

Health and climate change: complex problems with co- benefits

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Key points

- Health and the environment are key capitals for prosperity in the UK. Both are complex, systemic issues, requiring a long-term approach that goes well beyond the span of a government term of office, and encompasses action across society.
- The complex systems of determinants and impacts of health and climate change are interconnected, and climate change is adversely harming human health, through both direct and indirect impacts. There are significant global inequalities in this harm, and in carbon use.
- The direct impact of climate change on health in the UK is relatively small compared with other parts of the world, and with other risk factors for ill health and death in the UK. But the UK is a significant contributor to global carbon emissions, and there are actions the UK can take now to reduce carbon emissions that will bring immediate and long-term co-benefits for health in the UK.
- Progress has been made in positioning climate change as a systemic issue, requiring a whole-society response, but this is not the case for health. In the UK, health is understood predominantly as the responsibility of the NHS and of individuals. While there are signs of increasing recognition of the need for a whole-society, systemic approach to health, this is not borne out in practice.
- Given the rising prevalence of ill health and widening inequalities in the UK, and the fact that health is a critical capital stock for the nation, there is an urgent need to adopt a new approach. This must encompass all available levers to improve people's health, across government and wider society, and must be long term.
- Understanding how this positioning has been achieved for climate change provides lessons that the health agenda can draw on. Areas to prioritise include:
 - building consensus across government about the evidence and action required – an independent review for government of the costs and risks of acting or not to improve the nation's health could be influential in this regard
 - adopting a common measurement framework with independent oversight, so that the impact of actions across sectors can be better evaluated and understood – wider use and further development of the ONS Health Index could be considered for this purpose
 - building understanding across society, including among the public and in the private sector, about the need to act and the action required – wide and consistent use of effective framing strategies will be important for this.

Introduction

Creating opportunities for people to thrive requires a broad definition of prosperity. This must encompass **four key capitals**: human capital (mental and physical health, as well as knowledge and skills), natural capital (aspects of the natural environment needed to support life), social capital (including communities, culture, local identity and pride), and financial/physical capital. Good health is interconnected with all these forms of capital.

In this long read, we focus on the interrelationship between climate change and health in the UK, and the opportunities for health offered by action on climate change.

In the UK, actions to reduce carbon emissions and achieve net zero targets are gaining a greater sense of urgency. These actions – and the path that has led to them – offer insights and opportunities for people working to improve health. They derive both from the benefits to people’s health arising from action to reach net zero in the UK, and from the way the climate agenda is understood as a whole-system, whole-society responsibility.

Climate change and health are both **‘wicked’, complex, systemic problems**, requiring a whole-society response. Both are products of **complex systems** of multiple interrelated causes, with many interdependencies. And furthermore, the systems of determinants and impacts of climate change and health are interconnected, meaning action to change one has the potential to affect the other. Complex problems do not have single, definitive solutions or resolutions, and these are highly context-specific. Tackling them is socially and organisationally complex, requiring coordinated, long-term action **across government departments**, by non-governmental organisations, and in wider society.

Progress has been made in positioning climate change as an issue requiring action at many levels and across sectors, whereas health is still predominantly seen as the business of health care services and health departments and professionals, and is **understood by the public** as an individual rather than a systemic issue. Health is a critical capital stock for the nation, and as such, cross-government action that outlasts the span of any one government is needed.

As the UK faces rising ill health – as well as **rising inequalities** in health, increasing numbers of people **report** being economically inactive due to ill health – and a cost-of-living crisis that will widen these inequalities, it is time to act on the lessons from the climate agenda to secure whole-system change for health. This long read explores the progress made on the climate agenda, as well as evidence for actions that have co-benefits for health and the environment, to draw out lessons for health.

Understanding the impact of climate change on human health

Climate change is already adversely affecting human health through:

- **direct impacts** – including health impacts of rising temperatures and extreme weather events
- **indirect impacts via ecosystems** – such as impacts on global food supplies and changes in vector-borne disease transmission
- **indirect impacts via socioeconomic systems** – including increased poverty, migration and intensification of existing inequalities, through loss of livelihoods (eg due to crop failure) and reductions in habitable land (eg due to flooding or extreme temperatures).

These impacts are not evenly distributed, and significant inequalities exist. The global north is relatively shielded from the worst impacts, while many lower-income and middle-income countries feel the effects of climate change more severely, with less developed health infrastructure and fewer resources to adapt and mitigate consequences. Significant global inequalities also exist in carbon use, and the countries and communities most affected are, in large part, those that have contributed the least to climate change.

