



Environment
Agency



NHS
*Sustainable
Development Unit*



Local health and wellbeing in a changing climate

Building preparedness for people, services and communities

Extreme Events and Climate Change – the emerging local challenges?

Professor Virginia Murray

Health Protection Agency

March 7, 2013

Outline

Health Protection Agency

- Extreme Events
 - Cold
 - Heat
 - Flood
 - Drought
 - Wildfire
- Air Pollution and Climate Change Group
 - Health effects of climate change in the UK – update of the evidence 2012
 - First UK's Climate Change Risk Assessment – Health Sector
- Emerging local challenges





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Climate Change and Extreme Events references

Extreme weather events and natural disasters



In the event of a major natural disaster or emergency, such as a severe flood or heatwave, the HPA's specialists in environmental hazards, infectious diseases and emergency planning, work together alongside local and national agencies such as the NHS, police, local government and Environment Agency, to provide health protection advice to affected communities through their network of Health Protection Units across England.

The Health Protection Agency has been involved in advising on health implications of extreme weather events such as: the extensive flooding in the South West in 2007, the volcanic ash cloud caused by an Icelandic volcano in early 2010, and research into the effects of extreme cold weather and heatwaves.

The HPA's new extreme events and health protection section collates information about natural disasters and extreme weather events both from within the HPA and from national and international partners, and provides relevant up-to-date evidence based information to support the planning for extreme events.

Related Information

[» International Event Response](#)
[» Natural disasters](#)
[» Extreme Events and Health Protection Section \(EEHPS\)](#)
[» Real-time Syndromic Surveillance](#)
[» Oak processionary moth](#)

External Links

[» WHO disaster information](#)
[» UN International Strategy for Disaster Reduction](#)
[» CDC - Natural Disasters & Severe Weather](#)
[» Met Office - extreme weather events](#)
[» Environment Agency](#)
[» British Geological Survey](#)
[» Drinking Water Inspectorate](#)
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[» Foresight project](#)

Extreme Events and Health Protection



Provides a **focal point for evidence based health protection** advice and planning, response and recovery to extreme weather events and other natural hazards at

- Local
- National
- International



Extreme events include



Cold

Windstorms

Thunderstorm asthma

Heat

Earthquakes

Oak Processionary Moth

Floods

Tsunamis

Vectors and Algal Blooms

Drought

Volcanic ash

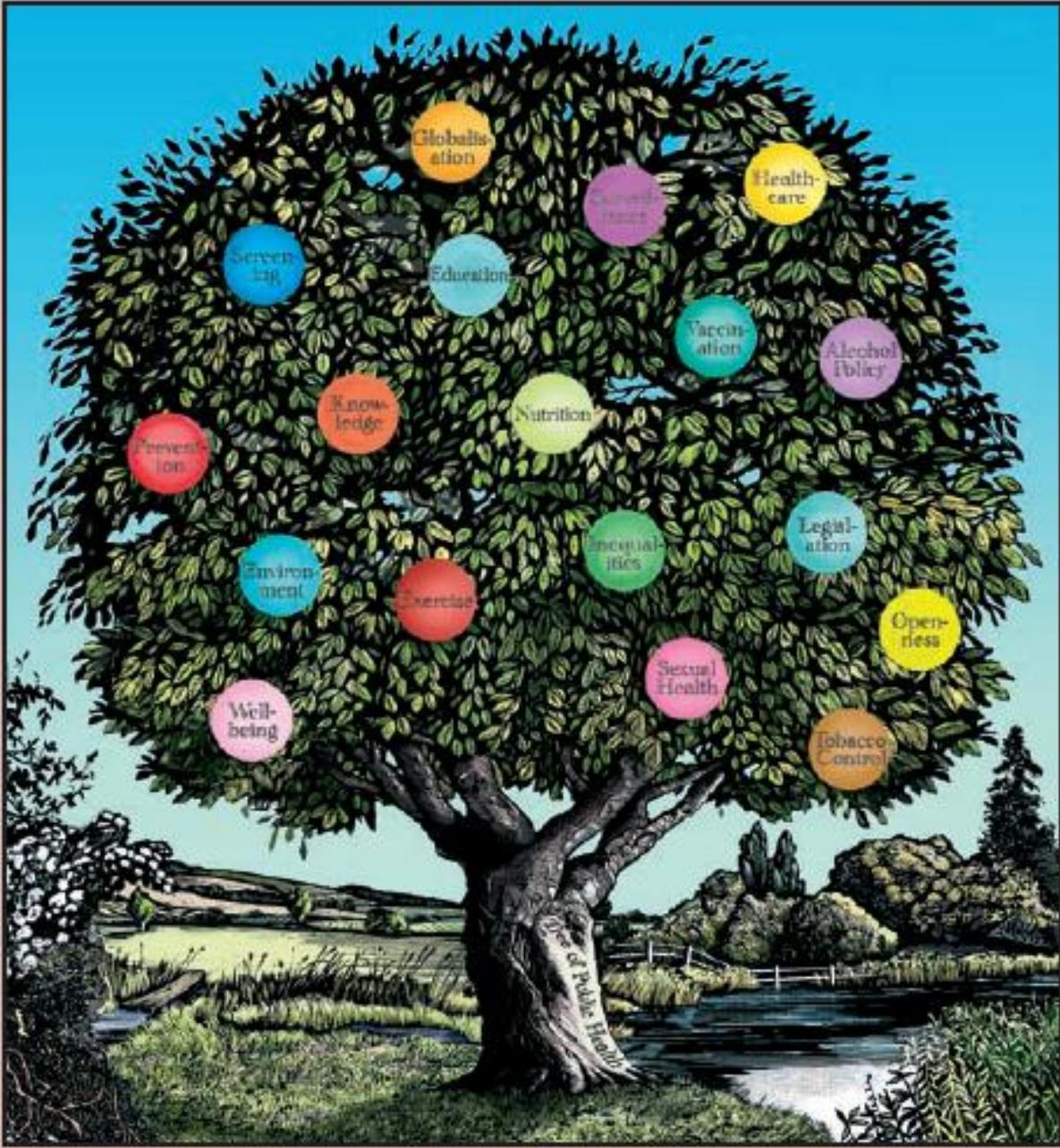
Space Weather

Wildfires

Landslides

and others...





