

Climate and Health



The health implications of climate change in Cumbria, and the health benefits of action to address it.

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Introduction

The most recent report from the Intergovernmental Panel on Climate Change (IPCC) is clear that our climate is changing, and that this is already affecting weather extremes across the planet⁽¹⁾. Without urgent action, global temperatures will continue to rise, and the observed changes in our climate system will worsen, having a huge impact on nature and the way we live our lives.

Climate change, the natural environment, and public health are intimately linked, with the World Health Organization (WHO) identifying climate change as the single biggest threat to health facing humanity today.

In the 2015 UN Framework Convention on Climate Change Paris Agreement, countries committed to limit the global temperature rise to less than 2°C above pre-industrial levels, and as close as possible to 1.5°.

Here in Cumbria, the 2019 Joint Public Health Strategy set out the following commitments:

- To become a “carbon neutral” County and to mitigate the likely impact of existing climate change.
- To protect and enhance Cumbria’s green and blue spaces, ensuring that everyone in the County has good access to a high-quality natural environment.
- To promote Cumbria’s biodiversity through protection and enhancement of a wide variety of wildlife habitats.
- To improve air quality in Cumbria through action on transport, industrial, agricultural and domestic emissions.
- To reduce the amount of waste produced in Cumbria through reduced material use, promoting greater product re-use, and improving recycling rates.

As such, Cumbria aims to become the first carbon neutral county by 2037. A significant amount of work is already underway across the county to achieve this. In particular, the Zero Carbon Cumbria Partnership brings together more than 80 members across the public, private and voluntary sectors in a variety of programmes and projects with the goal of cutting greenhouse gas (GHG) emissions. To support this work, this document has been developed by the Cumbria Public Health Alliance to highlight the health implications of climate change in Cumbria, and the health co-benefits of action to address it. It is hoped that the information it contains will both raise awareness and motivate climate action among partners and the wider public.

Our planet in crisis

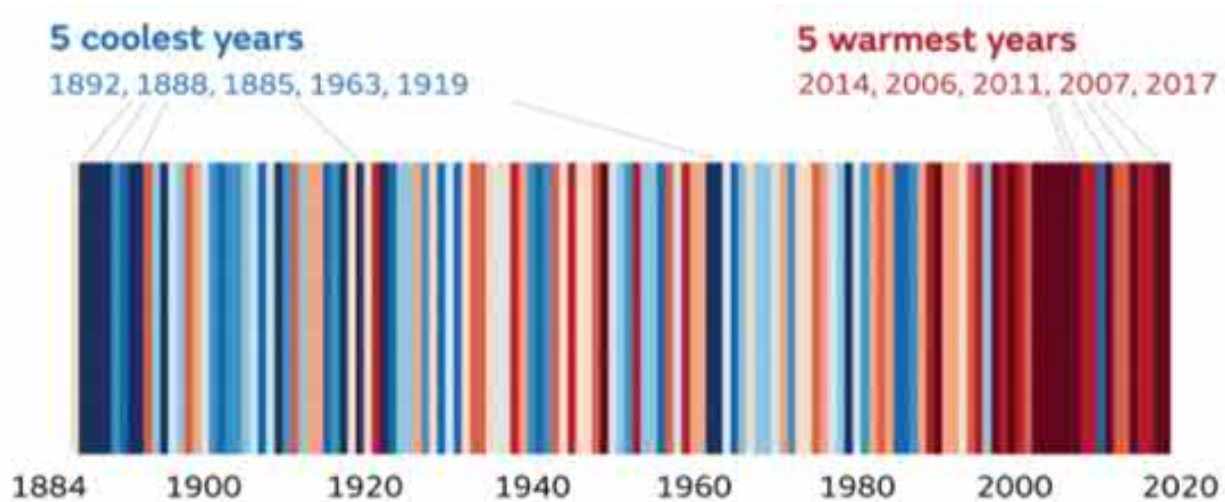
“Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years” (1,p7)

There is unequivocal evidence that our climate is changing, and that human activity is the main cause⁽¹⁾. Since the Industrial Revolution, the burning of fossil fuels, deforestation and other activities which emit greenhouse gases (GHGs), most notably carbon dioxide, have increased⁽²⁾. As a result, GHGs have built up in the atmosphere; trapping additional heat from the sun, and resulting in global warming^(2,3). The temperature of the planet has risen by more than 1.2°C since 1850, with each of the last four decades being successively warmer than any of the preceding decades since records began^(1,4).

