GIG CYMRU NHS WALES | Iechyd Cyhoeddus Cymru Public Health Wales

World Health Organization Collaborating Centre on Investment for Health and Well-being





Areas of Research Interest in Climate Change and Public Health

November 2026

Mae'r ddogfen yma ar gael yn y Gymraeg/
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Executive Summary

Background

Climate change poses significant and unequal risks to health and wellbeing in Wales. Impacts such as extreme heat, flooding, air pollution, food and water insecurity, and disruption to services are likely to affect some communities more than others, particularly those already experiencing disadvantage.

As Wales' national public health agency, Public Health Wales has a key role in supporting evidence-informed action to protect health, reduce inequalities and strengthen resilience. This report identifies areas where research and evaluation could strengthen the evidence needed to support climate change mitigation, adaptation and population health improvement in Wales.

What we did

To support future research, policy and practice, we drew on a review of climate change documents relevant to Wales, stakeholder input from a climate change and health research webinar, and interviews with Public Health Wales' Climate Change Programme Board to identify evidence gaps and research needs.

What we found

We identified eight key areas of research and evaluation interest for climate change and public health in Wales:

- Climate resilience and emergency preparedness
- Health equity and vulnerable populations
- Sustainable health systems
- Mental health and community wellbeing
- Food and water security
- Environmental quality
- Built environment and housing
- Community engagement, communication and co-production

Work with us

This report summarises Public Health Wales' Areas of Research Interest in Climate Change and Public Health, supporting our Research and Evaluation Strategy and broader Areas of Research and Evaluation Interest for 2026. The areas will help focus research, guide funding and investment, and support collaboration to generate evidence that informs policy and practice, strengthens climate resilience, and protects health and wellbeing across Wales.

Public Health Wales welcomes collaboration with researchers, funders and partners to develop these areas into actionable research. To discuss opportunities to work with us, please contact the Research and Development Office at **PHW.Research@wales.nhs.uk.**

1. Background

In Wales and across the UK, climate change poses significant and unequal risks to health and wellbeing, including through extreme heat, flooding, food and water insecurity, and disruption to essential services. These impacts are expected to increase, with some communities already disproportionately affected, particularly those experiencing social, economic or health disadvantage.[1]

As Wales' national public health agency, Public Health Wales has a key role in supporting evidence-informed action to protect health, reduce inequalities and strengthen resilience. Our Long-Term Strategy 2023–2035 recognises tackling the public health effects of climate change as one of our six strategic priorities.[2]

To help us address the impact of climate change and better protect the health and wellbeing of the population, Public Health Wales needs to understand where best to concentrate research efforts. While the evidence base in climate change and health has continued to grow significantly over the last few years, knowledge gaps still exist.

Recognising the need to ensure future research investment addresses the most important evidence gaps in Wales, we undertook a mapping exercise to identify key areas of research interest in climate change and health. The resulting areas aim to guide researchers, policymakers, practitioners and funders, while providing a foundation for collaboration across academia, the public and third sectors, industry and beyond. Together, they will help focus future research and generate evidence to protect and improve health in Wales.

This document complements Public Health Wales' broader Areas of Research and Evaluation Interest 2026 by setting out the fuller evidence base and detailed areas of interest underpinning the long-term strategic priorities for climate change.

2. What we did

We used three main sources of evidence and stakeholder input to identify and summarise the areas of research interest for Wales: a review of published climate change documents relevant to Wales; a webinar with key stakeholders in climate change and health research; and interviews with Public Health Wales' Climate Change Programme Board. This approach was informed by recognised principles for health research priority setting, including evidence gathering, stakeholder involvement and transparency in how research needs were identified and consolidated.[3] The exercise did not involve formal scoring or ranking of the resulting areas, as all areas were considered important and interconnected.

2.1 Climate change document review

In summer 2024, the Public Health Wales Health and Sustainability Hub identified four key climate change documents relevant to Public Health Wales with a focus on the climate change impacts on health, including the historical Areas of Research and Evaluation Interest for Public Health Wales 2024 (Appendix 1)[4]. These documents were:

- Areas of Research and Evaluation interest for Public Health Wales 2024[4]
- Climate Change in Wales: Health Impact Assessment Summary Report (PHW Climate Change HIA)[5]
- Summary for Wales (CCRA3-IA)[6]
- Health Effects of Climate Change (HECC) in the UK State of the Evidence 2023[7]

A researcher from Public Health Wales reviewed each document, extracting the topics recommended for further research relating to climate change and health. We then grouped similar or overlapping research interests into thematic areas. See Appendix 2 for a full list and breakdown of these areas from the document reviews.