http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_114012.pdf

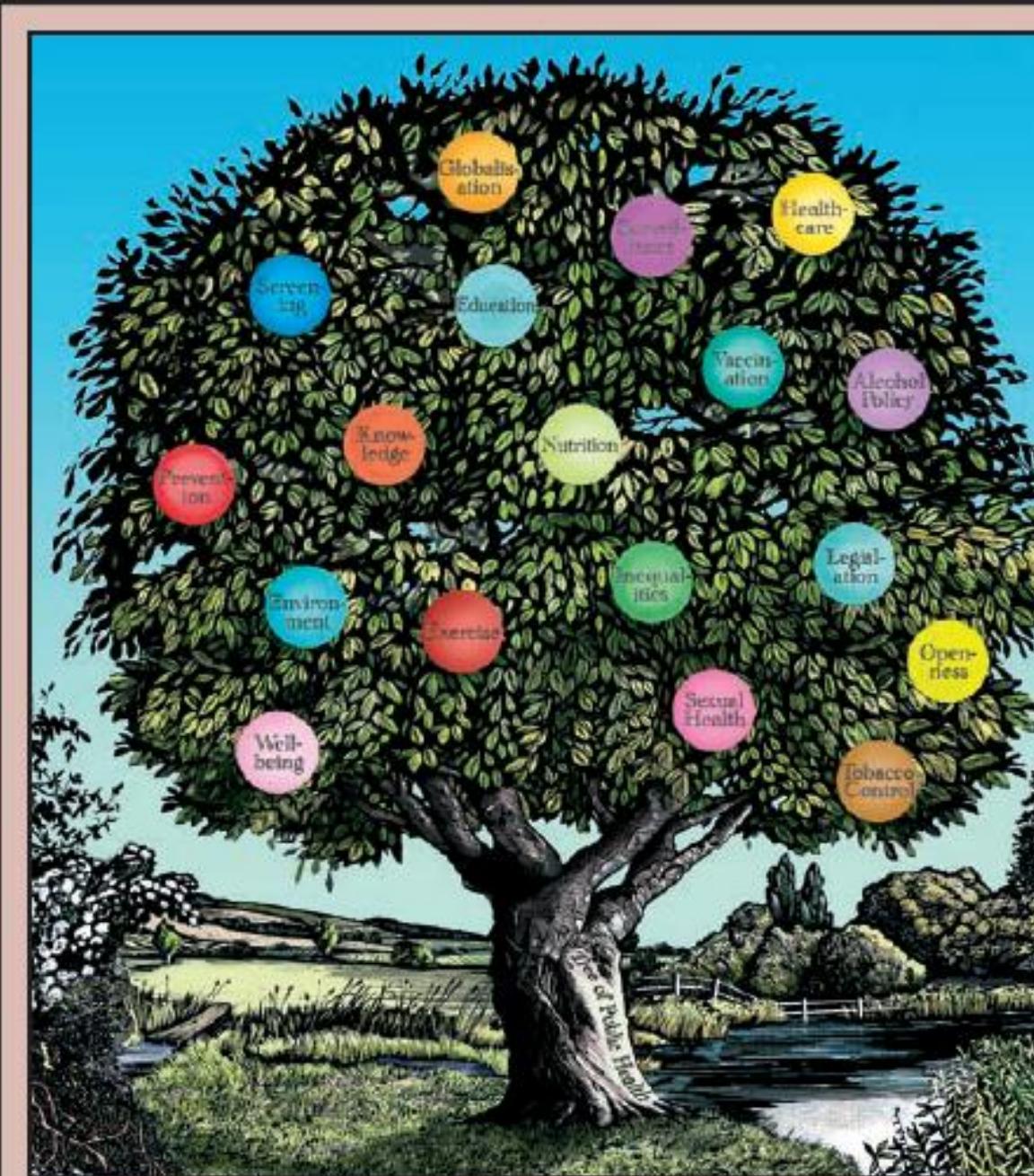
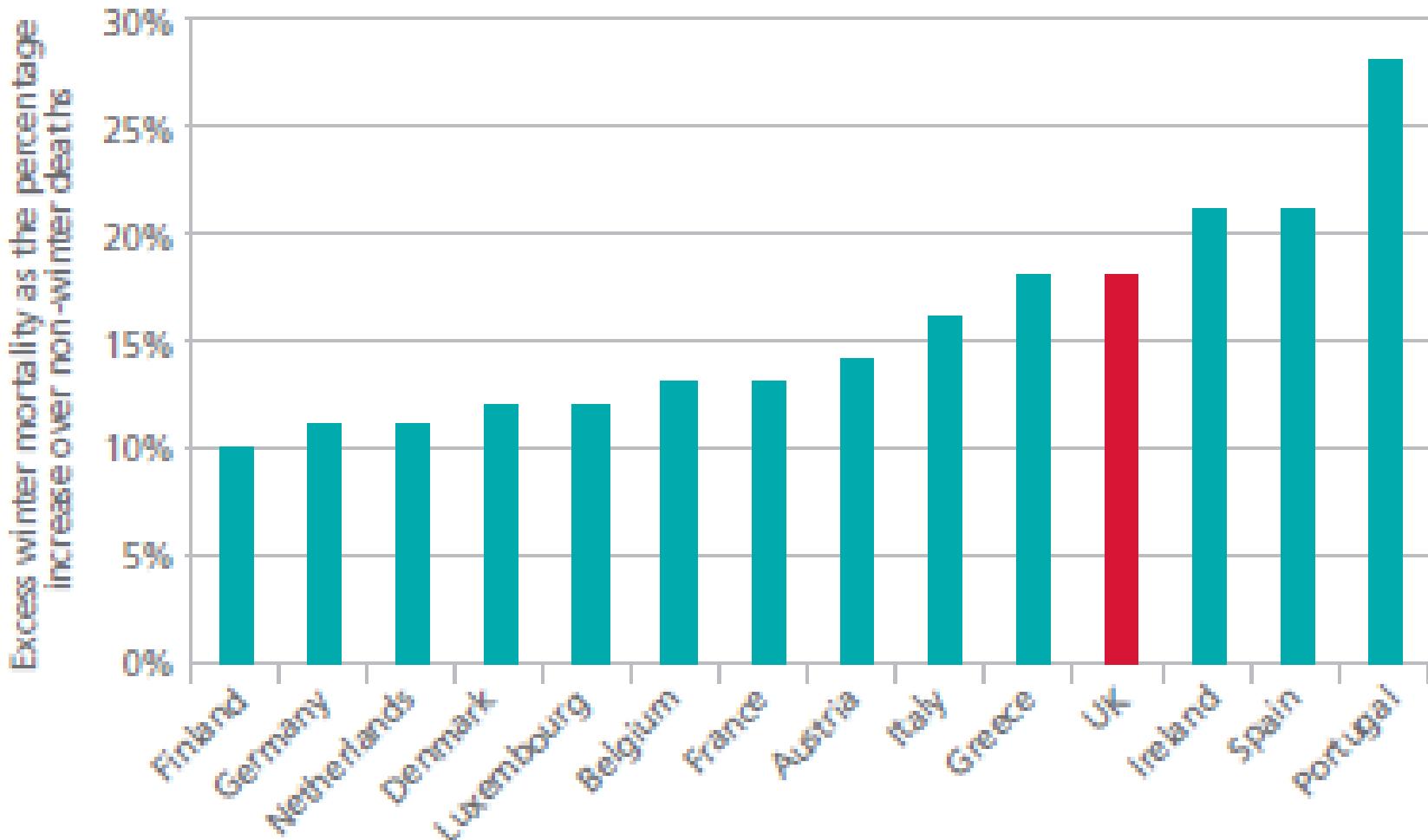


