



# *Welcome to the ESG Risk Webinar Series*

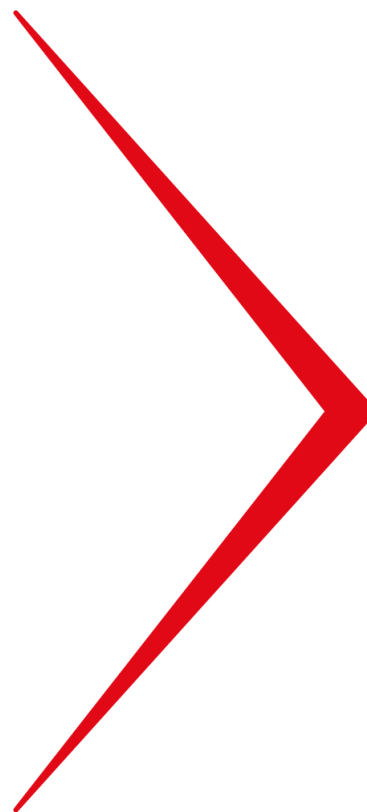
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Brought to you by the Financial Services Faculty

*We will begin the webinar shortly...*

# *ESG Risk Webinar Series*

- The **Science** behind the risks we face
- 08 September 2021, 11:00 - 12:00
- **Data**: Are we at peak complexity?
- 15 September 2021, 11:00 - 12:00
- **Data** - in practice
- 21 September 2021, 16:00 - 17:00
- **Risk Management**
- 06 October 2021, 11:00 - 12:00
- **Reporting**
- 13 October 2021, 11:00 - 12:00
- **Assurance** - getting it right
- 20 October 2021, 11:00 - 12:00



*ESG: The science  
behind the risks we  
face*

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# *Presenters*



**Professor Alan Dangour**  
MSc PhD RNutr  
LSHTM



**Dr Sari Kovats BA MSc  
PhD**  
LSHTM



• **Dr Rachel Lowe BSc  
MSc PhD**  
• LSHTM

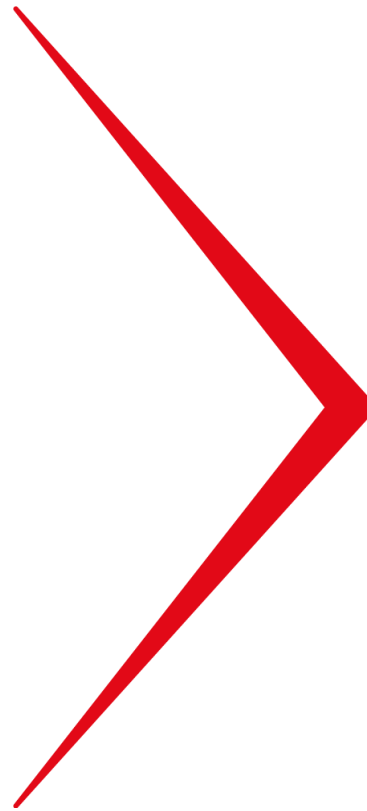


**Hitesh Patel, NED &  
Chair of ICAEW  
Insurance Committee**



**Zsuzsanna Schiff,  
Financial Services  
Faculty**  
ICAEW

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*Professor Alan  
Dangour MSc PhD  
RNutr*

# Climate change and health

Dr Sari Kovats

Dr Rachel Lowe

Professor Alan Dangour

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& TROPICAL  
MEDICINE

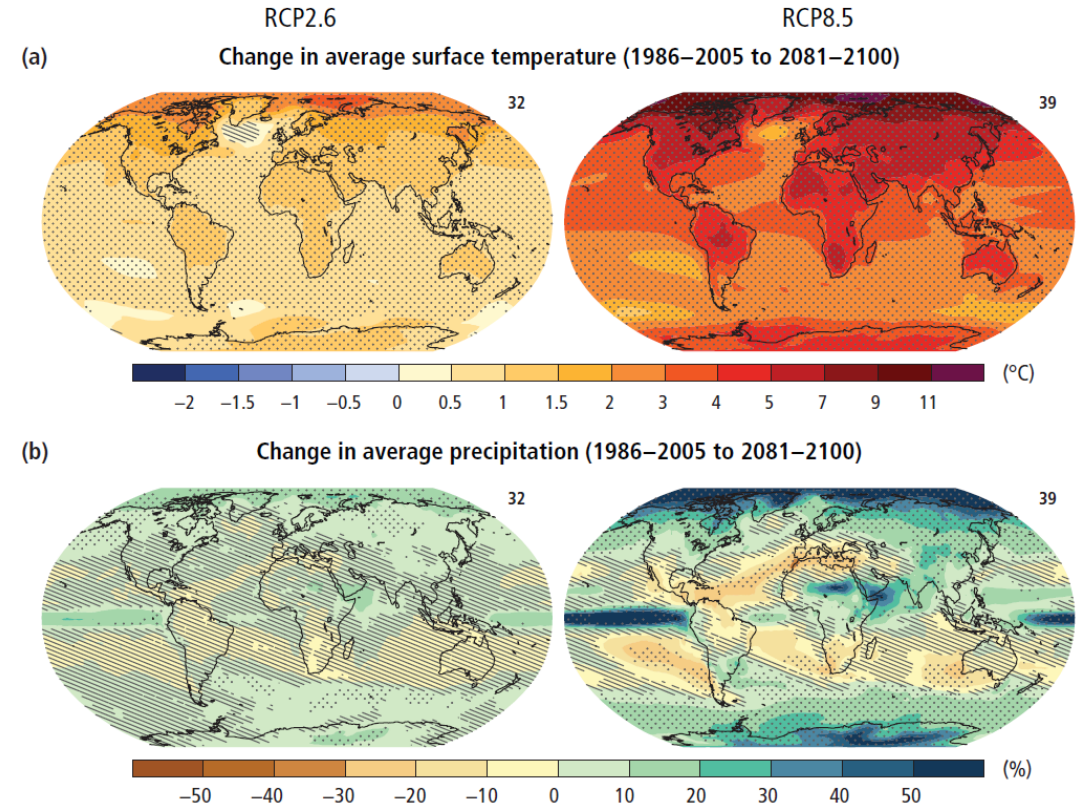
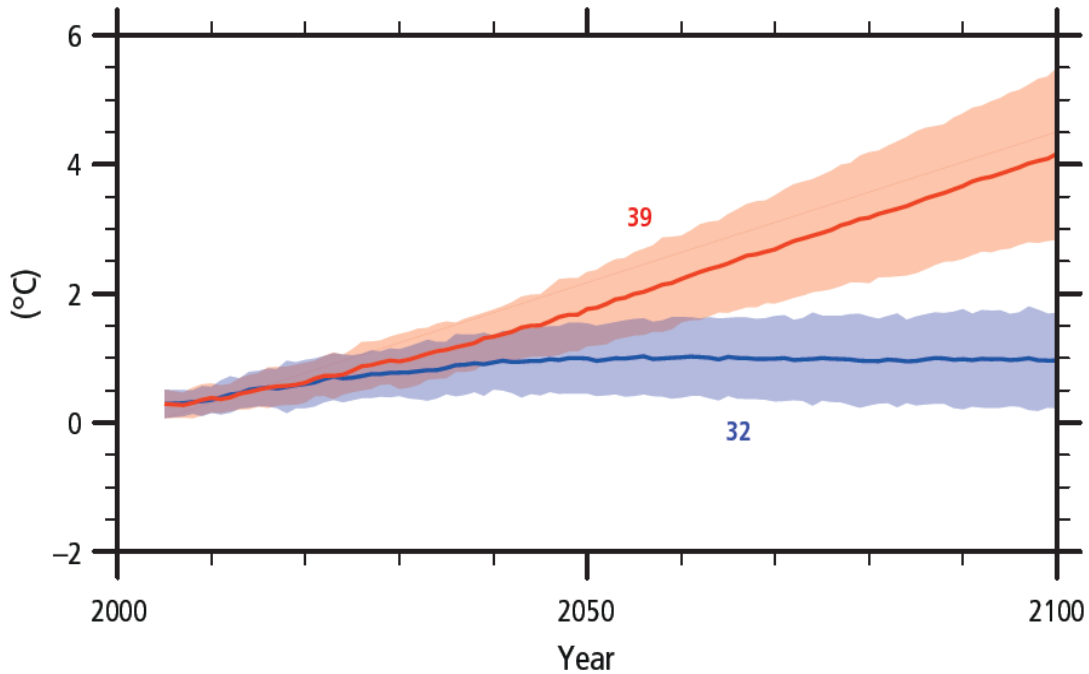


**Climate Change  
& Planetary  
Health**

@LSHTM\_Planet

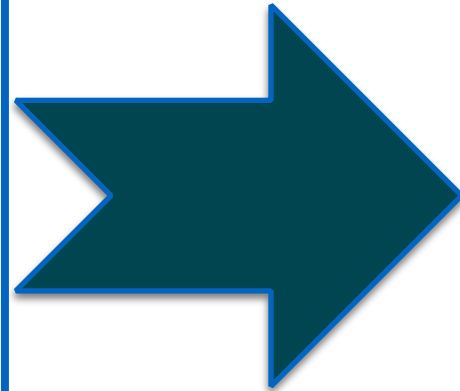
# Projected environmental change

### Global average surface temperature change (relative to 1986–2005)



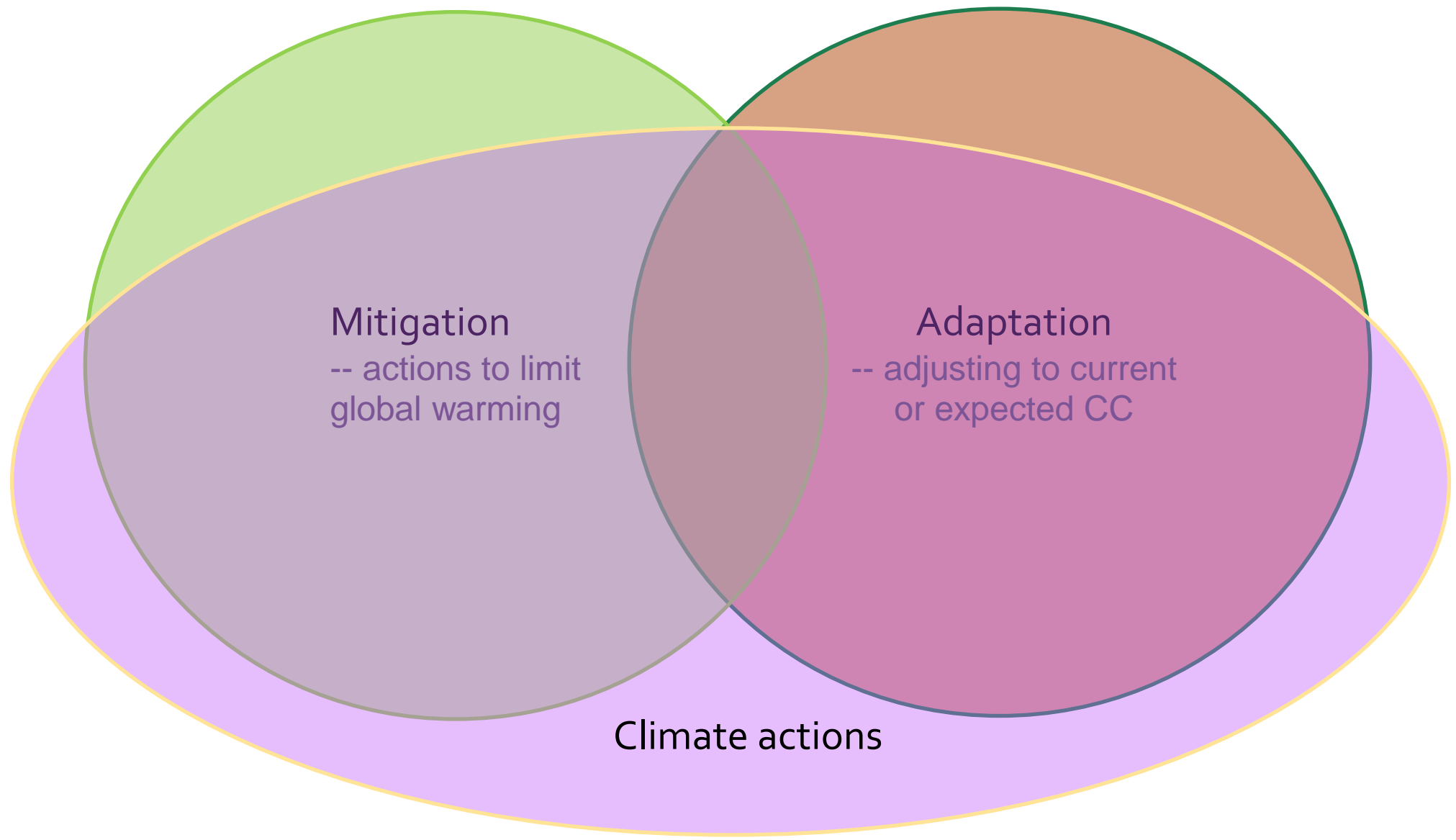
# Environmental change-health impacts

- Climate change
- Freshwater depletion and contamination
- Land use change and soil degradation
- Biodiversity loss
- Ocean acidification and overfishing
- Air pollution