2.2 Stakeholder Webinar

On 6 June 2024, Public Health Wales worked with Public Health Network Cymru to host a webinar titled "Health Impacts of Climate Change in Wales: Examining the evidence base and identifying future priorities". The webinar brought together 107 members of the public health community concerned with climate change. Participants included those from academia, Public Health Wales, Welsh Government, local authorities, health boards, and the third sector. The aim of the webinar was to gather stakeholder input on the key areas of climate change and health research needs in Wales. Participants were split into four breakout rooms to identify key areas of evidence gaps and research questions.

A Public Health Wales researcher grouped these evidence gaps and research questions into thematic areas. See Appendix 3 for further details of the webinar methods and Appendix 4 for the areas of research interest identified through the webinar.

2.3 Interviews with Public Health Wales' Climate Change Programme Board

Between February and June 2025, the researcher interviewed 10 members of Public Health Wales' Climate Change Programme Board to gather their perspectives on evidence gaps in Wales, ongoing research and areas of future interest. This information was used to refine and add context to the emerging areas from the document review and webinar, rather than to generate a separate set of themes.

2.4 Collating the data

We summarised the evidence gaps, research questions and areas of research interest identified through the document review and stakeholder webinar. We then mapped the areas raised in the webinar against the evidence gaps identified in the climate change documents and used perspectives from the Programme Board interviews to refine and add context to the emerging areas. Areas were retained where they were supported by evidence or stakeholder perspectives from one or more sources. Overlapping and complementary themes were then consolidated into eight areas of research interest. See Appendix 5 for further detail on how the themes were mapped and combined.

3. What we found

We identified eight areas of research and evaluation interest for climate change and public health in Wales through the document review, stakeholder engagement and discussions with Public Health Wales' Climate Change Programme Board.

The eight areas are presented in Table 1, each with a summary of its scope. The sections that follow provide further detail and set out indicative research questions reflecting the evidence needs identified. These questions expand on those in Public Health Wales' organisation-wide Areas of Research and Evaluation Interest 2026. They are not comprehensive but provide a starting point for further research and evaluation in Wales. Further examples of questions and evidence gaps can also be found in the Appendices.

Table 1: Public Health Wales Climate Change and Public Health Areas of Research Interest

Area of Research Interest	Scope
Climate resilience and emergency preparedness	Preparedness, surveillance, emergency response and recovery, extreme weather, flooding, displacement and climate-sensitive infectious diseases
Health equity and vulnerable populations	Unequal exposure, vulnerability, barriers to adaptation, vulnerable settings and population groups
Sustainable health systems	Health and care service resilience, infrastructure, workforce, changing service demand and capacity, decarbonisation, equitable access and cross-sector collaboration
Mental health and community wellbeing	Immediate and longer-term mental health impacts, community resilience and protective interventions
Food and water security	Nutrition, food systems and food security; water availability, quality and safety, including private water supplies
Environmental quality	Air quality, pollutants, allergens, environmental exposures and the health co-benefits of climate action
Built environment and housing	Housing adaptation, overheating, flooding, energy efficiency, retrofit, indoor environmental quality and climate-resilient places
Community engagement, communication and co-production	Participation, risk communication, education, misinformation, trust and locally appropriate action

Climate resilience and emergency preparedness

Climate resilience and emergency preparedness were identified as areas of interest because extreme weather events, including flooding, heatwaves and drought, can create immediate and longer-term risks to health and wellbeing. Climate change may also alter the risk of land instability, climate-sensitive infectious diseases and other emerging threats. Future research should strengthen understanding of these risks in Wales, identify effective approaches to preparedness, response and recovery, and ensure that interventions protect communities most at risk.