Figure 2: Excess winter mortality by country



Source: Healy JD. Excess winter mortality in Europe: a cross country analysis Identifying key risk factors. *Journal of Epidemiology and Community Health* 2003; 57(10): 784–9

Cold Weather Plan for England 2012

Protecting health and reducing harm from severe cold



Cold Weather Plan for England 2012

Protecting health and reducing harm from severe cold



Cold Weather Plan for England

Making the Case: Why cold weather planning is essential to health and well-being



Cold Weather Plan for England 2012

Protecting health and reducing harm from severe cold



Cold Weather Plan for England

Making the Case: Why cold
weather planning is essential



Cold Weather Plan for England 2012

Supporting the Case



Cold Weather Plan levels

Level 0	Long-term planning <i>All year</i>
Level 1	Winter preparedness programme <i>1 November to 31 March</i>
Level 2	Severe winter weather is forecast – Alert and readiness <i>Mean temperature of 2°C and/or widespread ice and heavy snow are predicted within 48 hours, 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 Weather Alert

Tel: 0870 900 0100 www.metoffice.gov.uk



NHS (Ref: MO43)

Page 1 of 3

Forecast Issued on Sunday, 24 February 2013 at 09:05



Cold Weather Alert

Level 2 - Cold Weather Action

<http://www.metoffice.gov.uk/public/weather/cold-weather-alert/#?tab=coldWeatherAlert>

There is an 80% probability of severe cold weather/icy conditions between 0900 on Sunday and 0900 on Tuesday in parts of England. This weather could increase the health risks to vulnerable patients and disrupt the delivery of services.

Please refer to the national Cold Weather Plan and your Trust's emergency plan for appropriate preventive action.

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:

<http://www.metoffice.gov.uk/public/weather/forecast/#?tab=map>

Regional Risk Assessments for occurrence of Cold Weather conditions between 0900 Local Time on Sunday and 0900 Local Time on Tuesday.

The areas that are likely to be affected are:

Region	Risk	Comments
North East England	80 %	Remaining cold with wintry showers and a risk of icy conditions. Becoming less cold during Monday,
North West England	80 %	Remaining cold with a few wintry showers and a risk of icy conditions. Becoming less cold during Monday,
Yorkshire and the Humber	80 %	Remaining cold with wintry showers and a risk of icy conditions. Becoming less cold during Monday,
West Midlands	70 %	Remaining cold with an isolated wintry shower and a risk of icy conditions. Becoming less cold during Monday,
East Midlands	70 %	Remaining cold with a few wintry showers and a risk of icy conditions. Becoming less cold during Monday,
East of England	60 %	Remaining cold at first, especially in strong winds, but temperatures recovering somewhat during Monday.
Southeast England	60 %	Remaining cold at first, especially in strong winds, and with some light sleet or snow in places, but with temperatures recovering somewhat during Monday.
London	60 %	Remaining cold at first, especially in brisk winds, and perhaps with some occasional light sleet or snow, but with temperatures recovering somewhat during Monday.
Southwest England	60 %	Remaining cold at first, especially in strong winds, but temperatures recovering somewhat during

Cold Weather Alert

Tel: 0870 900 0100 www.metoffice.gov.uk



NHS (Ref: MO43)

Page 1 of 3

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<http://www.metoffice.gov.uk/public/weather/forecast/#?tab=main>

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Providing an authoritative source of information for:

- Health , social care and local authorities: commissioners
- Health , social care and local authorities: providers
- Health, social care and community professional staff
- GPs and Primary Care teams
- Community and voluntary sector
- Individuals





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① Key topics: Novel coronavirus updates

The Health Protection Agency

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Cold weather alert

The health effects of severe winter weather and advice on how to prepare

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Evaluation Report

Warm Homes, Healthy People Fund 2011/12



http://www.hpa.org.uk/webc/HPAw ebFile/HPAweb_C/1317136356595



Evaluation Report

Warm Homes, Healthy People Fund 2011/12



http://www.hpa.org.uk/webc/HPAw ebFile/HPAweb_C/1317136356595



Evaluation Report

Warm Homes, Healthy People Fund 2011/12



**Leeds Warm
Homes Healthy
People Fund**



Outcomes

Care & Repair

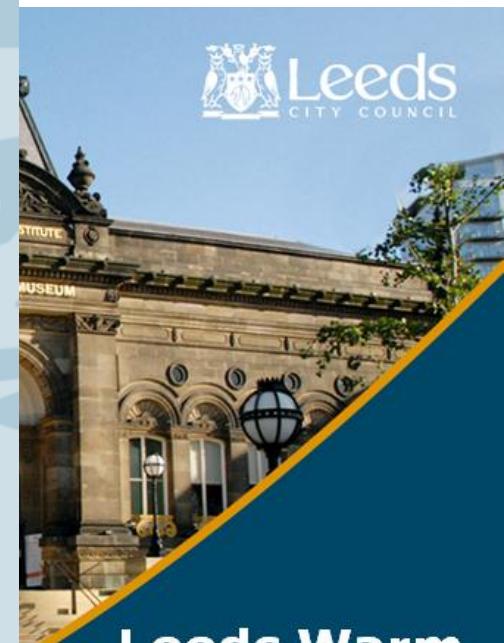
- Provided emergency heating repairs/ servicing to 265 vulnerable households

Groundwork

- Supported 90 additional households
- Provided additional measures to 63 households

Leeds Community Foundation

- 33 Community projects supported
- Reached over 8,000 vulnerable people
- Emergency boxes (tbc)