- Direct  
heat  
extreme events
- Ecosystem-mediated  
vector-borne diseases  
water-borne diseases  
mental health  
(mal-)nutrition
- Socially-mediated  
poverty  
migration  
conflict

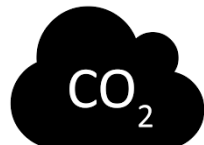
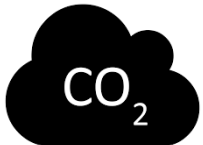
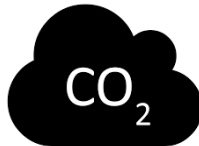




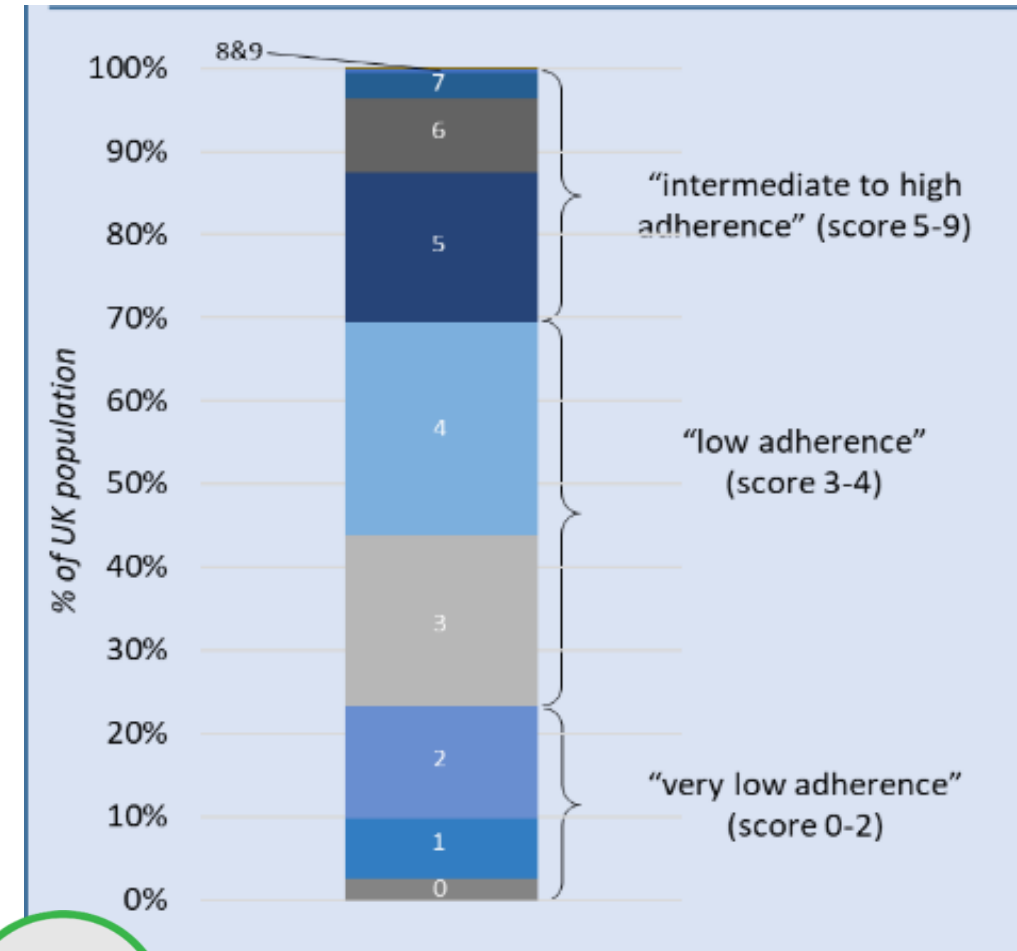
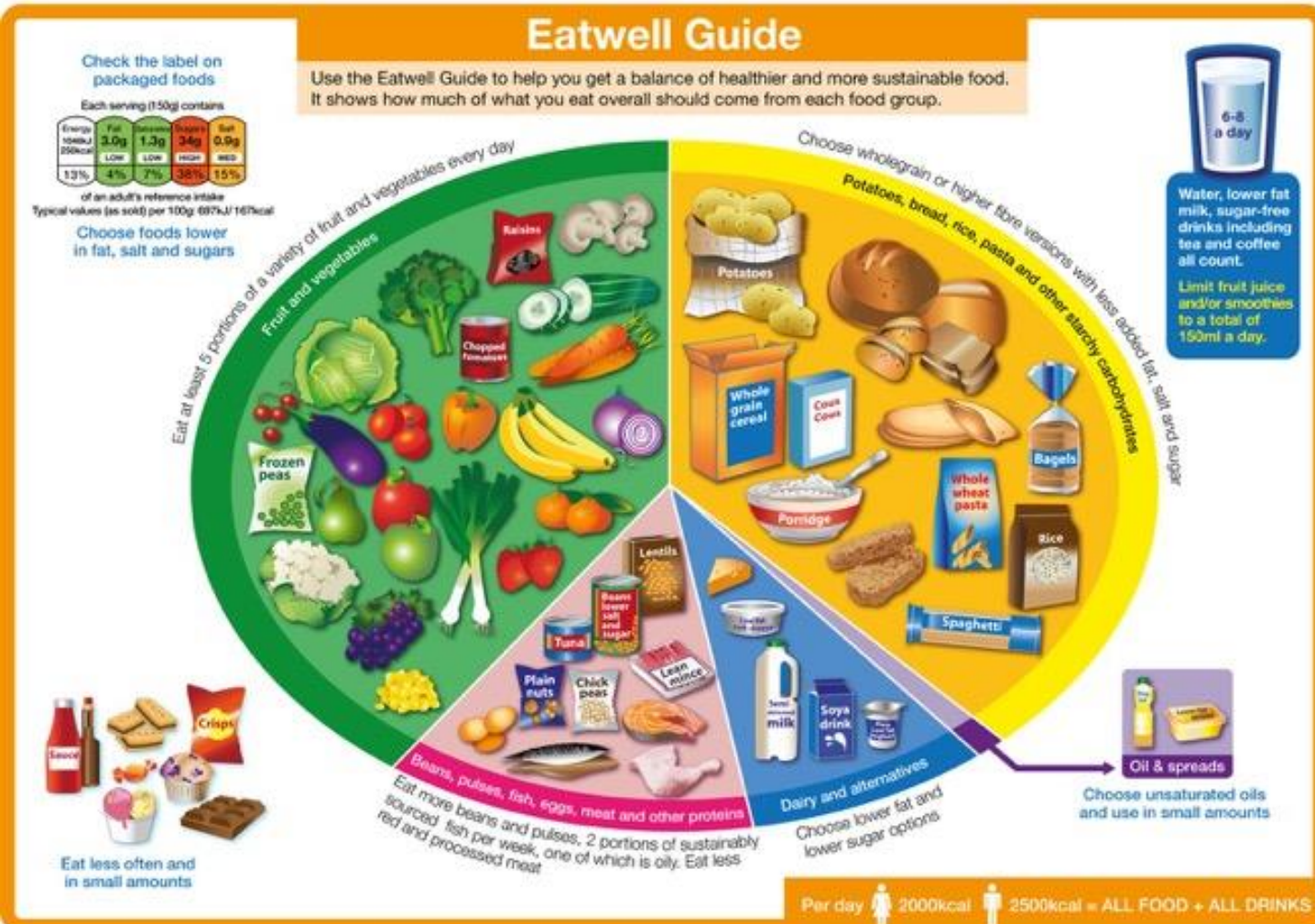
**Mitigation**  
-- actions to limit  
global warming

