Syndromic Surveillance in climate-sensitive water-related disease trends based on health, seasonality and weather data in India

Dr. Rabbanie Tariq ,MD, FRSPH, IPFPH

Background

Water-related diseases like cholera, malaria, typhoid, and dengue are a significant public health problem that result in about 5 million fatalities yearly. Climate change, shifting weather patterns, water access, and security are all contributing factors to many water-related disorders. Malaria, Typhoid and dengue are three water-related diseases influenced by environmental factors

Objective

To examine whether rainfall and seasonality could predict malaria, typhoid, and dengue reporting symptoms in India.

Results

Prolonged fever, possible dengue, and watery diarrhea all showed seasonal patterns with maxima occurring during the rainy season.

Seasonality was the most common predictor for people aged 5 and older for watery and bloody diarrhea, persistent fever, likely dengue, malaria, and acute fever plus rash, accounting for 1.2 percent to 29.7 percent of the variation in all illnesses.

Increased rainfall was the most frequent predictor, accounting for between 1.2 percent and 6.8 percent of the variation across all circumstances, for acute fever with rash and acute jaundice syndrome in children under 5 years old.
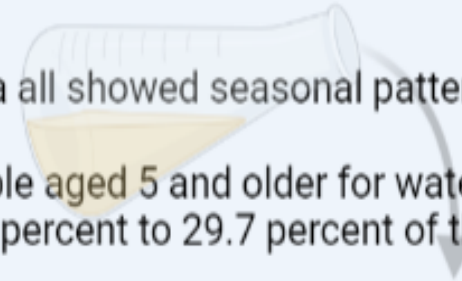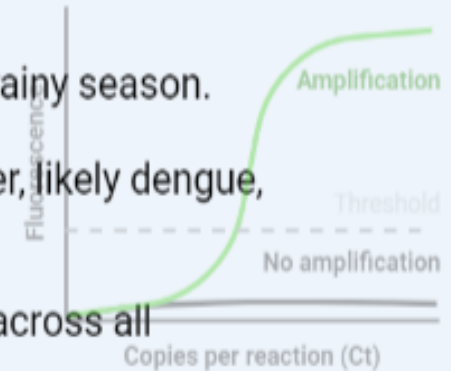
Conclusion

The relationship between EWARS data, seasonality, and rainfall in the South Asian Countries has to be further investigated. Data on rainfall and seasonality can be used as a decision-support tool to help pre-position diagnostic and treatment resources to stop and lessen epidemics of water-related diseases. In India and the South Asian region, it is crucial to develop robust, flexible systems that reduce the harmful effects of climate change on human health and stop disease outbreaks

A Health Impact Assessment of Climate Change in Wales

Authors: Liz Green and Nerys Edmonds, Wales HIA Support Unit.
Email: Nerys.S.Edmonds@wales.nhs.uk

Background:
The climate and nature emergencies are a cross governmental priority in Wales.
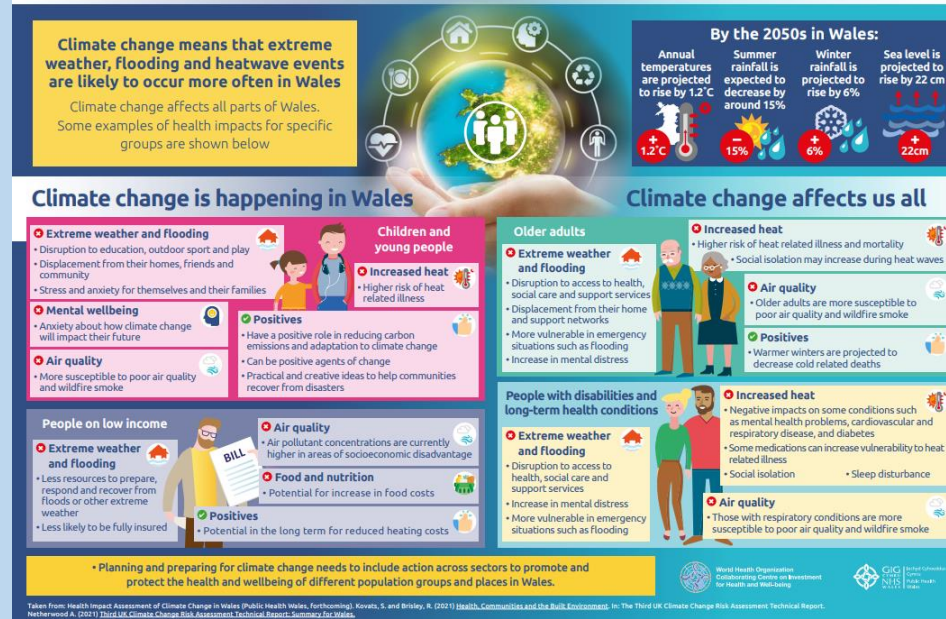
Aims:
- Identify physical and mental health and well-being impacts of climate change in Wales
- Bring a population perspective- how climate change will affect people's lives
- Provide evidence to inform adaptation policy
- Advocate for health equity
- Inform Public Health Wales work programme

