

Climate Change in Wales: Health Impact Assessment

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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>

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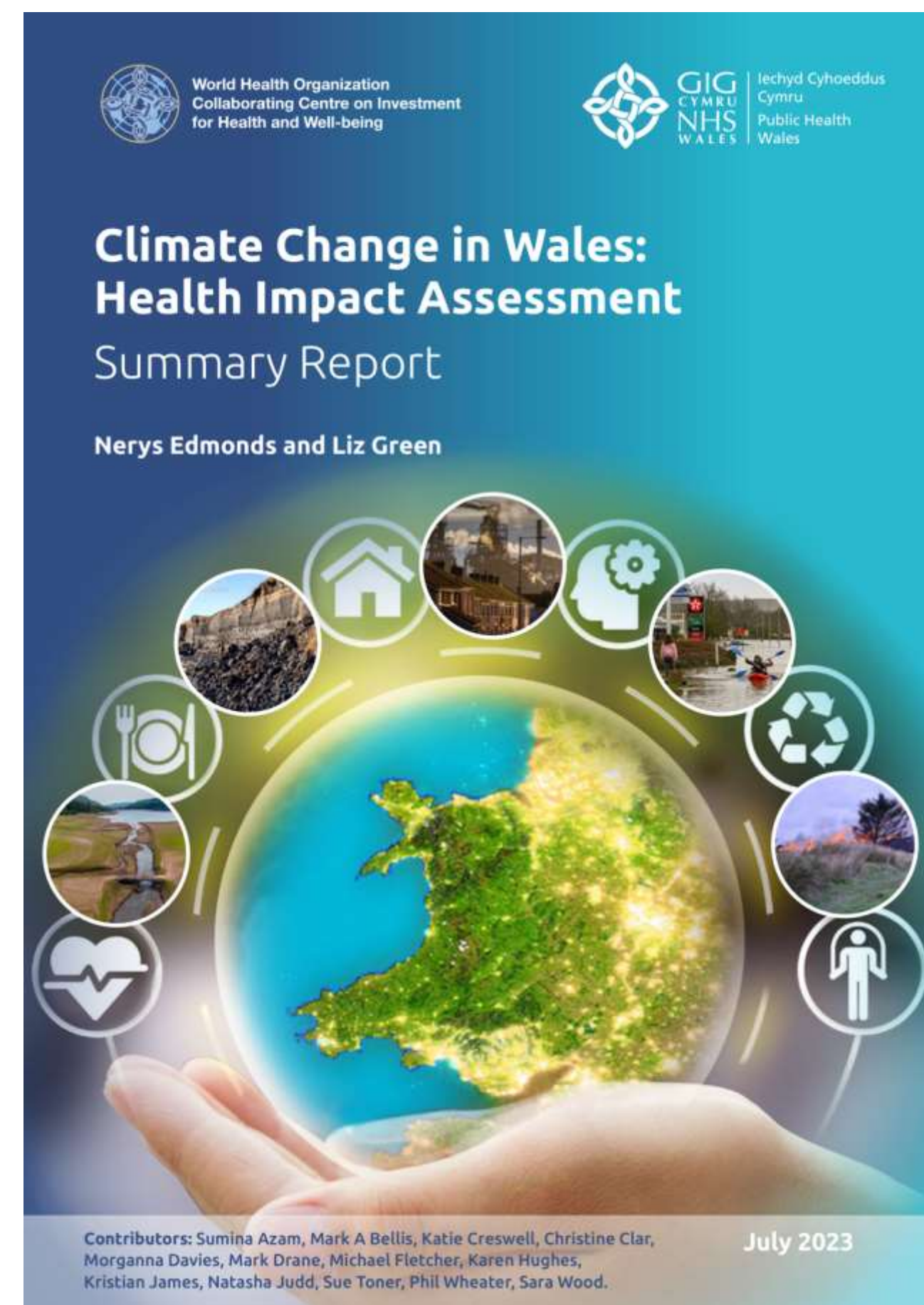
Background

The Health Impact Assessment was initiated by Public Health Wales following the declaration of a climate emergency by Welsh Government in 2019.