Indicative research questions include:

1. *How can analysis of climate-related risks and health outcomes across time, place and population inform preparedness, targeted adaptation, resource allocation and action to reduce inequalities in Wales?*
2. *How can surveillance and preparedness systems support the early detection of, and response to, emerging climate-sensitive infectious diseases, including vector-borne diseases, in Wales?*
3. *What approaches are most effective in strengthening the preparedness and resilience of communities, public services, and health and care systems in Wales to extreme weather and other climate-related emergencies?*

Health equity and vulnerable populations

Climate-related health risks are not experienced equally. Factors such as age, income, disability, existing health conditions, housing, employment, social isolation and access to services can affect exposure to climate hazards and people's ability to adapt. Research is needed to evaluate approaches that protect people without widening existing inequalities. Particular attention is needed in settings and communities where people may have limited control over their environment or face barriers to accessing information, services and support.

Indicative research questions include:

1. *Which interventions most effectively protect people in vulnerable settings, such as care homes, prisons, schools, social housing and hostels, from climate-related risks, particularly extreme heat, and what enables their equitable implementation?*
2. *Which policies and interventions are most effective in reducing inequalities in exposure, vulnerability and health outcomes associated with climate change in Wales, and how can unintended inequalities be identified and avoided?*
3. *How are the health benefits and potential burdens of climate mitigation and adaptation policies distributed across different populations and places in Wales, and how can policies be designed to reduce inequalities?*

Sustainable health systems

Sustainable health systems were identified as an area of research interest because climate change is likely to affect service demand, infrastructure, workforce resilience, and the ability of health and care services to operate during extreme events. Future research should examine how NHS Wales and wider public services can adapt to climate-related pressures while supporting decarbonisation, environmental sustainability and equitable access to care.

Indicative research questions include:

1. *What approaches are most effective in strengthening the resilience of health and social care systems and protecting the health and wellbeing of their workforce in a changing climate?*
2. *How can health and care services anticipate, prepare for and respond to changes in demand and disruption associated with extreme weather and other climate-related pressures?*
3. *How can health and care services adapt to and mitigate climate change while maintaining quality, equitable access and continuity of care?*

Mental health and community wellbeing

Climate change can affect mental health and community wellbeing through direct experiences of extreme weather, disruption and displacement, as well as anxiety about current and future climate impacts. These effects may be particularly significant for young people and communities already experiencing social, economic or health disadvantages. Research is needed to better understand these impacts, identify protective factors and evaluate interventions that strengthen psychological and community resilience. This includes examining how climate action, education and green and blue spaces can support mental wellbeing without widening inequalities.

Indicative research questions include:

1. *How can climate education be delivered in ways that build knowledge, resilience, agency and hope without increasing distress?*
2. *How can climate adaptation policies and interventions be designed and implemented to improve mental wellbeing, reduce inequalities, and strengthen community resilience in Wales?*
3. *How do the immediate and longer-term mental health and wellbeing impacts of climate change vary between populations, places and types of climate-related event in Wales?*

Food and water security

Food and water security were identified as key areas of research interest because climate change may affect the availability, affordability and safety of nutritious food and water, particularly for populations already experiencing disadvantage. Research is needed to understand how food and water systems in Wales can become healthier, more sustainable and climate resilient, including through domestic food production, sustainable diets and protecting the quality, safety and availability of private water supplies.

Indicative research questions include:

1. *What are the potential health, environmental and equity effects of increasing sustainable domestic food production in Wales alongside sustainable imports?*
2. *What approaches to communication and engagement are most effective in supporting people and communities to grow food and adopt healthy, affordable and environmentally sustainable diets?*
3. *What are the current and future health risks associated with private water supplies in Wales, and how might climate change affect their availability, quality and safety?*

Environmental quality

Environmental quality was identified as an area of research interest because climate change can affect air quality, allergens and pollutants, with consequences for respiratory, cardiovascular and wider population health. Future research should strengthen understanding of combined exposures, identify groups at greatest risk, and evaluate interventions that deliver climate, environmental and health benefits while reducing inequalities.

