

Mapping Expected Health Impacts in 2030 Among Older People Due to Climate Change *(Examples from the BIOPICCC project)*

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<http://www.dur.ac.uk/geography/research/researchprojects/biopiccc/>



The UK perspective on climate change hazards

Climate/sea level change:

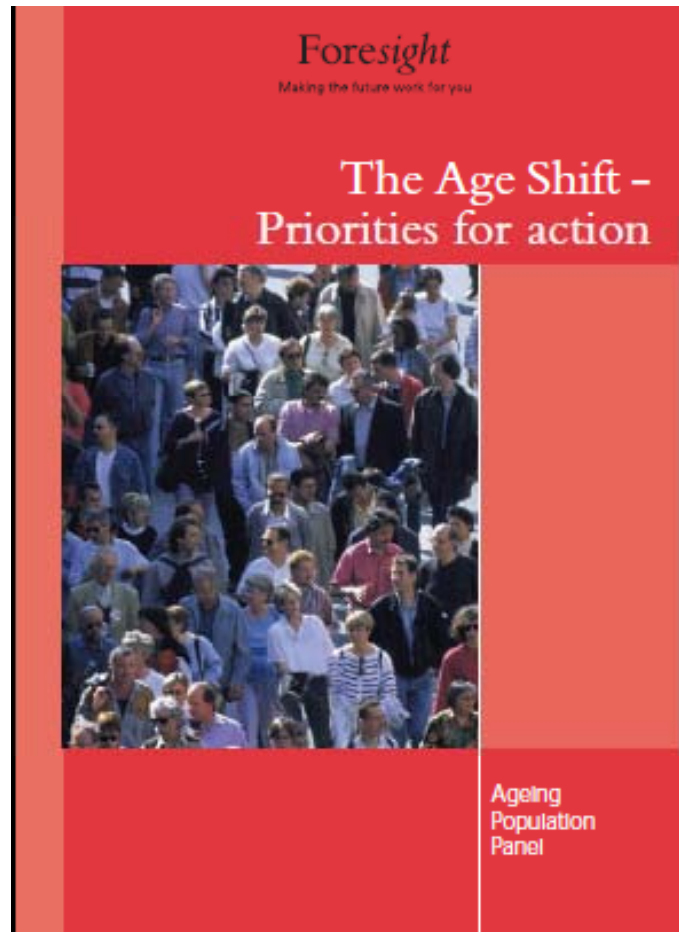
Greater frequency and ***intensity*** of weather-related **hazards** in the UK

e.g. UK Climate Projections Briefing Report 2009:

- **heat waves**
- **floods**



Population ageing in the UK



Population ageing increases vulnerability:

% older people in the UK will increase:

- e.g. Popn. over 85 years projected to increase x 2.5 between 2009 and 2034 (1.4m to 3.5m)

(<http://www.statistics.gov.uk/cci/nugget.asp?id=2157>)

National prospective assessment of implications for health and social care systems and the infrastructures supporting them

- Focus on adaptation and resilience as well as mitigation;
- requires prospective impact assessment by multiple sectors

e.g. **NHS Heatwave plan for England** (2010)

Long-term/ general preparedness:

- 'greener' /more 'heat resilient' infrastructure;
- raise public and professional awareness and consult on strategic planning.

Short term preparedness

(if 60% chance of heatwave in 2-3 days) action in community and health care facilities to put intervention strategies on 'stand-by';

Heatwave event: active risk monitoring; public information; intervention.



Local adaptation and resilience strategies must be sensitive to variations in hazard and vulnerability

Research to support local impact assessment and strategic planning
Multi disciplinary team from Durham and Heriot-Watt Universities.

BIOPICCC :

Built Infrastructure for Older People in Conditions of Climate Change

Map regional variations in future hazards

Map local variations in 'vulnerability' in the population

Select 'case studies' of local areas most 'at risk' for in depth analysis

Explore how to adapt systems engineering models for built infrastructure to make it more resilient to climate change risks.