Methods and evidence base:
- Systematic literature review
- Participatory workshops
- Interviews with key stakeholders
- Case studies
- Population health profile

WHIASU — Wales Health Impact Assessment Support Unit

GIG CYMRU NHS WALES — Iechyd Cyhoeddus Cymru / Public Health Wales

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
+1.2°C	−15%	+6%	+22cm

Climate change is happening in Wales

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

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

Air quality
- More susceptible to poor air quality and wildfire smoke

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

Increased heat
- Higher risk of heat related illness and mortality
- Social isolation may increase during heat waves

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

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

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

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

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.

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

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Taken from: Health Impact Assessment of Climate Change in Wales (Public Health Wales, forthcoming). Kovats, S. and Brisley, 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.

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

+1.2°C

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

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

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

Workplaces:
- Heat related illness
- Reduced productivity
- Decreased safety

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

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

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)

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

GIG CYMRU NHS WALES — Iechyd Cyhoeddus Cymru / Public Health Wales

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

Overview of findings:
- Impacts across all of the social determinants of health and a wide range of population groups.
- Impacts arise from both direct impacts of climate change but also indirectly via social and economic change, and how adaptation & mitigation policies are decided and implemented.
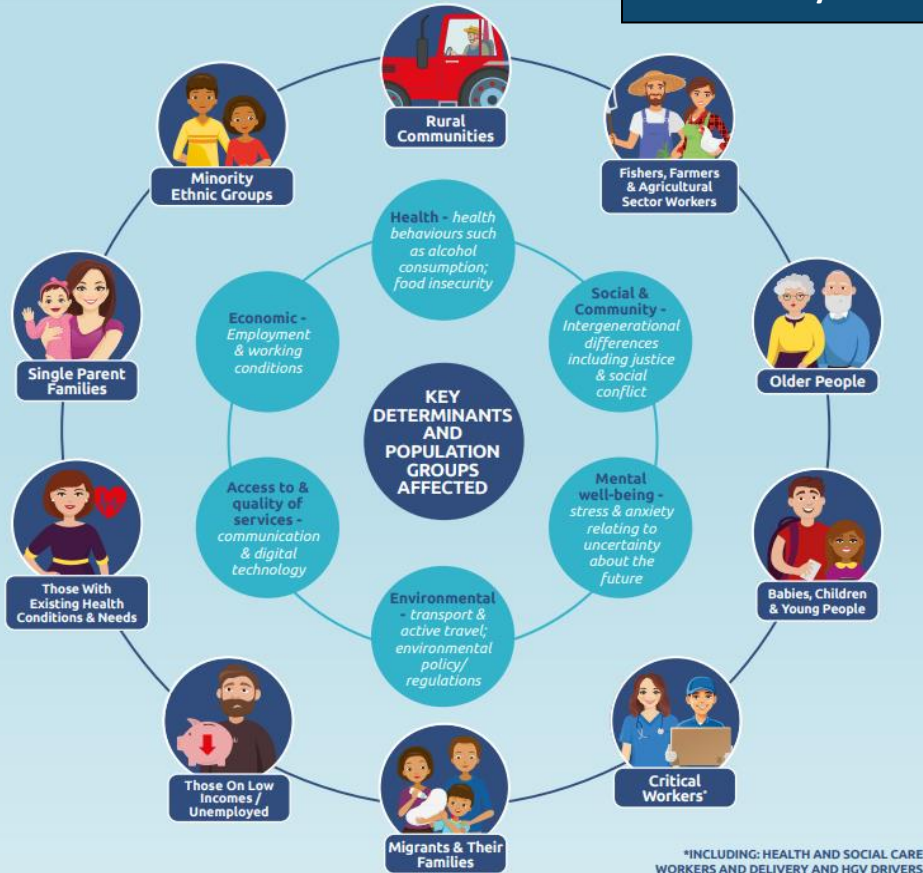
Outputs:
Four infographics produced and presented at COP Cymru in Nov 2021 have enabled early engagement with the findings and key messages on population health.