Indicative research questions include:

1. *Which interventions can deliver combined climate, air-quality and health benefits in Wales while reducing inequalities?*
2. *How might climate-related changes in behaviour, such as spending more time outdoors during warmer weather, affect personal exposure to air pollution and allergens?*
3. *What are the economic and health benefits of improvements in air quality resulting from climate mitigation and adaptation policies?*

Built environment and housing

Built environment and housing were identified as areas of research interest because the places where people live and work shape their exposure to climate-related risks and associated health outcomes. Research is needed to understand how homes, buildings and neighbourhoods can be designed or adapted to improve climate resilience and health, particularly for people living in poor-quality housing. This includes evaluating energy-efficiency and retrofit measures, indoor environmental quality, the performance of housing and the wider built environment during extreme weather, and barriers to implementing healthier, climate-resilient solutions.

Indicative research questions include:

1. *Which housing adaptations most effectively protect health and wellbeing from future climate risks, and what enables their equitable implementation in Wales?*
2. *How do people experiencing energy poverty experience climate-related risks, and which policies and interventions most effectively protect their health and wellbeing?*

3. *What are the intended and unintended effects of housing retrofit and energy-efficiency measures on indoor environmental quality and health, and how are these effects distributed across population groups?*

Community engagement, communication and co-production

Community engagement, communication and co-production were identified as areas of research interest because effective climate action depends on public understanding, trust and meaningful participation. Research should examine how communities, particularly those most affected by climate-related risks, can participate in developing and implementing mitigation and adaptation approaches. It should also explore how health risks can be communicated without increasing distress, how misinformation can be addressed, and how evidence can be translated into locally relevant action. Where appropriate, co-production should be embedded from the development of research questions through to dissemination and implementation.

Indicative research questions include:

1. *Which approaches are most effective in informing, engaging and supporting communities, particularly those most affected by climate change, to participate in mitigation, adaptation and decisions that affect them?*
2. *How can climate-related health risks be communicated to different communities in ways that build understanding, agency and trust without increasing fear or distress?*
3. *How can co-production help translate research evidence into locally relevant and equitable climate action?*

4. Summary

This work was based on a focused review of selected Wales-relevant documents, stakeholder engagement and discussions with Public Health Wales' Climate Change Programme Board. It was not a systematic review, and the eight areas should not be viewed as exhaustive. The areas were deliberately not formally scored or ranked, as all were considered important and interconnected. They reflect the evidence and perspectives available at the time and Public Health Wales will review the areas every two years to ensure they remain relevant to evolving evidence needs in Wales and beyond.

The eight areas highlight the need for a coordinated, evidence-informed and systems-based response to the health impacts of climate change in Wales. Although presented separately, they should be considered collectively and taken forward in ways that recognise the relationships between health, wellbeing, communities, services and the wider determinants of health.

Equity, lived experience and co-production should remain core principles across all future research. These principles reflect Public Health Wales' wider approach to research and evaluation by supporting evidence that is prevention-focused, equity-oriented, policy-relevant, co-produced where appropriate and grounded in the Welsh context.

Advancing these areas will require collaboration across public health, academia, local authorities, the third sector, funders, practitioners and communities. Strengthening data sharing, building research and practice capacity, and embedding climate considerations within policy and planning will also be essential.

The next step is to translate the areas and their indicative- or similar- research questions into funded, collaborative research programmes that generate actionable evidence and support better health outcomes for current and future generations in Wales.

5. Work with Us

The areas set out in this report provide a framework for collaboration and will be reviewed as the evidence base, policy context and climate-related health challenges evolve. Public Health Wales welcomes opportunities to work with researchers, funders, policymakers, public sector partners, third sector organisations, practitioners, industry and communities to develop research that addresses these evidence needs.

Those interested in working in partnership with Public Health Wales on climate change and health research are invited to contact the Research and Development Office using the email address below.