Global warming has major implications for our climate system, and is already affecting every region across the world; increasing the risk of heavy rainfall, heatwaves, wildfires, flooding, drought and other extreme weather events^(1,3,5,6).

In the UK, the ten hottest years since 1884 have all occurred since 2002 (Figure 1)⁽⁷⁾. We are already experiencing rising sea levels, more frequent, longer heatwaves and increased heavy rainfall with associated flooding^(6,8). These problems are expected to worsen, with increasingly hotter drier summers, warmer wetter winters and more frequent and severe weather extremes^(6,9,10).

Figure 1: UK annual temperatures between 1884 and 2020



Source: Met Office

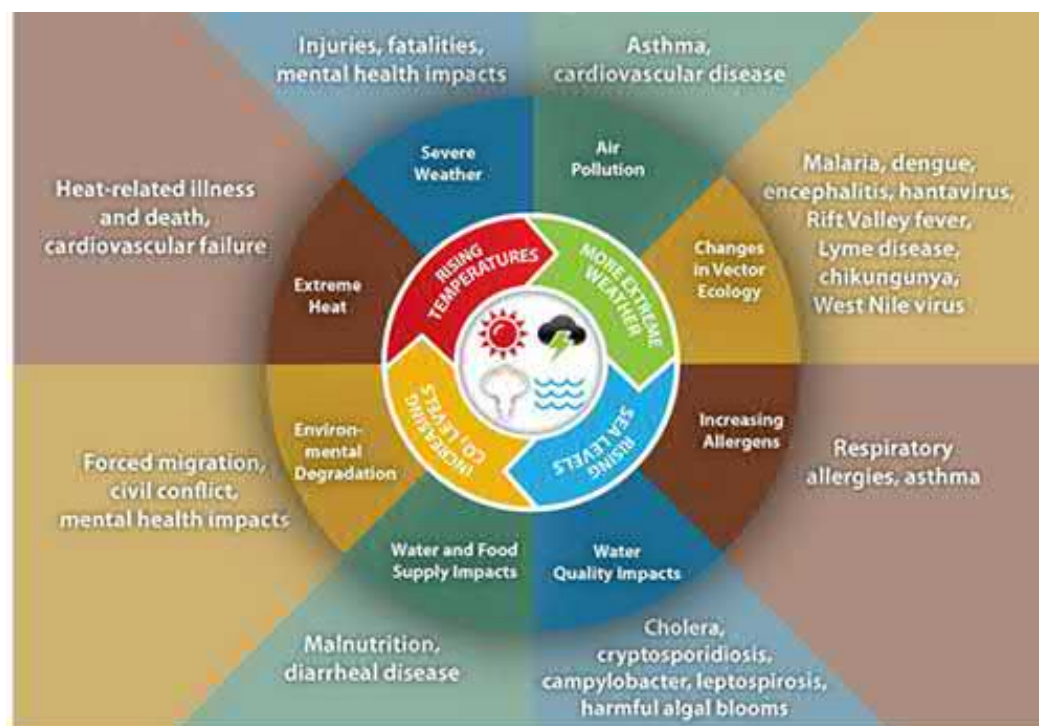
The health impacts of climate change

“Climate change threatens the very foundations of human health and wellbeing” (4p131)

Climate change has been identified as the “biggest global health threat of the 21st century”^(11, p1693). It affects physical and mental health both directly (through more frequent extreme weather events) and indirectly (through disrupted food systems, worsening air pollution, the increased risk of communicable diseases, forced migration and the impact on employment, equality, access to health care and social support) (Figure 2).