**Leeds Warm
Homes Healthy
People Fund**

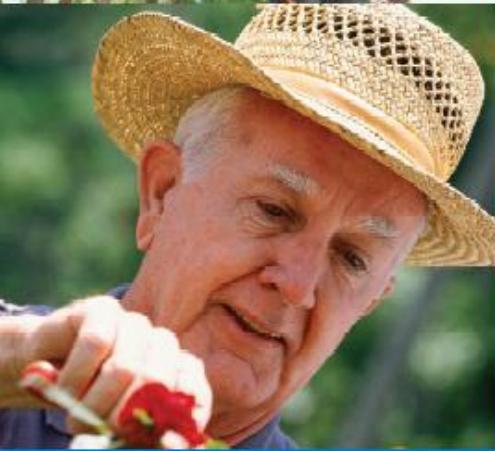
France, August 2003

~14800 deaths (30,000+ in Europe)





PLAN FOR ENGLAND 2012



PROTECTING HEALTH AND REDUCING HARM FROM SEVERE HEAT AND HEATWAVES



World Health Organization
Regional Office for Europe

PUBLIC HEALTH ADVICE



on preventing
health effects
of heat

NEW and UPDATED
information
for different audiences

Development of intervention measures



Short term strategies

Weather based
warning systems

Heat advice

Electric fans

Long term strategies to

Improve care of elderly
and high risk
individuals

Housing design

Reduce urban heat
island (more green
spaces, trees)





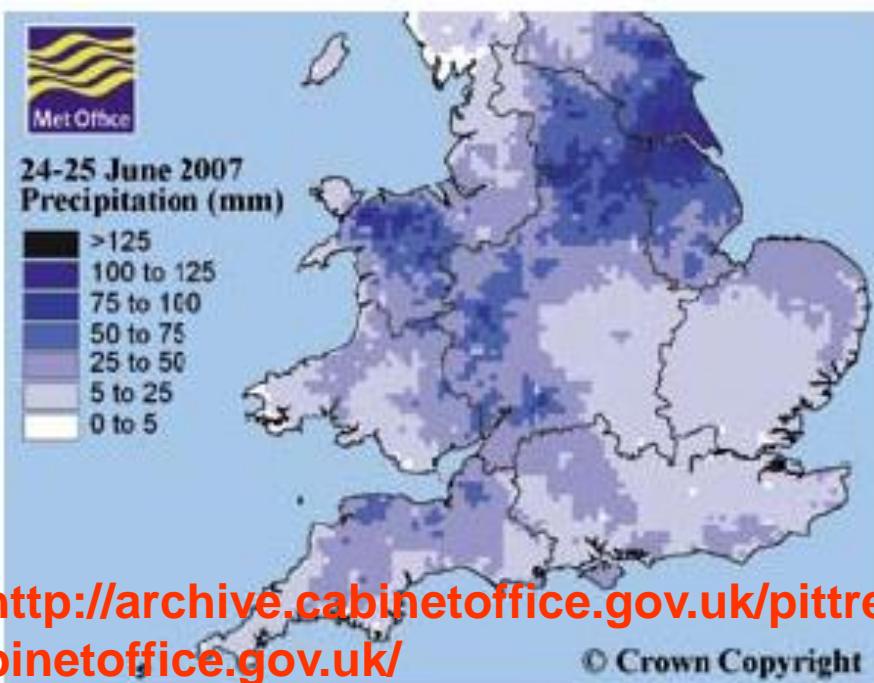
Flooding from River Don, outside South Yorkshire HPU offices, Sheffield, with a smoke plume from a concurrent fire at local steel works possibly caused by a short circuit due to flooding on Monday 25th June 2007

(© South Yorkshire Health Protection Unit).

Learning lessons
from the 2007 floods
An inspection review by Sir Michael Pitt

June 2008

Figure 1 – Precipitation Levels for England and Wales during



http://archive.cabinetoffice.gov.uk/pittreview/_media/assets/www.cabinetoffice.gov.uk/flooding_review/pitt_review_full%20pdf.pdf

Health

General info

This leaflet provides information to keep you and your family safe from flooding and general flooding advice can be seen at see website www.environment-agency.gov.uk

Main health risks

Drowning is the clearest and most obvious risk but can also be caused by falling into floodwater, such as missing manhole covers or holes in walls.

There is also a serious danger from generators and other fuel-burning equipment if they are not well ventilated.

Do not underestimate the risks of flooding. Take time to consider your safety when cleaning up, and remember that it is normal in these circumstances.

The risk from bugs in floodwater

Infection problems arising from contact with floodwater become very common. Here are some ways we can take:

- Wherever possible, try to avoid areas where you have to go into the floodwater. If you do, be careful of potential hazards.
- Wash your hands – this is important. Use warm, clean water from a toilet, before eating or preparing food. Sewage or with items washed in warm water, or wet clothes.
- Keep any open cuts or grazes covered. Wear waterproof plasters.

If you feel unwell

This leaflet provides information to keep you and your family safe from flooding and general flooding advice can be seen at see website www.environment-agency.gov.uk

How to clean

Further general advice is available in the leaflet 'Flood, which can be seen at see website www.environment-agency.gov.uk

Starting off
Put on protective clothing: rubber boots, waterproof trousers, mask, such as those sold in DIY stores, and a respirator for pressure-washing. Goggles of eye protection are essential for washing. Cover any open cuts or grazes.

Easy does it - The stress and strain of cleaning up can cause additional health problems

Take care with electrics and gas
Do not touch electrical equipment or plug anything into a socket unless you are sure there is no risk of electrocution.

Even if gas appliances appear to be working

they may still be affected. For safety reasons, turn off the gas supply.

Keep children safe: keep children away from floodwater until it has been completely cleared. Damaged tiles and floorboards may present a risk of injury to children.

Remember to wash your hands before eating or preparing food.

How and what to clean

Using clean water, detergent, soap and a scrubbing brush, clean surfaces, plates, pans, cutlery and crockery. Powerful disinfectants, such as bleach, can be used on surfaces.

Thoroughly clean all other affected items, such as furniture with hot soapy water. Clean as thoroughly as this will also help to remove any remaining debris.

Health advice -

Coping without mains water

This leaflet provides practical and health advice for managing in the home with disrupted or no mains water, and should be read together with latest information from your water company regarding the safety of the water supply.

Follow the advice

If you have a mains water supply, follow the advice of your local water company, which has a duty to protect public health. If there are problems with the supply then alternative water will be made available, such as bottled water or bowsers (large water transporters), but in the meantime consumers may be advised to boil tap water before drinking it.

Boiling water for use in the home

If your water company has advised you to boil your tap water, this will be for drinking and for food preparation. This water should be brought to a boil and then allowed to cool before it is used.