Full HIA Report and technical paper to be published later this year. Follow up work on a health and adaptation toolkit has developed including a workforce survey and briefing on application of HIA in adaptation and decarbonisation policies.

Conclusions and reflection:
Whilst work on the HIA was disrupted by COVID-19, the process of stakeholder engagement, including with policy makers, initiated by the HIA process has enabled ongoing advocacy on the health and well-being impact of climate change to continue.

Opportunity now exists to inform local climate risk assessments and PHW Climate Change programme. HIA is a key tool for strengthening integration of health and equity into adaptation policy.

WHIASU Wales Health Impact Assessment Support Unit

European Public Health Conference – Rising to the Triple Challenge of Brexit, COVID-19 and Climate Change for health, well-being and equity in Wales

Presented by: Liz Green and Kathryn Ashton. Email: Liz.Green@wales.nhs.uk

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KEY DETERMINANTS AND POPULATION GROUPS AFFECTED

Minority Ethnic Groups · Rural Communities · Fishers, Farmers & Agricultural Sector Workers · Older People · Babies, Children & Young People · Critical Workers* · Migrants & Their Families · Those On Low Incomes / Unemployed · Those With Existing Health Conditions & Needs · Single Parent Families

Health - health behaviours such as alcohol consumption; food insecurity

Economic - Employment & working conditions

Social & Community - Intergenerational differences including justice & social conflict

Access to & quality of services - communication & digital technology

Mental well-being - stress & anxiety relating to uncertainty about the future

Environmental - transport & active travel; environmental policy/ regulations

*INCLUDING: HEALTH AND SOCIAL CARE WORKERS AND DELIVERY AND HGV DRIVERS

The Triple Challenge: BREXIT, COVID-19, CLIMATE CHANGE → POSITIVE IMPACTS / NEGATIVE IMPACTS → Health, well-being and equity of population groups across Wales → IMMEDIATE / SHORT TERM / MEDIUM TERM / LONG TERM

What is the Triple Challenge?

The Triple Challenge is the cumulative and individual health and wellbeing impacts of Brexit, COVID-19 and Climate Change.

What methods were used?

- Synthesis of three HIAs
- Academic and grey literature
- A policy synthesis
- Interviews with key stakeholders

Key findings:

- Common determinants affected include, mental well-being, food insecurity, health behaviours, environmental policy, employment and working conditions.
- Population groups impacted include rural communities, fishers and farmers, those on low incomes and children and young people.
- There is an opportunity to strengthen public health messaging around health behaviours, for example, nutrition; food insecurity and waste.
- Trade and Free Trade Agreements (FTAs) are an important driver for the three challenges and impacts on health should be considered.
- Brexit and the pandemic can present opportunities for the future, for example to support a 'green industrial revolution', and to create a fairer, more sustainable Welsh economy and 'Economy of wellbeing'.

Opportunities

- The Well-being of Future Generations (Wales) Act 2015 provides an enabling environment for Wales to utilise the application of a Triple Challenge lens to policies and strategies.
- Strengthening public health messaging around health behaviours with the increased profile of public health and environmental issues.
- Current 'window of opportunity' for policy change.
- To support a 'green industrial revolution' and 'green jobs' to create a fairer, more sustainable Welsh economy.

