

Local health and wellbeing in a changing climate

Building preparedness for people, services and communities

Extreme Events and Climate Change – the emerging local challenges?

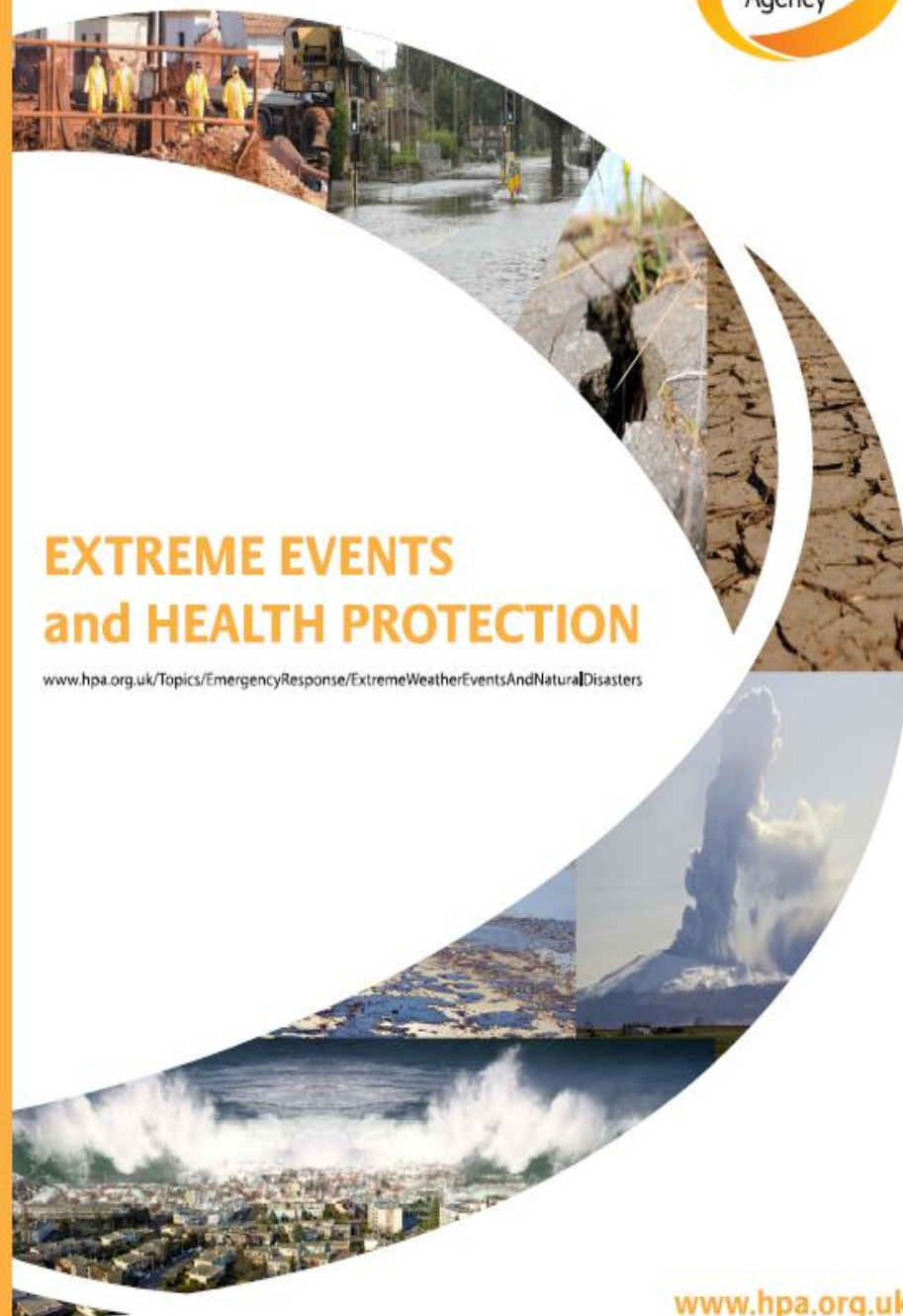
Professor Virginia Murray
Health Protection Agency

March 6, 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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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](#)
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[» CDC - Natural Disasters & Severe Weather](#)
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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...