In these circumstances it is safe to use unboiled tap water to prepare food that is to be cooked, and for cooking if it will be boiled during the cooking process.

Boiling water can scald, so it is safer to use a kettle rather than pots and pans. If you must, use pots and pans then take care with young children and vulnerable people. Keep panhandles turned inwards so that children cannot reach them.

Water from the hot tap is not suitable for drinking in any circumstance.

Bowsers

Your water company may provide extra supplies of water through bowsers placed locally. This water should be safe to drink, but it requires boiling before use because the containers people use to transfer water from bowser to home may not be clean.

If your mains water is turned off

Only boiled bowser water or bottled water should be used for drinking, brushing teeth, washing food, cooking and making ice. If there is no gas or electricity available to householders to boil water then bottled water should be used in all circumstances.



Health advice: General information about mental health following floods

This leaflet provides important advice and information about the impacts of being flooded on people's mental health. See the Health Protection Agency flooding website for further advice about the other health effects of flooding:

[www.hpa.org.uk/Topics/EmergencyResponse/ExtremeWeatherEventsAndNaturalDisasters/
EffectsOfFlooding/](http://www.hpa.org.uk/Topics/EmergencyResponse/ExtremeWeatherEventsAndNaturalDisasters/EffectsOfFlooding/)

The latest alerts and general flooding advice are provided by the Environment Agency, see the website: www.environment-agency.gov.uk/homeandleisure/floods/default.aspx

Floods and mental health

Experiencing a flood can be frightening, and the activities of normal life can be disrupted. For most people, feeling temporarily distressed does not interfere with their abilities to cope with the process of recovery. However, it is important not to underestimate the stress and strain of being flooded and cleaning up after floods. Take the time to consider your and your family's mental health and well-being. Do not overdo it when cleaning up, and remember that tiredness



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 A photograph showing a white car completely submerged in floodwater up to its roofline. The water covers the entire street, and a stone wall is visible on the left. The word "FLOODING" is prominently displayed in large white letters across the center of the image.

FLOODING

The Health Protection Agency has prepared advice for the public and healthcare professionals on the effects of flooding

[» Read more about flooding](#)

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Disaster Risk Management

Global Platform for Disaster Risk Reduction

Expert guidance

PHASE

Additional expert centres and sources of information

Climate Change and Extreme Events references

Drought

What is drought?

A drought is a period of water shortage for people, the environment, agriculture or industry. A hot, dry summer is an example of a short, intense drought; dry winters can have a big impact on water resources. It is extremely unlikely that public health in the UK will be detrimentally and directly affected by drought. However, drought can lead to situations where health can be put at risk. Several factors play a part in contributing to a drought, including:

- lack of rainfall
- an environment/soil which is poor at retaining water
- hot weather which increases evaporation of water

Modern forecasting systems are increasingly good at predicting how severe a drought will be and which areas will be affected, but it is difficult to predict a drought more than a month in advance for most locations.

Am I affected?

- The Environment Agency [external link] produces maps of drought affected areas

External Links

- » [British Geological Survey](#)
- » [Environment Agency](#)
- » [Met Office Climate prediction](#)
- » [Centre for Ecology & Hydrology](#)
- » [Defra - water](#)
- » [Drinking Water Inspectorate](#)

Health Impacts of Wildfires

November 2, 2012 · Research article

Sarah Elise Finlay¹, Andrew Moffat², Rob Gazzard³, David Baker¹, Virginia Murray¹

1 Health Protection Agency, **2** Forest Research, **3** South East England Wildfire Group

Finlay SE, Moffat A, Gazzard R, Baker D, Murray V. Health Impacts of Wildfires in England. PLoS ONE 2012; 7(11):e47600. doi:10.1371/journal.pone.0047600

Abstract

Introduction

Wildfires are common globally. Although there has been considerable work on the health effects of wildfires in countries such as the USA where they occur frequently there has been little work in the United Kingdom. Climate change may increase wildfire frequency, therefore there is an urgent need to further understand the health impacts of wildfires. This study was designed to review current evidence about the health impacts of wildfires from a UK perspective.

Methods

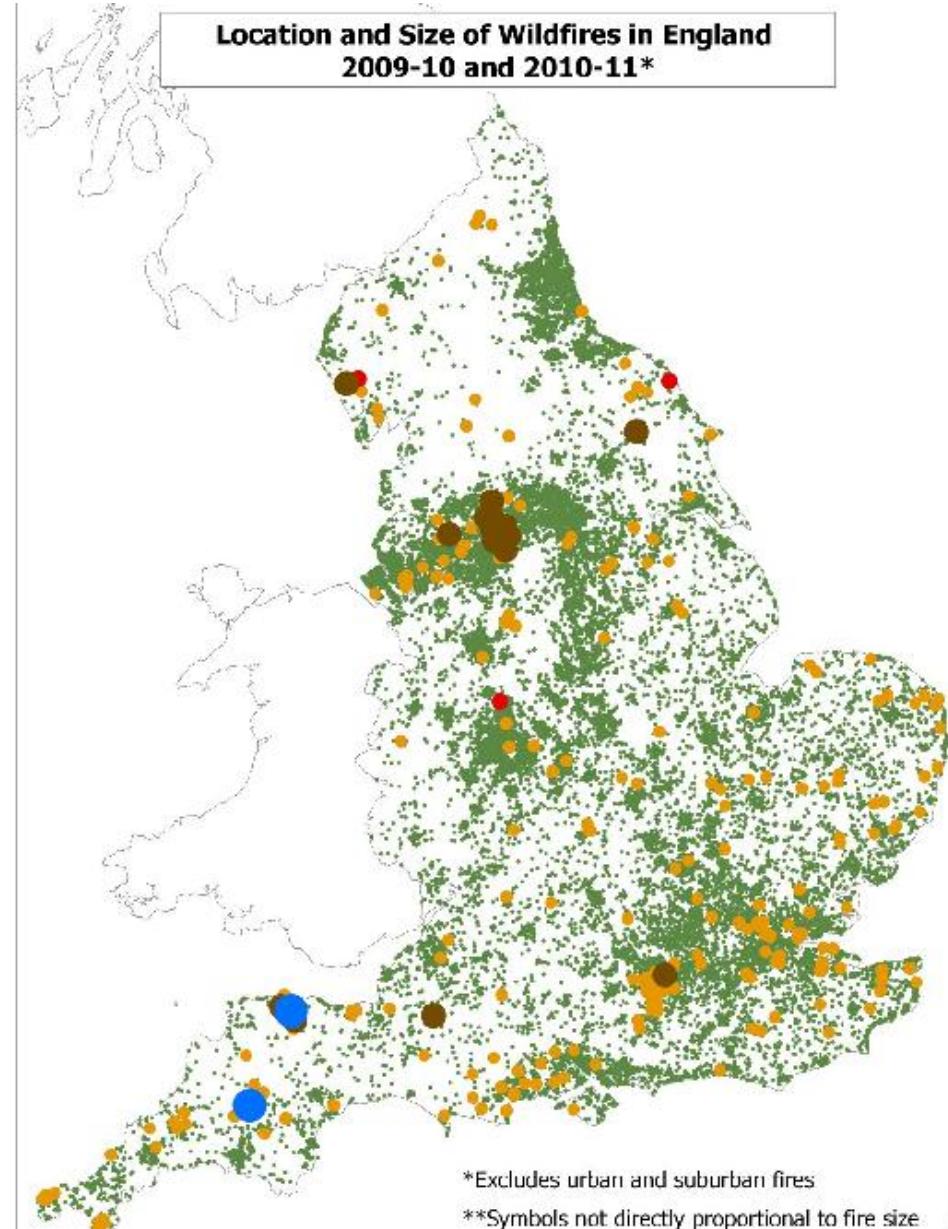
A comprehensive literature review of international evidence regarding wildfire health impacts was conducted in January 2012. Further information was gathered from authors of relevant studies.