The work has been led by the Wales Health Impact Assessment Support Unit in Public Health Wales.

A Strategic Advisory Group was convened in 2019 including representatives from Welsh Government, Natural Resources Wales (NRW), local public health teams and the Welsh Local Government Association.

Work on the HIA was delayed due to the COVID 19 response.



Aims of the Climate Change Health Impact Assessment in Wales

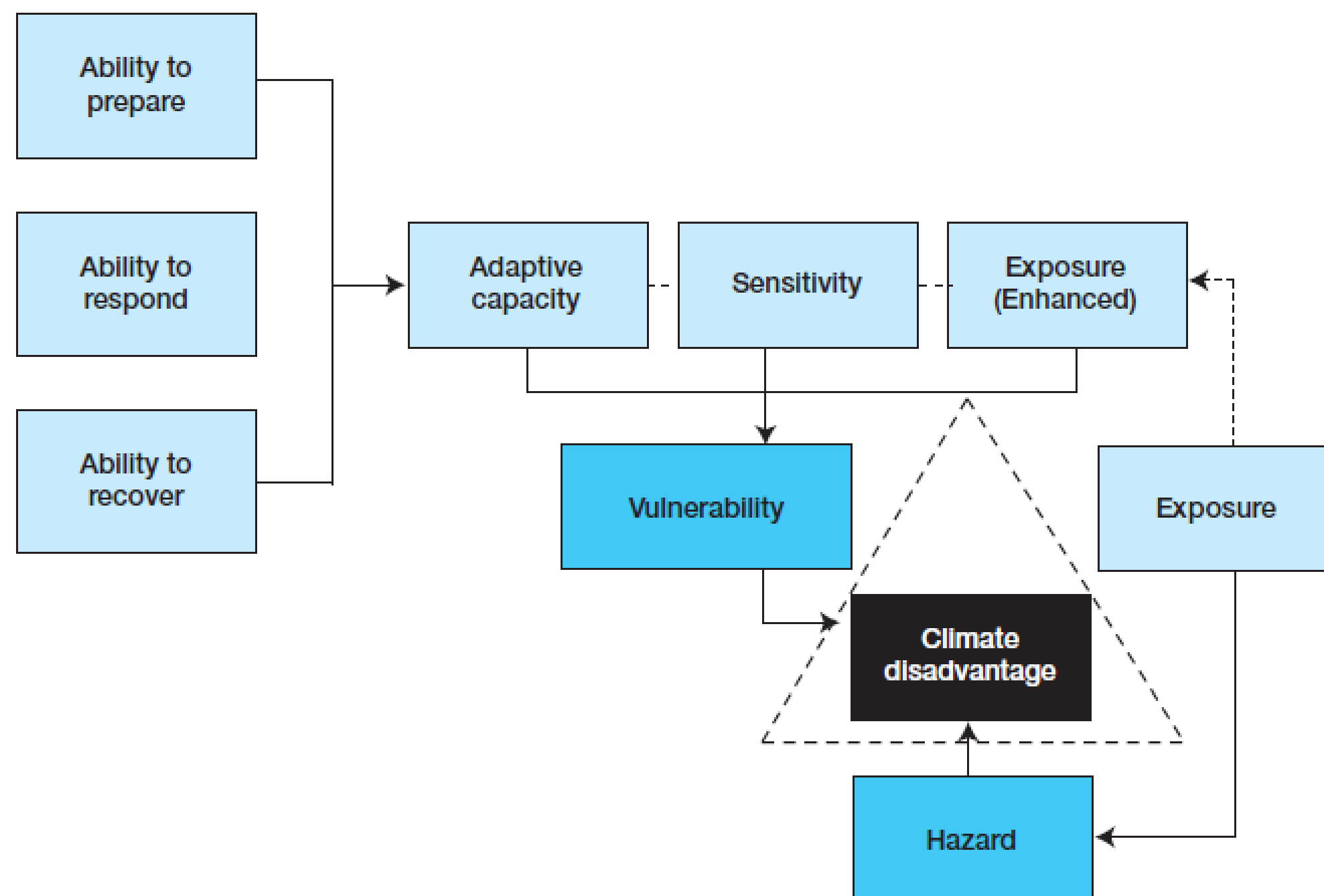
- To identify the potential health and well-being impacts of climate change in Wales - whether physical, mental or social
- To identify how climate change will affect people's lives where they live, work, learn and play - what does it mean?
- Provide evidence for integration of health into adaptation planning and policy making
- To support organisations and decision and policy makers and inform plans, policies and programmes
- To inform Public Health Wales work programme and public bodies planning for the future