Potential actions for policy and decision-makers

- Collaborate at a strategic level and co-ordinate action and responses to the Triple Challenge.
- Use impact assessment methodology to support early identification of impacts.
- Use health promotion messages to highlight the co-benefits of behaviour change to target audiences.
- Develop more data, evidence and research for the three challenges as a whole.
- Develop an action orientated 'health in all policies' conceptual framework to support policy development.
- Support building resilience at a population level.
- Engage with the public.
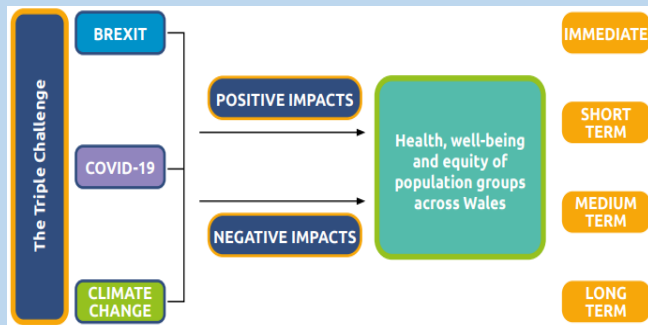
Resources for Sustainable Health E-catalogue

Helping organisations and individuals to consider the natural environment and the health of the planet and people in everything they do

What is the e-catalogue?

- A guide to the resources produced by Public Health Wales' Health & Sustainability Hub.

- Short summaries explaining the e-briefs, reports, toolkits and resources available, which bring together research, ideas and practical actions to support sustainable behaviours, reduce our impact on the planet and improve health and well-being.

Why did we develop the e-catalogue?

- To build capacity to support action on sustainability and climate change.

- The Resources for Sustainable Health e-catalogue will help teams and individuals take action on climate change, reduce their impact on the environment, and encourage sustainable behaviour in their work and home life.

Where can I access?

- **Resources for Sustainable Health - World Health Organization Collaborating Centre On Investment for Health and Well-being (phwwhocc.co.uk)**

- Contact: publichealth.sustainability@wales.nhs.uk
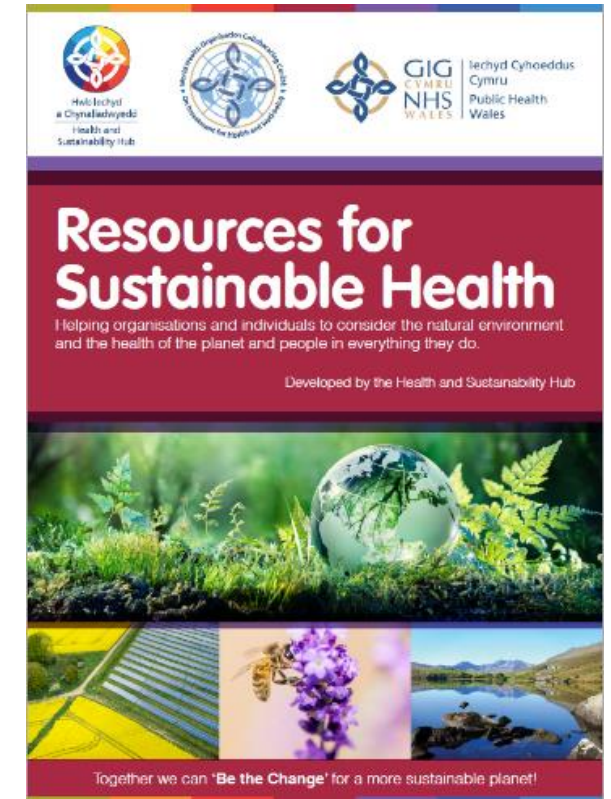
Establishing the UKHSA's Centre for Climate and Health Security

George Leahy, Interim Deputy Director, Centre for Climate & Health Security, UK Health Security Agency