Disseminate 'demonstration projects' and 'toolkits'

Local adaptation and resilience strategies must be sensitive to variations in hazard and vulnerability

Hazard

Map **current heat wave and flood hazard** for England and the **projected increase** under future climate change (2030s)

Vulnerability

Identification of local authorities with:

- **medium to high projected growth** in the **numbers of older people** (2006-2031);
- **high concentrations** of **future health care need**.

Risk = f (hazard, vulnerability, resilience)

Identification of areas with the greatest projected increase in:

- **weather-related hazards**
- **vulnerability of older people**

Generation of ***national scale*** hazard, vulnerability and risk maps particular focus on **older people's health care need**

What counts as a heat wave hazard for older people's health?

No standardised definition of a heat wave:-
people acclimatize to prevailing conditions

based on previous research, **older people's health outcomes** and **health care use** are affected by:

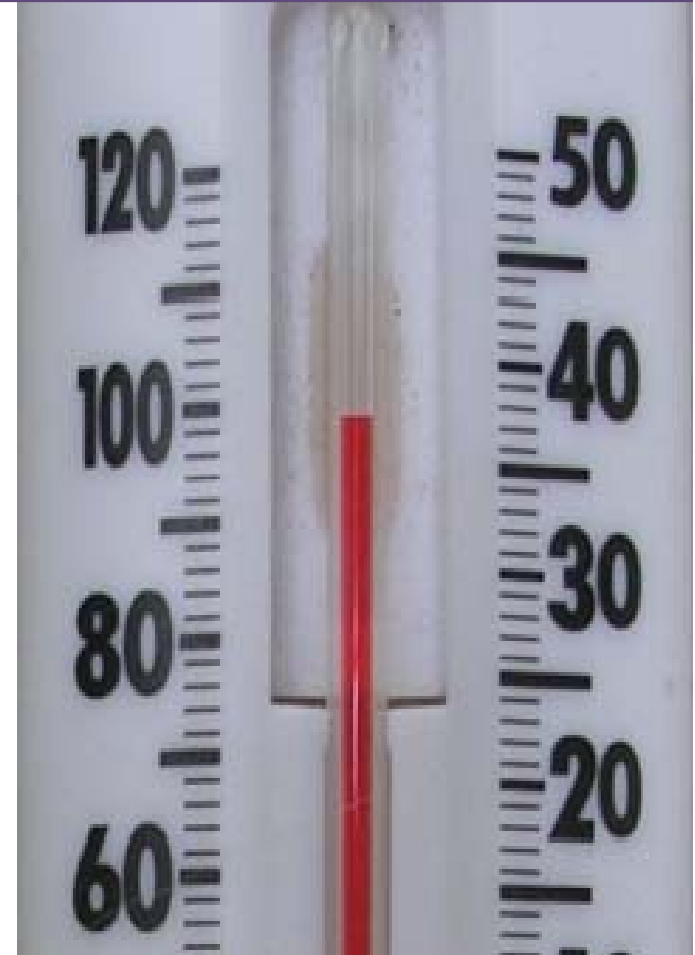
1. ***Persistent temperatures exceeding a threshold (+5/+9 °C) above the typical level***

Fouillet *et al.* (2006) – 2003 heat wave in France

2. ***Extreme events which only occur 5-10% of the time***

Hajat *et al.* (2002) and Armstrong *et al.* (in press) – UK

Also low winter temperatures present risks!