The **third UK climate change risk assessment**, an independent report by the Climate Change Committee, outlines some of the major health impacts of climate change facing the UK. These include increases in the frequency of extreme weather events, rising temperatures, flooding, vector-borne disease as the climate becomes most hospitable to animal-borne infectious diseases, food security and safety, poor air quality and disruption to water supplies. Some of these risks will also have an impact on the delivery of health and social care services in the UK.

The scale of their impact is uncertain and there are significant challenges inherent in predicting this. However, **most recent estimates** suggest that the direct impact of climate change on health is relatively small in the UK – compared with many other parts of the world, and also compared with the **leading risk factors** for ill health and death in the UK.

Securing the co-benefits of climate action for health

The UK's approach to reducing carbon emissions has the potential to deliver improvements in health too. Cleaner transport systems, better quality housing and changes to our food system can all help towards net zero emissions. With sufficient planning, resources and leadership, these actions can also improve health.

Transport

Traffic-related air pollution has been linked to a range of adverse health effects, including lung cancer and cardiovascular and respiratory diseases. It is thought to contribute to up to 40,000 deaths per year. Beyond the human tragedy, the **economic cost** of premature deaths from air pollution is approximately £54bn a year.

Decarbonising transport (through more use of hybrid and electric vehicles, and improving public transport, for example) and encouraging active travel will reduce illness and deaths from air pollution over the short and long term, and will have positive physical and mental health benefits through increased physical activity. These benefits could be substantial, with one study **estimating** 1 year longer life expectancy for workers who are able to cycle or walk their commute.

Housing

Poor energy efficiency of housing is having a direct effect on physical health in the UK. Poor quality housing and insufficient insulation and/or heating increase the incidence of damp and mould. Children living in inadequately heated households are **more than twice as likely** to suffer from conditions such as asthma and bronchitis as those living in warm homes. During winter 2019–20, there were an estimated **28,300 excess winter deaths** in the UK, of which approximately a third were considered attributable to living in a cold home.

Improving the quality and efficiency of housing can reduce childhood illness, winter deaths from cold temperatures and respiratory infections, as well as reducing CO₂ emissions. Increasing the energy efficiency of properties can also save money, allowing adequate heating during the winter for people living in fuel poverty.

Food

Policies to reduce meat consumption – especially red meat – would reduce both greenhouse gas emissions and the incidence of some of the leading causes of death in the UK.

The health benefits of a low-carbon diet are primarily derived from a reduction in red meat consumption. Diets with relatively high amounts of beef, lamb and pork **are associated with**

increased risks of cardiovascular disease, stroke and some cancers. The industrial farming of animals makes up over an eighth of all greenhouse gas emissions. If diets in the UK matched national guidelines, greenhouse gas emissions **could decrease by 17% while increasing life expectancy by 8 months**.

Employment

An expanding green sector could be planned to create high quality, secure jobs – which are associated with **health and wellbeing benefits**.

In 2020, the UK's low-carbon and renewable energy sector was worth £41.2bn and accounted for 207,800 full-time jobs. As plans to reduce CO₂ emissions across the economy advance, this sector will continue to grow. If the transition away from fossil fuels and towards renewables is managed thoughtfully, there is **potential to generate high quality, secure jobs**.

Ensuring equity

Not all actions for the climate will bring co-benefits for health though, or bring these equitably. **Taking a broad and systemic view** in assessing potential impacts – both intended and unintended – on planetary and human health will be important. Beyond this, the journey that has led to climate action being seen as a whole-system challenge provides a route map for those wanting to secure sustained and system-wide action on health.

A systems approach to the climate crisis: lessons for health

While improving health and reducing inequalities is often seen as the responsibility of the Department of Health and Social Care and the NHS, it requires action **across the whole of government**. With the estimated cost to the country of poor health being £100bn a year, there is a strong economic – as well as social and moral – case for coordinated action across government to improve health and reduce inequalities.

Action on climate change has become an important topic across sectors and at all levels of policy, giving rise to a system-wide response at national and international levels. This shift in focus over the past two decades has been precipitated and supported by a range of factors that we have categorised as:

1. enablers of a systems approach through consensus and leadership, public buy-in, and agreed and accepted metrics
2. governance arrangements that include international agreement, cross-government action and independent expert oversight
3. non-governmental buy-in from industry, the research community and individuals.

