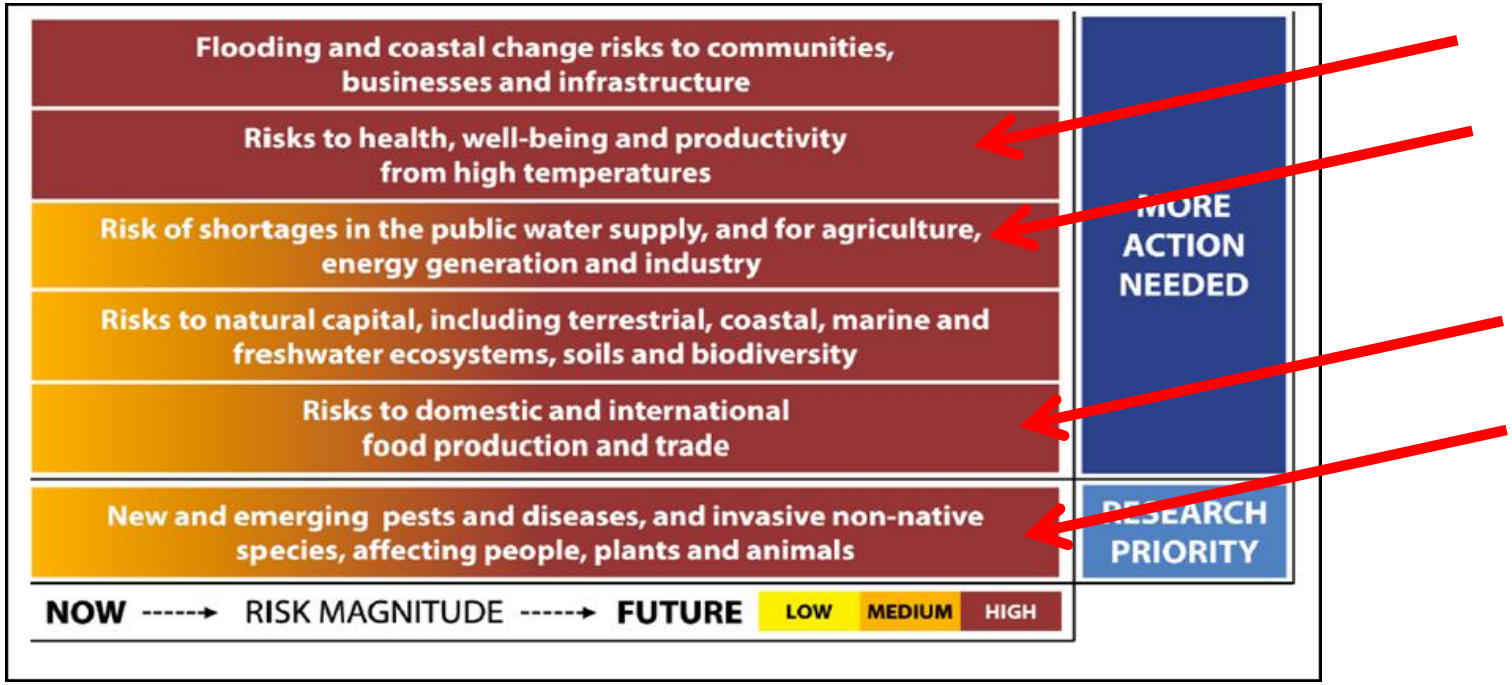
Public Health England

Extreme Events and Climate Change

- Extreme Events already affect thousands of people across England and cause huge health and economic impacts
- Extreme events *will* increase in frequency, duration and intensity because of climate change
- Impacts of adverse weather not just at extremes

Public Health England

Priority risks in CCRA2



Public Health England

National Adaptation Programme

2nd National Adaptation Programme (NAP#2) published June 2018

PHE deliverable:

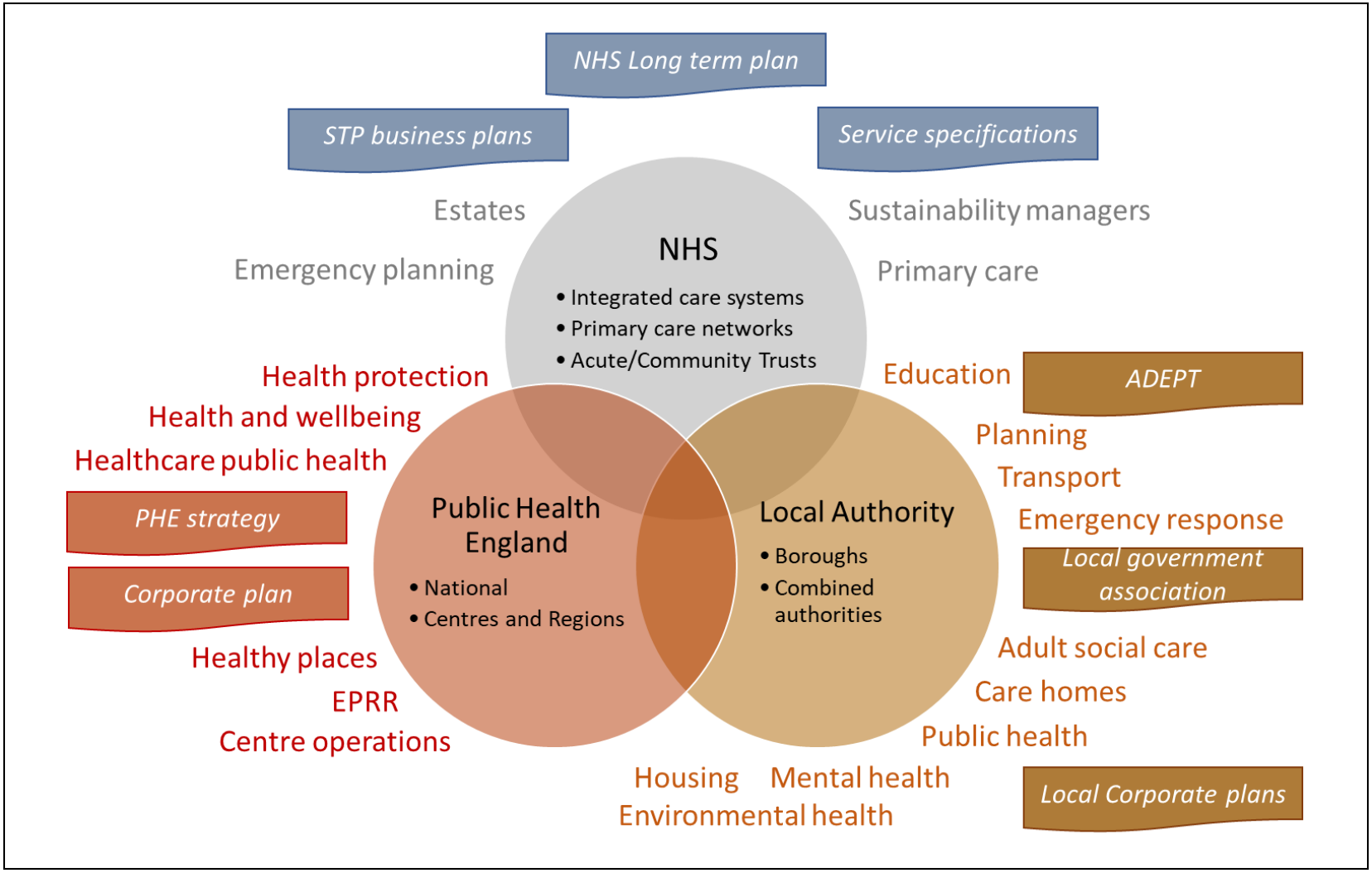
- Develop a **single adverse weather and health plan**, bringing together and improving existing guidance with an aim to **mainstream action** within the health system and local communities, reduce health risks associated with adverse weather and address the health risks identified in CCRA2.

Public Health England

Shift in focus

- Expand from an EPRR focus to a year round strategic preventative approach
- Cross-sectoral action to reduce vulnerabilities
- Maximise co-benefits

Commitment to co-production



Some questions

What are the risks to the NHS/ health sector from extreme weather/ climate change?

- Changing demand on service
- Vulnerabilities arising as a result of health/social care infrastructure
  - E.g. overheating in wards; care homes

What Actions to address these risks?
Mitigation – Reduce healthcare's carbon footprint
Adaptation – Prepare for extreme weather and climate risk
Leadership/ advocacy to protect public health from climate change

Public Health England

Thank you!

Contact:
Ishani.Karpurkayastha@phe.gov.uk
ExtremeEvents@phe.gov.uk

Acknowledgements:

Virginia Murray, Owen Landeg, Stephen Dorey, Carla Stanke, Carl Petrokofsky

Thomas Waite, Ross Thompson, Emer O’Connell, Mattea Clarke