Scope

- Wales only; comprehensive / complex; participatory; assesses potential and actual impact.
- Negative (-) and positive impacts / opportunities (+) identified
- Focus on the impacts on the social determinants of health, population groups affected and inequalities
- Evidence based: Literature review; interviews, 2 stakeholder workshops; case studies

HIA Process

1. Screening
2. Scoping
3. Appraisal of three types evidence: Population, published, qualitative
4. Report and recommendations
5. Review and reflection including monitoring and evaluation



A conceptual framework for assessing socio-spatial vulnerability and climate disadvantage . Credit: Sarah Lindley, John O’Neill, Joseph Kandeh, Nigel Lawson, Richard Christian and Martin O’Neill (2011) Climate change, justice and vulnerability. JRF

Evidence base

- Systematic literature review guided by a detailed protocol carried out by Bangor University
- Updated targeted literature review in 2021 – 2022
- Participatory stakeholder workshops x 2
- Interviews with key stakeholders x 19
- Population health profile

The evidence was triangulated, synthesised and analysed and impacts identified and characterised.

Communicating the findings

Outputs

- Summary report
- Impact tables
- Individual downloadable appraisal chapters on the social determinants of health and population groups impacted
- Set of 4 infographics
- PowerPoint slide deck
- Technical Report

[Climate Change in Wales: Health Impact Assessment - World Health Organization Collaborating Centre On Investment for Health and Well-being \(phwwhocc.co.uk\)](https://phwwhocc.co.uk)

Nature supports our health and wellbeing

Physical wellbeing

Keeping active in green and natural spaces like beaches, forests, parks and the countryside by walking, running, cycling, conservation work and playing

✓ Health outcomes:

- General physical health
- Cardiovascular health
- Healthier immune systems
- Healthier weight
- Mental wellbeing



Cut down on waste

Reduce, repair, reuse and recycle

[Reuse more](#) | [Wales Recycles](#)



Switch to active travel

Walk or cycle for your short distance journeys instead of going by car. All local authorities in Wales are producing active travel maps to help people plan car free journeys

Taking care of yourself and others

Mental wellbeing

Peaceful places; keeping active; taking notice of nature; feeling connected to nature; appreciating beauty

✓ Health outcomes of access to green and natural spaces:

For children and young people:

- Better emotional wellbeing
- Reduced stress and hyperactivity
- Improved resilience

For adults:

- Lower stress, depression and anxiety;
- Higher positive emotions and mental wellbeing



Social wellbeing

Places to meet with others; shared activities and experiences

✓ Health outcomes:

- Reduce social isolation
- Sense of belonging
- Improved mental wellbeing



Essentials for life

Clean air

Water

Food



Taking care of nature

Reduce energy use

Save money on your bills at the same time as reducing your carbon footprint [Nest Wales](#)



Support nature and biodiversity

Make your garden wildlife friendly

[Nature on your Doorstep – Wildlife-friendly Gardening](#) | [The RSPB](#)



Volunteer for a local environmental charity

You could be food growing, fundraising, litter picking or conserving nature

[I want to volunteer](#) - [WCVA](#)



Work together

Find out how communities across Wales are tackling climate change and helping nature together

[Renew Wales](#)



In the UK, **40% of species** are in decline, and **25% of mammals** are at risk of extinction



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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:

Annual temperatures are projected to rise by 1.2°C



Summer rainfall is expected to decrease by around 15%



Winter rainfall is projected to rise by 6%



Sea level is projected to rise by 22 cm



Climate change is happening in Wales

✖ 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



Children and young people

✖ 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



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



Climate change affects us all

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 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.



