



Public Health
England

Protecting and improving the nation's health

Temperature and Health – Public Health Agenda

CIEH London Housing Study Group CPD Day

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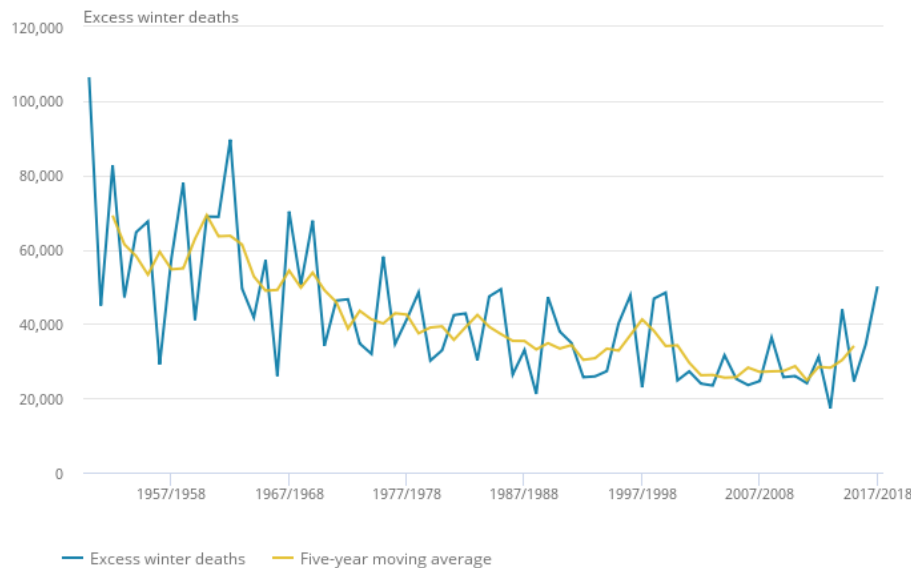
March 27th

Outline

- Health impacts of adverse temperatures
- Heatwave and Cold Weather Plans for England
- Challenges
- Strategic long term approach to reducing the health burden
- Other priority areas

Excess winter deaths in England

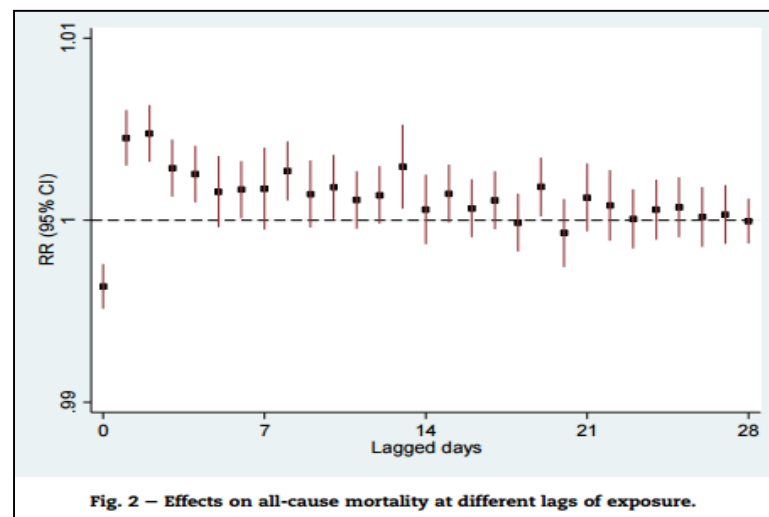
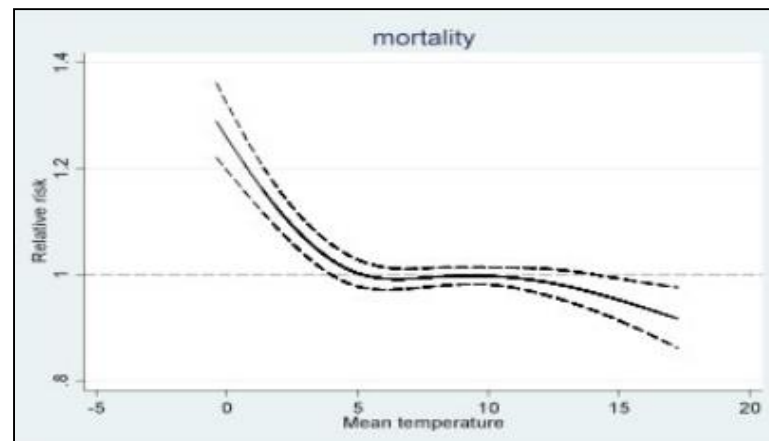
Figure 1: Excess winter deaths and five-year central moving average
England and Wales, between 1950 to 1951 and 2017 to 2018



- More people die during the winter than at other times of the year
- 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 – 2017/18 largest EWD since 1975/76
- Complex causes – cold weather, influenza and other circulating infections