The World Health Organisation (WHO) estimates that climate change could result in around 250,000 additional deaths per year between 2030 and 2050; 38,000 due to heat exposure in elderly people, 48,000 due to diarrhoea, 60,000 due to malaria, and 95,000 due to childhood undernutrition⁽²⁾.

Figure 2: An overview of the impact of climate change on health⁽¹²⁾



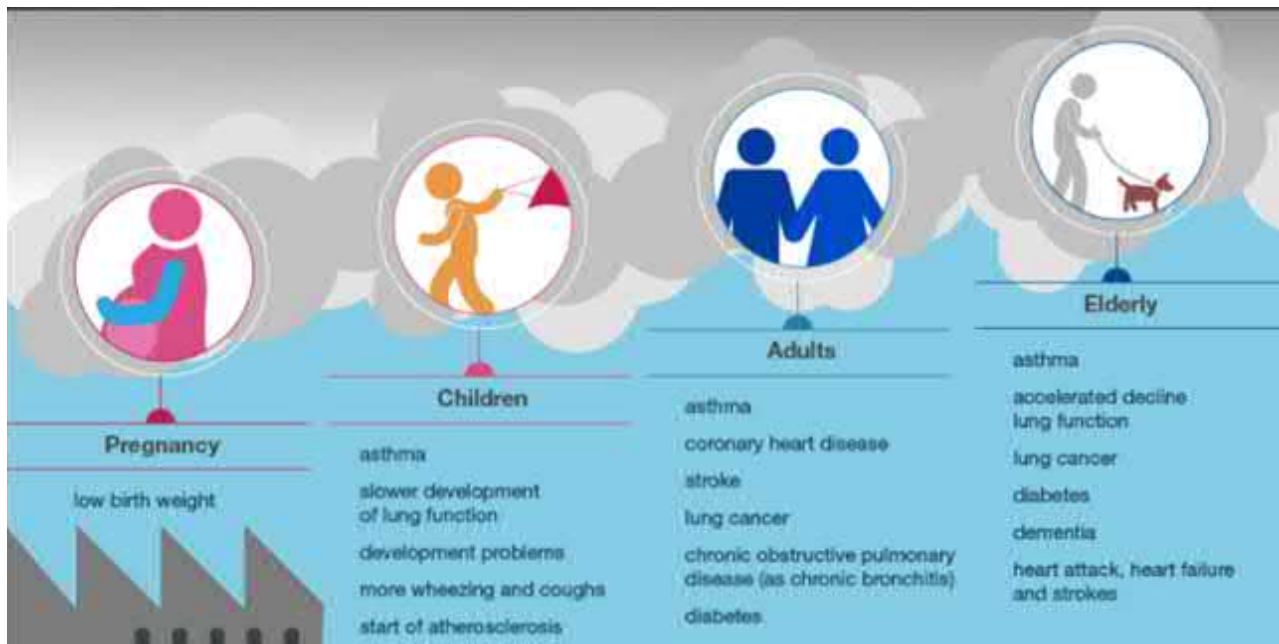
Source: Centre for Disease Control and Prevention

Rising temperatures

Very warm weather can cause immediate problems, such as heat stroke and dehydration, and can affect people’s ability to safely exercise or work outdoors. It can also cause health conditions such as heart disease to worsen, especially among the elderly and those with long-term health conditions^(2,4,8,13). In addition, high temperatures increase the levels of pollutants and allergens in the air (many of which are produced by human activity), which can impact on health throughout the life course (Figure 3)^(2,14).

By the 2040s, half of all British summers are expected to be as hot, or hotter, than the 2003 heatwave which contributed to tens of thousands of deaths across Europe⁽¹⁵⁾. Projections suggest that heat related deaths could more than triple by 2050⁽⁸⁾. Heat changes in Cumbria will likely not be as great as those in the South of the country, but they will still be significant. With ongoing high emissions in the North West, daily temperatures in Cumbria could increase by between one and two degrees by 2050⁽¹⁶⁾.

