

How the impacts of climate change on transport have implications for health and wellbeing

THINK Seminar on public transport resilience to climate change in the UK
October 23rd 2023

Nerys Edmonds, Principal Public Health Practitioner, Public Health Wales



Setting the scene

Public Health Wales NHS Trust (PHW) recognises that climate change is one of the most significant threats of the century, endangering physical health, mental health and wellbeing. It threatens all areas of life that impact our ability to achieve and maintain good health.

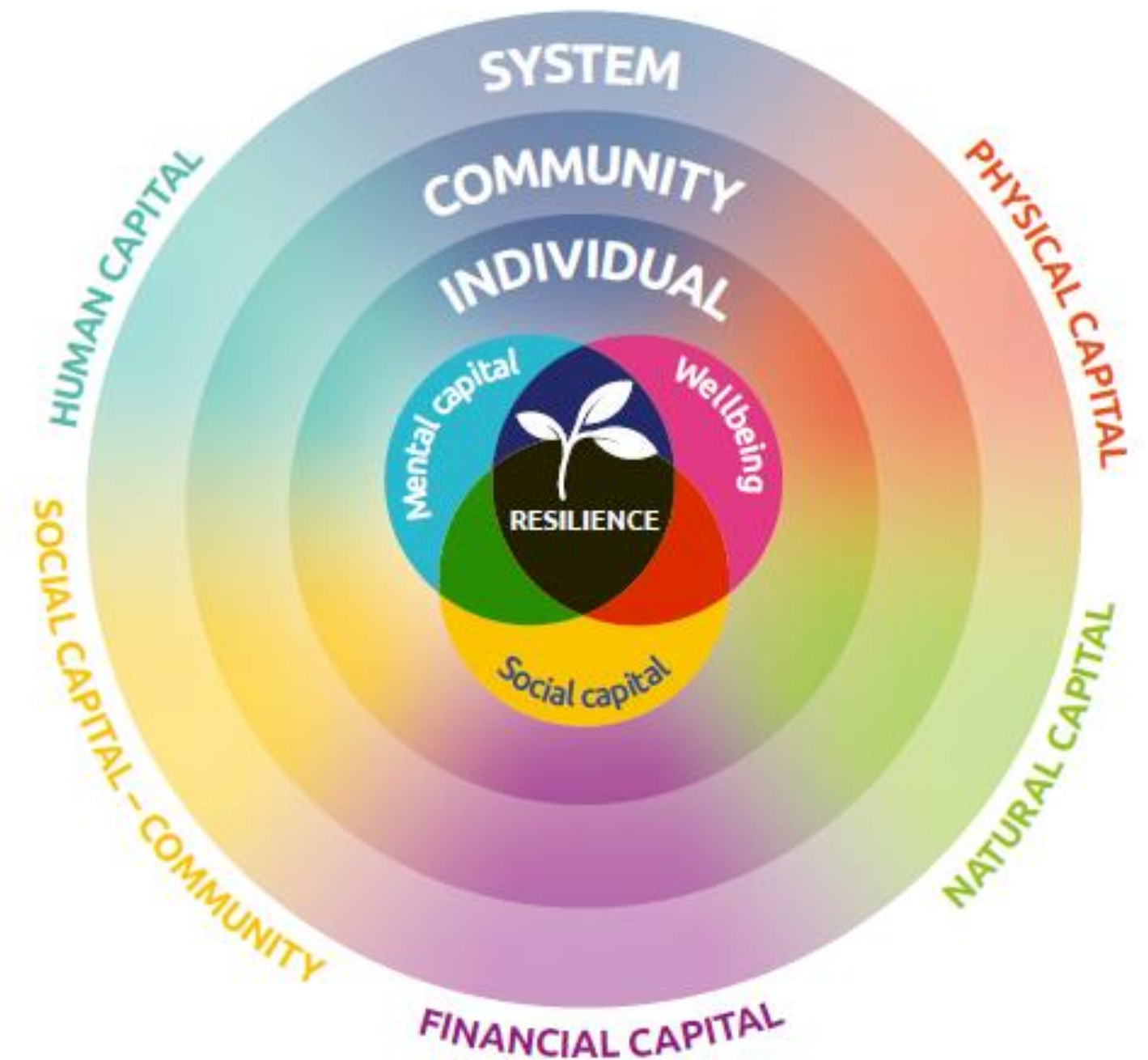
PHW has made tackling the public health effects of climate change a priority in its Long Term Strategy from 2023 – 2035 and is committed to working with partner agencies to respond and facilitate action on climate adaptation and mitigation (Public Health Wales NHS Trust, 2023).