Research and Development Office
Public Health Wales
PHW.Research@wales.nhs.uk

6. References

1. Climate Change Committee (2026) A Well-Adapted UK: The Fourth Independent Assessment of UK Climate Risk (CCRA4-IA). London: Climate Change Committee. Available at: https://www.theccc.org.uk/publication/a-well-adapted-uk/ (Accessed: 19 November 2026).
2. PHW's Long-Term Strategy 2023-2035
3. Viergever RF, Olifson S, Ghaffar A, Terry RF. A checklist for health research priority setting: nine common themes of good practice. *Health Research Policy and Systems*. 2010;8:36. https://doi.org/10.1186/1478-4505-8-36
4. Areas of Research and Evaluation interest for Public Health Wales 2024
5. Climate Change in Wales: Health Impact Assessment Summary Report (PHW Climate Change HIA)
6. Summary for Wales (CCRA3-IA)
7. Health Effects of Climate Change (HECC) in the UK State of the Evidence 2023
8. Well-being of Future Generations (Wales) Act 2015

7. Appendices

Appendix 1: Areas of Research and Evaluation Interest for Public Health Wales 2024 (historical, used in the review)

Priority 6: Tackling the public health effects of climate change

Climate change is recognised as the most significant public health threat of the century, endangering physical health, mental health and well-being. The impacts of climate change are multi-faceted, impacting the social and environmental determinants of health. As climate change impacts on different areas of life and on health inequalities, research and evaluation areas of interest in this area will emerge and change over time.

Research Questions

Protection, Promotion and Education Around Climate Change

1. What role does public health play in the context of climate change mitigation and adaptation, and where does it have the most significant impact?
2. What forms of messages and communication techniques are the most efficacious for conveying environmental risk to communities confronting such risks?
3. How might climate change influence the prevalence of infectious diseases in Wales, and what measures might be necessary to address emerging threats?

Responding and Facilitating Action on Climate Change

1. What strategies prove most effective in motivating and engaging communities to actively participate in climate change mitigation and adaptation efforts?
2. What proven strategies exist for mitigating the immediate, medium-term, and long-term consequences of flooding and other extreme weather events on the mental health and well-being of affected populations?
3. How does social capital and community action contribute to the effectiveness of responses to climate change adaptation and mitigation?
4. What public health measures are necessary to offer support to communities confronted with displacement or adaptation due to imminent flooding threats?
5. Which interventions are essential to prepare homes for future challenges and to adapt them in ways that ensure health and well-being?

Monitoring and Evaluating Climate Change

1. What disparities exist between urban and rural areas concerning their capacity to adapt to climate change impacts, including housing modifications and the enhancement of energy efficiency in cold homes?
2. How do the health service demands change as a consequence of climate change, encompassing areas such as mental health services, respiratory health, and unplanned care?
3. To what extent do public services function as anchor institutions in the context of climate change, and what repercussions arise from NHS interventions for promoting green health?

Appendix 2: Areas of research interest – climate change documents

While each climate change research document identified key areas for research and evidence gaps for climate and health research in Wales, there were several areas of overlap. Combining the research areas across the four documents, we identified 10 unique climate and health areas of research interest for Wales, detailed in Table 2. Please note, these themes are not in order of importance or relevance.

Table 2: Areas of research interest identified by climate change documents

Area/Theme	Description	Examples of specific questions/themes
Community Engagement and Resilience	Community engagement was a strong theme across the documents, highlighting its critical role in climate adaptation and resilience. Research questions emphasised the need to explore effective strategies for motivating public participation in climate action and leveraging social capital and community networks. The effectiveness of community-led initiatives and their influence on health outcomes during climate events were also key areas of interest. Additionally, the development of tools to support engagement and the identification of barriers to participation were seen as essential steps toward empowering communities to take meaningful climate action.	Explore strategies to motivate community participation in climate action. Assess the role of social capital and community networks in adaptation efforts.
Communication including public health's role in climate action	Understanding and strengthening the role that public health plays in climate change mitigation and adaptation was a recurring theme throughout the documents. Research areas of interest focused on identifying where public health can have the greatest impact, particularly in shaping policies and interventions that protect population health. Effective communication of environmental risks and public health messaging were highlighted as essential tools for fostering public awareness and action. There was also emphasis on	Define how public health can most effectively contribute to climate change mitigation and adaptation. Identify impactful communication strategies for environmental risk awareness.