Results

A review of the published evidence shows that human health can be severely affected by wildfire smoke. Vulnerable populations are particularly vulnerable. Wood smoke has high levels of particulates and other pollutants. Respiratory morbidity predominates, but cardiovascular, ophthalmic and skin conditions are also affected. Addition severe burns resulting from direct contact with the fire require considerable medical attention. There are also significant multi-organ complications. The wider health implications from spreading smoke and ash are less well understood and concern. Access to affected areas and communication with populations living near the fires is a key issue.

Conclusion

This study has identified factors that may reduce public health risk from wildfires. However, more research is needed to evaluate longer term health effects from wildfires. An understanding of the health impacts will inform preparedness within health care services for such events.



*Excludes urban and suburban fires

**Symbols not directly proportional to fire size

Fire size - UK Vegetation Fire Standard classification**

- Landscape Scale ≥ 1000 ha
- Very Large 100 - 999 ha

- Large 50 - 99 ha
- Medium 1 - 49 ha
- Small $1\text{m}^2 - 1\text{ha}$



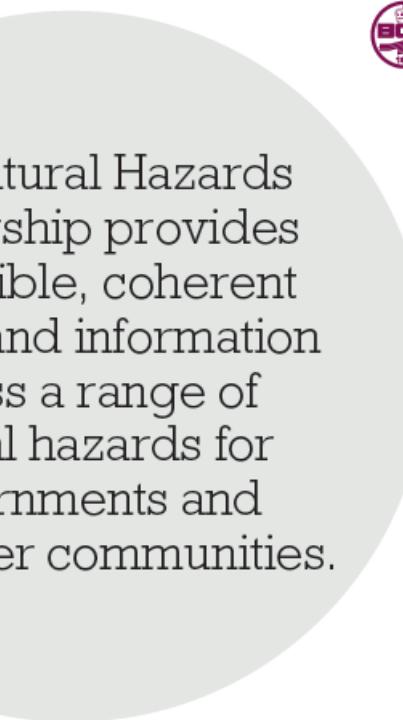
Forestry Commission
England

12,800,000

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Natural Hazards Partnership

CabinetOffice



The Annual Report of the Director of Public Health in Leeds 2010

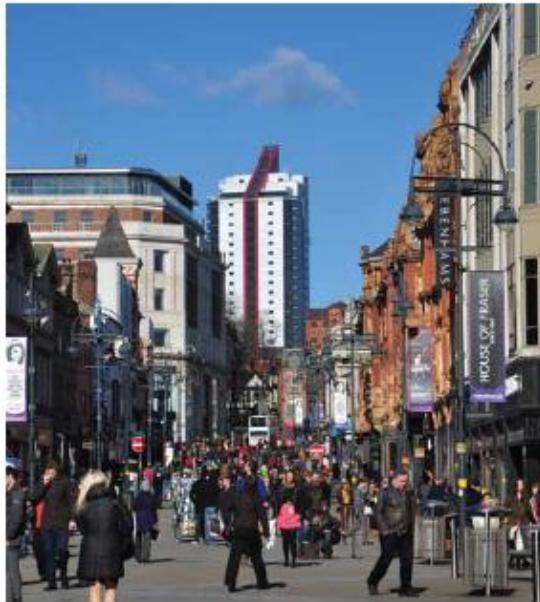
Sustainable Living. Healthy Lives.



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Leeds|Joint Strategic Needs Assessment 2012

Executive Summary

<http://www.leedsinitiative.org/assets/0/348/350/356/378/7d6f2080-a7fd-4b39-8421-1186cadbce3d.pdf>

Housing



Stable, sustainable and good quality housing is a prerequisite for good health. The biggest housing challenge for Leeds is provision of enough affordable, accessible and good quality housing to meet the city's growing population. To be classed as 'decent' a house must be warm, weatherproof and have reasonably modern facilities.

Leeds Joint Strategic Needs Assessment 2012

Executive Summary

<http://www.leedsinitiative.org/assets/0/348/350/356/378/7d6f2080-a7fd-4b39-8421-1186cadbce3d.pdf>



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Climate change



There is a broad scientific consensus that human activity is contributing to climate change. All over the world governments and populations are having to plan for, and adapt to, the effects that a changing climate is bringing to daily life.

In the UK the Health Protection Agency is the official adviser to all arms of the UK government, including the devolved administrations, on the health effects of climate change.

Climate change has both long-term, such as sea-level rise, and short term, such as extreme weather events, components, both of which can have public health implications.

Research into the health effects of climate change in the UK is undertaken at the HPA's Centre for Radiation, Chemical and Environmental Hazards.