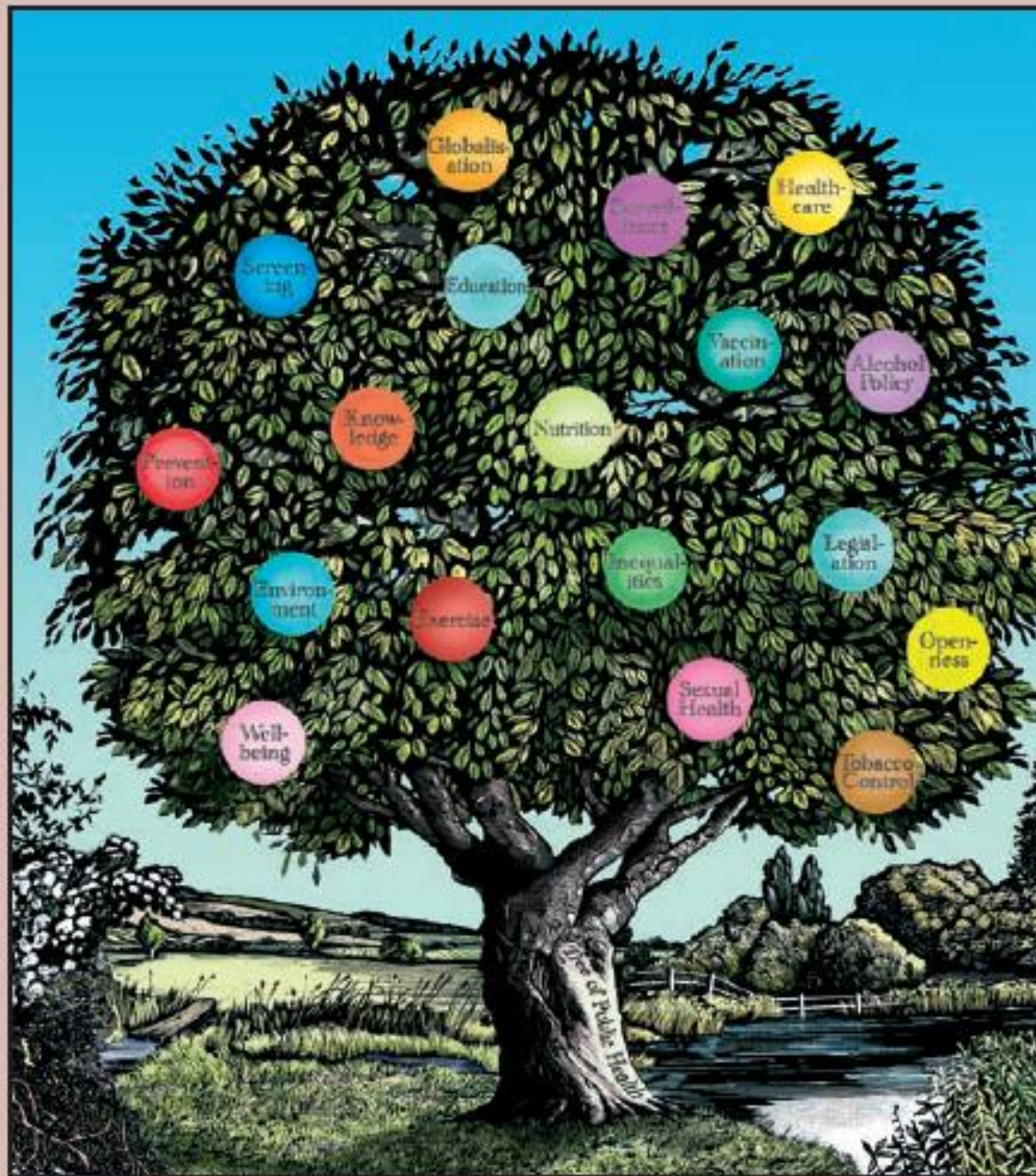
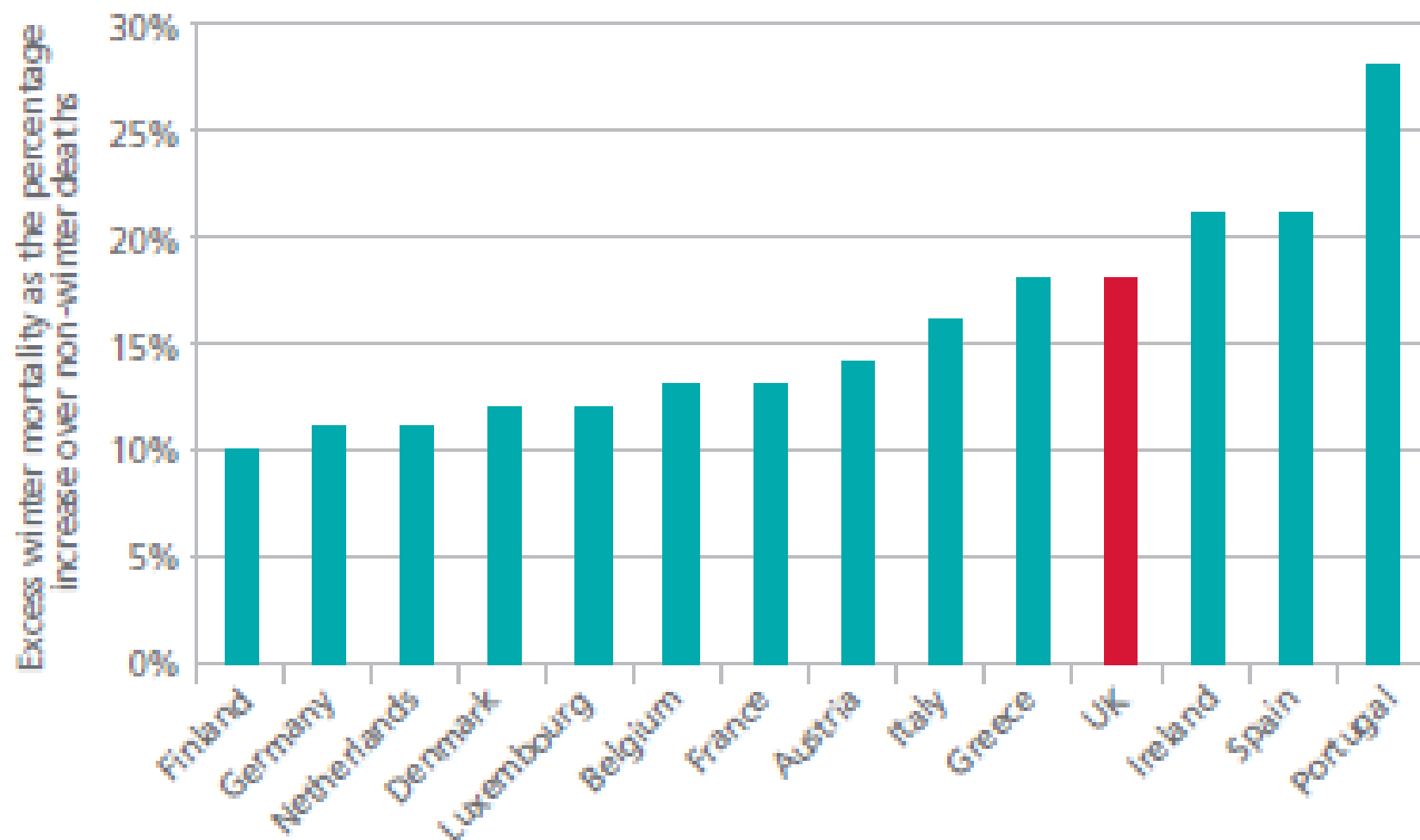


Figure 2: Excess winter mortality by country



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 h 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

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.