Mortality due to cold

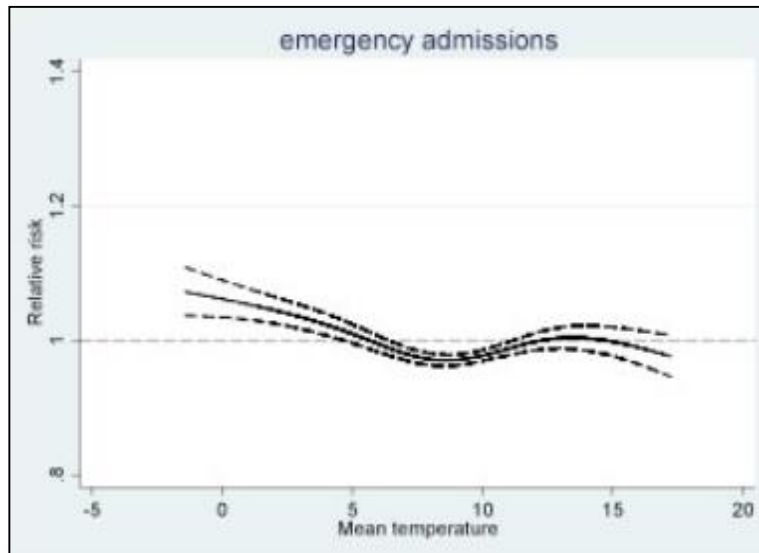
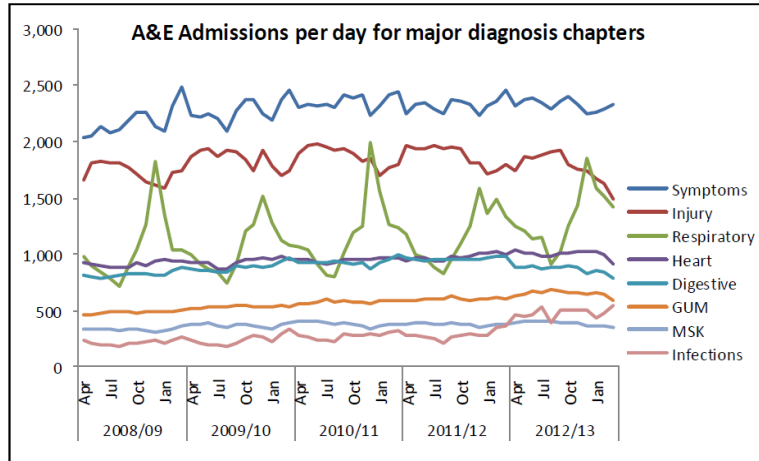
- The risk of death increases with falling temperatures¹
- Effects are seen from mean outdoor temperatures of 4-8°C (depending on region)¹
- Cold does not just kill people who were about to die anyway^{1, 2}
- Cold impacts on mortality are observed for up to 4 weeks following a cold day¹
- Most cold-attributable deaths are cardiovascular and respiratory



1. Hajat et al, Public Health 2016, PIRU CWP evaluation 2016

2. Rehill N, et al. BMJ Open 2015

Morbidity due to cold temperatures



- Each winter sees an increase in emergency admissions to hospital 'winter pressure'; particularly respiratory disease¹
- Relationships between emergency admissions and cold temperatures are similar to mortality but not as strong; significantly increased risk of respiratory and cardiovascular admissions²
- Cold homes linked to poor mental health; home improvements result in significantly improved mental health³
- Cold may increase sense of social isolation and vice versa⁴