Why transport and health?

Transport is an important enabler of participation, social inclusion and wellbeing, affecting economic and social outcomes, as well as inequality (NatCen, 2019).

Figure 3. Resilience from individuals to communities – the interplay across capitals



[Davies et al. \(2019\) phw.nhs.wales/files/research/resilience/resilience-understanding-the-interdependence-between-individuals-and-communities/](https://phw.nhs.wales/files/research/resilience/resilience-understanding-the-interdependence-between-individuals-and-communities/)

A population health lens

Those in rural communities in Wales already face challenges in accessing services due to travel times, distances and lack of public transport.

Over 60% of the population of Wales lives and works in coastal areas (Welsh Government, 2015): Coastal areas are particularly at risk of damage and disruption to transport infrastructure due to flooding and storms.

33% of adults in Wales reported a limiting longstanding illness in 2021/22 (Welsh Government, 2022). People living with a range of health conditions are more vulnerable to climate change related health impacts including higher temperatures, flooding and reduced air quality and require greater access to

healthcare



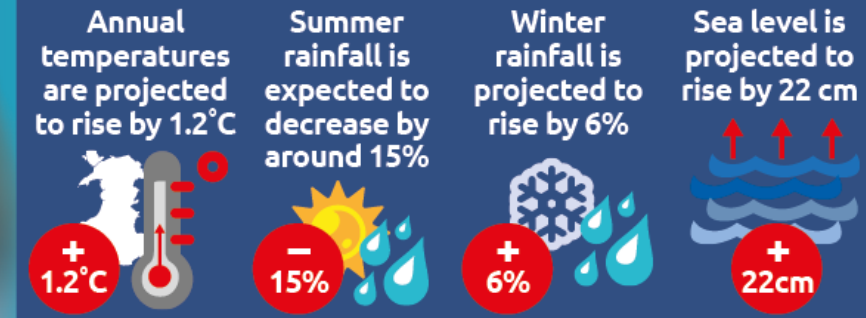
Health and wellbeing impacts of climate change

Climate change means that extreme weather, flooding and heatwave events are likely to occur more often in Wales

Climate change affects all parts of Wales. Some examples of health impacts for specific groups are shown below



By the 2050s in Wales:



Climate change is happening in Wales

Climate change affects us all

Children and young people

- ✘ Extreme weather and flooding**
 - Disruption to education, outdoor sport and play
 - Displacement from their homes, friends and community
 - Stress and anxiety for themselves and their families
- ✘ Increased heat**
 - Higher risk of heat related illness
- ✘ Mental wellbeing**
 - Anxiety about how climate change will impact their future
- ✘ Air quality**
 - More susceptible to poor air quality and wildfire smoke
- ✔ Positives**
 - Have a positive role in reducing carbon emissions and adaptation to climate change
 - Can be positive agents of change
 - Practical and creative ideas to help communities recover from disasters

Older adults

- ✘ Extreme weather and flooding**
 - Disruption to access to health, social care and support services
 - Displacement from their home and support networks
 - More vulnerable in emergency situations such as flooding
 - Increase in mental distress
- ✘ Increased heat**
 - Higher risk of heat related illness and mortality
 - Social isolation may increase during heat waves
- ✘ Air quality**
 - Older adults are more susceptible to poor air quality and wildfire smoke
- ✔ Positives**
 - Warmer winters are projected to decrease cold related deaths

People on low income

- ✘ Extreme weather and flooding**
 - Less resources to prepare, respond and recover from floods or other extreme weather
 - Less likely to be fully insured
- ✘ Air quality**
 - Air pollutant concentrations are currently higher in areas of socioeconomic disadvantage
- ✘ Food and nutrition**
 - Potential for increase in food costs
- ✔ Positives**
 - Potential in the long term for reduced heating costs

People with disabilities and long-term health conditions

- ✘ Extreme weather and flooding**
 - Disruption to access to health, social care and support services
 - Increase in mental distress
 - More vulnerable in emergency situations such as flooding
- ✘ Increased heat**
 - Negative impacts on some conditions such as mental health problems, cardiovascular and respiratory disease, and diabetes
 - Some medications can increase vulnerability to heat related illness
 - Social isolation
 - Sleep disturbance
- ✘ Air quality**
 - Those with respiratory conditions are more susceptible to poor air quality and wildfire smoke

• Planning and preparing for climate change needs to include action across sectors to promote and protect the health and wellbeing of different population groups and places in Wales.