**Adaptation**  
-- adjusting to current  
or expected CC

**Climate actions**

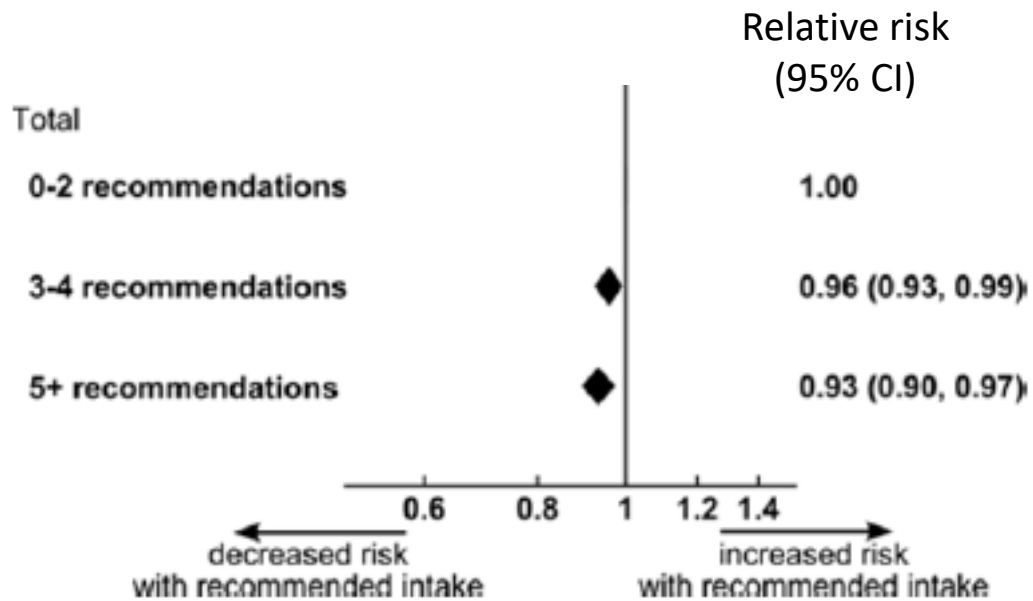


# What are we eating in the UK?

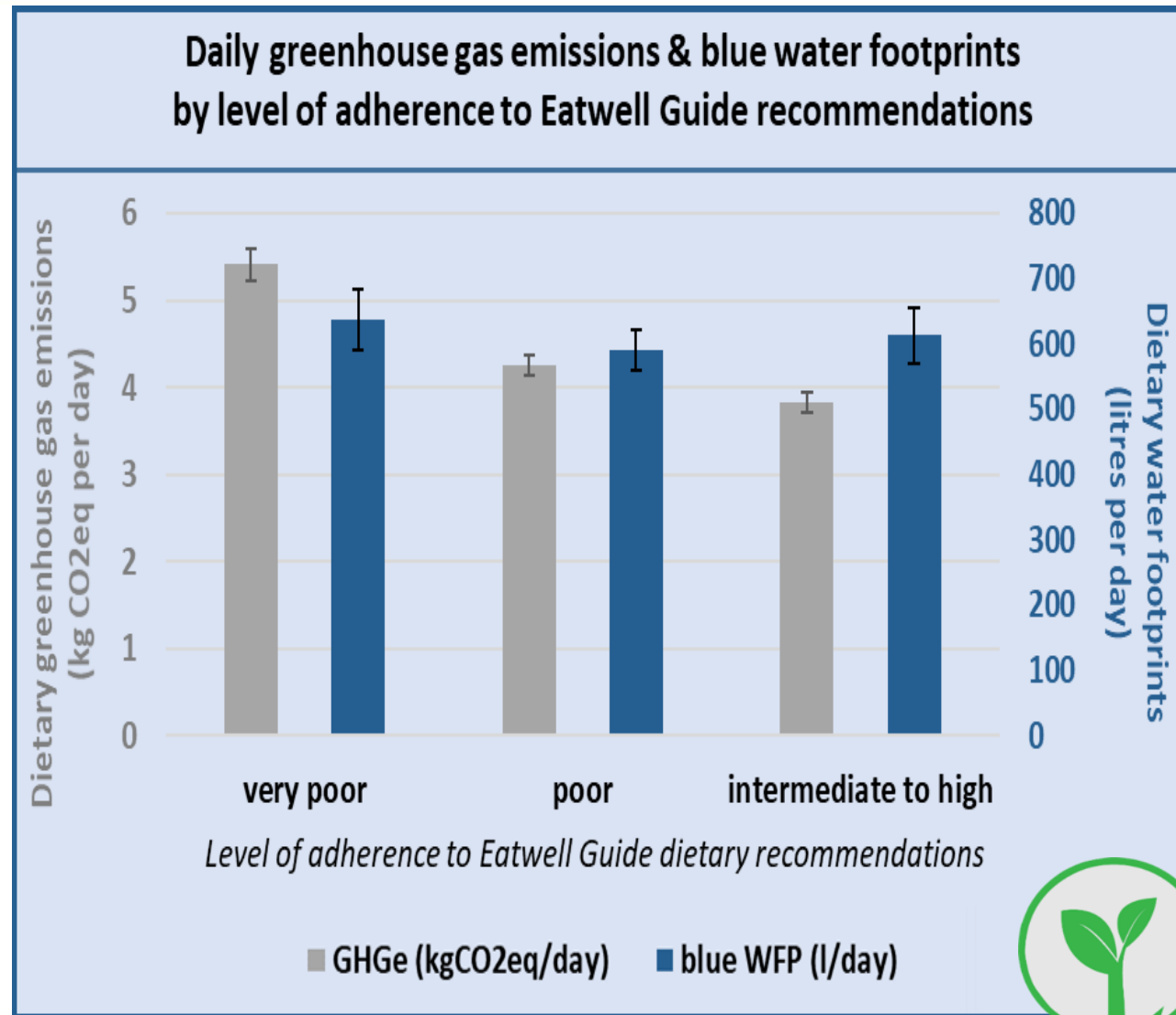


Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland

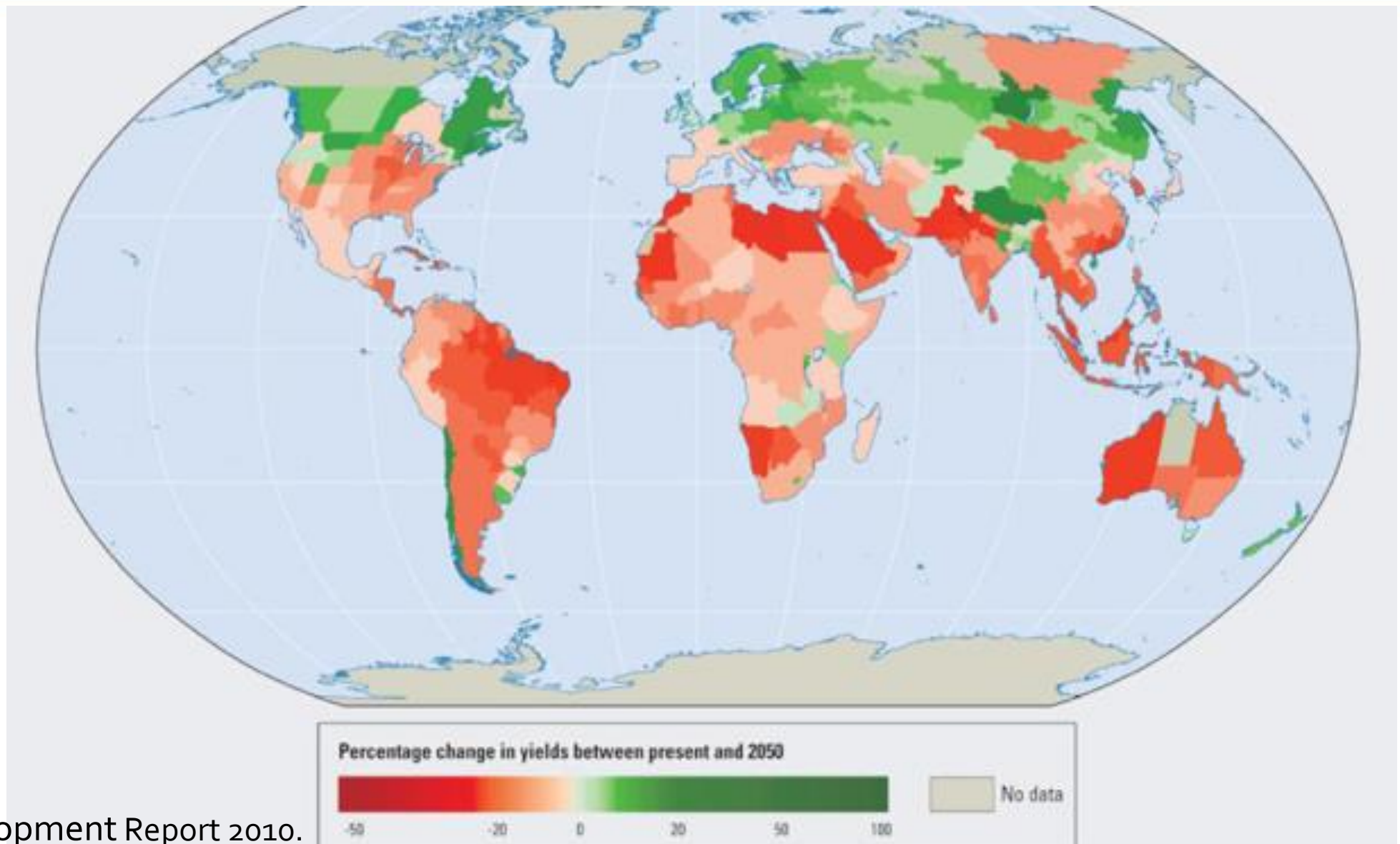
# Eatwell Guide is healthy and has lower footprint



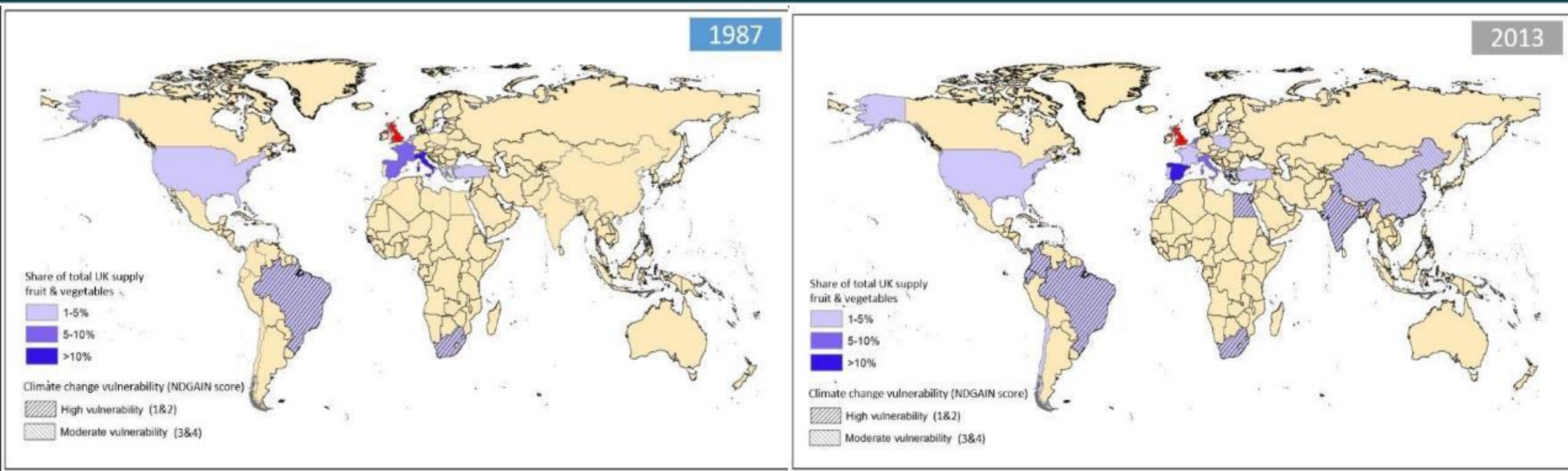
Following 5+ recommendations equates to a 7% reduction in risk of early mortality in adults in the UK.



# Impacts on cereal yields



# Who produces UK fruit and vegetables?



**Supply from climate vulnerable countries:**  
**1987: 20%**  
**2013: 37%**



Due to continued weather problems in Spain, there is a shortage on Iceberg and other varied lettuce products.

To protect the availability for all customers, we are limiting bulk purchases to 3 per person.

We apologise for any inconvenience caused.



Scheelbeek *et al*, Nature Food 2020.

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# Madagascar on the brink of climate change-induced famine

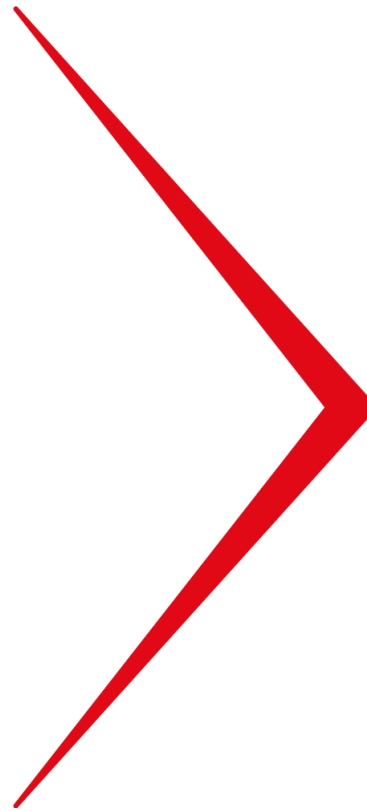
By Andrew Harding

Africa correspondent, BBC News

🕒 25 August

**Madagascar is on the brink of experiencing the world's first "climate change famine", according to the United Nations, which says tens of thousands of people are already suffering "catastrophic" levels of hunger and food insecurity after four years without rain.**

"These are famine-like conditions and they're being driven by climate not conflict," said the UN World Food Programme's Shelley Thakral.



***Dr Rachel Lowe***  
***BSc MSc PhD***





# Climate change and infectious diseases: risks and opportunities

Rachel Lowe

Associate Professor / Royal Society Dorothy Hodgkin Fellow  
London School of Hygiene & Tropical Medicine

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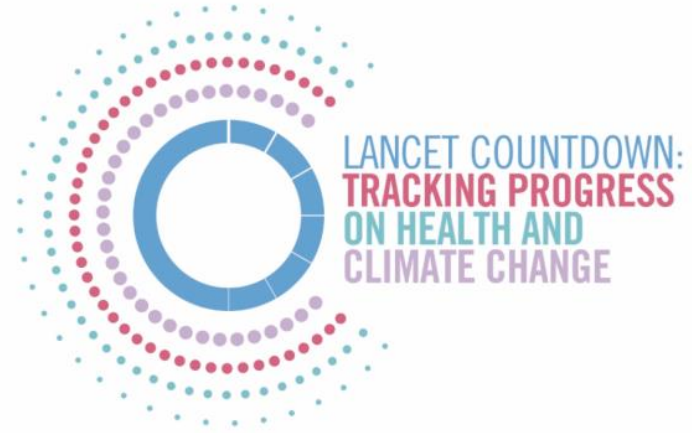
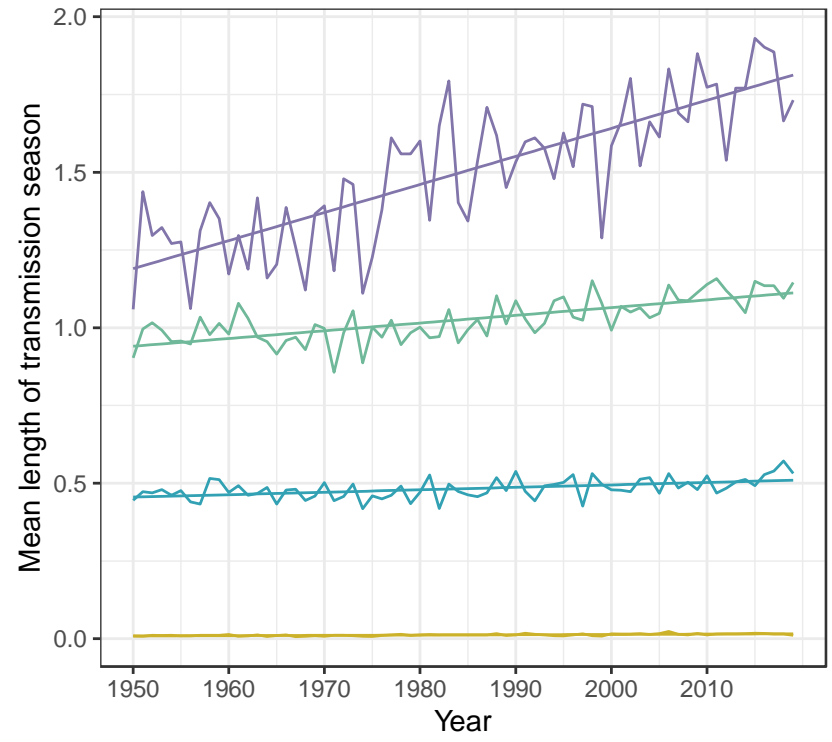
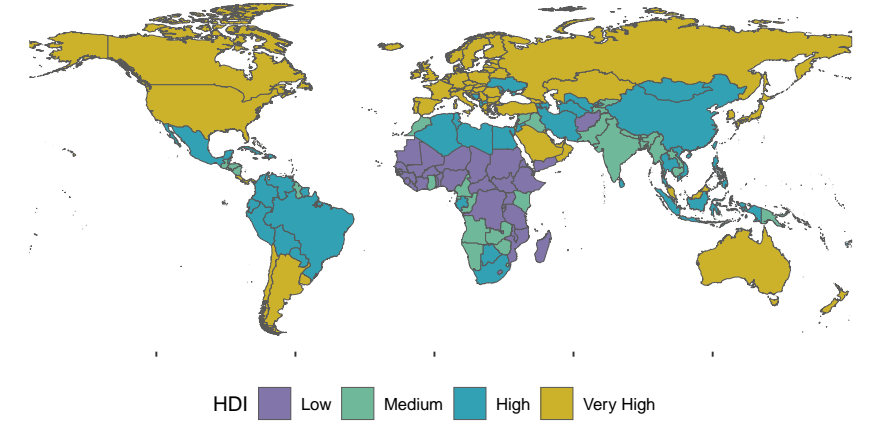
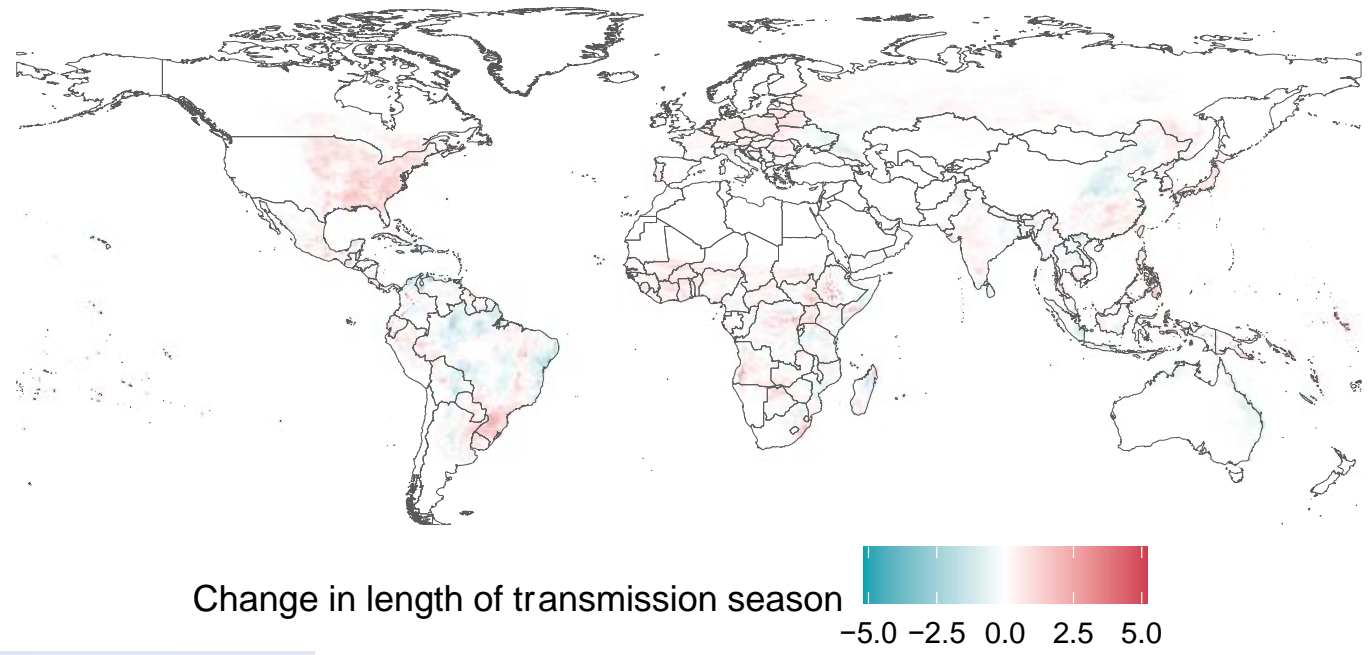