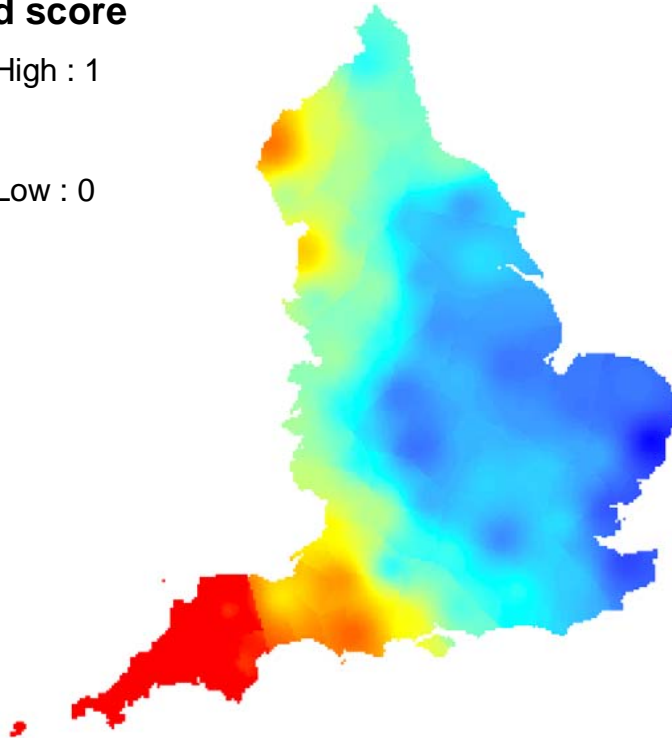
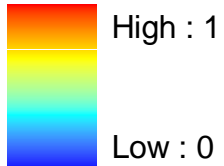


Definition should take account of future increases in temperature and spatial variability in heat wave hazard

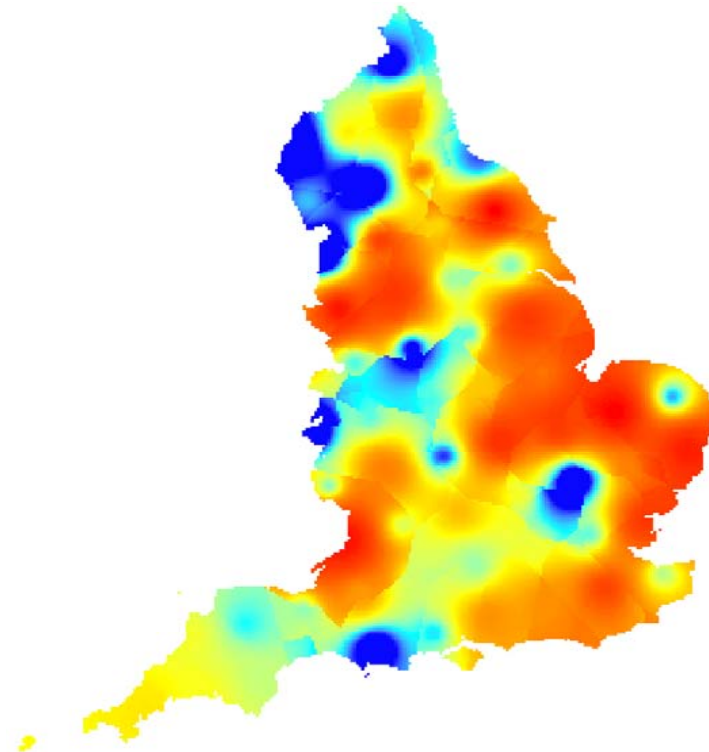
Mapping future increase in heatwave hazards

Emissions scenario: medium

Hazard score



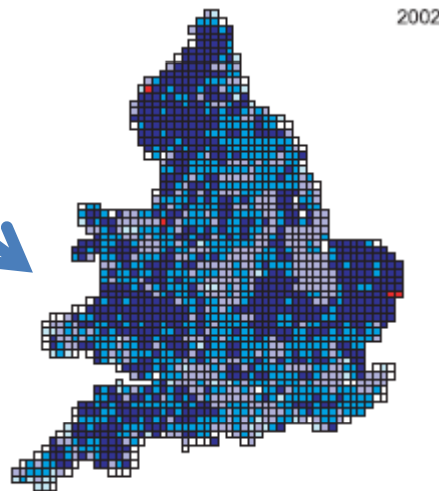
More events above a fixed threshold: 5 and 9°C above the prevailing average night time and day time temperatures respectively for ≥ 3 consecutive days