	integrating climate considerations into public health infrastructure and programs to ensure resilience.	
Health System Adaptation	The need for health systems to adapt and respond to climate change was a key research area of interest across the documents. Understanding how climate change influences demand for services- for example such as respiratory and mental health care -is essential for future planning. The documents also highlighted the need to assess the resilience of healthcare infrastructure and to develop strategies for system-wide adaptation. Research gaps ranged from understanding the behavioural dimensions behind the uptake of adaptation measures to understanding how adaptation measures may interact and affect people's health. In this theme, the NHS was also identified as a potential anchor institution in promoting "green health" and leading by example in sustainability. Building capacity and identifying training needs for health professionals, particularly in using climate data for informed decision-making, were seen as critical to ensuring a responsive and future-ready health sector.	Investigate how climate change alters demand for health services (e.g., respiratory, mental health). Examine the NHS's role as an anchor institution in promoting "green health." Build capacity in the health sector to use climate data effectively for decision-making.
Climate Modelling and surveillance	Modelling and measuring the health impacts of climate change was a research area of interest across the documents. There is a need to improve the integration of adaptation scenarios into climate-health models to better predict and plan for future risks. Research also called for tools to assess cascading and compound risks, such as the combined effects of heatwaves and flooding. Modelling interactions between climate change, air pollution, allergens, and health outcomes was highlighted as essential, alongside understanding the links between climate variables and diseases, including vector-borne illnesses. Standardising metrics and indicators for	Develop tools to assess cascading and compound risks (e.g., heatwaves followed by floods). Improve integration of adaptation scenarios into climate-health models. Standardise metrics and indicators for climate-health adaptation.

	climate-health adaptation was seen as a first step to support consistent monitoring and evaluation across sectors.	
Understanding and addressing inequalities and vulnerability	Equity was a central theme throughout the documents, with a strong emphasis on embedding fairness and justice in all climate-health research. Evidence needs included identifying populations most at risk - such as older adults, low-income groups, and ethnic minorities -and understanding how social determinants shape climate vulnerability. Research focused on assessing the impact of climate change on health disparities and evaluating the effectiveness of policies aimed at reducing inequities is also needed. Strategies to protect vulnerable populations and ensure inclusive adaptation efforts were seen as essential.	Embed equity in all climate-health research. Identify populations most at risk and least able to adapt (e.g., elderly, low-income, ethnic minorities).
Mental Health	Mental health was identified as a distinct and urgent area of concern in relation to climate change. Research areas focused on evaluating the psychological impacts of climate-related events and stressors, including the growing phenomenon of climate anxiety. There was a strong emphasis on developing targeted interventions and assessing the capacity of mental health services to respond effectively. Vulnerable populations at heightened risk of climate-related mental health issues were highlighted, alongside the need to understand their specific needs. The role of mental health professionals in supporting adaptation and resilience was also seen as a key component of a holistic climate-health response.	Evaluate the mental health impacts of flooding, heatwaves, and displacement. Develop interventions to support affected populations, especially vulnerable groups.
Extreme Weather (including floods and heatwaves)	Extreme weather was consistently highlighted as a major public health concern in the context of climate change. Research evidence needs focused on evaluating the health impacts of events such as flooding, heatwaves, and displacement, and on developing interventions to support affected	A more strategic approach is needed to identify and support communities at risk of coastal change. Estimates are needed for heat and cold-related mortality across the UK

	populations. Understanding the relationship between extreme weather and health outcomes, particularly for vulnerable groups, was seen as essential. There was also a strong emphasis on assessing the effectiveness of emergency response systems and exploring the role of public health in preparedness and response.	under a range of scenarios that combine different levels of warming and adaptation. Similarly estimates are also needed for heat and cold impacts on morbidity, including chronic diseases.
Built Environment and Housing	Housing and the built environment were identified as critical areas for climate-health research, particularly in the context of increasing climate risks. Themes and questions included assessing how to retrofit homes to improve climate resilience while safeguarding health and evaluating the health impacts of energy efficiency measures and indoor environmental quality. The relationship between housing conditions and health outcomes during climate events was also a key focus. Research gaps included the development of guidelines for climate-resilient housing design and for understanding how urban planning influences both resilience and health. Identifying and addressing barriers to implementing these housing solutions was seen as essential for equitable and effective adaptation.	Assess how to retrofit homes for climate resilience while protecting health. Evaluate the health impacts of energy efficiency measures and indoor environmental quality.
Food Security and Nutrition	Food security and nutrition were identified as vital areas for climate change and health research, particularly in the context of a changing agricultural landscape. Research themes included studying the health and environmental impacts of increasing domestic production of fruits, vegetables, and legumes, as well as assessing the resilience of food systems and the implications of novel plant-based foods. Understanding how climate change affects food security and nutrition was seen as essential, especially for vulnerable populations. Strategies to enhance food system resilience and evaluate the effectiveness of sustainable	Study the health and environmental impacts of increasing domestic production of fruits, vegetables, and legumes. Assess the resilience of food systems and the health effects of novel plant-based foods.