Centre on  
Climate Change &  
Planetary Health



centre for the  
mathematical  
modelling of  
infectious diseases

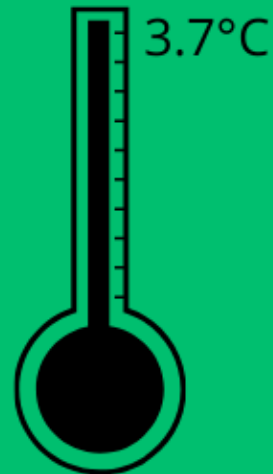
# Tracking climate suitability for mosquito-borne diseases



## Global warming, malaria and dengue



Additional people at risk by 2100 due to rising temperatures and population growth:



4.7 billion people\*

vs.



2.4 billion people\*\*

Relative to 1970-1999:

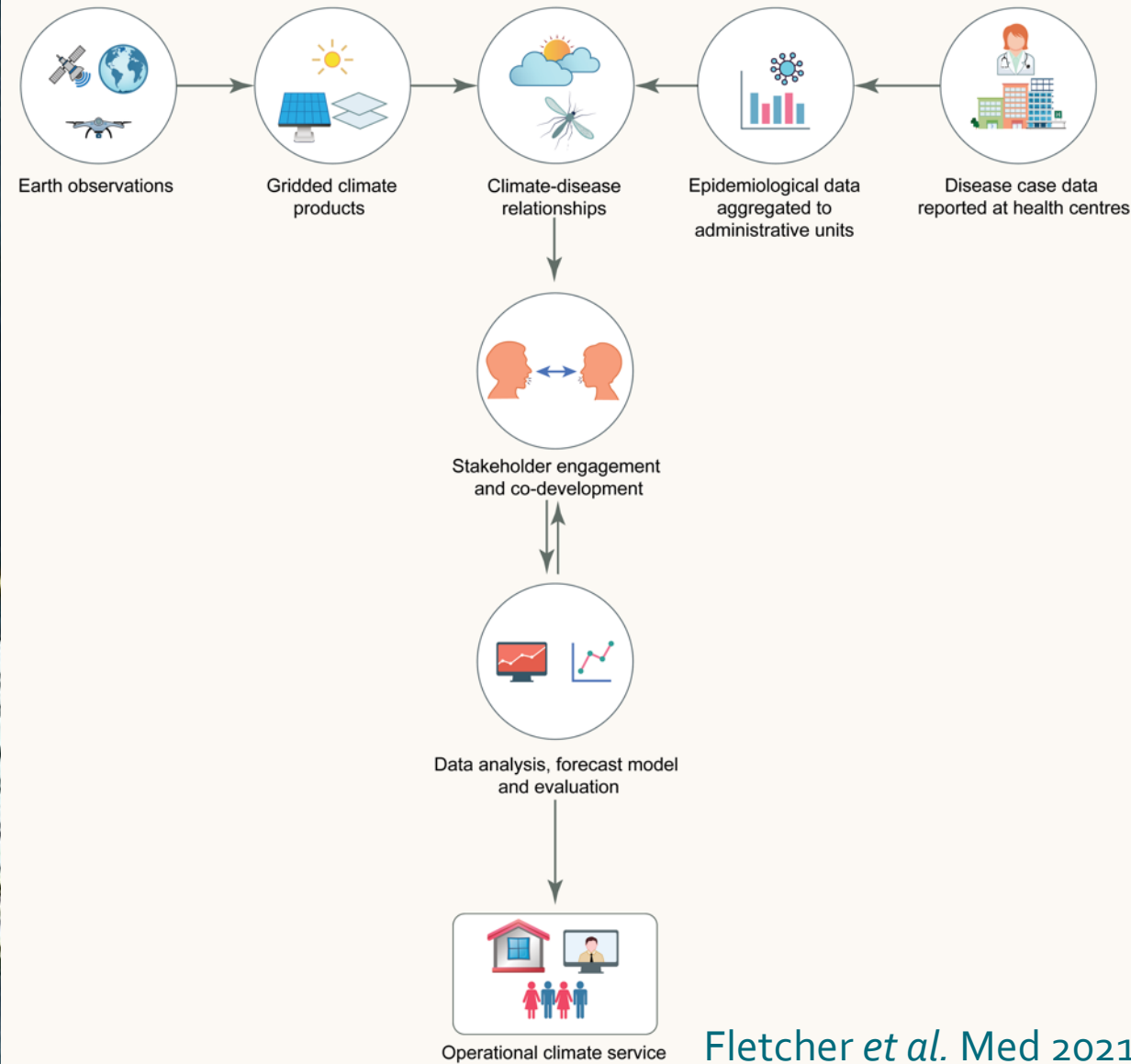
\*in worst-case scenario where emissions continue to rise at current levels

\*\*in scenario where emissions are reduced the most

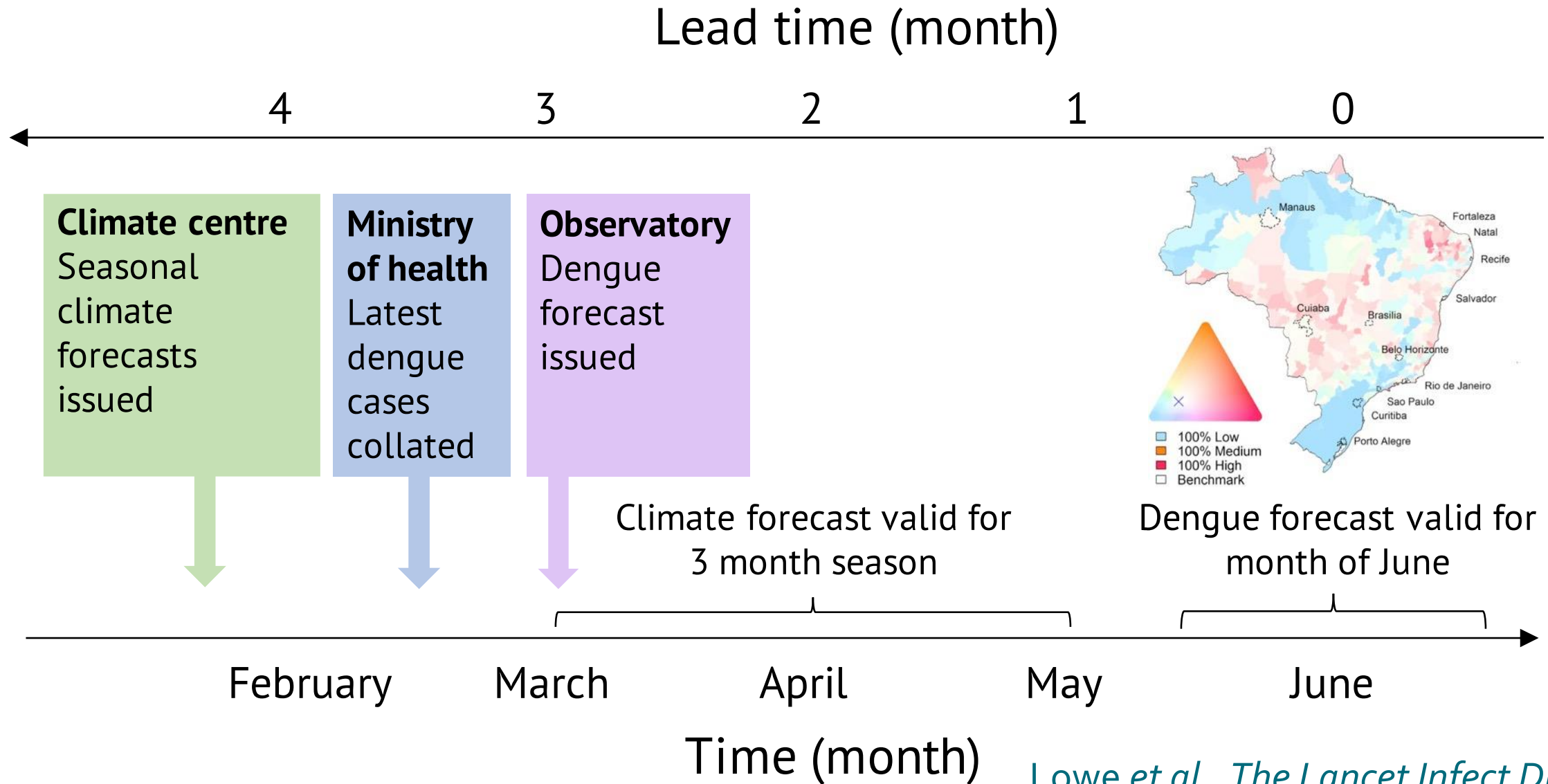
# From global observations to local interventions