Climate change is a major current and future risk to the global population, representing not only extreme risks to biodiversity but also to human health. Scientific evidence has confirmed that the impacts of climate change are not speculation but scientific fact and the risks that these pose to populations are diverse and stark. Collectively these impacts result in increased illnesses and deaths that disproportionately affect the most disadvantaged in societies, further increasing health inequalities.
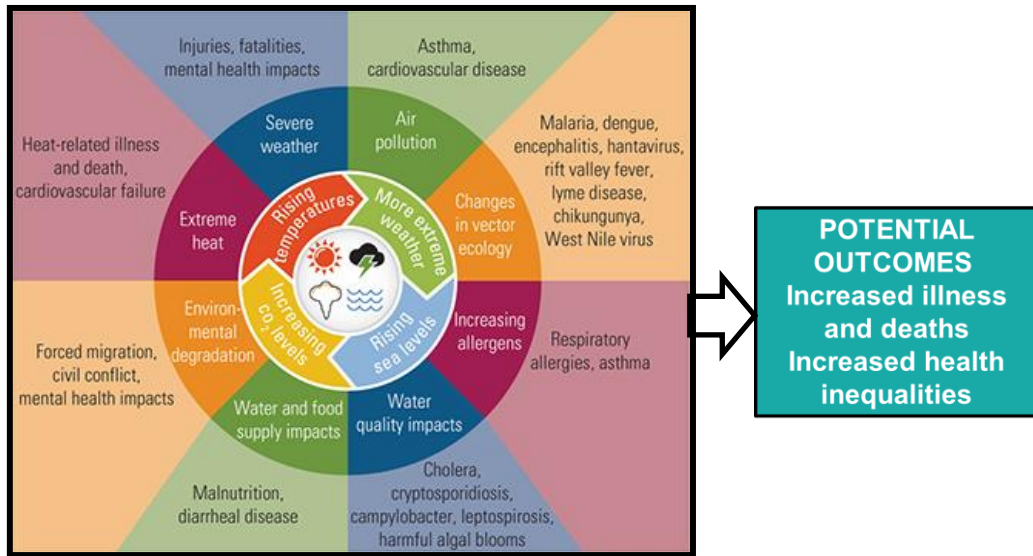
POTENTIAL OUTCOMES
Increased illness and deaths
Increased health inequalities

This figure is a derivative of "Impacts of Climate Change on Human Health", in Patel, V., D. Chisholm., T. Dua, R. Laxminarayan, and M. E. Medina-Mora, eds. 2015. Mental, Neurological, and Substance Use Disorders. Disease Control Priorities, third edition, volume 4. Washington, DC: World Bank. It has been adapted with permission from Dr. George Luber (PhD), National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA, USA.

UKHSA is establishing the Centre for Climate and Health Security (the 'CCHS') to **provide scientific advice and support to local, national and international partners to ensure that the impacts of climate change on public health are considered and embedded in system design**.

Possessing multi-disciplinary teams, scientific infrastructure, and a broad network of partners, UKHSA can speak with an authoritative voice that will aid the design of local, national and international policies, as well as the organisations responsible for delivering them. Specifically, the CCHS will:

- Deliver UKHSA's existing commitments under the Climate Change 2008 Act including updates to the Health Effects of Climate Change Report and creation of a Single Adverse Weather and Health Plan
- Maintain and expand established vector surveillance schemes
- Develop a 'Knowledge Hub' which will be a digital space where knowledge concerning climate change health hazards will be shared
- Develop a research strategy that identifies, prioritises and fills evidence gaps concerning the health impacts of climate
- Develop a toolkit that offers guidance to LAs to assess, map and respond to climate change health impacts
- Develop a prioritised list of climate change policies and plans to ensure that their development accounts for public health; develop indicators that track climate change impacts across a variety of public health sectors.

Partnership and action to build a London for Climate and Health

Climate change is already impacting Londoner's health. In 2021 flooding affected TfL stations, schools, hospitals & homes with over 1.25 million people living in areas of fluvial & tidal flood risk. London average summer temperature has risen by 1.9 deg since 1960s, with projections indicating 2/3 of flats in London could experience overheating by 2030s. London's air quality is poor to the extent that all school children in London breathe air that currently doesn't meet the WHO's clean air standards. The heaviest burden continues to fall on those who are most vulnerable.