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

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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Flooding

Norovirus

Cold weather alert

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

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» HPA update on seasonal norovirus activity
News | 12 December 2012

» Challenges still to be met in reducing occup
News | 7 December 2012

» HPA update on seasonal norovirus activity
News | 4 December 2012

» Whooping cough cases continue to increas
News | 30 November 2012

Evaluation Report

Warm Homes, Healthy People Fund 2011/12



[http://www.hpa.org.uk/webc/HPAw
ebFile/HPAweb_C/1317136356595](http://www.hpa.org.uk/webc/HPAw ebFile/HPAweb_C/1317136356595)

Case study 7: Providing duvets to vulnerable families

The Bayswater Family Centre works annually with 700 of the most vulnerable families in Westminster, including families fleeing domestic violence, those with no recourse to public funds and those in temporary accommodation.

Recognising the issue of child poverty in the borough, Westminster council's housing team wanted to build

Case study 12: Strengthening Age UK's volunteer force

One component of Lambeth's WHHP project aimed to strengthen the capacity of Age UK Lambeth's existing volunteer workforce. As a result of the advertising put in place, 42 additional volunteers were recruited (and retained) by Age UK. Volunteers participated in events, home visits and advertising/marketing the project. A wide range of volunteers were engaged, including people with

Case study 8: Knitting group

Waltham Forest council promoted a local knitting group, many of whom had previously volunteered for Age UK, Waltham Forest, to provide 'warm layers' for older people on pension credit. They were provided with wool, and the knitting took place at their homes or during 2 afternoon tea knitting events (the first a Jubilee Tea Party).

To date, 137 hats, 36 gloves, 75 scarves, 13 pairs of socks, 6 blankets and 1 poncho have been produced, and distributed to vulnerable residents in Waltham Forest.

This sustainable local initiative has added value; many of the knitters were elderly themselves, and so the group provided a social opportunity in addition to the feeling of 'giving something back'.

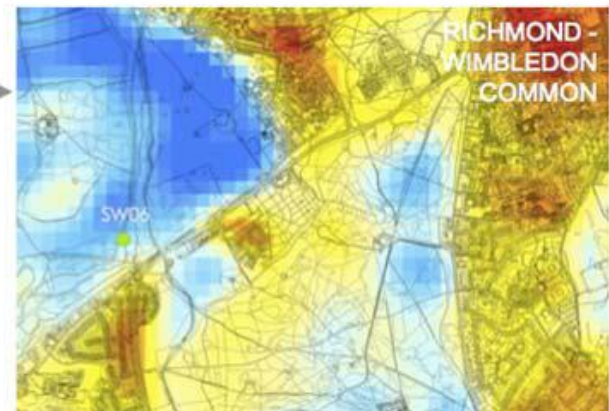
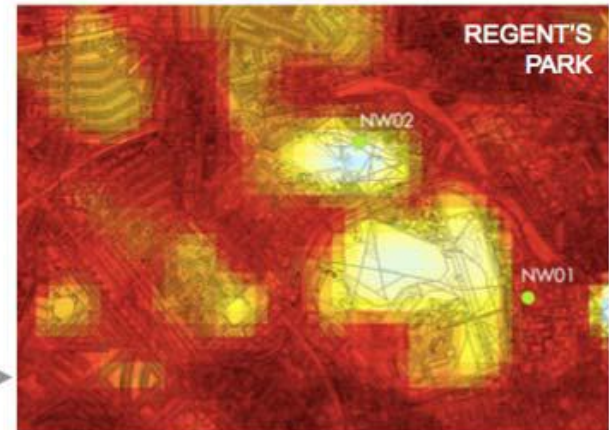
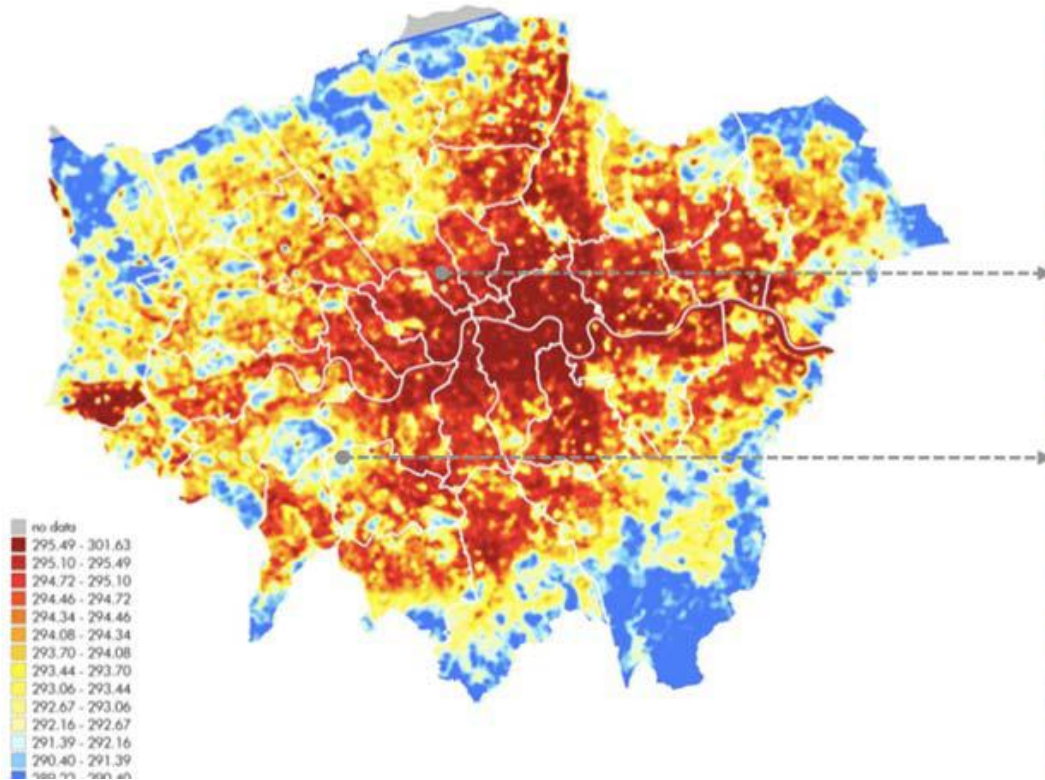
France, August 2003