As the next sections show, more progress is needed to secure such a comprehensive approach to improving health.

1. Enablers of a systems approach

Consensus and leadership

In 1973, the United Nations Conference on the Human Environment began the first formal international discussion about the need for a global response to climate change. Growing in profile through the 1980s, the Intergovernmental Panel on Climate Change (IPCC) was established in 1988 as a collaboration of experts to investigate and develop models on climate change and international responses needed.

While there remains much controversy regarding the exact nature of targets and financial burdens, broad consensus now exists on the nature of climate change and the role of humanity, the type of harms that will occur globally, and the need for global action across all of society.

In contrast, while the **wider case for improving health and its benefits to the economy** are starting to be aired in broader discourse, there is a lack of consensus in the UK about the role of both national and local governments in policies and action to improve health that fall outside the NHS.

There is also opposition to many **effective and equitable public health interventions** that are perceived to constrain individuals' freedoms or curtail commercial activity. Acceptability of public health policies that are seen as being more restrictive **varies between countries**, and evidence from the examples of tobacco and diet suggests such policies are generally better accepted in more authoritarian countries compared with liberal democracies.

Public interest and support for action

The issue of climate change pervaded the public consciousness toward the end of the 20th century. **Mainstream media coverage increased**, and **notable films and TV documentaries** were released. While some opposition remains, the increased public support for action on climate and environmental issues has given governments a strong imperative and mandate to act and is driving policy change.

However, **research by the FrameWorks Institute** for the Health Foundation has found that most people in the UK understand health first and foremost as being an individual issue, determined by individuals' behaviours – rather than a systemic one. And when public attention turns to solutions, these are predominantly seen as being the responsibility of health departments and services, and of individuals themselves. Media narratives reflect and shape these understandings, and there is a lack of demand for systemic action across local and national governments to strengthen the building blocks of health to create healthy places and healthy lives.

A clear set of metrics

Although climate modelling is highly complex, and degrees of uncertainty are inherent, there is a clear set of reliable metrics that politicians and the public can understand. The most common metric, CO₂ emissions, provides comparable and understandable targets across a range of situations, and allows careful monitoring of change. The failure of initial measures to curb increases in CO₂ emissions has triggered urgent calls to action.

The complexity of health and the health care system means data do not lend themselves to a simple set of metrics that fully encompass physical and mental wellbeing. Life expectancy is relatively easily measurable and understood but fails to capture the impact of poor health. This requires additional subjective data. Metrics such as disability-adjusted life years (DALYs) or quality-adjusted life years (QALYs) are more comprehensive but complicated to calculate and understand, and are generally confined to health economic analyses.

Furthermore, as many important health outcomes change slowly over long periods, there is a risk of focusing on short-term targets and measures, encouraging a myopic focus on treatment and health services, rather than a long-term approach to preventing ill health through action on the wider determinants.

Index measures can enable us to capture multiple dimensions of health and its determinants – both long and short term – in a single value that can be measured over time, but also broken down to

provide deeper insight. The ONS introduced the **Health Index for England** as an experimental statistic in 2020. This index uses a broad definition of health and includes measure of health outcomes, health-related behaviours and personal circumstances, and the wider determinants of health in local areas. It can be used to measure health at local authority, regional and national levels, but only in England currently. In addition, the CBI and Business for Health have developed the **Work Health Index** to help employers assess their health offer to employees and monitor improvements over time.

2. Governance of a systems approach

International agreement

International agreements allow resources and expertise to be pooled and distributed to where they will have the greatest impact. This also diffuses the risk and economic impact of being an early adopter or pioneer.

The annual Conference of the Parties to the United Nations Framework Convention on Climate Change (COP) is the most prominent example of international commitment and cooperation in addressing climate change. As a result of international agreements made, over 90% of the world's greenhouse gas emissions are now covered by commitments to reach net zero emissions by 2050, with 193 countries further committing to new targets by 2030. At the recent COP27 in Egypt, the establishment of a **loss and damage** fund to compensate vulnerable countries experiencing climate-induced disasters was agreed.

While not all health issues have global or international responses, the shared nature of many of the biggest health problems, and the multinational nature of research and industry, mean that international cooperation is important. This is relevant for health technology development and for the regulation of health-harming commercial products. More widely, international policies that impact on the UK economy will affect people's health through socioeconomic factors, as will future trade agreements, including via changes to food prices and/or quality.