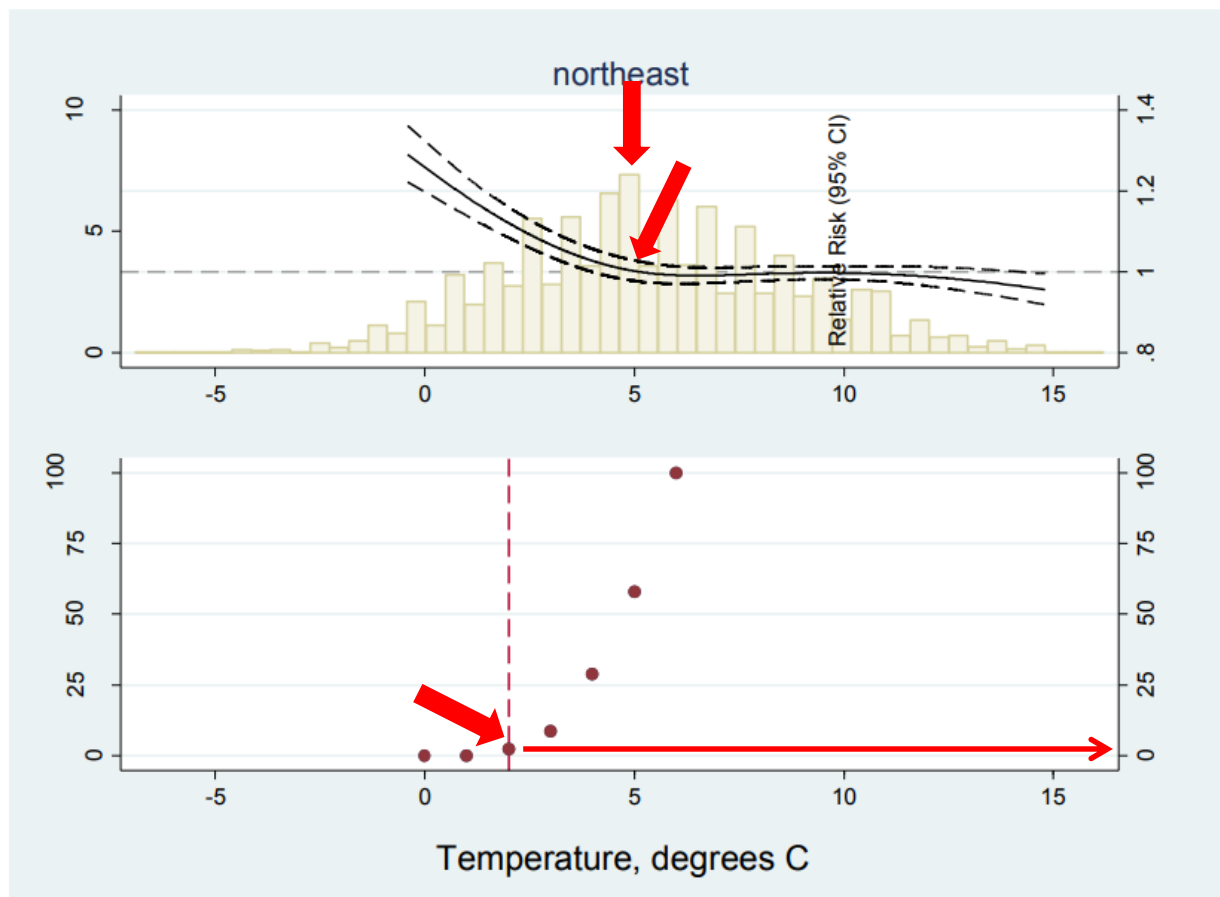
1. NHS England (2014) Understanding Winter Pressures in A&E Departments
2. Hajat et al, Public Health 2016, PIRU CWP evaluation 2016
3. Howden-Chapman 2007, BMJ
4. Zhong and Leonardelli 2008 Psychological Science

Cold Weather Plan for England

| | |
|----------------|--|
| Level 0 | Year-round planning <i>All year</i> |
| Level 1 | Winter preparedness and action programme <i>1 November to 31 March</i> |
| Level 2 | Severe winter weather is forecast – Alert and readiness <i>mean temperature of 2°C or less for a period of at least 48 hours and/or widespread ice and heavy snow are predicted, with 60% confidence</i> |
| Level 3 | Response to severe winter weather – Severe weather action <i>Severe winter weather is now occurring: mean temperature of 2°C or less and/or widespread ice and heavy snow.</i> |
| Level 4 | Major incident – Emergency response <i>Central Government will declare a Level 4 alert in the event of severe or prolonged cold weather affecting sectors other than health</i> |

Cold – not an impact of ‘extremes’

Figure 3.1 Relationships between Temperature and Mortality



Source: PIRU Evaluation of the implementation and health-related impacts of the Cold Weather Plan for England 2012 Final report (2015)

Health impacts of heat

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

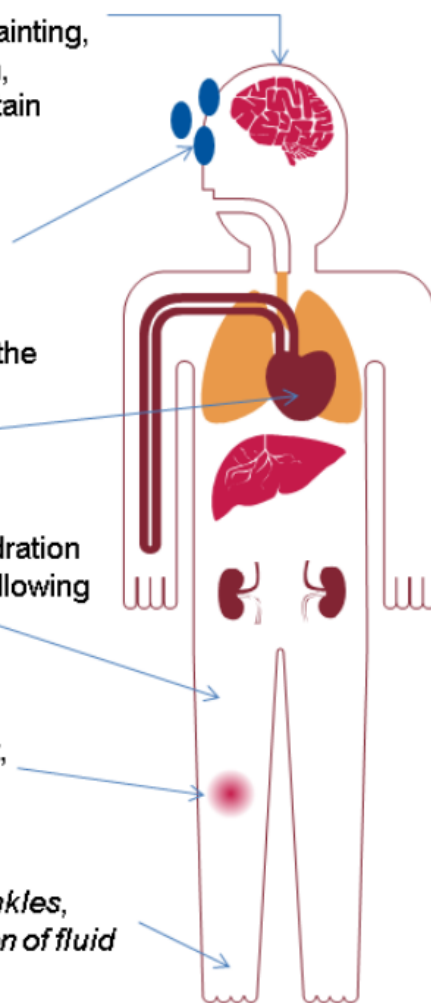
Excessive sweating can deplete fluid and salts