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Climate change impacts on access to healthy food

A healthy, nutritious diet is essential for:

Healthy growth and development in children



Good physical and mental health and wellbeing



Preventing obesity, cardiovascular disease and cancer



Changes to how we eat can promote health and help the planet:

Eating less meat and dairy products



Eating more fruit, vegetables and legumes



Cutting down on food waste



Food is essential for life

Our planet is essential for food

Healthy eating is already a public health priority in Wales because:



61% of adults are overweight or obese

27% of children aged 4 to 5 years are overweight or obese

25% of people eat the recommended five portions of fruit or vegetables a day



Poverty and the cost of food were already barriers to a healthy diet in Wales before 2020:



10% of households had low or very low food security and another 10% had weak food security

Families with children under 16 were less likely to have high food security

Low income families would have needed to spend **42% of their after-housing income** on food to meet the costs of healthy eating guidelines



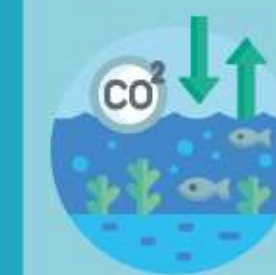
Climate change is likely to impact on access to healthy food in Wales in a number of ways:

Extreme weather can disrupt food production and supply in the UK and internationally, leading to food price spikes in the UK



Increased risk of pests, invasive species and diseases impact on crop yields and livestock health

Poorer soil quality and less water impact on crop yields



Higher water temperatures and ocean acidification impact on the availability of fish

More action is needed to develop resilient food systems to protect health in Wales in response to climate change

- More investigation and improved data are needed to plan for present and future climate risks to food systems to ensure vulnerable groups are protected and the impacts to health are minimised.
- Food security for health and wellbeing can only be achieved by a wide range of sectors including health, environment, government, civil society, farmers, trade and food producers / retailers working together.

Health and wellbeing impacts of increased heat

Climate change means that heatwave events are likely to occur more often in Wales.

By the 2050s annual temperatures are projected to rise by 1.2°C in Wales



The 2021 Independent Assessment of UK Climate Risk says:

- Heat risk in homes and buildings is a top priority for action in the next 2 years
- More action is needed to address risks to human health, wellbeing and productivity



Cross sector action is needed

We need to plan and adapt

Schools and other educational settings:

- Heat related illness
- Loss of concentration
- Reduced ability to learn



Workplaces:

- Heat related illness
- Reduced productivity
- Decreased safety



Homes:

- Heat related illness
- Sleep disturbance
- Potential long term reduced heating costs



Hospitals and care homes:

- Thermal discomfort of patients/residents and staff
- Heat related illness of patients/residents and staff
- Sleep disturbance
- Negative impacts on conditions such as mental health problems, cardiovascular and respiratory diseases
- Failure of equipment and IT systems
- Disruption to laboratory equipment
- Damage to medicines



Factors affecting heat in buildings include:

- Building design and materials
- Type of building
- Location and positioning
- Room occupancy levels
- IT and electrical equipment generating heat
- Insulation
- Ventilation
- Outdoor shade
- Type of activities









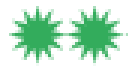








More action is needed across sectors to plan for increased heat:

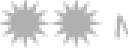
- New schools, homes, hospitals and care settings need to be designed to prevent health impacts from increased heat
- There is a need to increase incentives for retrofitting existing homes
- Well planned tree planting can provide shade to reduce exposure to heat in urban areas, care settings, homes, schools, and playgrounds