Oct 21 — Declared London Public Health Climate Emergency

Nov 21 — Scoping of System Needs

Feb 22 — First London PH Climate and Health Network meeting

Apr 22 — Initial data, evidence and London narrative products shared

Jun 22 — Co-hosted ONS Wellcome and OHID data workshop

Jun 22 — System opportunities consultation and academic collaborations
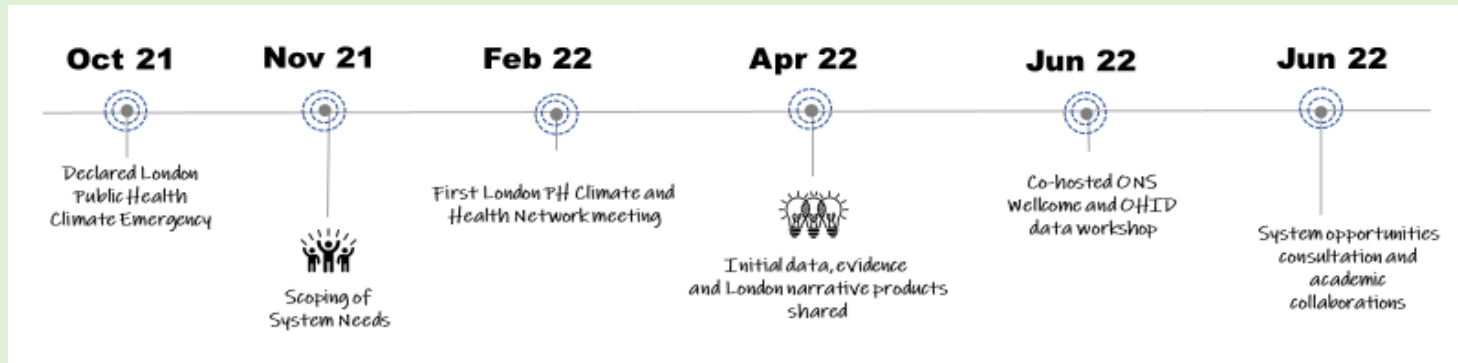
In response, the London Public Health System declared a Climate Emergency in October 2021 and has since built a mutli-agency coalition, fronting the Mayor of London's Green New Deal and carbon neutral targets and local borough and ICS climate action plans. Through in-depth stakeholder consultations key objectives and work packages have been developed to co-ordinate, provide leadership and build capacity to drive climate and health action and advocacy focussed on air quality, active travel, sustainable urban design and green and blue spaces.

Evidence & Data
Synthesise evidence base and data on climate and health, as applied to London as a global city, including identification of key research/evidence gaps.

Collaboration
Develop ways for the London public health system to work in a strategic and collaborative way and to provide effective leadership with partner organisations.

Health in All Policies
Scope and summarise the HiaP opportunities for action on climate and health, highlighting alignment with work of other London partners.

Shared Narrative
Develop with partners a shared narrative, including key risks and opportunities, supported by relevant data and insights.

Communications & Advocacy
In alignment with narrative, co-design joint knowledge and communications strategy – to build climate literacy, advocacy and sustainability leadership.

Office for Health Improvement & Disparities

ADPH London

GREATER LONDON AUTHORITY

NHS

Public health professionals' role in the climate and ecological crisis

Dr Maria van Hove[1]*, Dr Peter Davey[2]* and Dr Anya Gopfert[1]
[1]University of Exeter, UK [2]University of Manchester, UK. *joint first authors. Contact: maria.van-hove@nhs.net, p.davey@nhs.net

BACKGROUND

The climate and ecological crisis is a huge threat to public health causing heatwaves, storms, flooding, disruption of food systems, an increase in infectious diseases and impacting mental health (1).

Public health professionals have a crucial role in preparing for the impacts but action currently taken by public health teams in England varies(2).

AIM

To explore the perception of public health professionals around their role in tackling the climate and ecological emergency

METHODS

Public Health Consultants in English local authorities were recruited using convenience, purposive & snowball sampling.