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:

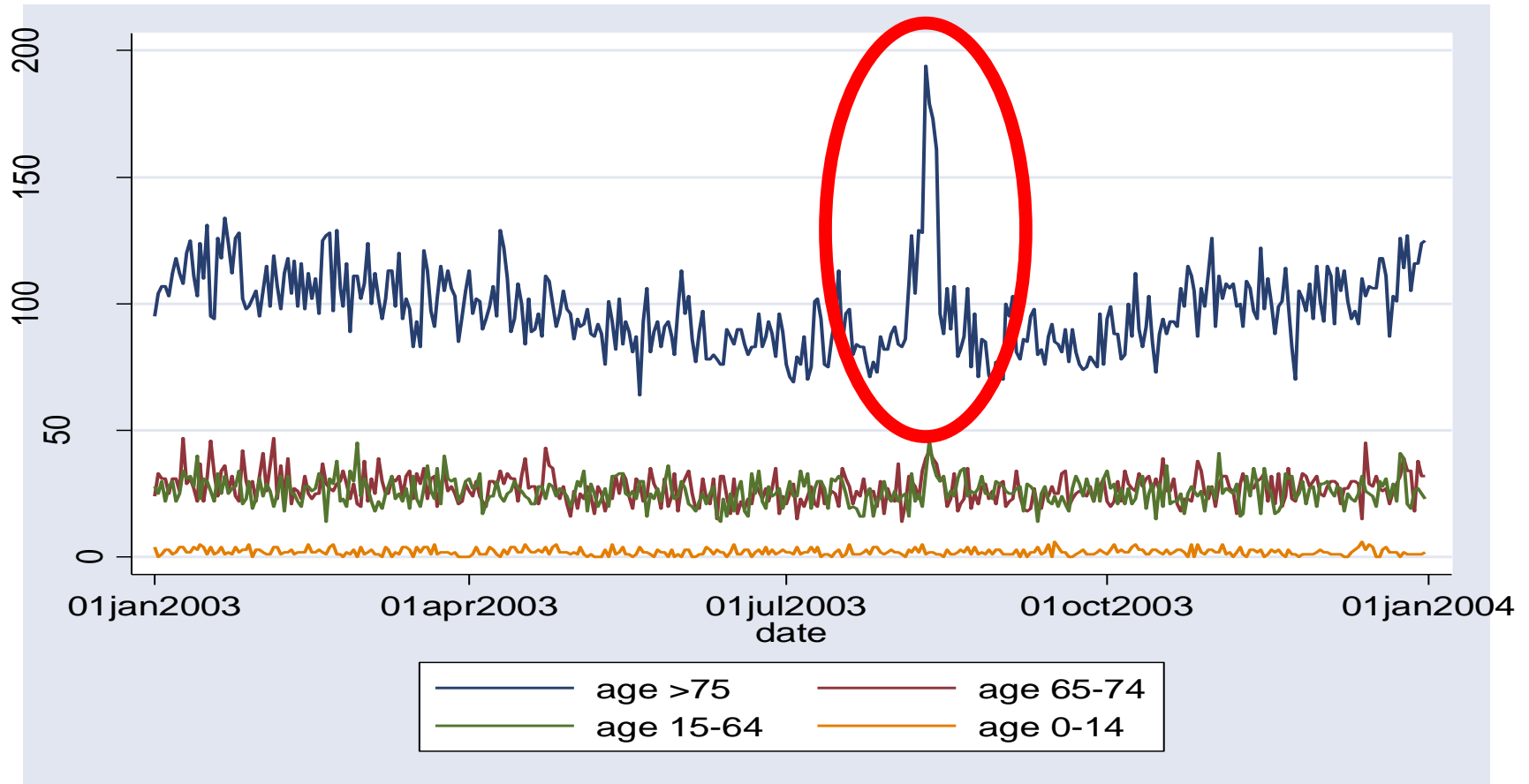
Heat Exhaustion

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

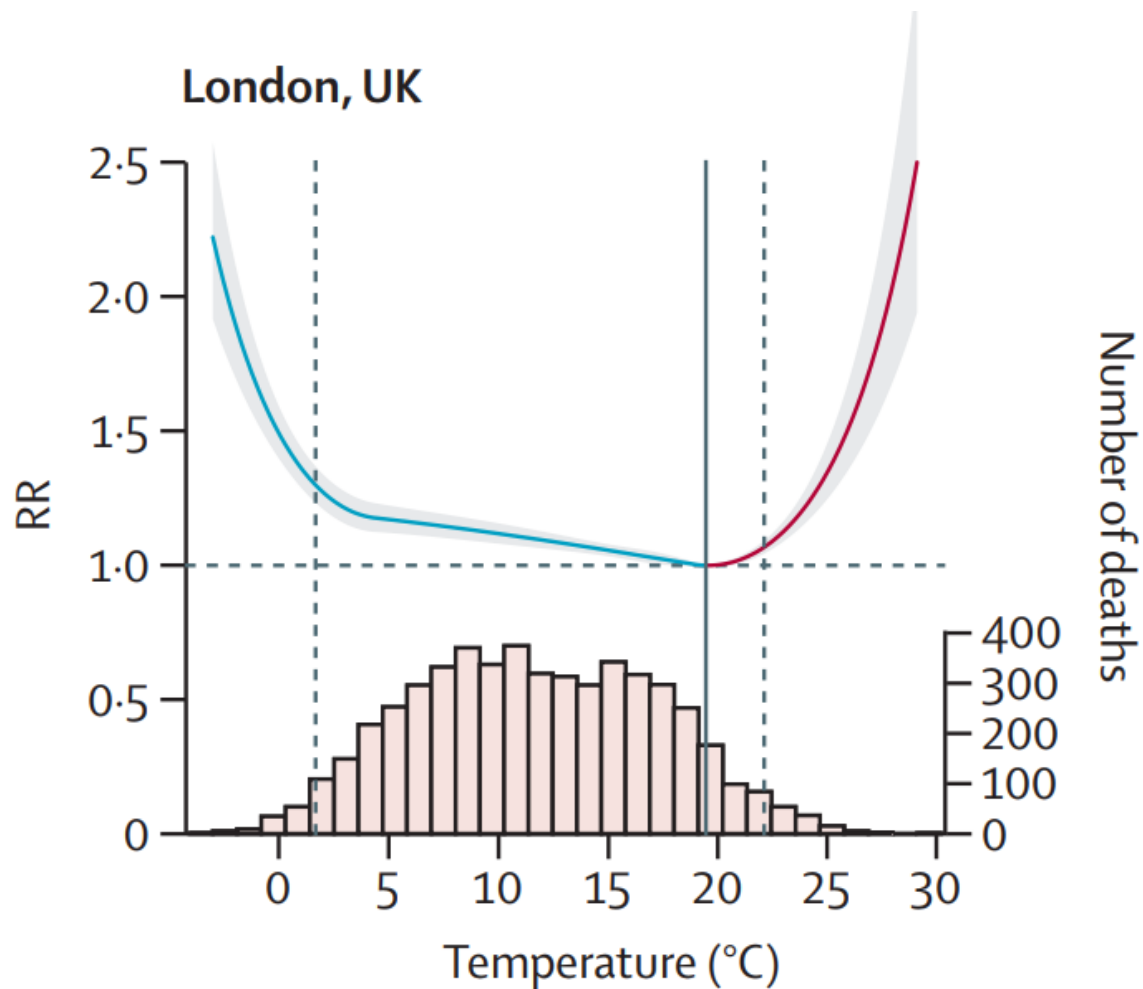
Heatstroke

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

Heat mortality – example 2003