Cross-government action

Climate change is a cross-government concern in the UK. Currently, the Department for Business, Energy and Industrial Strategy and the Department for Environment, Food and Rural Affairs have lead responsibility for mitigation and adaptation respectively, and this is set in legislation.

The **Climate Change Act (2008)** sets out the target for net zero carbon emissions by 2050, requiring 5-yearly risk assessments to monitor progress and identify evolving barriers and opportunities. The government's ability to legislate has been key in enacting a whole-system approach, providing the dual aspects of targets and a regulatory framework for different interventions to work towards, and acting as an intervention in and of itself.

While responsibility for health sits with the Department of Health and Social Care, levers to improve the conditions that shape people's health are found across virtually all departments of government. This needs to be recognised through targets, resources and legislation that enable a **whole-government approach to health**. A longer term approach is also needed, that goes beyond well beyond a government term of office. This will require agreement across political parties and ideologies on the evidence and what to do.

Strong mechanisms – '**commitment devices**' – are needed to hold policymakers to account for an agreed course of action. Examples that are leading the way in health include Wales' Wellbeing of Future Generations Act, with the **Future Generations Framework** to help with application of the act, and New Zealand's **Wellbeing Budget**, which has redesigned the budget process around a set of wellbeing priorities.

Independent expert oversight and advice

In 2006, the Treasury published a landmark report, *The Economics of Climate Change: The Stern Review*. This assessed the costs and risks to the economy of climate change, concluding that the benefits of strong and early action far outweighed the economic costs of not acting. The **Director General of the CBI at the time said**, 'The Stern Review adds up to a powerful argument for collective action by the nations of the world. Provided we act with sufficient speed, we will not have to make a choice between averting climate change and promoting growth and investment.'

Despite the approaches taken in the review having been the subject of much debate, the review was highly influential across political parties. It triggered an **inquiry** into the implications of climate change for Treasury policy and the establishment of an Office for Climate Change which sought to promote cross-government cooperation – and later **produced the first work plan** for the Climate Change Committee.

The **Climate Change Committee** (CCC) is an independent, statutory body established under the Climate Change Act 2008. The CCC provides independent advice to the UK and devolved governments on emissions targets, and reports to parliament annually on progress made in reducing emissions and adapting to the impacts of climate change. The CCC offers policy recommendations covering every part of government, a monitoring framework, independent assessments of risks from climate change in the UK, and carbon budgets. It draws expertise from multidisciplinary specialists, including engineers, environmental scientists, economists, computer scientists, doctors, psychologists and solicitors.

As yet, there is no single independent oversight covering the breadth of action (and potential action) to improve health. An independent review for government of the economic costs and risks of acting or not acting to improve health and reduce inequalities in the UK (an equivalent of the Stern Review

for health) could raise the profile of health across government, and make a strong case for long-term preventive investment.

3. Non-governmental action as part of a system-wide approach

Private sector

When the private sector interacts with policy there will always be a balance to be struck between subsidies and regulation, balancing potential harm to business and the economy with harms resulting from inaction. Subsidies have been offered in the energy sector for green energy to decarbonise the energy grid. And from the regulatory perspective, companies are **required** to report on their environmental impact, including their greenhouse gas emissions, their energy usage, and the steps they are taking to reduce their carbon footprint.

A systems approach to health must use a **range of levers**, encompassing change to commercial behaviours, regulation and legislation, economic and fiscal policy changes, and environmental and social planning.

There are signs that the private sector is recognising the contribution of health and a healthy workforce to social and economic progress. The **CBI's health policy work** notes the potential of businesses to improve the health of the nation, through employee health, via the goods and services produced, and through wider impacts of their actions. These impacts can be positive (eg investment in facilities for local communities) and negative (eg pollution created). In addition, **Business for Health** – a coalition of more than 150 organisations – is engaging the business community in the need to invest in preventive action to improve health.

Investors also have a role to play, and are increasingly interested in encouraging corporations to support positive health outcomes. ShareAction's **Long-term Investors in People's Health Programme** aims for health to become a recognised core component of ESG (environmental, social and governance) frameworks, and for investors to incorporate health into their asset management. Examples of impact include the recent health-related shareholder resolution filed at the supermarket Tesco, which agreed to boost sales of healthier food and drinks in response to investor pressure coordinated by ShareAction.