More very extreme Events
95th percentile of year-round daily temperature distribution for ≥ 3 consecutive days

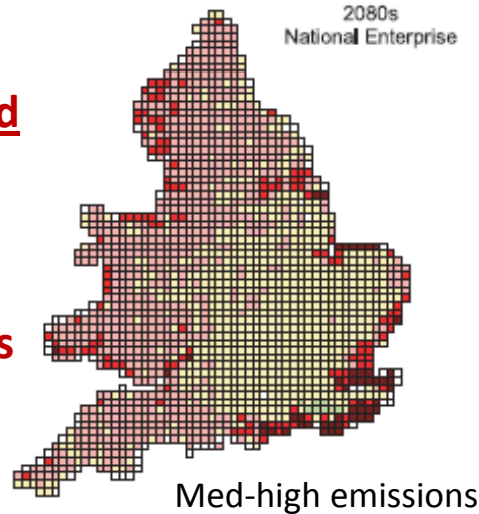
Mapping areas likely to see more flooding...

Flood risks now



2002

Increased Risk in Future – various scenarios



2080s
National Enterprise

Med-high emissions



2080s
Local Stewardship

Med-low emissions

Present day (2002)
Probability of inundation to a depth greater than 0.0m

- Negligible (<0.001)
- Low (0.001 to 0.005)
- Medium (0.005 to 0.013)
- High (0.013 to 0.1)
- Very high (>0.1)
- Outside IFP

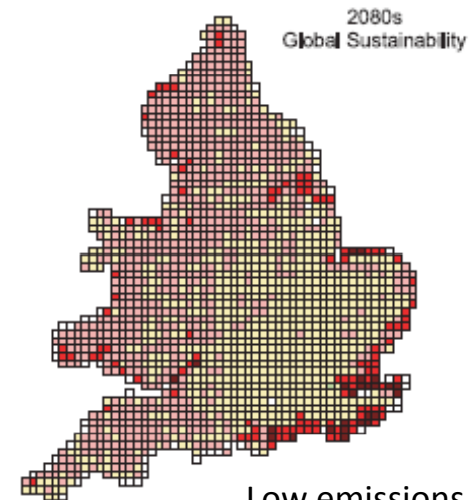
2080s Foresight scenarios
Change from present day (2002)

- Decrease (<-0.01)
- Negligible (-0.01 to 0.01)
- Low (0.01 to 0.05)
- Medium (0.05 to 0.3)
- High (>0.3)
- Outside IFP



2080s
World Markets

High emissions



2080s
Global Sustainability

Low emissions

Source: Foresight Report, 2004



‘Vulnerability’: Where will the older populations grow fastest?

Population projections (2006-2031)

**Produced by Office of National Statistics
using:**

Geographical unit: **local authority level**
older people’s care services are organised
at this level

Indicators of future ‘vulnerability’ based
on degree of concentration or relative
growth?



Source: Office for Social Inclusion, 2007

Which groups of older people need most health care?