Heat mortality



The Heatwave Plan for England

Figure 2.1: Heatwave Alert levels

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

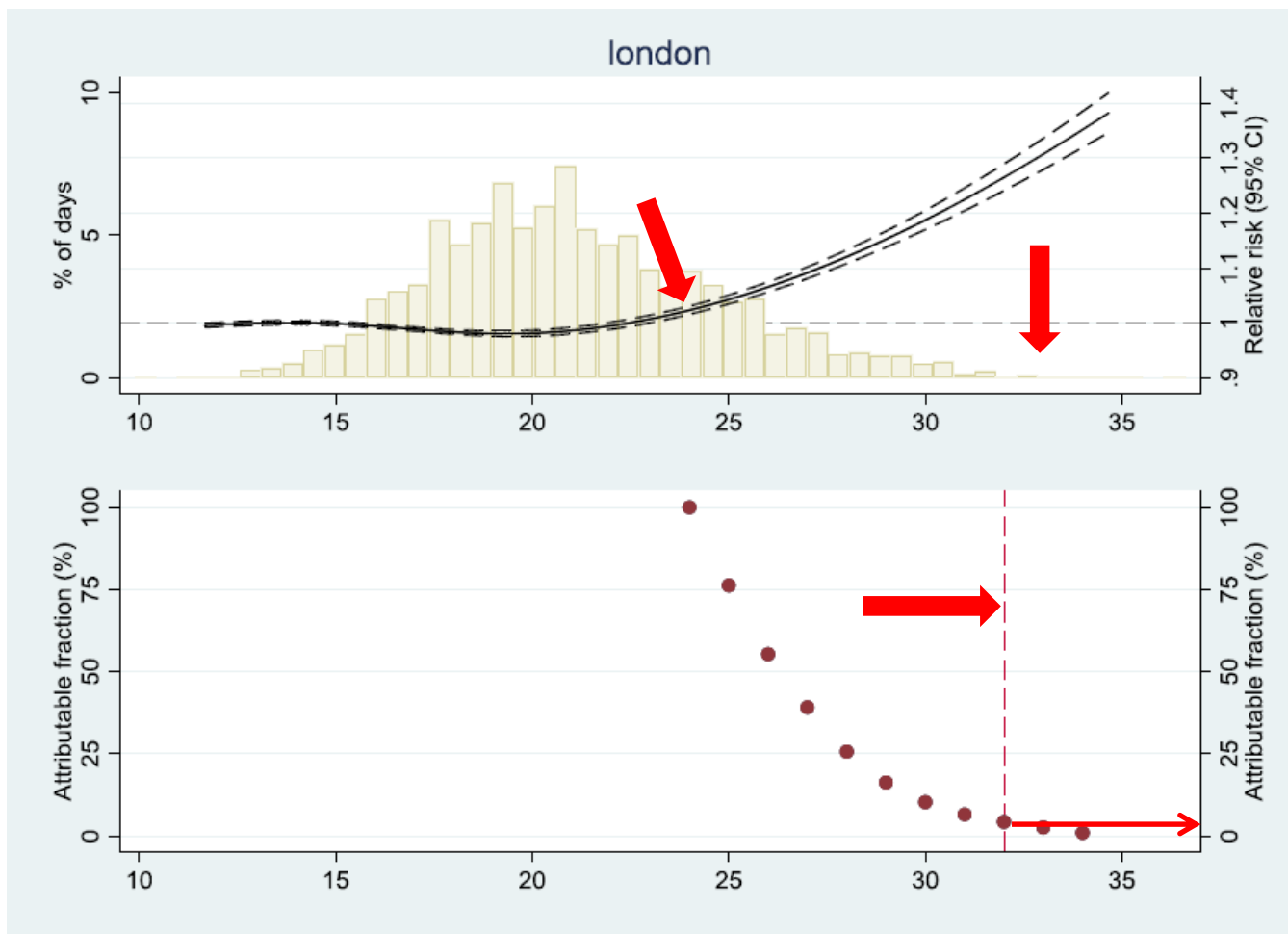
LOCAL Threshold temperatures

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

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 |