Extreme Weather Advice






















- Public Health Wales Environmental Health Protection Team provide extreme weather advice for the public and organisations across Wales on how to protect health during extreme weather, heatwaves and flooding. Find out more at: [Extreme Weather Events - Public Health Wales \(nhs.wales\)](https://www.nhs.uk/extreme-weather-events/)

Descriptors used to characterise impacts

Type of impact		
Positive / opportunity Impacts that are considered to improve health status or provide an opportunity to do so		Negative Impacts that are considered to diminish health status
Likelihood of impact		
 Confirmed	Strong direct evidence e.g. from a wide range of sources that an impact has already happened or will happen	 Confirmed
 Probable	More likely to happen than not. Direct evidence but from limited sources	 Probable
 Possible	May or may not happen. Plausible, but with limited evidence to support	 Possible
Intensity / severity of impact		
 Major	Significant in intensity, quality or extent. Significant or important enough to be worthy of attention, noteworthy	 Major
 Moderate	Average in intensity, quality or degree	 Moderate
 Minimal	Of a minimum amount, quantity or degree, negligible	 Minimal
Duration of impact		
 = Short term		Impact seen in 0 – 3 years
 = Medium term		Impact seen in 3 – 10 years
 = Long term		Impact seen in >10 years

 Confirmed
  Probable
  Possible
  Major
  Moderate
  Minimal
  Short term
  Medium term
  Long

Summary of impacts on the determinants of health and wellbeing

Determinant of Health	Intensity i.e. minimal; moderate; major	Likelihood i.e. probable; possible; confirmed	Duration i.e. short/ medium/ long-term	Intensity i.e. minimal; moderate; major	Likelihood i.e. probable; possible; confirmed	Duration i.e. short/ medium/ long-term	Rationale i.e. positive / opportunity or negative / unintended consequence
	Positive / Opportunities			Negative / Unintended negative impacts			
D1 Food Security and Nutrition							
Food utilisation: healthy eating	No evidence identified		 to 				Positive/opportunity: Increased awareness of climate change may influence the increasing adoption of a more healthy and sustainable diets
Food availability: production and security	No evidence identified		 to 			 to 	Positive/opportunity: increase the production of sustainable, local food in Wales; potential for growing new crops in warmer temperatures. Negative: variability in access to food due to disruptions to the supply chain from arising weather events and climate hazards. Decreasing yields from extreme weather, rising temperatures, pests, water scarcity and ocean changes globally*.
Food accessibility: cost of food				 (in particular cumulative with Brexit and Cost of Living Crisis)		 to 	Negative: Climate related shocks to the international food system are becoming more likely and can lead to food price spikes, which exacerbate inequalities in access to healthy food*.
Nutritional content of food	No evidence identified		No evidence identified			 to 	Positive/opportunity: The introduction of new crops may improve nutrition*. Negative: high levels of carbon dioxide can reduce the nutrient content of some crops*.
Food Borne Disease				 (Note: rated as High risk in CCRA3 but combined with food security)	 (Note: rated as low confidence in CCRA3)	Unknown	Negative: increasing air and water temperatures, variations in rainfall impact occurrence and persistence of food borne disease. Food safety risks during transport and storage.

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

Downloadable Chapters

[D5.3P6.2-Flooding-Eng-final.pdf \(phwwhocc.co.uk\)](https://phwwhocc.co.uk/D5.3P6.2-Flooding-Eng-final.pdf)












D5.3/P6.2 Flooding

Flooding can cause death and injury, and there is strong evidence of long term and severe impacts on mental health and wellbeing. Flooding also damages and disrupts critical infrastructure, access to services and education, along with negative economic impacts on individuals, businesses and public services.

Characterisation of impact of flooding on health and wellbeing

Intensity	Likelihood	Duration	Intensity	Likelihood	Duration
Positive impacts/opportunities			Negative impacts		
			***	✓✓	S to L

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

? How do climate change impacts on flooding affect health and wellbeing?