	food policies were also emphasised. These efforts aim to ensure equitable access to nutritious food in the face of climate-related disruptions.	
Air Quality and Pollutants	Air quality and pollution were highlighted as significant concerns in the context of climate change and public health. Research gaps focused on modelling the combined effects of climate change on air pollution, allergens, and health outcomes, particularly respiratory and cardiovascular conditions. Understanding how behavioural changes -such as increased time spent outdoors -affect exposure was seen as important for shaping public health guidance. Strategies to reduce exposure during climate events and evaluating the effectiveness of air quality regulations were also emphasised. Identifying vulnerable populations at greater risk from air pollution was considered essential for targeted interventions and policy development.	Model the combined effects of climate change on air pollution, allergens, and health. Understand how behavioural changes (e.g., more time outdoors) affect exposure.

Appendix 3: Climate change research webinar methods

On the 6th of June 2024, a webinar was hosted by Public Health Network Cymru titled – "Health Impacts of Climate Change in Wales: Examining the evidence base and identifying future priorities". The webinar brought together various public health professionals and stakeholders to discuss research priorities in climate change and health in Wales.

During the webinar, firstly, a number of experts presented work on the health impacts of climate change in Wales to contextualise work for participants. Participants were then separated into 4 breakout rooms to focus discussions, 2 of which focused on the topic of Protection, promotion, and education around climate change. The remaining 2 groups focused on the topic of Responding and facilitating action on climate change. These topics were in line with the areas established by "Research and Evaluation Interest for Public Health Wales" 2024 summary.

Group facilitators encouraged discussions within each breakout room using a set of questions based on each topic to draw out participants' knowledge and thoughts on potential research areas. All sessions were recorded with participants' consent and transcribed. A reviewer from Public Health Wales went through the audio and transcript recordings along with facilitator notes recording the potential research questions raised.

We first explored the questions for each discussion topic separately (protection, promotion and education; and responding and facilitating action) and combined questions within each topic which overlapped into common themes. We then compared the themes across topic areas and again combined common themes, giving us a final set of areas of research interest identified from webinar discussions.

Appendix 4: Areas of research interest – webinar

While each breakout room identified key areas for research and evidence gaps for climate and health research in Wales, there were several areas of overlap. Combining the research areas from the four breakout rooms, we identified 5 unique climate and health areas of research interest for Wales, again not in order of importance, detailed in Table 3.

Table 3: Areas of research interest identified by webinar participants

Area/Theme	Description	Examples of specific questions/themes
Community engagement and co-production	Participants discussed a range of ideas, from engaging communities through participatory models such as climate assemblies to co-producing with communities locally tailored climate adaptation solutions over just general advice. Included here is to ensure an understanding of the public perceptions of adaptation measures and to identify best practice for engaging with vulnerable communities.	How best to go about community engagement to co-produce climate adaptation solutions which are specific to local areas? What are the best ways to engage with communities on climate adaptation to improve their uptake, how can voices be heard? Looking at climate assembly model (Blaenau Gwent)?
Communication and public awareness	Ensuring consistent communication with public service boards and local planners was stressed under this areas as was learning from past public health campaigns and modern communication trends to counter misinformation. Not using fearmongering communication tactics especially with vulnerable communities was stressed. Participants also discussed the importance of not overlooking and communicating some of the potential positive benefits of climate change such higher temperatures encouraging more people to use outdoor spaces.	How to effectively communicate in order not to fearmonger with specific communities (e.g. coastal areas, people living near spoil tips)? How to develop better health messaging in relation to people growing their own food and eating sustainable food?
Understanding and addressing inequalities and vulnerabilities	Participants discussed how climate change exacerbates health inequalities and restricts healthy behaviours, particularly in deprived	How does climate change create inequalities for people and prevent them from carrying out healthy behaviours? (e.g.