Heat-attributable deaths

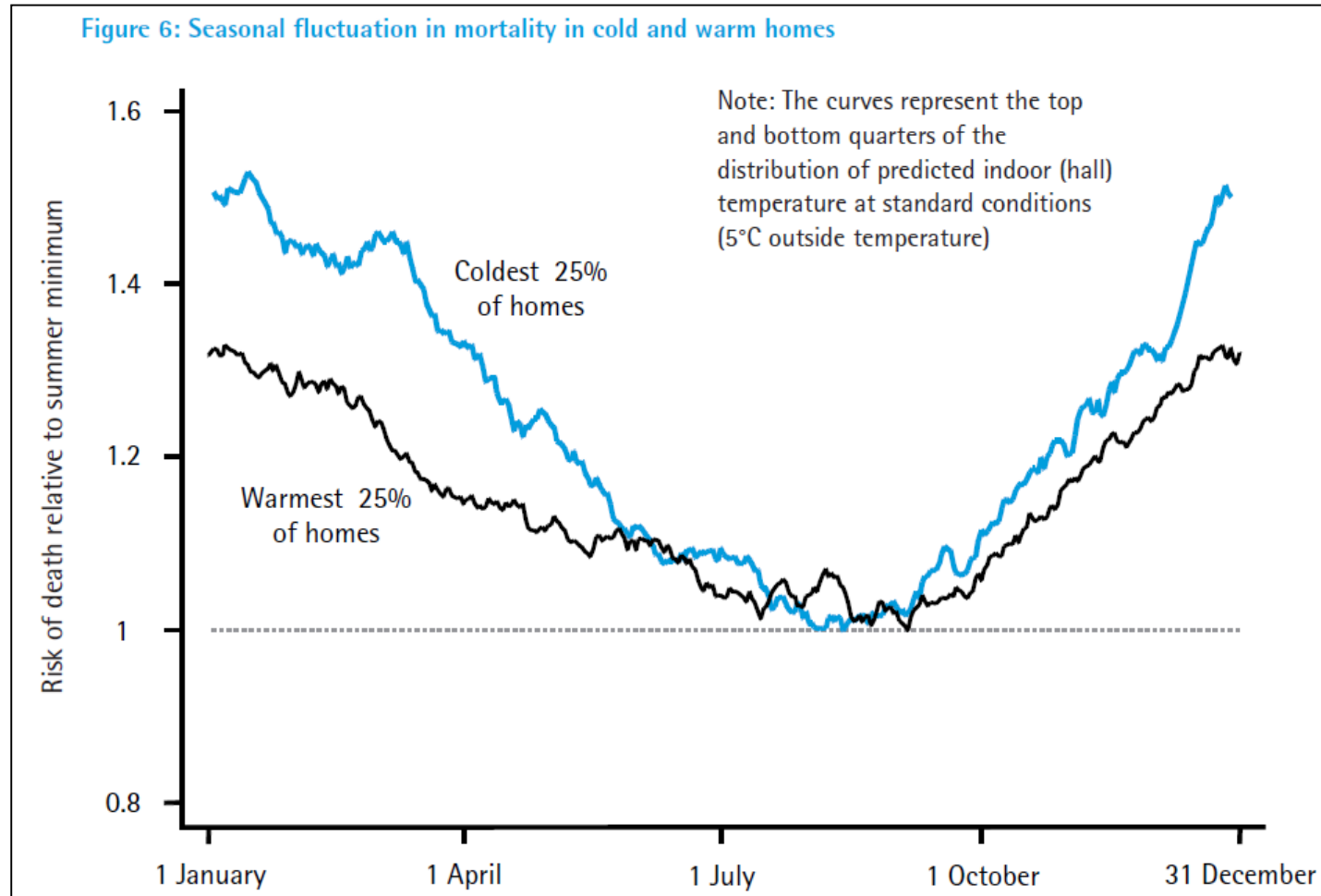


Source: PIRU Evaluation of the implementation and health-related impacts of the Heatwave Plan for England (DRAFT) Final report (2019)

Strategic challenge

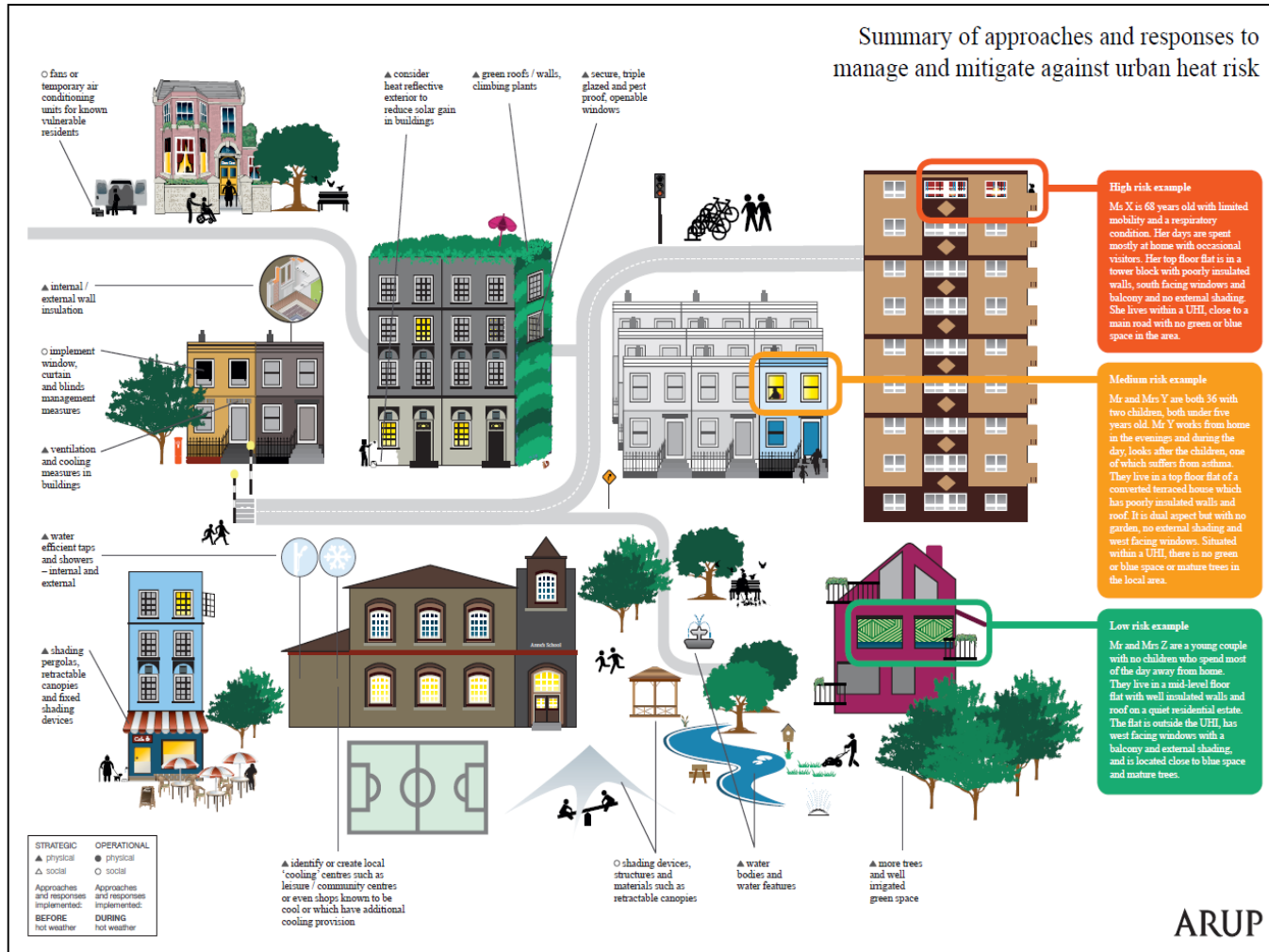
- Need to expand from an emergency response focus to dealing with heat and cold related health impacts
- Move to a year round strategic preventative approach
- We need to explore system working to address these risks e.g. urban planning, housing design and existing priorities
 - Cold homes and fuel poverty agenda
 - Indoor overheating