Positive impacts / opportunities

















- Opportunity to build community resilience and cohesion
- Mutual aid
- Early warning systems
- Community engagement with regards to development and implementation of Flood and Coastal Erosion Risk Management policies and plans

Negative impacts

- Death or injury
- Long term and severe impacts on mental health and wellbeing including depression and Post-Traumatic Stress Disorder
- Economic impacts on incomes, livelihoods and employment
- Disruption to education
- Loss of valued places leading to emotional distress ("solastalgia")
- Damage to homes
- Disruption to access to services
- Illness arising from contaminated water
- Loss of tourism, recreational and leisure amenity

D4 Mental health and wellbeing

Characterisation of impact on mental health and wellbeing

	Intensity	Likelihood	Duration	Intensity	Likelihood	Duration
	Positive impacts/opportunities			Negative impacts		
Mental wellbeing	No evidence identified		 to 			 to 
Social isolation				No evidence identified		 to 
Mental disorder					 (flooding)  (heat and other indirect impacts)	 to 
Suicide				No evidence for Wales identified		No evidence for Wales identified

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

? How does climate change impact mental health and wellbeing?

Positive impacts / opportunities

- Enhancing control and participation by taking action to mitigate climate change
- Building community resilience and cohesion
- Volunteering and helping others in both taking action to tackle climate change and in the response to, and recovery from, extreme weather events
- Learning new skills
- Increased outdoor activity and connecting with the natural environment in green and blue spaces

Negative impacts

- Feelings of worry and anxiety about the uncertainty of the future
- Feelings of loss, distress and grief
- Social isolation
- Depression
- Post-Traumatic Stress Disorder after experiencing an extreme weather event i.e. flooding
- Anxiety disorders
- Worse symptoms of mental disorders and dementia in extreme heat



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Key messages and summary

Our health and wellbeing is dependent on the health of the planet and its ecosystems

- Tackling climate change by reducing emissions has major co-benefits for health
- Climate change will have a major impact on health, wellbeing and equity in Wales, including quality and access in health and social care. We are already seeing these impacts.
- Some population groups are more vulnerable and / or exposed to impacts
- More action is urgently needed across Wales to adapt the environments in which people live, work, play and learn to protect health and wellbeing in the face of climate change.

- Action on adaptation needs to go beyond responses to individual episodes of extreme weather - long-term, preventative solutions are needed that adapt policy, housing, the living environment, and behaviour.
- Adaptation policy and decisions in other sectors will impact health outcomes. Health, wellbeing and equity need to be outcomes of adaptation policy across sectors
- Public participation and involvement in policy and planning for the future needs to be strengthened.
- More support is needed to build resilience and help communities to prepare, respond and recover from flooding, coastal erosion, and other environmental impacts.

Determinants of Health impacted by climate change in Wales

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D1 [Food security and nutrition](#)

D2 Behaviours Affecting Health

D2.1  [Physical and outdoor leisure activity](#)

A1* [Alcohol and substance misuse](#)

D3 Social and community factors

D3.1  [Community resilience and cohesion](#)

D3.2/P3.1  [Population displacement, mobility and migration](#)

A2 [Violence](#)

A3 [Family and intergenerational relationships](#)

D4 [Mental health and wellbeing](#)

D5 Living and environmental conditions affecting health

D5.1  [Housing](#)

D5.2  [Air Quality](#)

D5.3/P6.2  [Flooding](#)

D5.4  [Higher temperatures and extreme heat](#)

D5.5  [Water supply and quality](#)

D5.6  [Natural Environment and Biodiversity](#)

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D5.7  [Landslides and coal tips](#)

D5.8  [Wildfires](#)

D5.9  [Vector Borne Disease](#)

D6 Economic conditions affecting health

D6.1/P5  [Working conditions](#)

D6.2  [Economic development and skills](#)

D7 Access and quality of services

D7.1  [Health and social care: access and delivery](#)

D7.2  [Education](#)

D8 Macro-economic, environmental and sustainability factors

D8.1  [Transport](#)



D8.2  [Infrastructure](#)