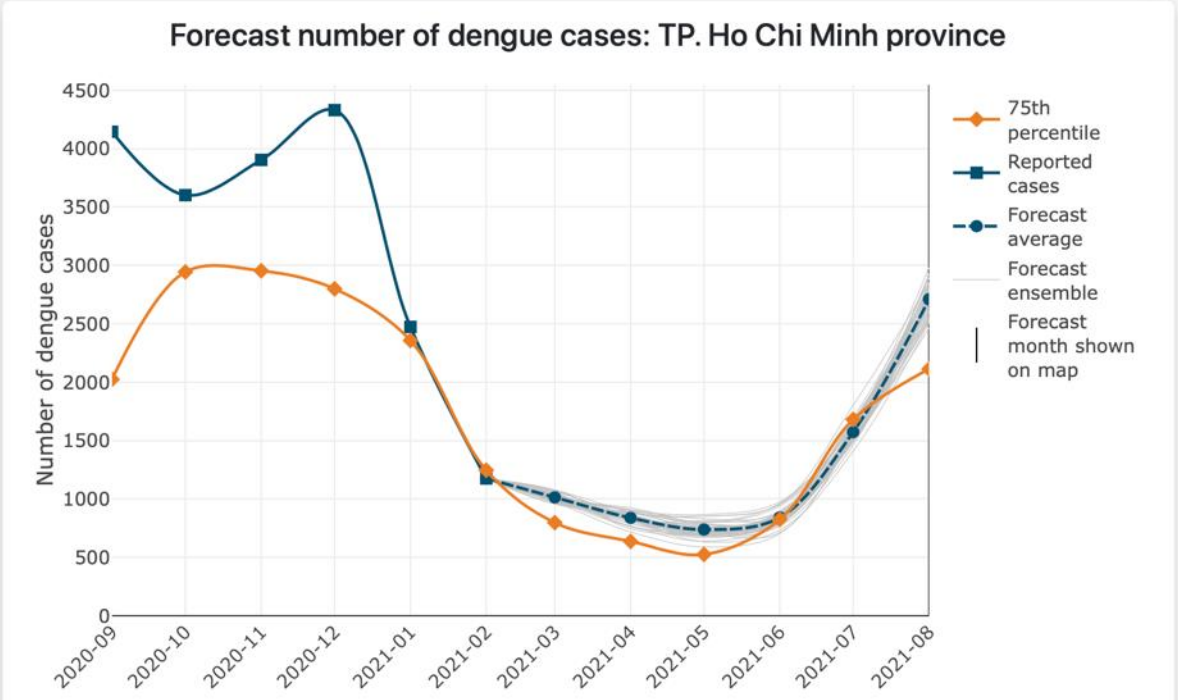
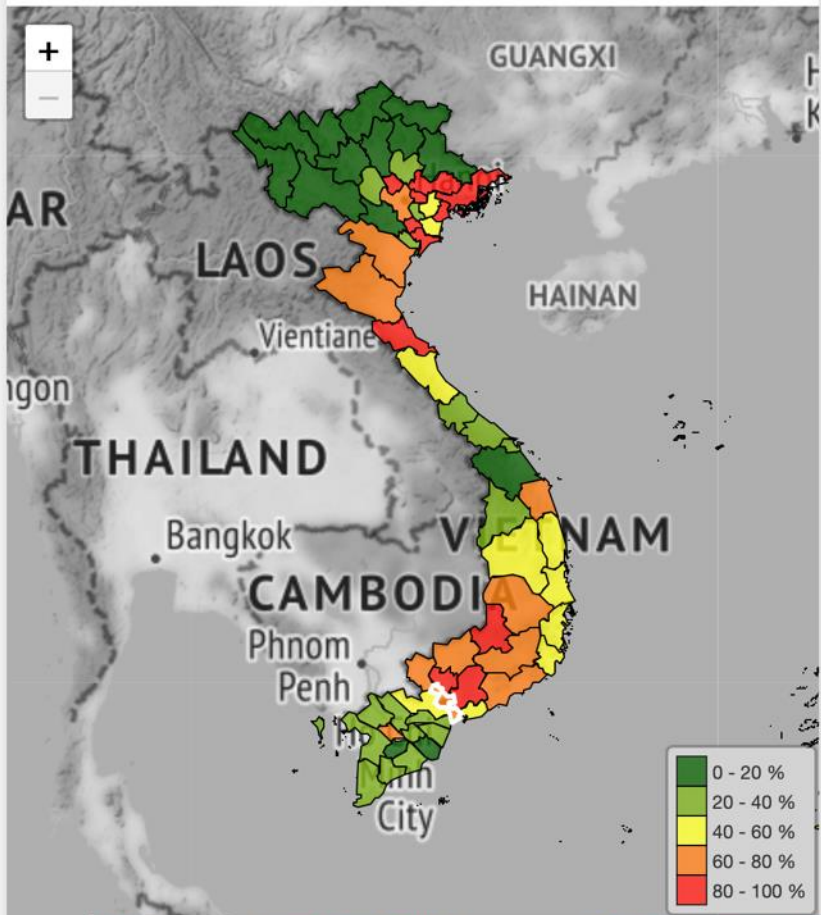
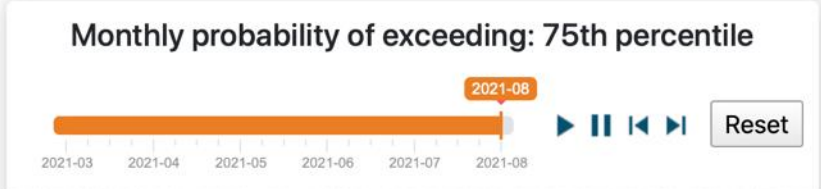
Illustration: David S. Reardon, *The Economist*



# Dengue early warning system framework in Brazil



Variable: 75th percentile ▾ Province: TP. Ho Chi Minh ▾  Greyscale Print [Technical information](#)

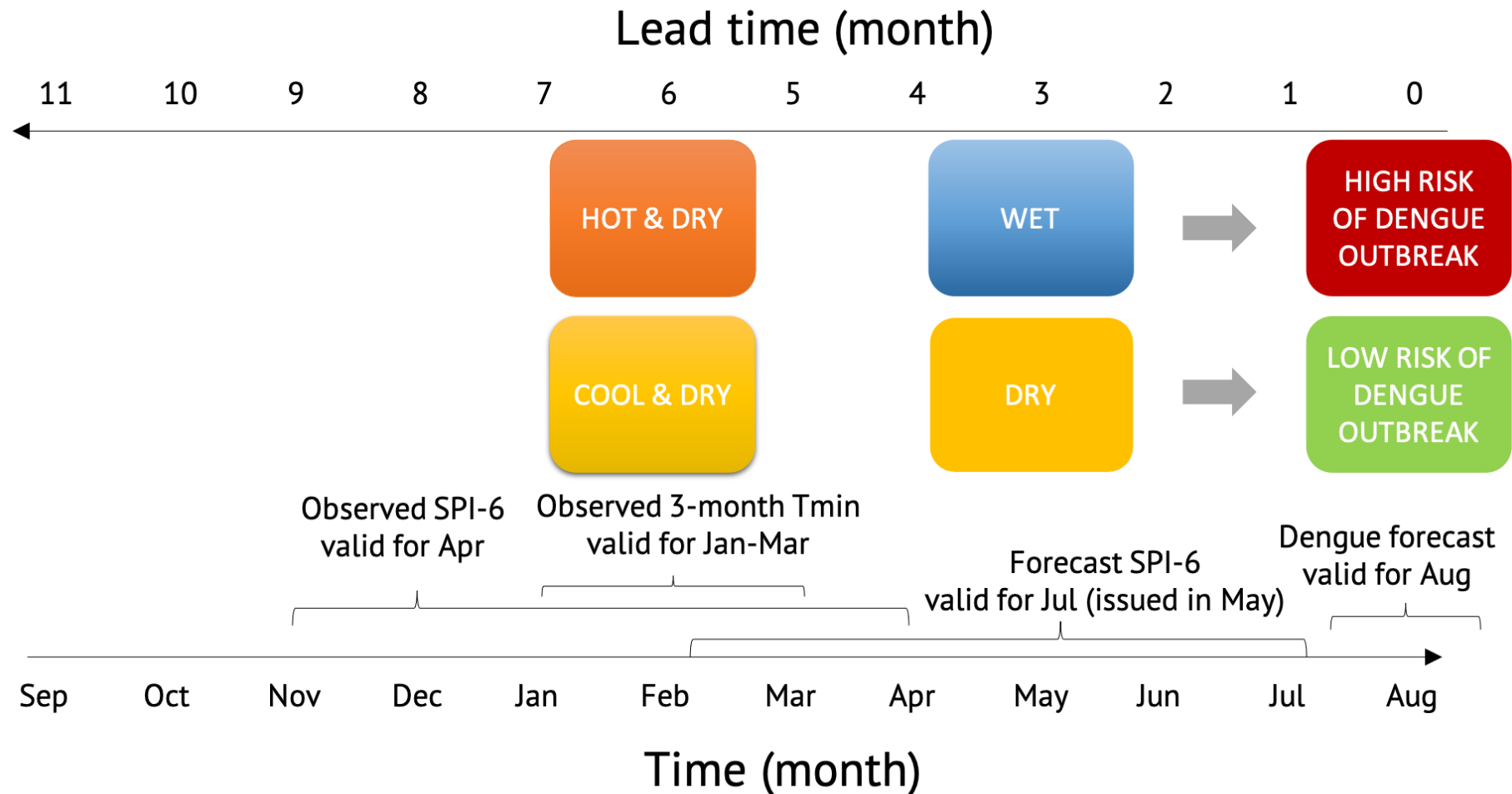


### Forecasted probability of exceeding 75th percentile threshold

Show lower and upper bound probabilities

Forecast months	2021-03	2021-04	2021-05	2021-06	2021-07	2021-08
75th percentile threshold value (Cases)	797.3	636.5	525.0	824.8	1681.0	2112.5
Probability of exceeding 75th percentile	87%	89%	95%	53%	46%	65%

# Compound climate extremes and dengue in the Caribbean





## Caribbean Health Climatic Bulletin

### Climate Conditions and Dengue in 2020

- Recent research (e.g. Lowe et al., 2018) on the link between climate conditions and dengue cases in eastern Caribbean countries suggests that drought conditions followed 4-5 months later by warmer than usual temperatures and excessive rainfall, increases the chance of Dengue outbreaks.
- In that regard, climate conditions in the Caribbean have been optimal for mosquito proliferation and dengue outbreaks throughout 2020, particularly in the eastern Caribbean. A regional drought implied increased water storage in the first half of 2020. This was followed by an intense heat season, particularly in the eastern Caribbean. Higher temperatures lead to increased rates of mosquito breeding, biting and disease transmission. The 2020 Caribbean wet season further brought episodes of excessive rainfall and flooding in many parts of the region, which contributed to an increase in mosquito breeding sites. Increased dengue case confirmations were recorded in several of the Eastern Caribbean states.



# Thank you



rachel.lowe@lshtm.ac.uk



@drrachellowe

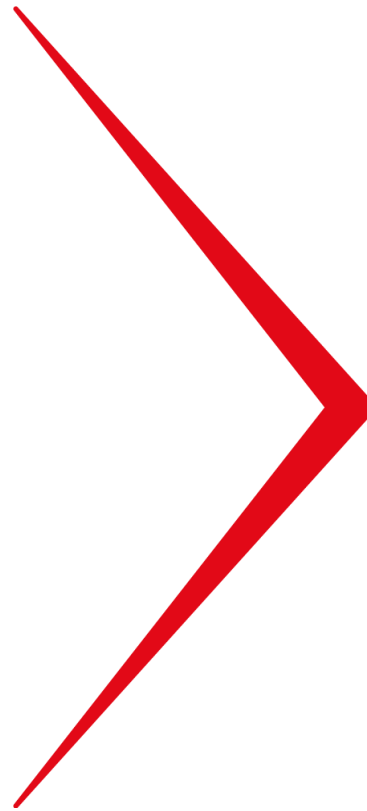


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**Climate Change  
& Planetary  
Health**

# Climate change and human health: risks and opportunities

Dr Sari Kovats, Faculty of Public Health and Policy  
Sari.Kovats@lsthm.ac.uk



**NIHR** | Health Protection Research Unit in  
Environmental Change and Health at London  
School of Hygiene and Tropical Medicine

June 2021

## Independent Assessment of UK Climate Risk

Advice to Government  
For the UK's third Climate Change Risk Assessment (CCRA3)

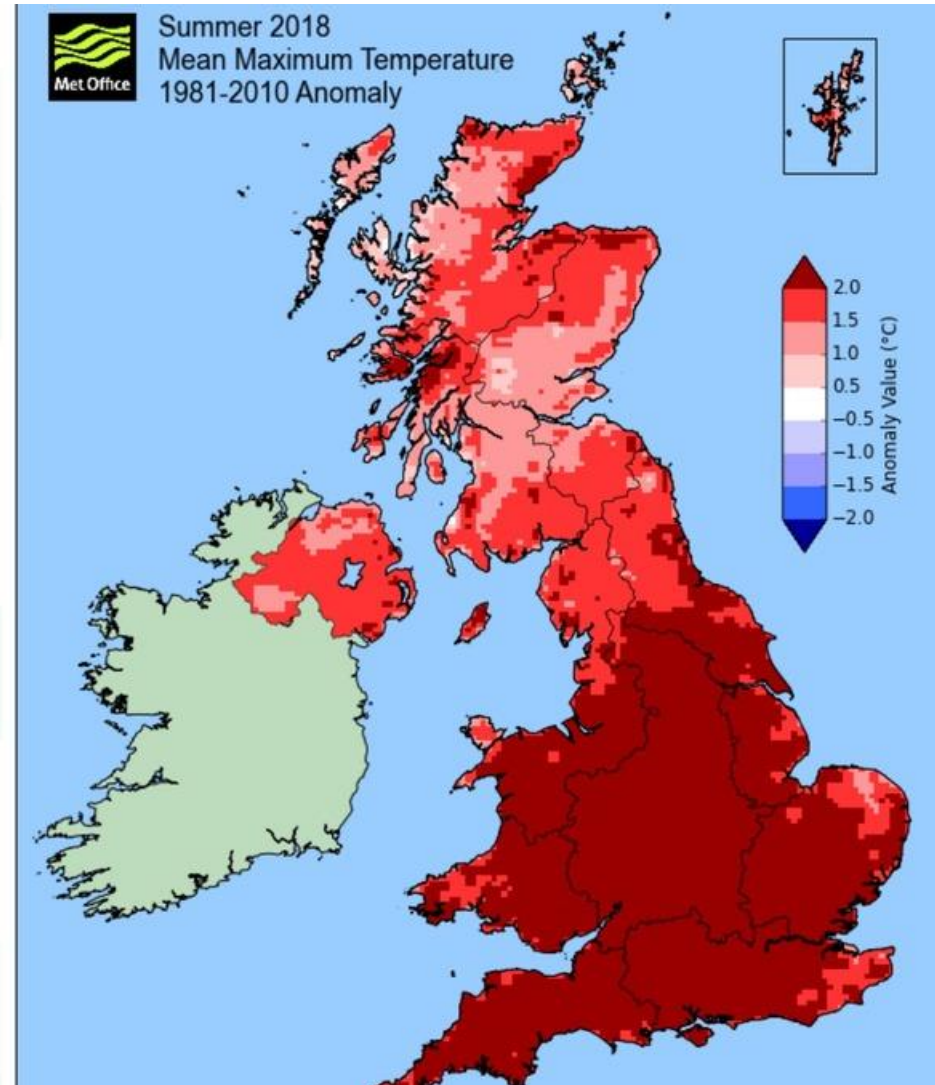


- UK Climate Change Risk Assessment
- Key risks
  - Heat
  - Flooding
  - Health services
- Adaptation gaps
  - Housing
  - Planning
  - Equity
- Synergies with mitigation
- Implications of COVID-19

# Hot summer 2018

Hot summers are expected to become more common.