Health Effects of Climate Change 2012

In September 2012 the HPA's Centre for Radiation, Chemical and Environmental Hazards published the Agency's latest assessment of the threats to UK public health

External Links

[» Health effects of climate change in the UK 2008](#)

Health effects of climate change in the UK – Current evidence, recommendations and research gaps



1. Climate change in the UK: current evidence and projections
2. **Temperature** effects of climate change on human health
3. Health effects due to changes in **air pollution** under future scenarios
4. Effects of **aeroallergens** on human health under climate change
5. Health effects of climate change in the **indoor environment**
6. Climate change, **ultraviolet radiation** and health
7. Health effects of **flooding**, and adaptation to climate change
8. Effects of climate change on **vector-borne diseases**
9. **Water and food-borne diseases** under climate change
10. **Health co-benefits** of policies to reduce greenhouse gas emissions

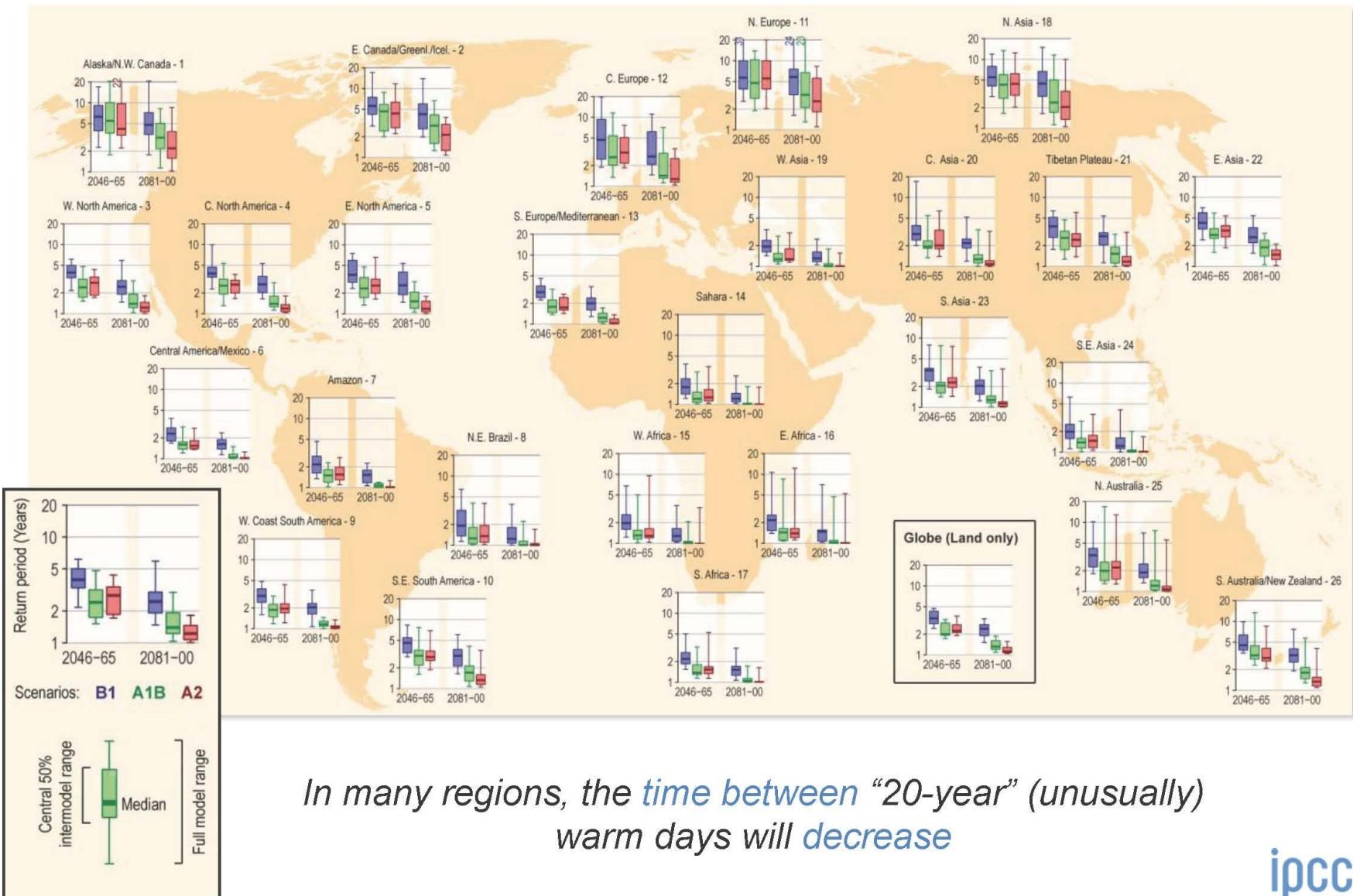


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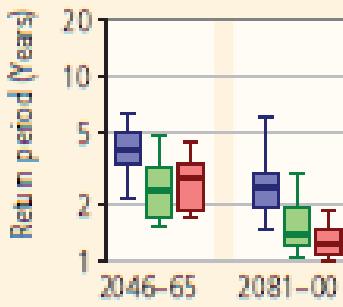
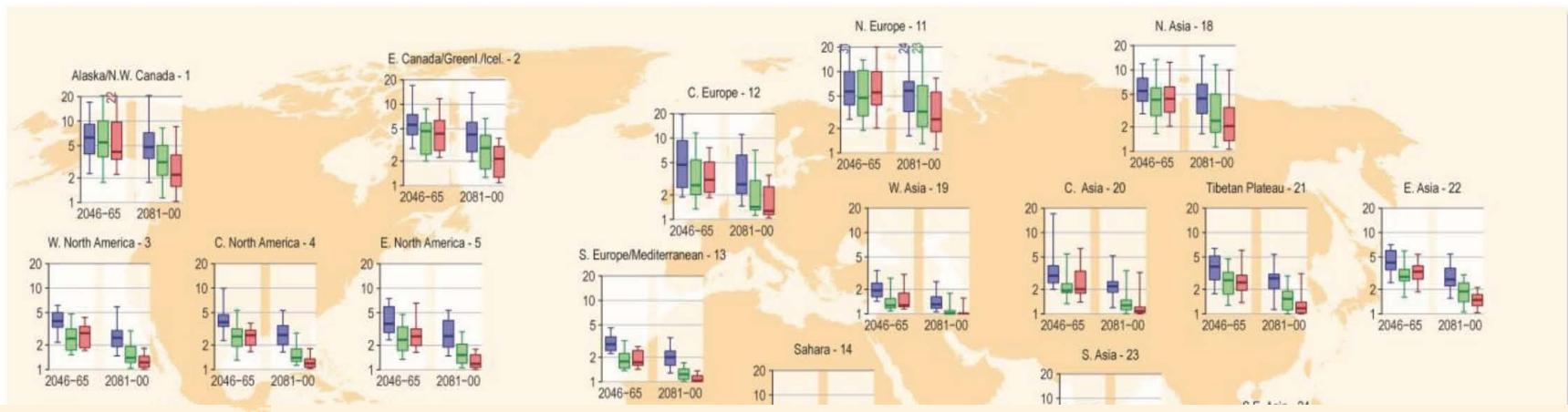


The IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

Climate models project more frequent hot days throughout the 21st century



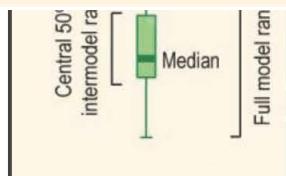
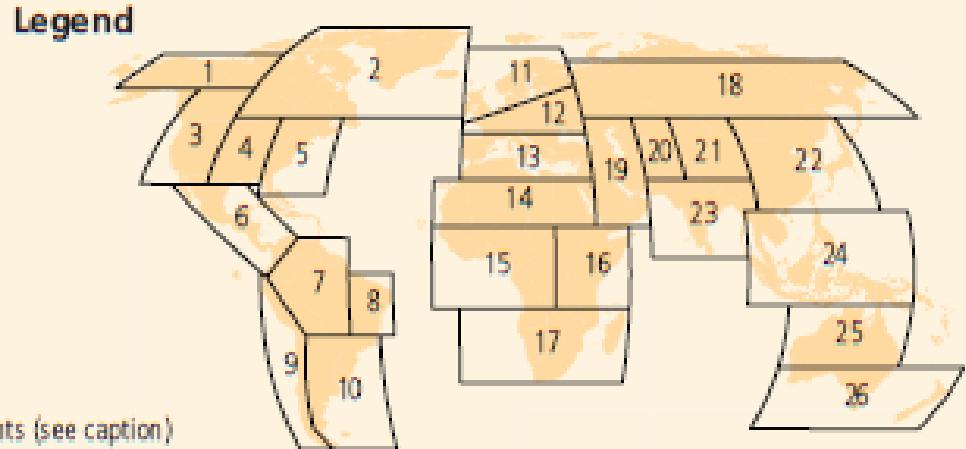
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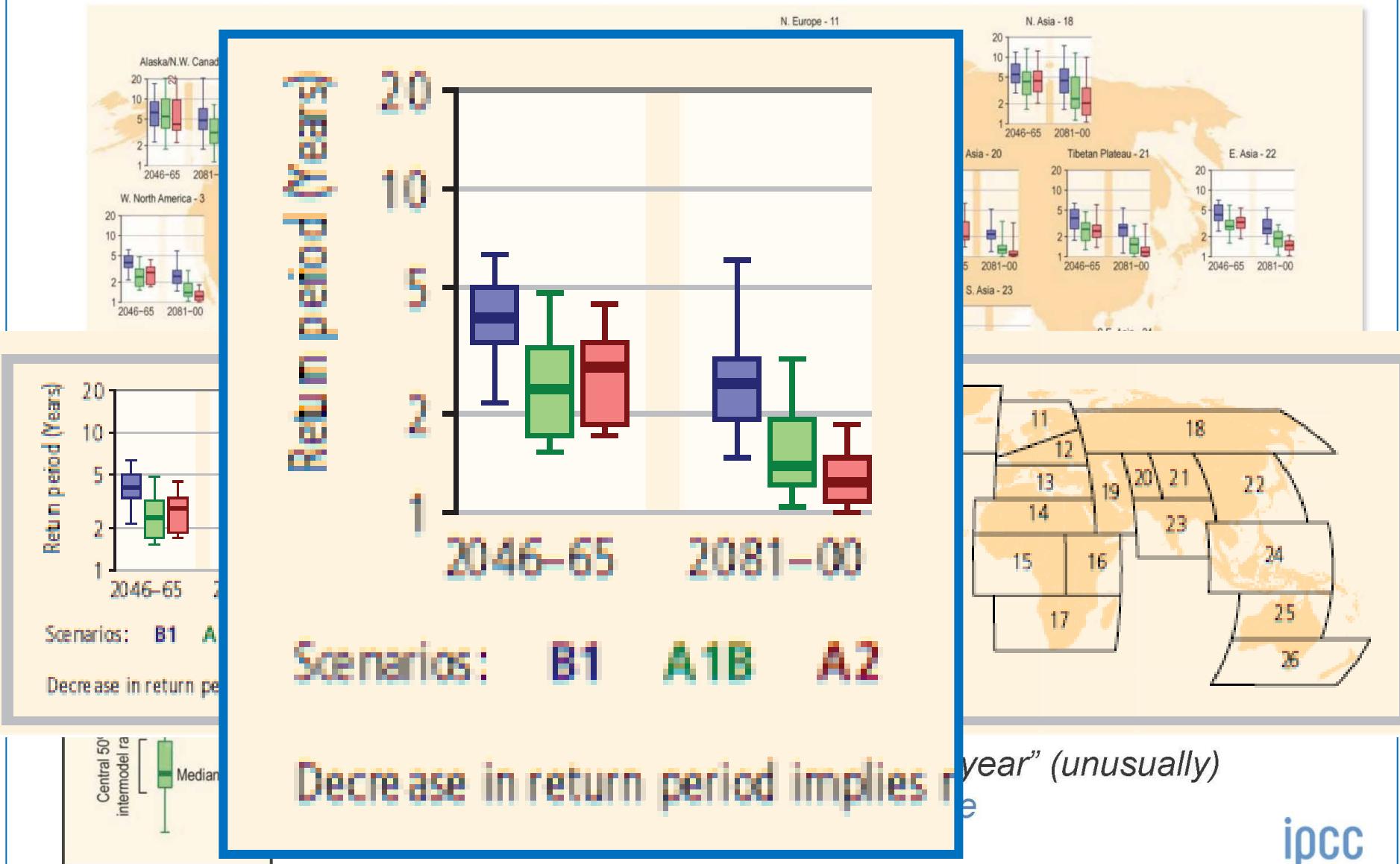
Scenarios: B1 A1B A2

Decrease in return period implies more frequent extreme temperature events (see caption)

In many regions, the time between “20-year” (unusually) warm days will decrease



Climate models project more frequent hot days throughout the 21st century



Managing the risks: heat waves in Europe

Risk Factors

- lack of access to cooling
- age
- pre-existing health problems
- poverty and isolation
- infrastructure



France, August 2003 (over 14,000 dead)

Risk Management/Adaptation

- cooling in public facilities
- warning systems
- social care networks
- urban green space
- changes in urban infrastructure

Projected: *likely* increase in heat wave frequency and *very likely* increase in warm days and nights across Europe

Extreme Events and Climate Change – the emerging local challenges?



- **Public health preparedness and response to a changing climate and extreme events is vital** - health professionals can reduce impacts from current and future hazards to **minimise potential health impacts**
- **Working with local HWBBs and their JSNAs to offer a route in partnership with PHE to build preparedness for people, services and communities**





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Extreme Events

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