~14800 deaths (30,000+ in Europe)



Overheating

Land Surface Temperature, 12 July 2006
(ASTER satellite image)





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)



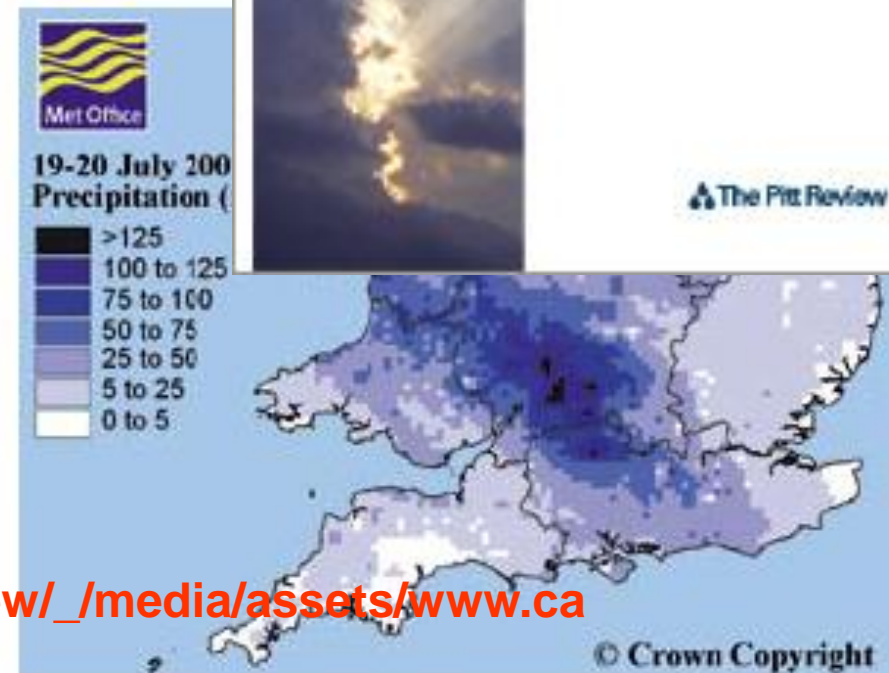
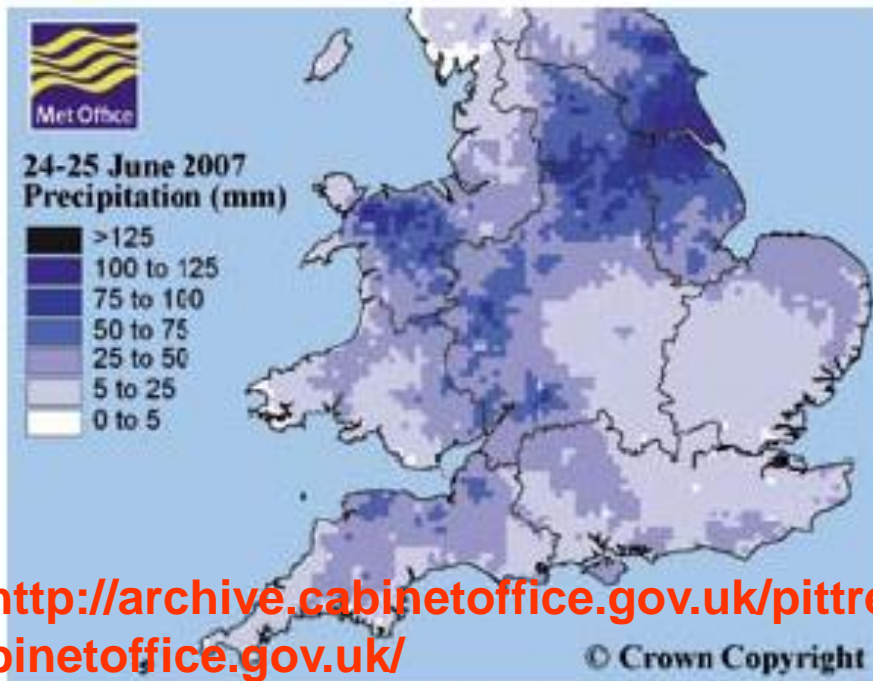


Flooding from River Don, outside South Yorkshire HPU offices, Sheffield, with a smoke plume from a concurrent fire at local steel works possibly caused by a short circuit due to flooding on Monday 25th June 2007

(© South Yorkshire Health Protection Unit).