* Sections labelled A1-A3 summarise evidence appraised on impacts on three social determinants of health that were identified as important by stakeholders and are highly relevant to population health in Wales. However, limited evidence was identified in the literature to enable assessment of the level of potential impact on Wales, therefore each of these areas are recommended areas for further research



Population Groups who are more vulnerable and disproportionately impacted by the health and wellbeing impacts of climate change in Wales

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P1 Age related groups

- P1.1  [Babies, children and young people](#)
- P1.2  [Older adults](#)

P2 Sex/gender related groups

- P2.1  [Women](#)
- P2.2  [Pregnant women](#)
- P2.3  [Men](#)

P3 Groups at higher risk of discrimination or other social disadvantage

- P3.1  [Displaced people and Refugee and asylum seekers \(see D3.2\)](#)
- P3.2  [People with long-term health conditions and/or disabilities](#)
- P3.3  [People who are homeless](#)
- P3.4  [Minority ethnic groups](#)
- P3.5  [People who are new to an area](#)

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P4 Income related groups

- P4.1  [People living on a low income](#)

P5 [Occupational groups \(see D6.1\)](#)

P6 Geographical Groups

- P6.1  [Coastal communities](#)
- P6.2  [Flood risk areas \(see D5.3\)](#)
- P6.3  [Former and current industrial areas](#)
- P6.4  [Urban areas](#)
- P6.5  [Rural areas](#)
- P6.6  [Areas of multiple disadvantage](#)

Other findings in the HIA

There are contextual factors that also influence health and wellbeing impacts including:

- Democracy, decision making and community engagement
- Psychosocial and behavioural factors
- Social media and communications (including risk communication)
- Sustainable development and decarbonisation



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Areas for Action

Eight areas for action are framed around the five ways of working

The Wellbeing of Future Generations (Wales) Act 2015 Five Ways of Working provide a useful overarching framework for the approach to adaptation to protect health and wellbeing, and reduce inequalities:



Long-term: climate change is with us for the long term and must be seen as a priority across all plans, strategies and investments. A long-term approach will enable sustainable, considered and robust approaches to adaptation to be developed.



Prevention: there are many opportunities identified in the HIA to prevent or mitigate negative health and wellbeing impacts of climate change, and realise co-benefits for health and equity from adaptation and mitigation.



Integration: climate adaptation and mitigation action across sectors is highly likely to impact on the “healthier” and “more equal” Wales goals. Taking a place based or population health based approach to climate adaptation can support an integrated systems-based approach to adaptation that moves away from a siloed sector-based approach, to understanding the interacting and cumulative impacts on people across the Wellbeing Goals and setting such as home, work, school, economy, environment and community.