Taken from: Health Impact Assessment of Climate Change in Wales (Public Health Wales, forthcoming). Kovats, S. and Brislley, R. (2021) Health, Communities and the Built Environment. In: The Third UK Climate Change Risk Assessment Technical Report. Netherwood A. (2021) Third UK Climate Change Risk Assessment Technical Report: Summary for Wales.

Extreme weather and access to essential services

Health and social care: quality and access

- Climate change driven disruption to transport infrastructure and networks is identified as a risk to the delivery of health and social care services (Netherwood, 2021; W2).
- Disruption to transport infrastructure (such as roads being flooded) can cause transport delays and impact **response times of ambulance and emergency vehicles** (Yu et al., 2020).
- A case study on the 2013 floods in England found significant disruption to the delivery of **increasingly complex healthcare being delivered in homes that had to be evacuated** (Landeg et al., 2019).
- Increasing provision of health and social care in people's homes means that there is a need to consider how care workers and informal carers **can access people following climate related extreme weather events.**

Access to education

- Climate change is likely to cause disruption to education (Kovats and Brisley, 2021).
- In Wales, approximately **108,455 pupils** are transported by bus to school each day (Welsh Government, 2022), therefore it can be anticipated that any disruption to the road network will impact on access to education.

Food security and economic impacts

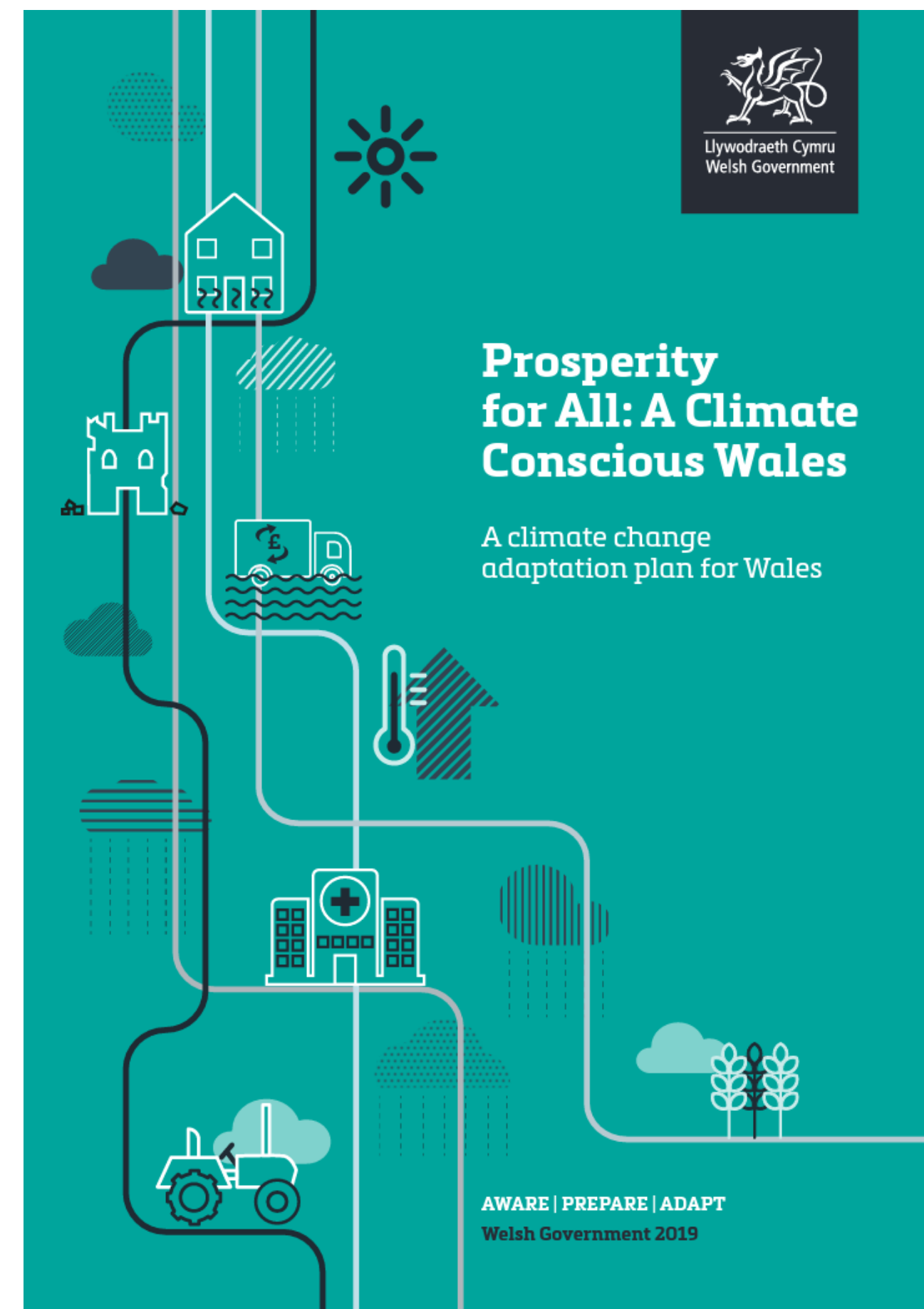
- Disruption to transport linked to higher temperatures and extreme weather, along with supply chain disruption, are identified as risks to business productivity and food security (Surminski, 2021)