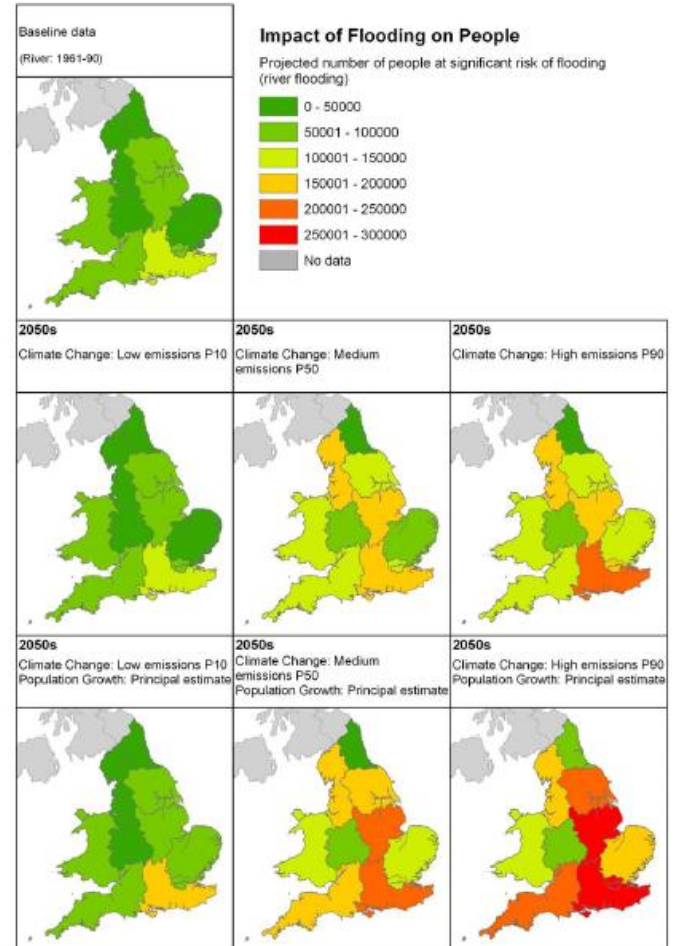


Figure 1 – Precipitation Levels for England and Wales during



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

Flooding



Health

General info

This leaflet provides information to keep you and your family safe and general flooding advice. For more information see website www.environmental.gov.uk

Main health risks

Drowning is the clearest and most immediate risk also be caused by falling in floodwater. Other risks such as missing manhole covers.

There is also a serious danger from gas generators and other fuel-burning equipment. Ensure they are well ventilated.

Do not underestimate the risk of infection. Take time to consider your health when cleaning up, and remain calm in these circumstances.

The risk from bugs in floodwater

Infection problems arising from floodwater become very serious if we can take:

- Wherever possible, try to avoid having to go into the water. If you do, be careful of potential contamination.
- Wash your hands – try to use clean water. Use warm, clean water from a toilet, before eating or drinking, and after sewage or with items that have been in warm water, or wet.
- Keep any open cuts covered. Wear waterproof gloves.

If you feel unwell

Health

How to clean

This leaflet provides information to keep you and your family safe. Further general advice is available from the Flood, which can be seen on the website.

Starting off

Put on protective clothing: rubber boots, mask, such as those sold in DIY stores. Avoid pressure-washing. Goggles of safety. Cover any open cuts.

Easy does it - The stress and strain of floodwater can cause additional health problems.

Take care with electrics and gas. Avoid contact with floodwater unless necessary. Risk of electrocution.

Even if gas appliances appear to be working, they may be affected. For safety reasons, turn them off.

Keep children safe: keep children away from floodwater until the danger has been completed. Damaged toys may present a risk of injury to children.

Remember to wash your hands after eating or preparing food.

How and what to clean

Using clean water, detergent, and disinfectant. Surfaces, plates, pans, cutlery. Powerful disinfectants, such as bleach, can be used on surfaces.

Thoroughly clean all other affected items and furniture with hot soapy water. Wash thoroughly as this will also help to prevent infection.

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 bowzers (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 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.

Bowzers

Your water company may provide extra supplies of water through bowzers 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.

Cleaning water containers and taps



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/

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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Flooding

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

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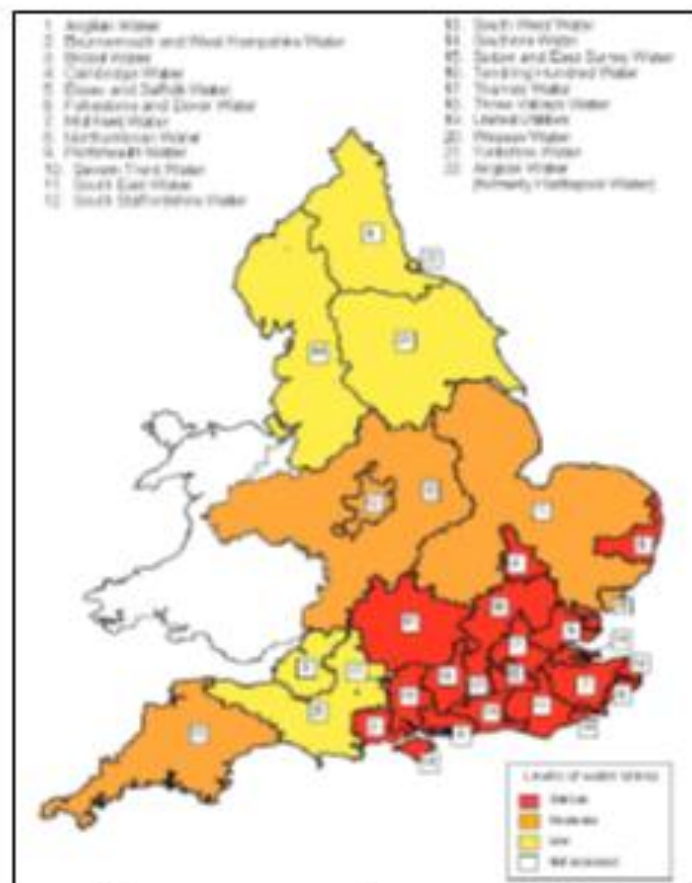
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Drought



Population Affected ('000s)