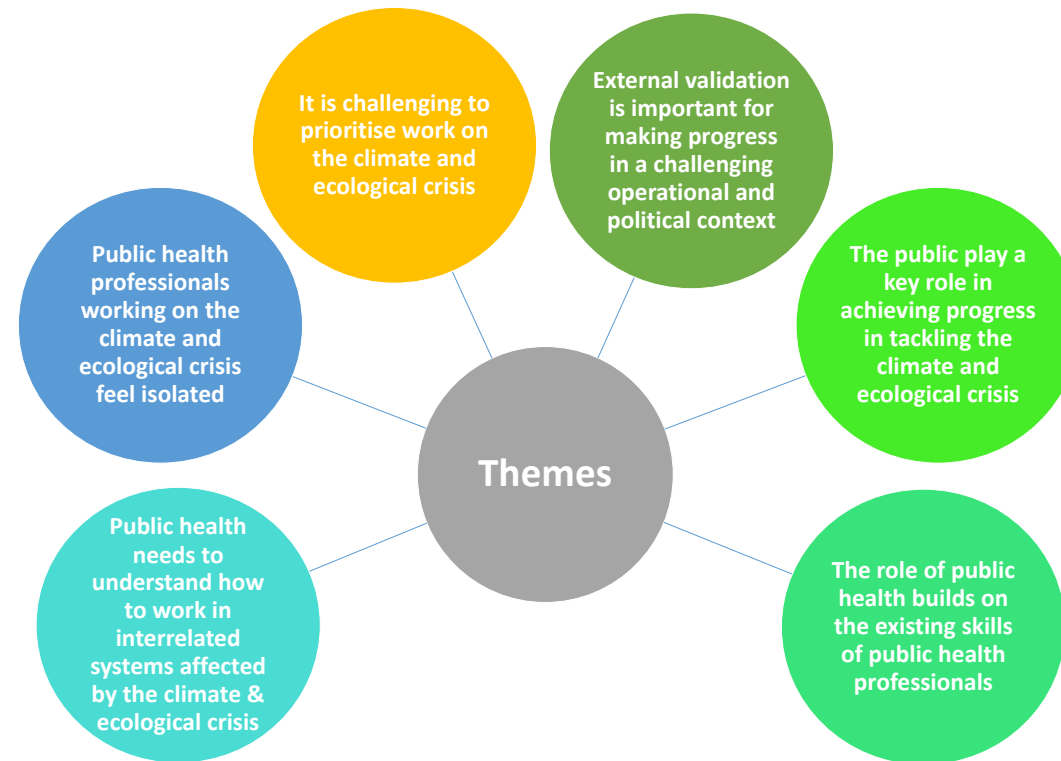Ethical exemption from University of Manchester. Written consent obtained from all participants.

Topic guide developed and piloted. Semi structured qualitative interviews completed, recorded and transcribed. All interviews pseudoanonymised.

Reflexive thematic analysis undertaken. 20% interviews double coded. Consensus reached among research team.

RESULTS

Themes

- It is challenging to prioritise work on the climate and ecological crisis
- External validation is important for making progress in a challenging operational and political context
- Public health professionals working on the climate and ecological crisis feel isolated
- The public play a key role in achieving progress in tackling the climate and ecological crisis
- Public health needs to understand how to work in interrelated systems affected by the climate & ecological crisis
- The role of public health builds on the existing skills of public health professionals

"So there's always something on the day to day radar, firefighting. Whether it's a recession, it's Brexit, it's COVID, it's Ukraine, there's always something, and there will be something."

CONCLUSIONS

- Public health professionals would like guidance on their role in the climate and ecological crisis.
- Public health professionals should use their existing skillset and apply it to the climate and ecological crisis.
- Further education and training is required on how to effectively work in the interrelated systems that are affected by the climate and ecological crisis.
- Public health professionals should engage the public and colleagues to make progress in tackling the climate and ecological crisis.
- Stronger and more visible networks to share best practice and evidence will support public health professionals to take up their role.

ACKNOWLEDGEMENTS

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1) Romanello, Marina, et al. "The 2021 report of the Lancet Countdown on health and climate change: code red for a healthy future." *The Lancet* 398.10311 (2021): 1619-1662.

2) Woodhall et al. Public health and climate change: How are local authorities preparing for the health impacts of our changing climate? *Journal of Public Health,* Volume 43, Issue 2, June 2021, Pages 425-432.