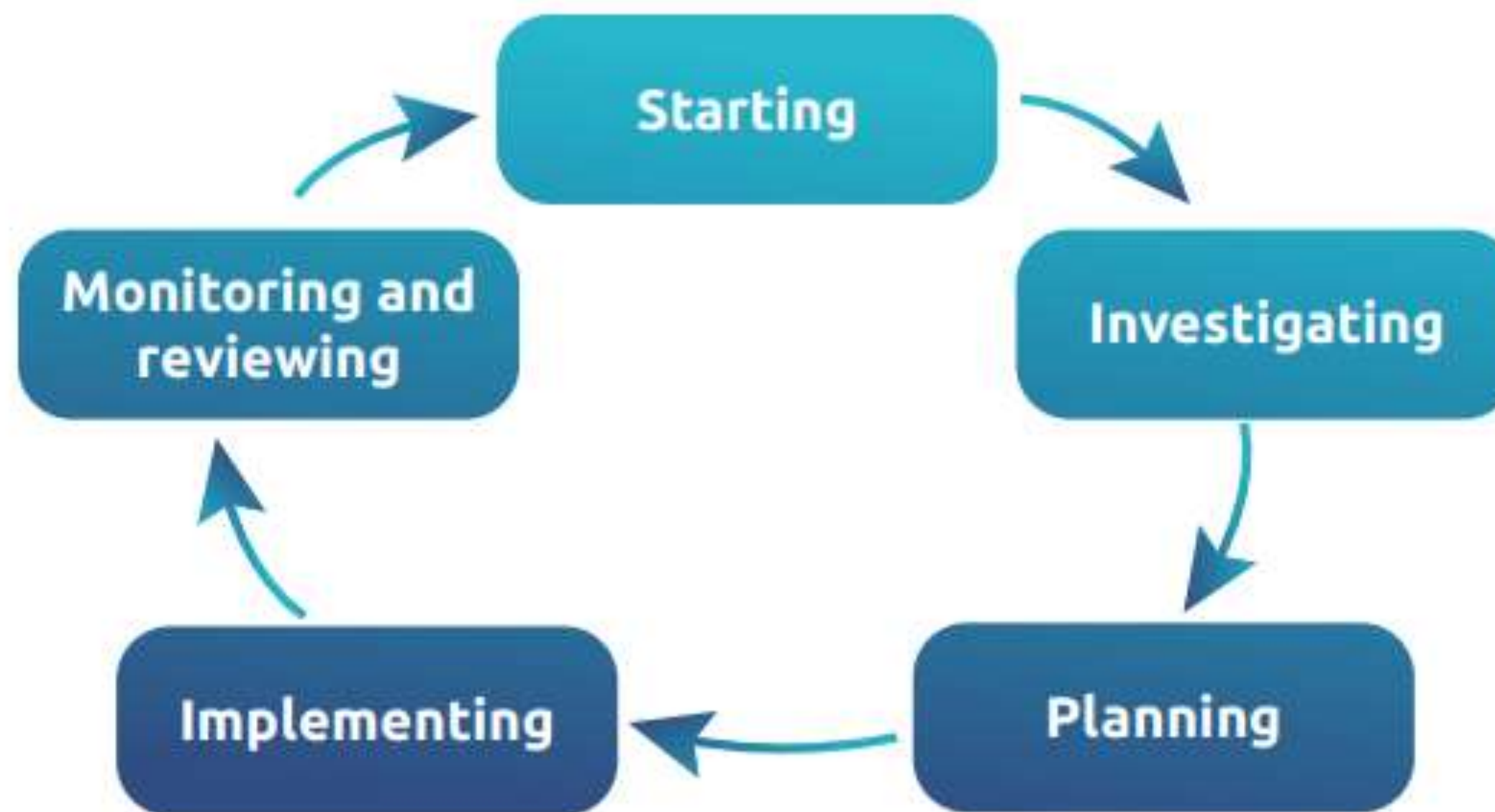
Involvement: people understand the impacts of climate change in their local areas, and high-quality engagement can help protect mental wellbeing by enhancing control and facilitating participation in decisions that affect people’s lives and livelihoods.



Collaboration: climate change impacts across human and natural systems. The impacts are felt across the economy, health, education, transport, natural environment, culture and heritage and more. Integrated systems-based solutions require collaborative approaches and shared learning and support will be central.

Area for action 1: Take action on the health impacts identified in the HIA

Figure 3: Welsh Government (2013) Adaptation Planning Cycle



Area for action 2:
Apply the evidence base on effective adaptation and mitigation measures and evaluate impacts

Area for action 3:
Enhance action on mitigation and adaptation via long-term investment in capacity building and preventive action

Area for action 4:
Enhance prevention and public involvement via communications and education

Area for action 5:
Enhancing public involvement and community resilience

Area for action 6:
Enhance integration and collaboration

Area for action 7:
Invest in co-benefits for health

Area for action 8:
Further research

Mobilisation and impact

- Benefits of HIA as a process
- Policy engagement

Windows of opportunity:

- Public Health Wales Long Term Strategy
- New National Adaptation / Resilience Plan
- Local climate risk assessments in Wales

Sharing learning

- UK and international

Climate Change and Health in Waitaha Canterbury

A scoping and profiling report to inform Health Impact
Assessment





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i greu Cymru iachach

Working together
for a healthier Wales