	communities. They emphasised the need to incorporate equity into climate planning to ensure vulnerable populations are not disproportionately affected. Additionally, the mental health and financial burdens—such as rising insurance costs—in high-risk areas were highlighted as critical concerns requiring targeted support and intervention.	temperature rises will encourage more people into parks but people with health issues may start to struggle due to areas becoming crowded). How can we monitor the impact of rainfall on coal tips and its impact on the local community (e.g. through water quality changes)?
System Resilience and Sectoral Preparedness	Discussions centred on evaluating how health services can adapt to increased demand, particularly in tourism hotspots, where climate impacts may strain existing infrastructure. Participants also highlighted the importance of assessing the financial implications of climate adaptation and mitigation for NHS Wales. Building resilience within health boards and ensuring business continuity were seen as essential steps in preparing for future challenges. Additionally, there was a focus on understanding how sectors like education are preparing for climate-related health impacts and not only identifying the support they need to strengthen their adaptive capacity but taking opportunities to learn from other sectors.	How can health services adapt to increased demand (e.g., in tourism hotspots)? Assess the cost of climate adaptation and mitigation for NHS Wales.
Integration and collaboration across sectors	Participants highlighted the importance of researching the interconnectedness of climate, ecosystems, and public health, emphasising the co-benefits and trade-offs of adaptation and mitigation strategies such as tree planting and sustainable drainage systems (SuDs). They advocated for promoting the One Health agenda, recognising the links between human, animal, and environmental	What learning can be taken from other public health areas to inform climate change work (e.g. obesity, health care systems, behaviour research)? Promote collaborative research and avoid siloed efforts. Map expertise and ongoing research across sectors.

	health. To strengthen impact, participants called for more collaborative research, avoiding siloed efforts, and mapping expertise across sectors. Sharing successful research grants and outcomes was also seen as a way to inspire broader participation and innovation.	

Appendix 5: Combining areas of research interest

We compared the areas of research interest identified through the document review and webinar, identifying overlaps and complementary topics. Where appropriate, we consolidated similar themes and broadened headings. Perspectives from the Programme Board interviews were used to refine and add context to the emerging areas. This process produced a streamlined list of eight areas reflecting the evidence and stakeholder perspectives gathered through the exercise. Table 4 shows how the themes identified through the document review and webinar were mapped and combined.

Table 4: Combined areas of research interest

New Public Health Wales area of research interest	Areas of research included	Area of research interest– climate change documents	Area of research interest - the webinar
Climate resilience and emergency preparedness	Modelling and surveillance, extreme weather, flooding, coal tip safety	Extreme weather (including floods and heatwaves) **and** Climate modelling and surveillance	Not applicable
Health equity and vulnerable populations	Addressing health inequalities amplified by climate impacts, focus on equity, social determinants, and disproportionate impacts.	Understanding and addressing inequalities and vulnerability	Understanding and addressing inequalities and vulnerabilities
Sustainable health systems	Adaptation, service and workforce resilience, decarbonisation and cross-sector collaboration.	Health system adaptation	Integration and collaboration across sectors **and** System resilience and sectoral preparedness
Mental health and community wellbeing	Psychological impacts of climate change and community support, includes climate anxiety	Mental health	Not applicable
Food and water security	Nutrition, food systems, and safe water access (including private supplies*)	Food security and nutrition	Not applicable

Environmental quality	Air quality, pollutants, pollution, allergens, exposure, and health outcomes.	Air quality and environmental pollutants	Not applicable
Built environment and housing	Climate-adaptive housing and infrastructure, includes retrofitting, urban planning, and housing-related health risks.	Built environment and housing	Not applicable
Community engagement, communication and co-production	Empowering local voices in climate action, includes a focus on participatory approaches, co-design, and empowering communities. Covers messaging strategies, misinformation, and public health campaigns.	Community engagement and resilience **and** Communication including public health's role in climate action	Community engagement and co-production **and** Communication and public awareness

*Water security and private water supplies and coal tip safety/land instability were strengthened through perspectives gathered from the Programme Board interviews.

Cite this publication

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Gweithio gyda'n gilydd i greu Cymr iachach

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