However, industry isn't simply a force to be controlled. It can drive improvements in people's wellbeing and has shown its innovative potential to address climate change. Similarly, there is a role for industry innovation to improve health. This could include reformulating products to make them healthier options, as seen in the impact of industry activity **in response to the UK soft drinks industry levy**, and since the announcement of legislation restricting the promotion of foods high in fat, sugar and salt.

Research

Research plays an ongoing role in tackling climate change, in developing and evaluating new technologies, interventions and strategies to mitigate or adapt to climate change. For complex issues straddling multiple sectors, it is important that research reflects this **multi-disciplinarity** – which might encompass physical science, biosciences, energy and engineering, economics, planning, legal, social sciences, ethics, governance, health and communication. This multi-disciplinarity can be seen in the representation of different disciplines in the CCC.

To understand the interrelated determinants of health, and how to tackle these, **a complex systems approach to research is needed**, taking account of the complexity of health, and drawing on a broad spectrum of research disciplines, evidence and expertise. Randomised controlled trials – which intentionally control context – are not a suitable research paradigm for complex and interrelated determinants, solutions and outcomes.

This new approach to research is beginning to be seen in the UK, including through the **UK Prevention Research Partnership**, which funds multidisciplinary research into primary prevention of non-communicable disease, involving end users in policy and practice. Bringing this broad and diverse perspective to research can also be helpful in identifying where potential gaps in understanding lie, and where evidence already exists in disciplines outside of health.

Individual actions

Increasing public awareness and concern about climate change and the environment has given increasing mandate for governments to act, and has also driven public demand for more environmentally friendly products, goods and services. In the case of climate change, a virtuous cycle can be seen in which these individual actions increase buy-in and support for wider system change, and the increased demand for goods and services from businesses with more robust green policies further encourages businesses to pursue these and to innovate.

However, the dominant focus on individual health in the UK can be counter-productive – or even harmful. Policy to improve health is **skewed towards encouraging individuals to change their behaviours**. Making these changes requires individuals to have significant resources, such as time, money and knowledge. Trying to change individual behaviours without changing the conditions in which they take place – and the barriers that some people experience – is inequitable and will increase health inequalities in the population. There is a need instead for stronger policies to create healthier environments for people to live and work in, and to target commercial rather than individual behaviours. The role of the wider determinants of health in defining the options available to people needs to be recognised in policy and practice, with greater use of population-level policies that do not rely on people having significant resources.

Conclusions

Health and climate change systems are interlinked. Climate change already causes significant harm to health globally, and while the direct health impact is not as significant in the UK currently, we are a big contributor and need to act. Furthermore, the mitigating actions required can benefit health and help reduce inequalities in the UK.

Realising these benefits, however, requires a systems approach to health and climate change, one that understands the multiple and interrelated determinants of both, and the consequences of action and inaction.

There is widespread recognition – internationally, politically, and among the public – of the need for action at all levels on climate change. There is the opportunity for health to learn from the example of climate change here. Positioning health as a systemic issue requiring a system-wide response will need:

- significant political leadership and capital, setting overarching targets across departments and sectors
- credible independent expert oversight, encompassing diverse disciplines and perspectives (an independent review of the costs of inaction on health could be highly influential)
- further research into metrics and interventions
- resources to be deployed across government including locally and regionally
- public engagement to ensure understanding and support – as well as advocacy and pressure – for the measures and interventions that are needed to improve the health of the nation.

There are hopeful signs that the need for a systems approach is increasingly recognised in some areas of health, but action must follow this recognition. We urgently need to learn about what an effective systems approach to health looks like in practice, and build evidence about the impact of this different approach.

Three priority areas in developing a new approach to health, based on the experience of the climate agenda, are:

- Building consensus across government about the evidence and action required. An independent review for government of the costs and risks of acting or not to improve the nation's health could be influential in this regard. This should take a broad view of costs and risks that fall across the economy, including the impact of health on the nation's productivity.
- Adopting a common measurement framework with independent oversight. This will enable better and consistent evaluation and understanding about the impact of actions across sectors

and over time. The ONS Health Index could be used more widely in this way, and developed for use and relevance across sectors.

- Building understanding across society – including among the public and in the private sector – about the need to act and the action that is required. This understanding will be critical to building support for necessary action, and will rely on more consistent messaging across channels and voices using **evidence-based communication strategies and techniques**.

Supporting information

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