- 1981-2000: the probability of a summer as hot as 2018 was low (10%)
- NOW probability is 10-20%.
- With future warming, hot summers by mid-century could become even more common (probabilities of the order of 50% depending on the emissions scenario)



UK: Summer 2018 was the joint hottest on record together with 2006, 2003 and 1976.

**England:  
summer 2018  
was hottest on  
record**

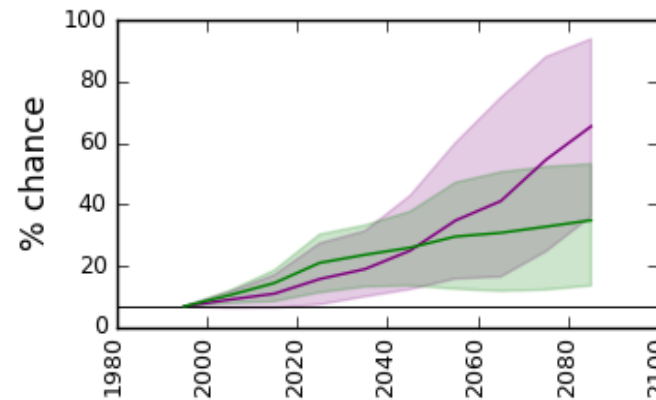
# Increases in heatwaves and hot weather

Annual likelihood of at least one heatwave event

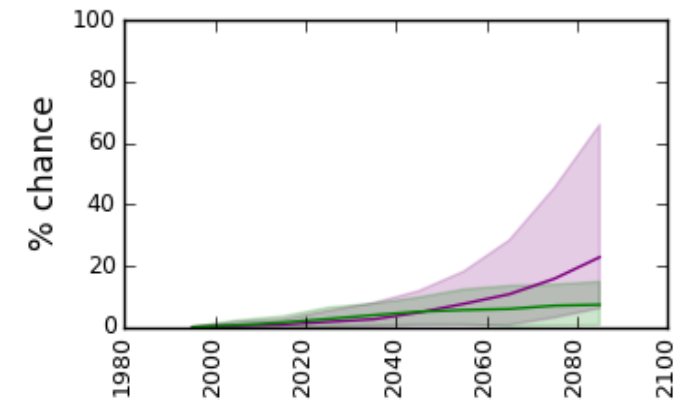
UKCP18 projections constrained to pathways to 2°C, and 4°C global warming at 2100

Source: Arnell et al. 2020.

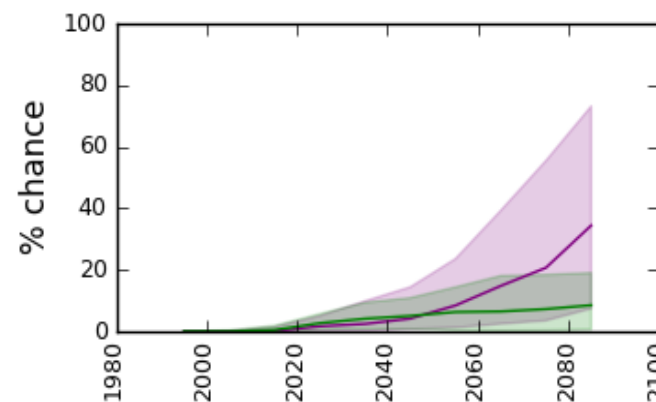
Heat-health alert: Amber Warning  
England



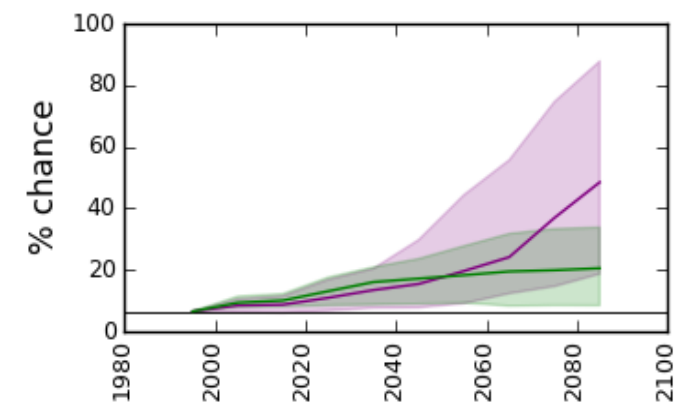
Northern Ireland



Scotland

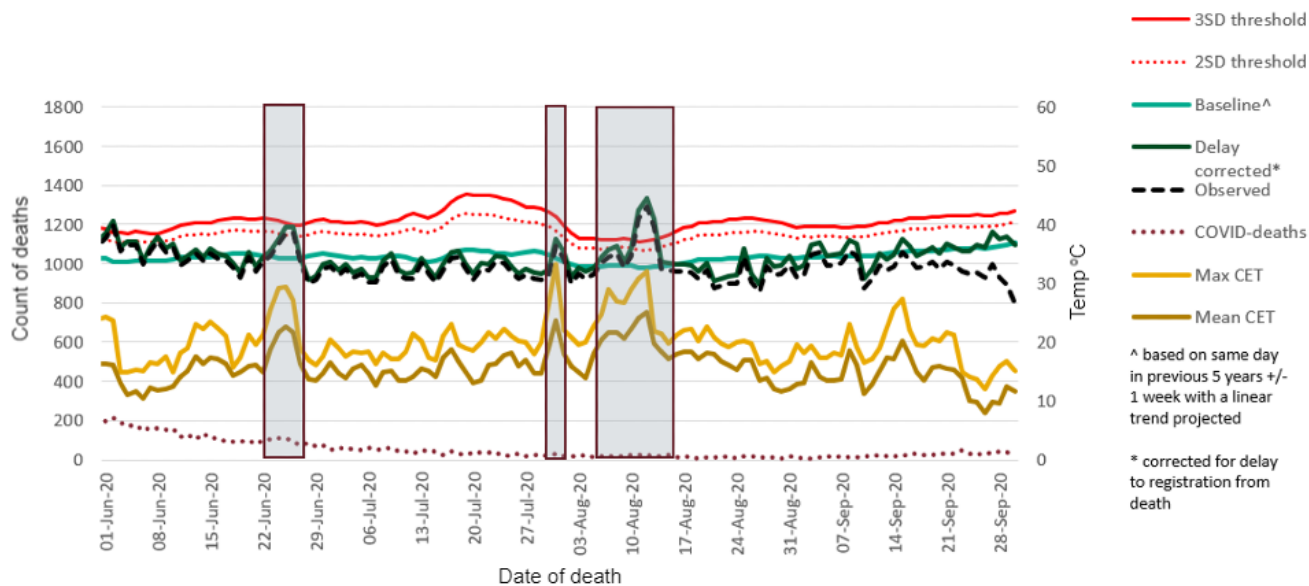


Wales



# Impacts of heat

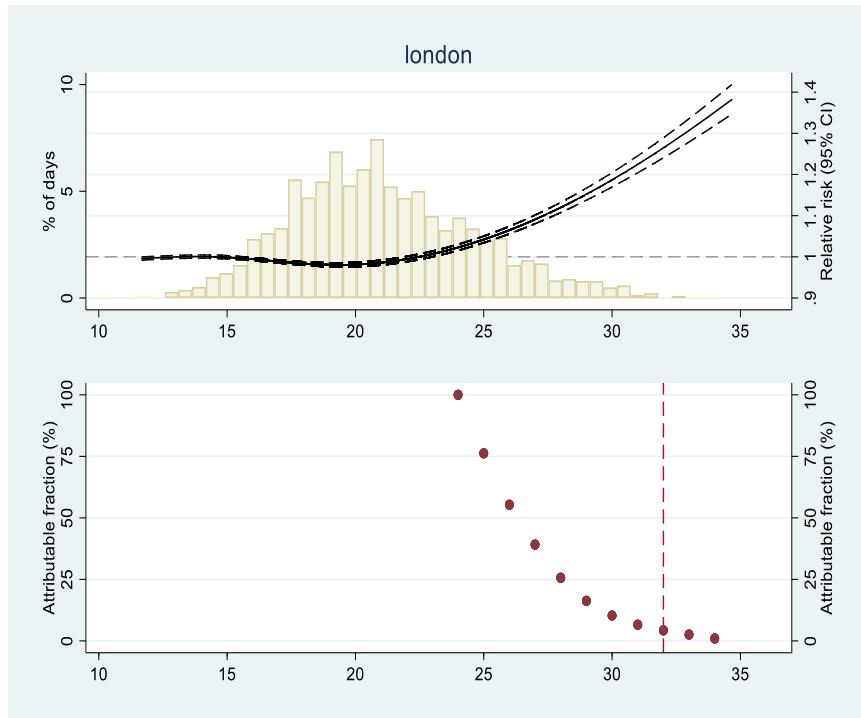
2,566 deaths in 2020 heatwaves  
[official estimate from PHE]



- Temperature-related mortality, heatwave deaths
  - Hospital admissions
    - Respiratory, renal, diabetes
  - Occupational hazard, accidents
  - Disruptions to public services
    - Overheating leading to closures, absences
    - Hospitals, care homes, schools and prisons
  - Impacts on wellbeing
    - Learning and cognition
    - Sleep disruption, anxiety
  - Maternal health
    - Risks to preterm birth
- Reduced labour productivity (see chapter 6 - Business)*

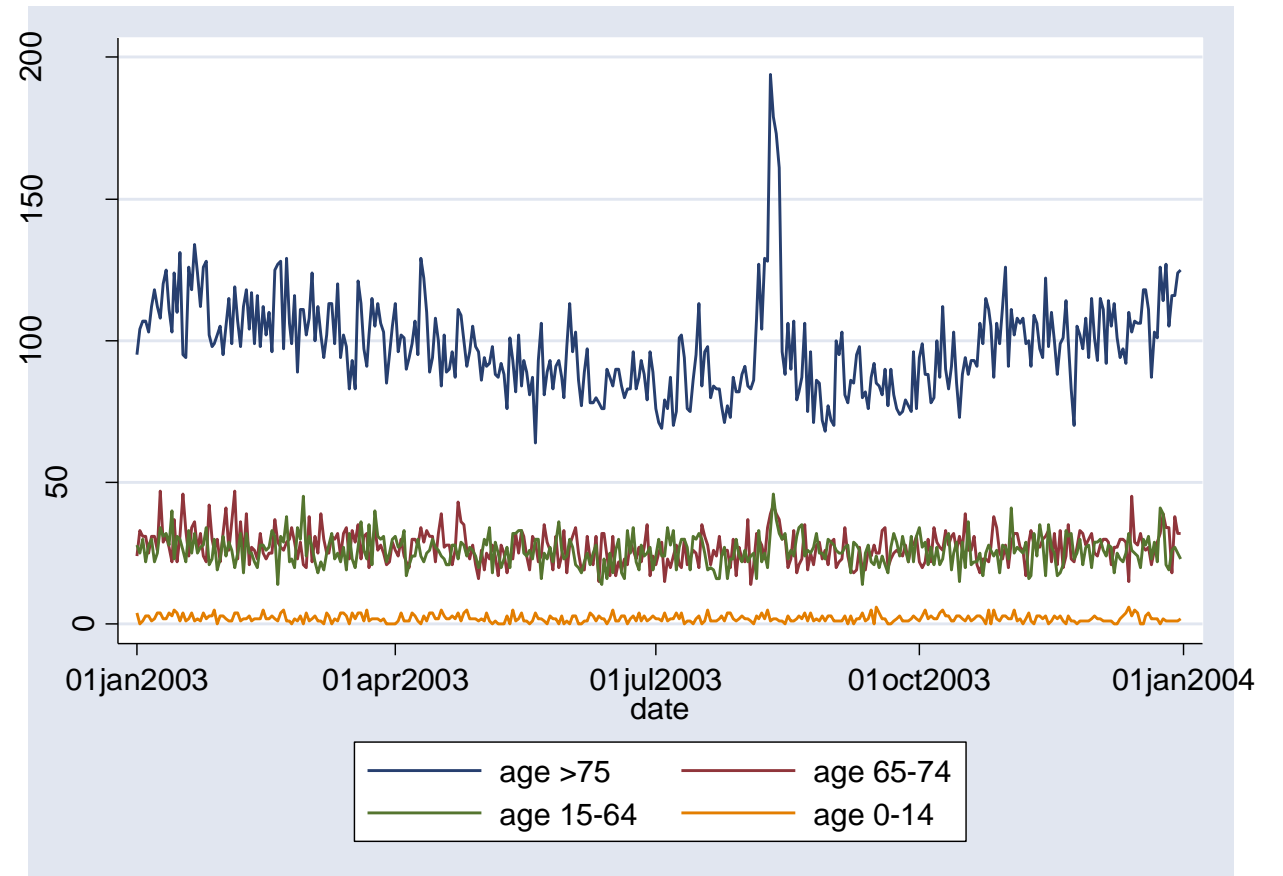
# Heatwaves and mortality in the UK

Temperature-mortality function..