Overheating on public transport

The national adaptation plan for Wales highlights overheating on public transport as an area that requires further research and investigation to inform adaptive action to protect health in Wales.

Population groups vulnerable to heat related illness include:

- Young children
- Older adults
- People with respiratory and cardiovascular disease
- People with dementia



Working conditions

50,000 jobs are located in the transport and storage sector in Wales (NOMIS, 2022)

The HEAT-SHIELD (2016) programme identified **heat risks to transportation workers**, for example, in relation to excessive heat in glazed driver’s cabins

The project reports: “periods with elevated environmental heat stress may negatively affect driving skills and **reduce safety**” (Nybo et al., n.d., p. 48).

Bonafete et al. (2016) also report on studies finding an association between **higher temperatures and accidents in the transport sector**.



[HEAT-SHIELD Research Project](#)

Physical activity: active travel

Warmer weather **may** create opportunities for outdoor and physical activity, which may benefit active travel, with benefits for physical and mental health and wellbeing (Kovats and Brisley, 2021; Elliot et al., 2019).

But, there is also evidence hot weather in the summer can reduce physical activity (Heaney et al., 2019)

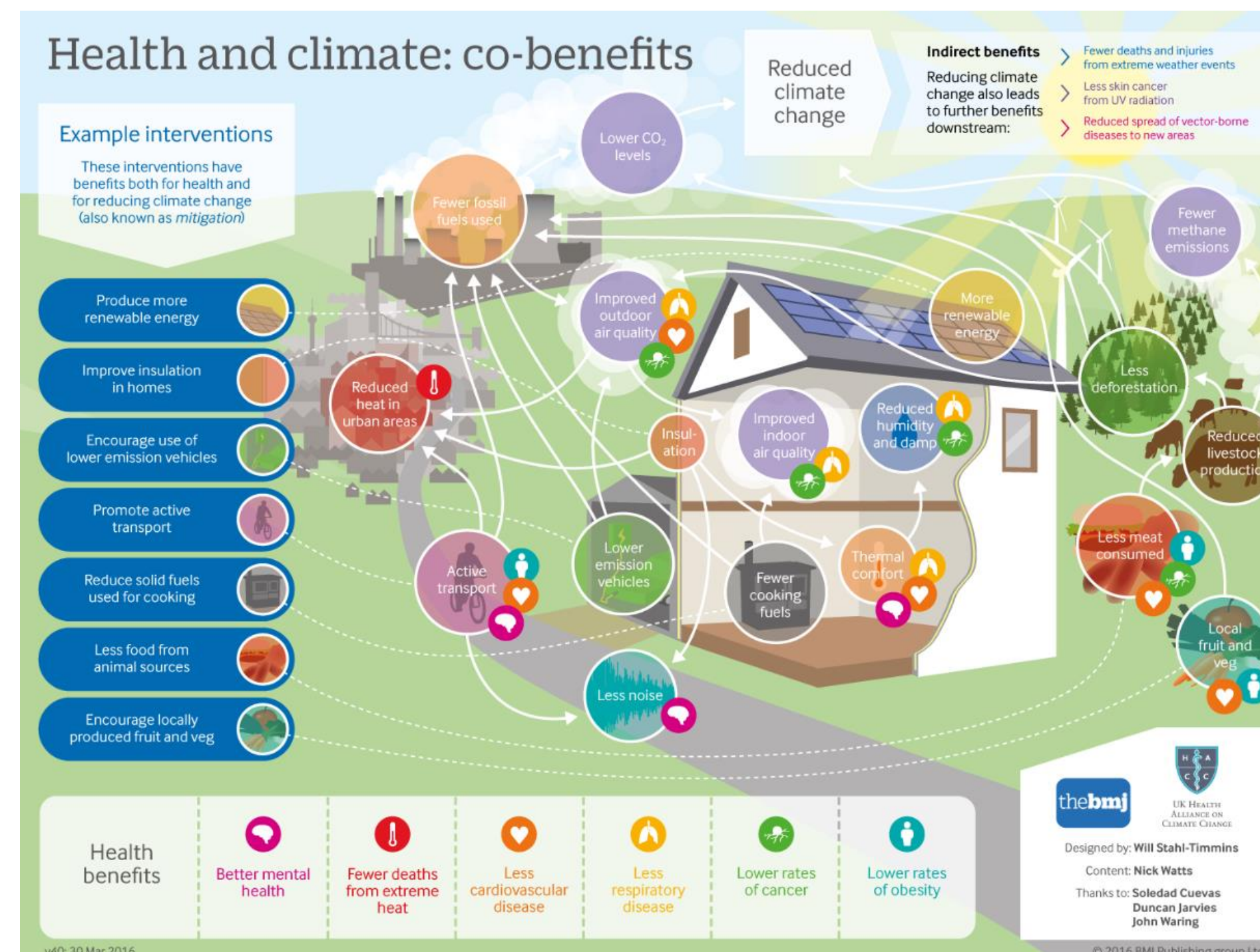
Stakeholders who we engaged as part of the HIA data collection reported that extreme weather can hinder outdoor play for children and active travel.



Opportunities to benefit health and wellbeing

Greater investment in decarbonised public transport and active travel can lead to positive health outcomes via lower emissions, **improved air quality**, and increased **physical activity**.

Reduced emissions of greenhouse gases via the use of lower or no greenhouse gas energy sources for transport are modelled to reduce outdoor air pollution, benefit health, and **reduce mortality** (Milner et al., 2023).