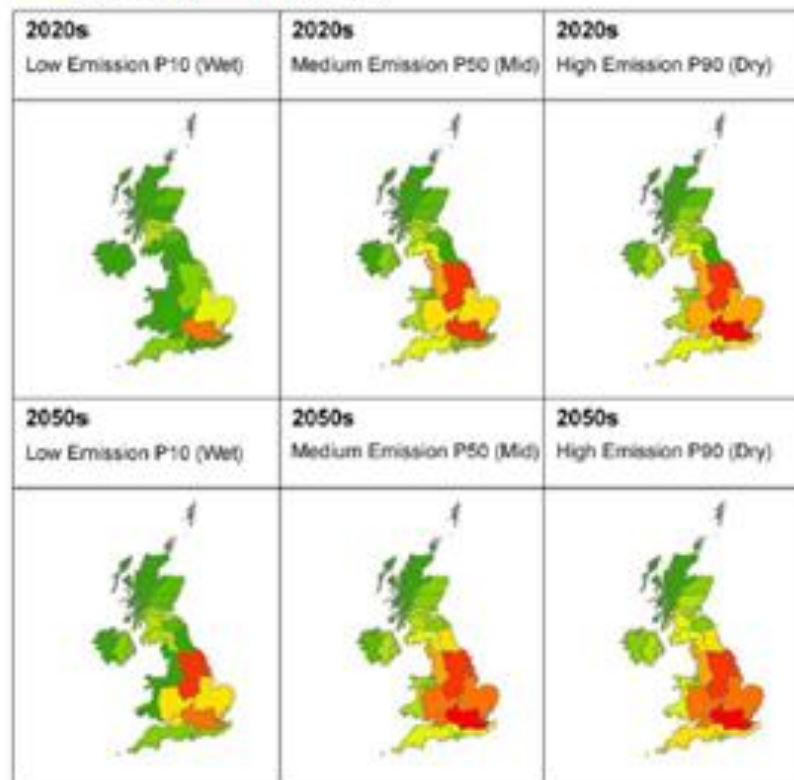
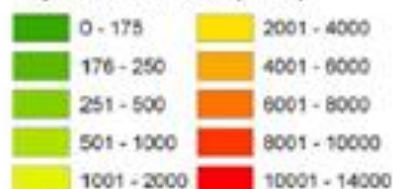


Figure 5.9 The population affected by a supply-demand deficit due to climate change only

Projections are shown by UKCP09 river basin region



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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 page](#)

[» 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

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

Finlay SE, Moffat A, Gazzard R, Baker D, Murray V. Health Impacts of Wild
Nov 2 [last modified: 2012 Nov 2]. Edition 1. doi: 10.1371/4f959951cce2c

Abstract

Introduction

Wildfires are common globally. Although there has been considerable wo
wildfires in countries such as the USA where they occur frequently there
investigate health effects in the United Kingdom. Climate change may in
frequency, therefore there is an urgent need to further understand the h
wildfires. This study was designed to review current evidence about the l
standpoint.

Methods

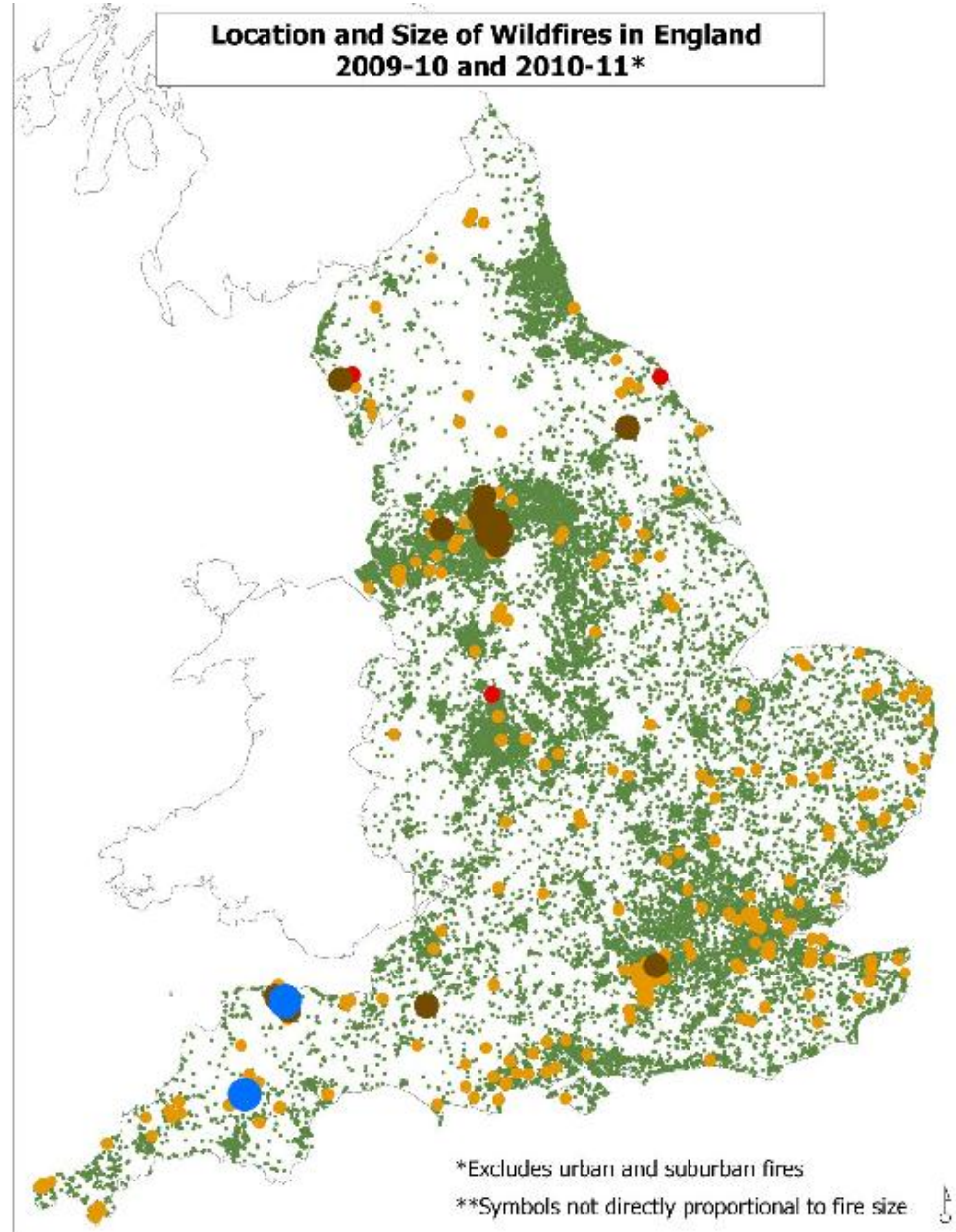
A comprehensive literature review of international evidence regarding wi
conducted in January 2012. Further information was gathered from autho

Results

A review of the published evidence shows that human health can be seve
populations are particularly vulnerable. Wood smoke has high levels of p
Respiratory morbidity predominates, but cardiovascular, ophthalmic and
addition severe burns resulting from direct contact with the fire require c
multi – organ complications. The wider health implications from spreadin
concern. Access to affected areas and communication with populations li
risk.