Source: Hajat

- Daily mortality, Greater London, 2003



Source: ONS



# Heat interventions

Built environment

Housing

Public health/education  
(Heatwave Plan for England)

Occupational health/health  
and safety

Heat Health Action Plans



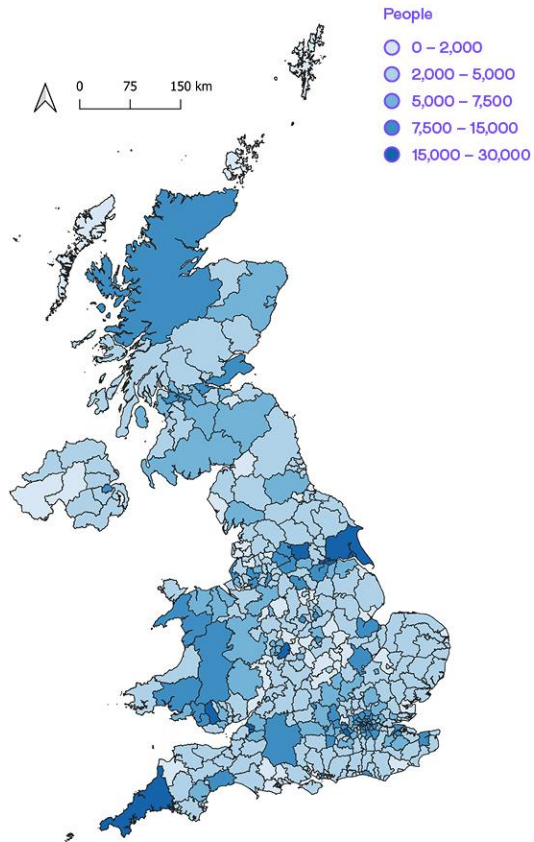
## Sustainable cooling strategies to protect health in heat-vulnerable settings

Heat extremes and hot weather are harming health. While mitigating climate change is vital, the inevitable rise in global temperature is expected to exacerbate these harms in future, and identifying opportunities for applying sustainable cooling strategies in heat-vulnerable settings is also important

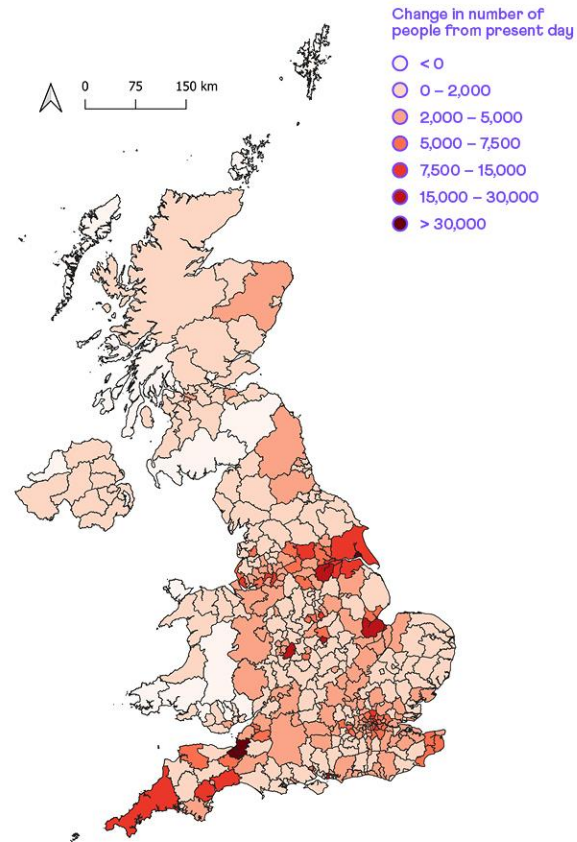
	Aged care homes	Workplaces	Schools	Playing sports	Mass gatherings	Refugee camps	Slums
<b>Individual-level strategies</b>							
Electric fans	● <sup>1</sup>	●	●				
Self-dousing	●	●	●	●	●	● <sup>2</sup>	● <sup>2</sup>
Foot immersion	●						● <sup>2</sup>
Drinking cold water <sup>3</sup>	●	●	●	●	●		
Optimising clothing	●	● <sup>4</sup>	●	● <sup>4</sup>	●	●	●
Evaporative coolers	●	●	●				
Ice towels	●			●			
Wet clothing	●			●		●	
1=to be used up to 38°C; 2=if water sanitation allows; 3=at a temperature that is most palatable (eg. ~10°C); 4=without compromising any required protective equipment							
<b>Building-level and urban-level strategies</b>							
Adequate natural ventilation	●	●	●	●		●	●
Improved construction materials	● <sup>5</sup>	●	●	● <sup>6</sup>		● <sup>7</sup>	● <sup>8</sup>
Outdoor misting fans				●	●		
Rooftop sprinklers	●	●	●				
Shaded areas	●	●	●	●	●	●	●
5=heat-reflective window glass; 6=playing surfaces that minimise heat retention and emitted radiation; 7=breathable tents; 8=insulating roofs and walls							
<b>Other strategies</b>							
Extra physical activity breaks		●		●			
Hydration monitoring	●	●					

Read the full paper: Jay O, Capon A, Berry P, et al. Reducing the health effects of hot weather and heat extremes: from personal cooling strategies to green cities. *The Lancet* 2021. Published online August 19

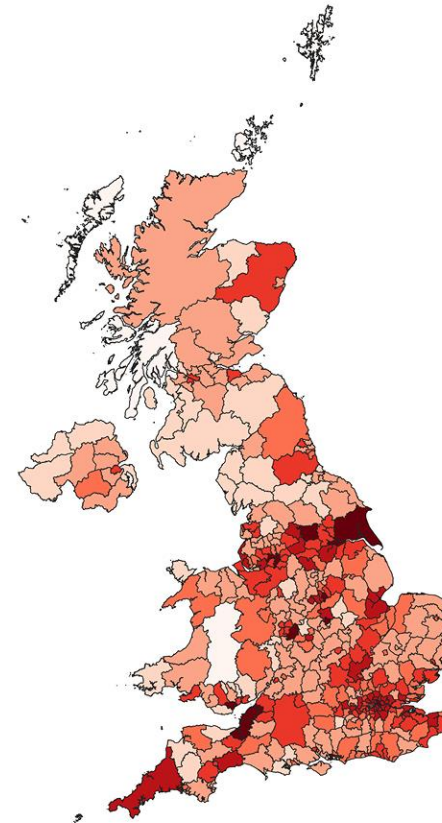
# Change in number of people at flood risk from present day



Present day – 2021



2050s on a pathway to 2°C global warming by the end of the century

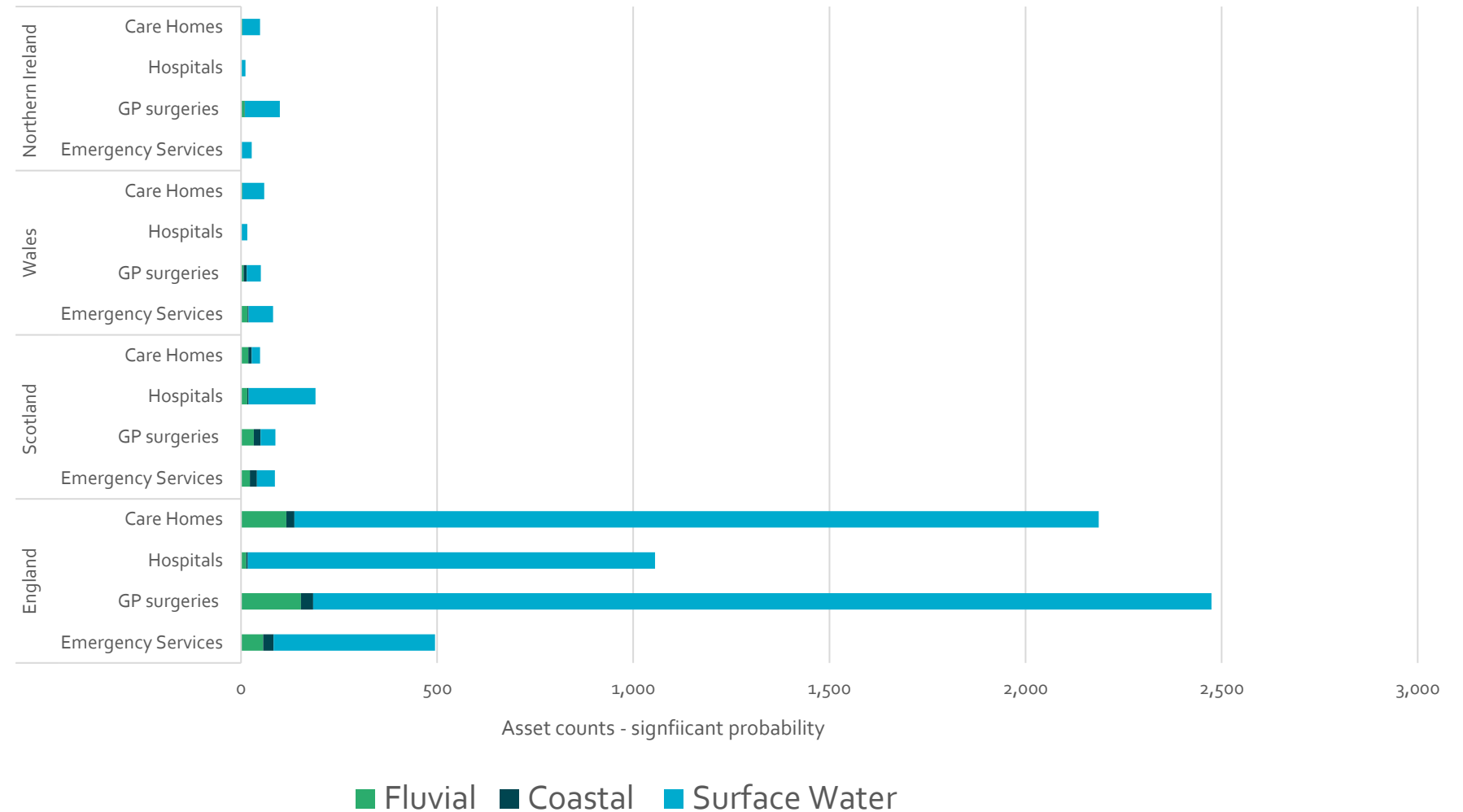


2080s on a pathway to 4°C global warming by the end of the century

Source: UKCP18 projections

# Health and social care assets at current risk of flooding

Sayers, P. B., Horritt, M. S., Carr, S., Kay, A., Mauz, J., Lamb, R., & Penning-Rowsell, E. (2020). *Third UK Climate Change Risk Assessment (CCRA3) Future flood risk - Main Report*. London, UK: <https://www.ukclimaterisk.org/wp-content/uploads/2020/07/Future-Flooding-Main-Report-Sayers-1.pdf>