D8.1 Transport

Characterisation of impact on transport

Intensity	Likelihood	Duration	Intensity	Likelihood	Duration
Positive impacts/opportunities			Negative impacts		

Confirmed
 Probable
 Possible
 Major
 Moderate
 Minimal
 Short term
 Medium term
 Long term

? How do the impacts of climate change on transport affect health and wellbeing?

Positive impacts / opportunities

- Greater investment in decarbonised public transport and active travel can lead to positive health outcomes via lower emissions, improved air quality, and increased physical activity

Negative impacts

- Damage to transport infrastructure and networks
- Disruption and delays to travel
- Disruption to delivery of essential goods
- Disruption to access to services and education
- Disruption to social participation leading to social isolation
- Disruption to emergency services and health and social care delivery
- Economic impacts

Reference:

Edmonds, N., and Green, L. (2023) Climate Change in Wales: Health Impact Assessment, Public Health Wales NHS Trust.
<https://phwwhocc.co.uk/resources/climate-change-in-wales-health-impact-assessment>

[Contact; Nerys.S.Edmonds@wales.nhs.uk](mailto:Nerys.S.Edmonds@wales.nhs.uk)

Contributors:

Sumina Azam, Mark A Bellis, Katie Creswell, Christine Clar, Morganna Davies, Mark Drane, Michael Fletcher, Karen Hughes, Kristian James, Natasha Judd, Sue Toner, Phil Wheeler, Sara Wood.

© 2023 Public Health Wales NHS Trust.

Material contained in this document may be reproduced under the terms of the Open Government Licence (OGL)

www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

provided it is done so accurately and is not used in a misleading context.

Acknowledgement to Public Health Wales NHS Trust to be stated.

Copyright in the typographical arrangement, design and layout belongs to Public Health Wales NHS Trust.



GIG
CYMRU
NHS
WALES

Iechyd Cyhoeddus
Cymru
Public Health
Wales

Gweithio gyda'n gilydd
i greu Cymru iachach

Working together
for a healthier Wales