Contribution of cold homes to mortality



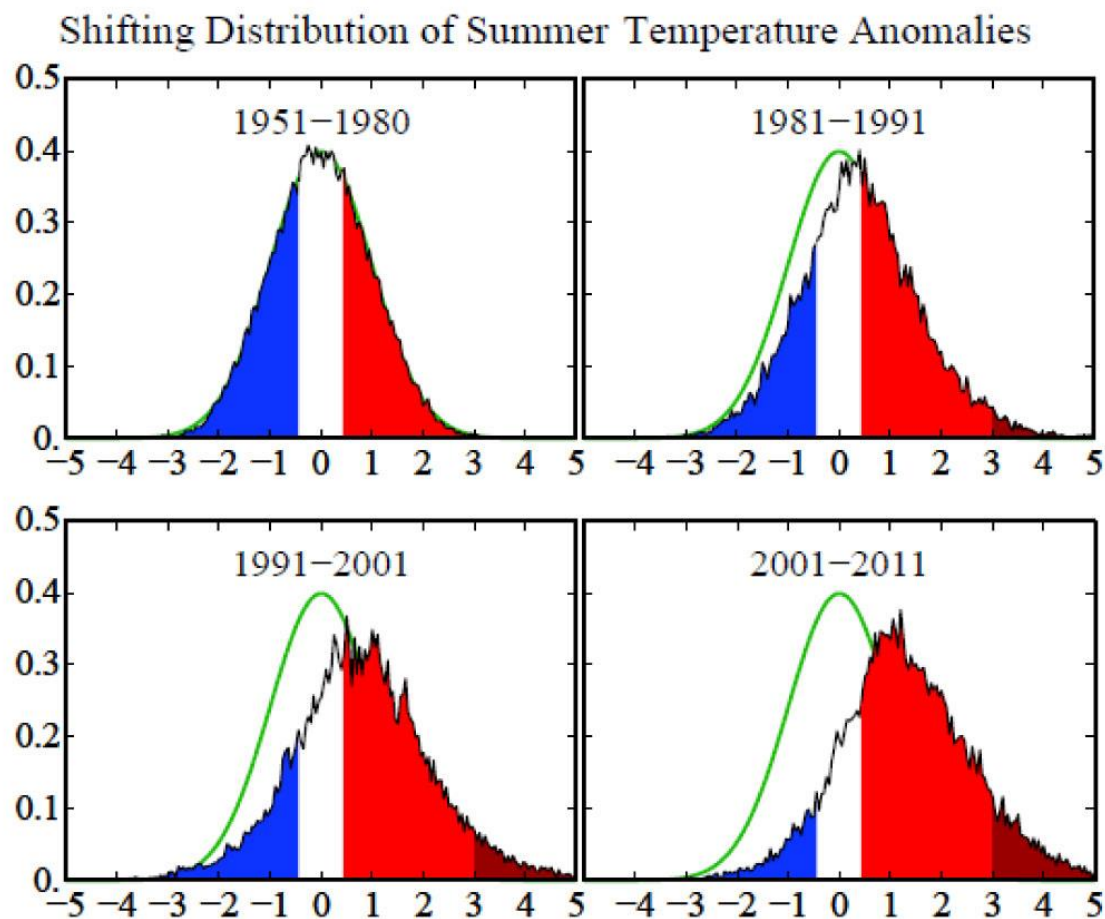
Cold comfort: The social and environmental determinants of excess winter deaths in England, 1986-96, Wilkinson et al

Overheating



Source: http://publications.arup.com/Publications/R/Reducing_urban_heat_risk.aspx

Context of climate change



Other areas of PH concern

- Indoor Air Quality
- Noise
- Mould and damp
- Access to green space and healthy streets
- Occupant behaviours to reduce risks