Not all older people have the ***same health care need***

Weighting by age

Weight the older population by 5 year age bands

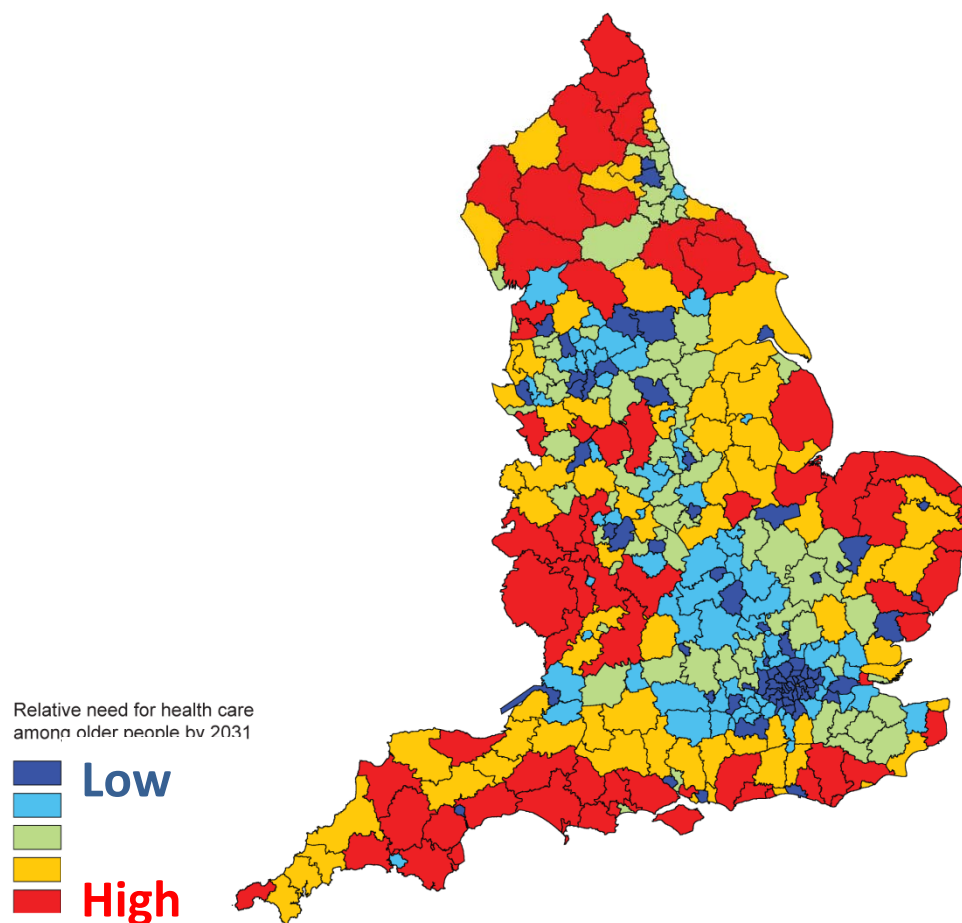
based on the '***needs element***' of the ***NHS capitation formula***



Compare **health care need** among the older age group between local authority districts

Mapping future health care need amongst the older age group

Local authorities in England: concentration of older people (weighted by health care need) in 2031



Spatial pattern:

High relative need in coastal areas:

- South/South west
- East
- North East

And rural areas:

- West Midlands
- North West

Several of these coincide with areas of greatest climate change hazard!

Identification of local areas of special interest

Identify **broad regions** with the **greatest projected increase in flood and heat wave hazard**



In these regions identify local authorities with :
large and growing older populations in future.



Select case studies for in depth discussions with local people and further statistical analysis help inform plans for adaptation and greater resilience to climate change

Source: BBC News and the Telegraph Online, 2009



Consultation Phase (parallel to HIA processes)

Compile a profile of key built infrastructure for older people's care in the study area

e.g. NHS buildings, social care facilities, roads, bridges, transport, people's homes.....?

Possible questions:

1. What are the most important parts of built infrastructure?
2. How is built infrastructure used and by whom?
3. How might built infrastructure be affected by extreme events?
4. Are different groups of people unequally affected?
5. What might make built infrastructure more resilient to extreme climatic events?

Stakeholders include:

- Older people and their carers
- Health and social agencies
- Planners and engineers
- Private and third sectors
- Department of Health Estates
- Age Concern
- Age International
- European Health Property Network (EuHPN)
- European Centre for Healthcare Assets and Architecture

Data sources: service provision inventories, local stakeholders

Summary



BIOPICCC – demonstrates research to support 'health impact' assessment of future hazard, vulnerability and risk associated with climate change

Challenges

- How to define future hazard and vulnerability?
- Risk is multi-faceted – predictions must draw on multiple criteria/scenarios.
- Risk is contingent on assemblages of local conditions; Case studies to capture the complex nature of these.
- Impact Assessment in this field requires collaboration across sectors!

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