Conclusion

This study has identified factors that may reduce public health risk from
needed to evaluate longer term health effects from wildfires. An underst
preparedness within health care services for such events.



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 $1m^2$ - 1 ha

Natural Hazards Partnership



The Natural Hazards Partnership provides accessible, coherent advice and information across a range of natural hazards for governments and responder communities.

Multi Hazard Strategic Assessment Sheet



Initial Objectives:

Provide an at a glance 'All Hazards' summary

Issue daily at 2pm to Partners only

To cover the following hazards with contributions from all partners:

- Flood
- Weather
- Volcanic Ash
- Space weather
- Wildfires
- Geological hazards



Issued 14:00 on Monday, 23 May 2011

For NHP task group members only. Not for circulation

Natural Hazards Summary: VOLCANO, WIND, WILDFIRES.

VOLCANIC ASH: - The Icelandic Met Office reported that Grimsvoth erupted around 1900UTC on 21st May. VAAC London aviation charts have been produced to NATS/CAA as per agreed instructions.

See below brief assessment of ash trajectories over the next few days.

The Met Office have issued an Amber wind warning for the north of England, Northern Ireland and Scotland for today Monday 23rd May.

The risk of wildfire is Yellow in parts of the southeast and east.

UK Hazard events for the next five days

- The Icelandic Met Office reported that Grimsvoth erupted on Saturday 21st May. The plume height according to radar is currently 8-10Km. VAAC London aviation charts are being produced and sent to NATS/CAA as per agreed instructions. See Modelled Ash Concentration Charts valid at 1200UTC on 24th and 25th below.
- "Any ash emitted today Monday 23rd is likely reach Scotland overnight tonight and into Tuesday morning. At this stage it seems that the higher concentrations would probably not come further south into Ireland or other parts of the UK, but extend east across the North Sea into southern Norway and Denmark. Scotland again looks at risk for Wednesday before clearing by Thursday, and with a northwesterly flow pattern likely for the end of the week, the whole of the UK could be at risk of ash from Friday onwards should the eruption continue through this period. Later in the weekend and into next week, the signs are that a westerly flow will develop, making the UK less at risk."
- An amber wind weather warning has been issued for the northern half of the British Isles for severe gales during Monday. Gusts of 60 mph are expected widely with gusts of 70 mph probable across parts of northern England, Northern Ireland and Scotland. Very exposed areas may see gusts as high as 80 mph. Some disruption to transport and power supplies as well as damage to trees and interruption to outdoor activities is expected.
- Wildfires: An area of medium to high fire severity conditions is expected to continue into the middle of the week across the southeast of England covering an area from Wiltshire to Kent in the south, across to East Anglia, and as far north as the southern fringes of Yorkshire. See the initial spread index maps below.
- Geomagnetic Activity is expected to remain quiet to unsettled for the next three days (23 May – 26 May).



Natural Hazards Partnership Strategic Assessment

Issued 14:00 on Wednesday, 13 February 2013

The Strategic Assessment is still under development and is for guidance only.

You are advised to seek detailed information before taking any action.

Hazards Five Day Summary – EXTREME TEMPERATURES: AMBER, SNOW/ICE: YELLOW, WIND: YELLOW, LANDSLIDE: YELLOW

EXTREME TEMPERATURES: - Cold Weather Alert 'Level 3' remains in force until Thursday morning, forecasting low temperatures, widespread icy conditions and snowfall for Midlands northwards for a time on Wednesday. (this service covers England only).

SNOW/ICE: - Snow will continue to affect Scotland, northern and central England and some eastern parts of Wales during the rest of Wednesday, with drifting and local blizzards in the strong winds, especially in northern UK. Risk of ICE for a time as snow turns to rain this evening.

WIND: - Severe gales are expected to affect the Orkney and Shetland for a time during Wednesday afternoon and evening.

LANDSLIDE: - A combination of widespread saturated ground conditions and heavy showers of rain and



Linking environment and health

A resource for policy and decision makers
working on Joint Strategic Needs Assessment

November 2012

Figure 5: Health Effects of Extreme Weather

Health outcome	Known effects of weather/climate
Heat stress, cold stress	Deaths from heart- and lung-related diseases increase with hotter and colder temperatures. Heat-related illnesses (heat cramps, heat exhaustion and heat stroke) and death increase during heatwaves.
Air pollution related morbidity and mortality	Weather affects air pollution concentrations with impact on those with respiratory disease, asthma or hayfever, bronchitis, emphysema, COPD, heart disease or angina. Weather affects the distribution, seasonality and production of air-transported allergens.
Flooding related morbidity and mortality	Floods cause direct effects (deaths and injuries), infectious diseases, long-term mental health problems, and (temporary) problems access to health services.
Vector-borne diseases	Higher temperatures shorten the development time of pathogens in vectors and increase the potential transmission to humans.
Water- and food-borne diseases	Survival of important bacterial pathogens is related to temperature. Increases in drought conditions may affect water availability and water quality due to extreme low flows. Extreme rainfall can affect transport of disease organisms into water supply.
Cataracts, skin cancers and sunburn	More cloud-free days and higher temperatures may encourage potential risk of overexposure to UV radiation.