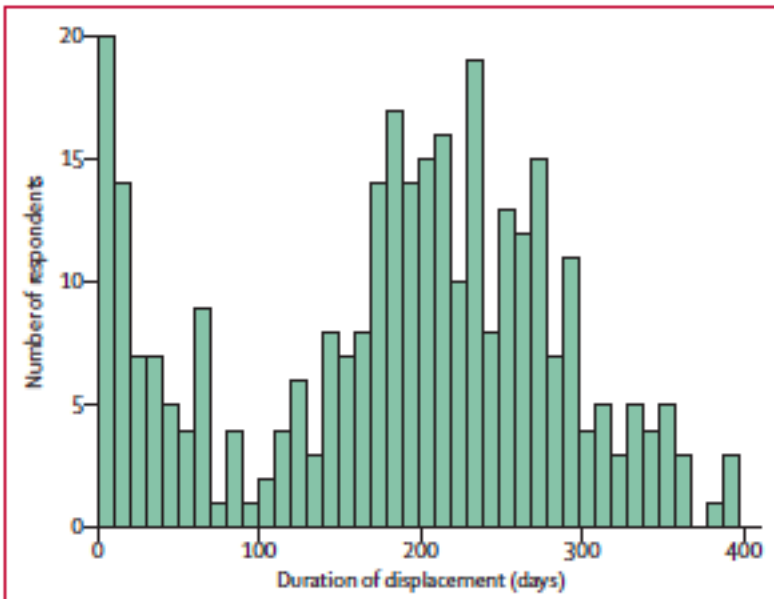
# Impacts of flooding and coastal change



- Death, injury, illness, displacement, damage and disruption
- Long term mental health implications
- Disproportionate impact on disadvantaged communities
  - Severe coastal impacts
- Increased subsidence, damp/moisture and structural damage
- Loss of recreational and leisure amenity and cultural heritage
- Economic and environmental costs
- Loss of coastal communities
  - Eastern/Southern England, west Wales
- Disruption to health care, prisons and education

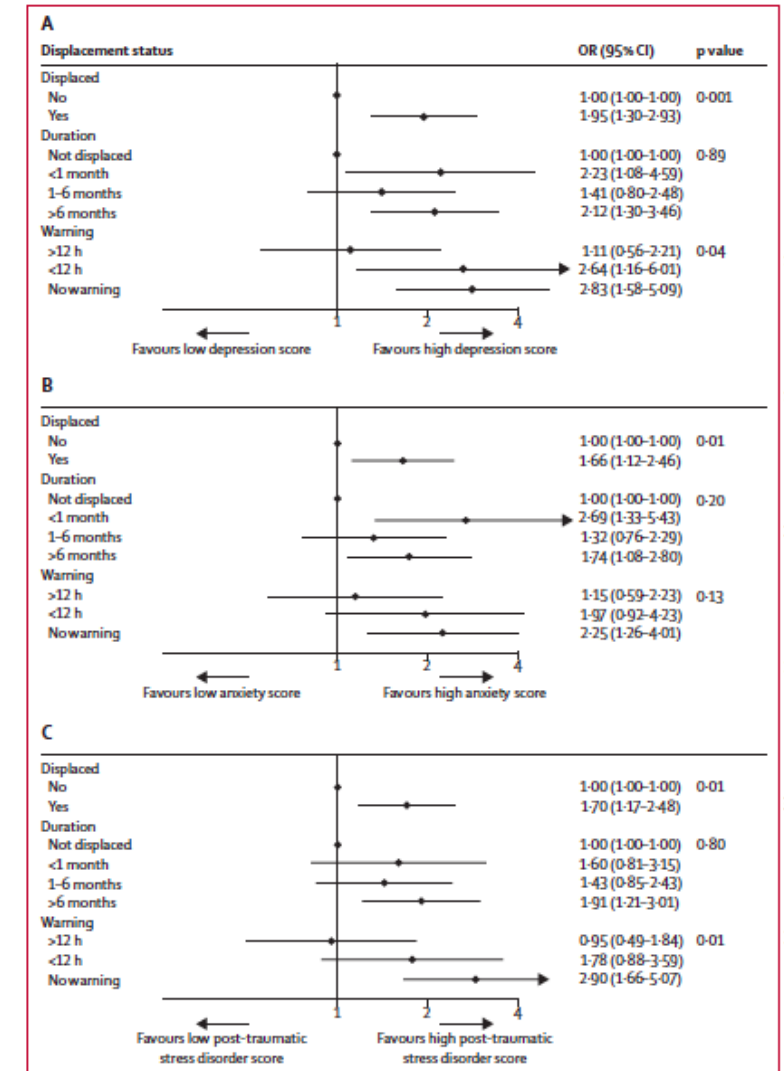
# PHE National Study on Flooding and Health

- Floods winter 2013/14
- Survey at 12 months post flood
- N= 2126
- Exposure classification: Flooded, affect and not-flooded



- Adjusted ordinal regression analysis of depression, anxiety, post-traumatic stress disorder by displacement status

- Munro et al. 2017. Lancet Planetary Health.
- Waite et al. 2017. BMC Public Health.



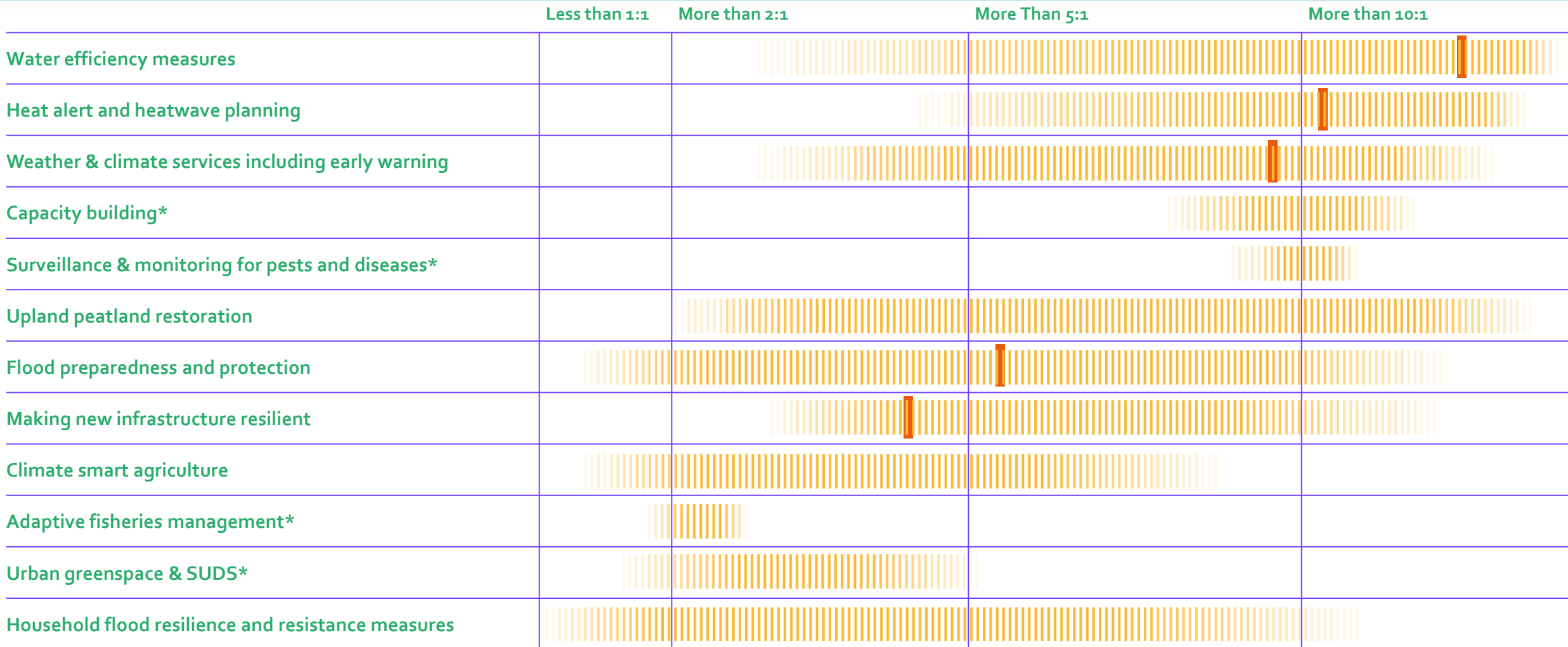
# Acting on adaptation

\*Based on single, limited or indicative studies

Source: CCC, based on Watkiss. P (2021)



Benefit: cost ratio



# Key Points

- Climate change is already having significant impacts on health and wellbeing.
- Reducing carbon emissions (mitigation) can have large benefits to health from active travel and sustainable diets
  - Health and other benefits offset the costs of emissions reductions
- Market unable to address adaptation sufficiently
  - Government has limited role in adaptation in the food system
- All countries will be affected by climate change
- Low and middle income countries will be the worst affected
  - Impacts on health from increases in malnutrition and infectious disease
- UK is ahead in developing adaptation policy but many gaps remain
  - Addressing overheating in buildings, offices and schools
  - Managing flood risks
- There are limits to adaptation



# Q&A

Find out more information at [www.icaew.com/esgrisk](http://www.icaew.com/esgrisk)



# The Centre on Climate Change & Planetary Health at the London School of Hygiene & Tropical Medicine

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& Planetary  
Health 

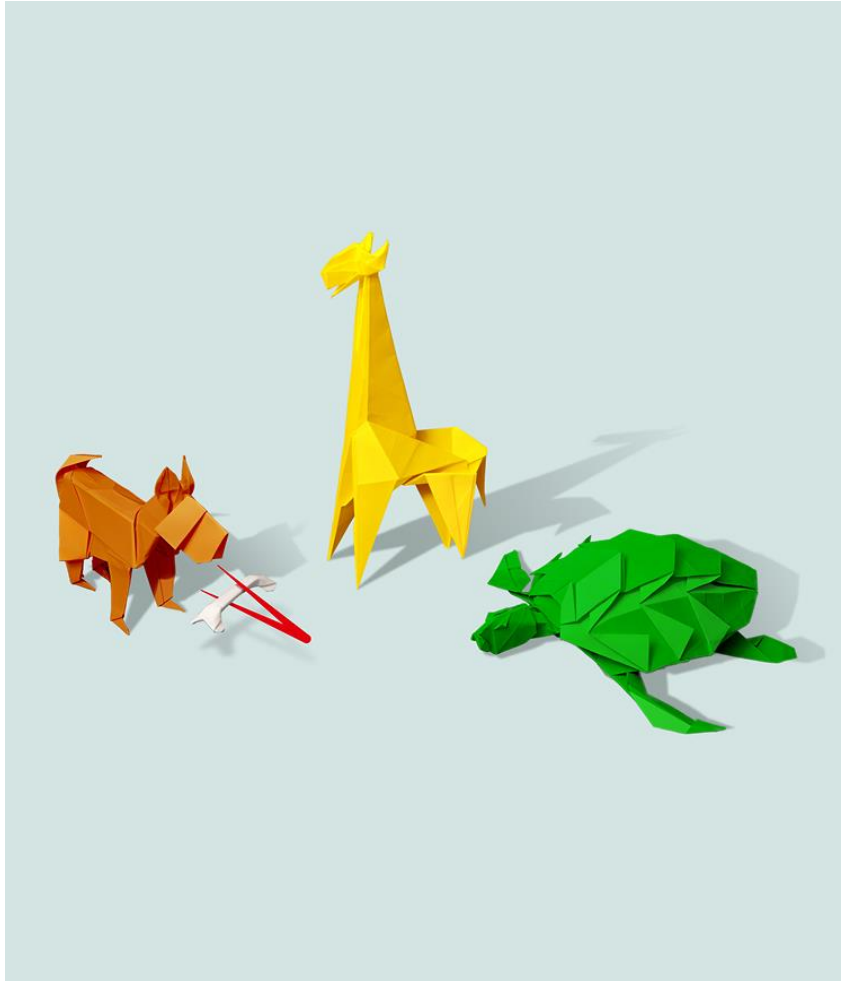
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- Find out about upcoming centre webinars and events
- Sign up to the monthly Centre newsletter
- Contribute to Centre research projects, such as the zero-carbon [Pathfinder Initiative](#) – we need your input!

Or contact Philanthropy Manager, Mary-Alice McDevitt at [mary-alice.mcdevitt@lshtm.ac.uk](mailto:mary-alice.mcdevitt@lshtm.ac.uk) or on 020 7612 7879



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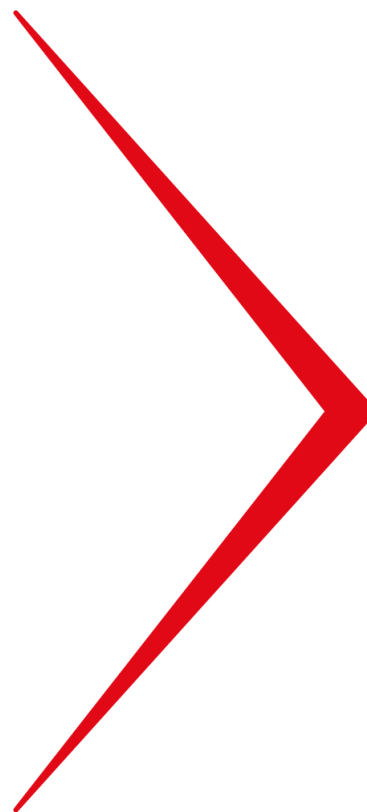
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