Source: Kovats et al. (2005) *Climate Change and Human Health in Europe*



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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, Chemicals 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

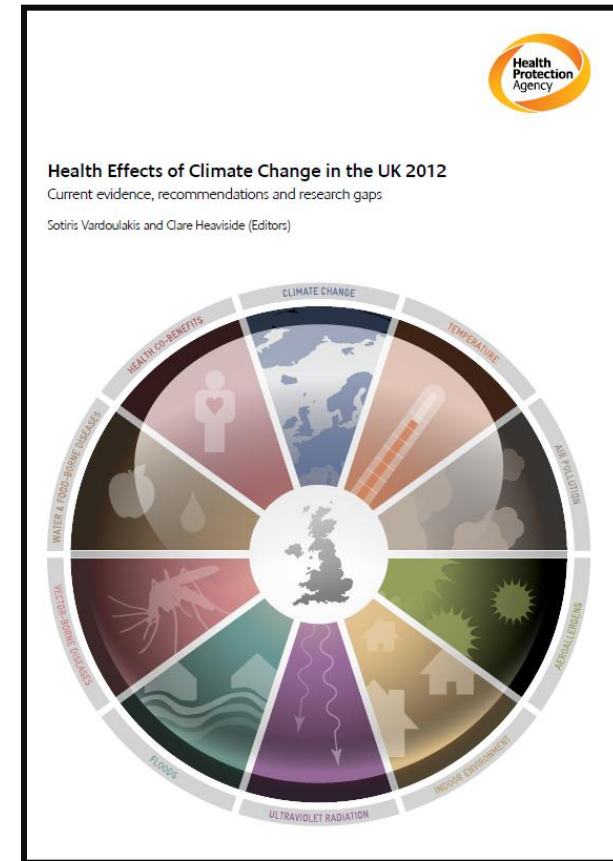
External Links

[» 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

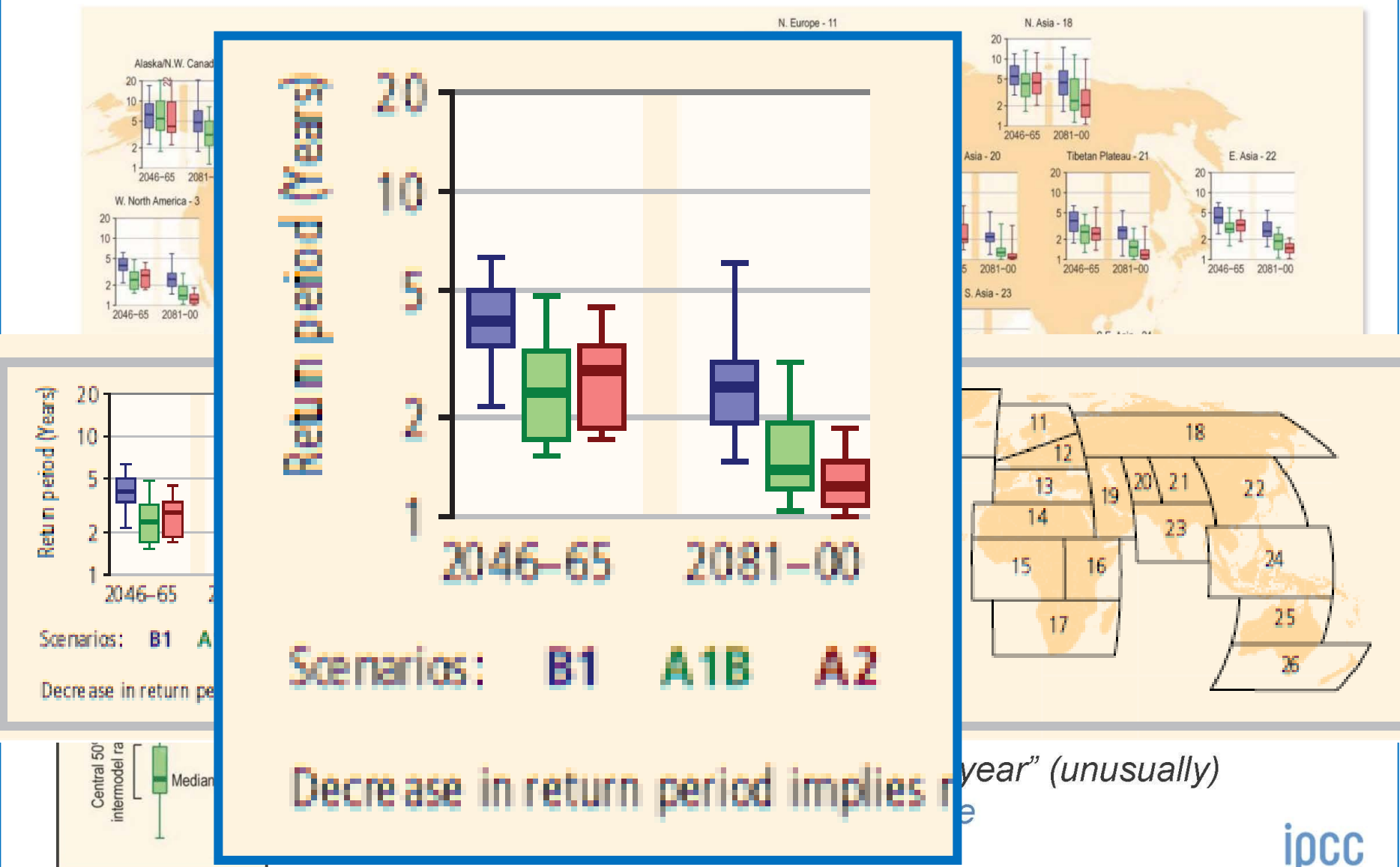


<http://www.hpa.org.uk/HECC2012/>



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



Managing the risks: **heat waves** in Europe

Risk Factors

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



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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Health Effects of Climate Change

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