Figure 3: The impact of air pollution throughout the life course



Extreme weather events

Globally, weather-related disasters, such as storms, floods, droughts and fires, are thought to account for over 60,000 deaths every year, mainly in low and middle income countries⁽²⁾. However, for each person killed, another 1,000 are estimated to be affected physically, mentally, or through the loss of property or livelihood⁽¹⁷⁾. Rising sea levels and extreme weather events can destroy homes, disrupt key services (including medical facilities), and make some areas inhabitable^(2,18). Variable rainfall patterns can lead to famine and drought in poor regions, increasing the prevalence of malnutrition and undernutrition^(2,18). These events in turn can lead to displacement of populations, conflict, economic loss and mental ill health^(2,18).

Here in Cumbria, flooding is already affecting us. In 2015, Storm Desmond flooded over 7,000 Cumbrian homes, causing devastation across the county, and resulting in long-term physical, mental and financial problems for many. Research suggests that people whose homes are flooded are at increased risk of post-traumatic stress disorder (PTSD), anxiety and depression^(8,19–21). Importantly, these mental health conditions can endure for many years, placing a huge burden on individuals, society and the NHS⁽⁸⁾. In addition to the effects on mental health and wellbeing, flooding can overwhelm sewage systems and cause water supplies to become contaminated, increasing the risk of water-borne diseases, such as cryptosporidiosis^(22–24). Carbon monoxide poisoning can also be a problem; both during the flooding event (due to indoor use of generators and appliances designed for use outdoors), and in the recovery phase (due to equipment for pumping and dehumidifying)^(8,25).

Communicable diseases

Increasingly hot and humid conditions alter the geographic distribution, and lengthen the transmission season, of some disease carrying insects such as mosquitoes; increasing the risk of infections such as malaria and dengue fever^(2,4,26). Increased rainfall and flooding also create breeding grounds for water-borne diseases such as typhoid and cholera^(2,8). Compounding this problem, water scarcity can affect the supply of fresh, safe drinking water, and impact on hygiene practices; further increasing the threat of diarrhoeal disease^(2,18).

Similar to other countries, the UK is likely to become more vulnerable to vector-borne diseases, such as those carried by ticks, sand flies and mosquitoes⁽⁸⁾. Lyme disease is a particular concern for the UK, and for Cumbria, due to rising tick populations⁽⁸⁾.

Health inequalities

Although climate change affects everyone, those living in resource-poor settings (particularly poor communities, migrants or displaced people, children and the elderly) are affected the most, despite contributing the least to its cause^(2,4,11).

Existing social and economic inequalities in the UK and Cumbria mean that many of the health impacts of climate change will be experienced disproportionately by our most vulnerable communities⁽⁸⁾. Older people are at the highest risk from heat and cold extremes, which is important given our aging population, and high numbers of elderly residents in Cumbria⁽²⁷⁾. People living in deprived areas face a higher risk of flooding, and are more likely to be exposed to air pollution⁽²⁸⁾. Compounding this, people on low incomes are more likely to live in poor quality housing, and are less able to modify their homes, or to move house to avoid or recover from extreme weather events⁽²⁸⁾. They are also more vulnerable to food poverty, caused by changes in the global food supply and rising food prices⁽²⁹⁾.

Natural capital and health

Human destruction of nature and loss of biodiversity has been described as being as destructive as climate change⁽³⁰⁾. Loss of biodiversity can have a significant impact on human health if ecosystem services (such as food, natural flood defences and crop pollination) are no longer adequate to meet our needs. The planet is already experiencing a loss in biodiversity. Since 1970, the population of animal species, including mammals, birds, fish and reptiles, has decreased globally by over 60%^(31,32). Here in the UK, the abundance and distribution of many species is also in decline, with 13% of species at risk of extinction⁽³²⁾. Declining ecosystems and species numbers are linked to a number of human factors, including agricultural intensification, man-made pollution, urban and infrastructure development, mineral extraction and invasive species. Climate change is also a significant factor behind species loss; many species will struggle to adapt to rising temperatures and extreme weather events.

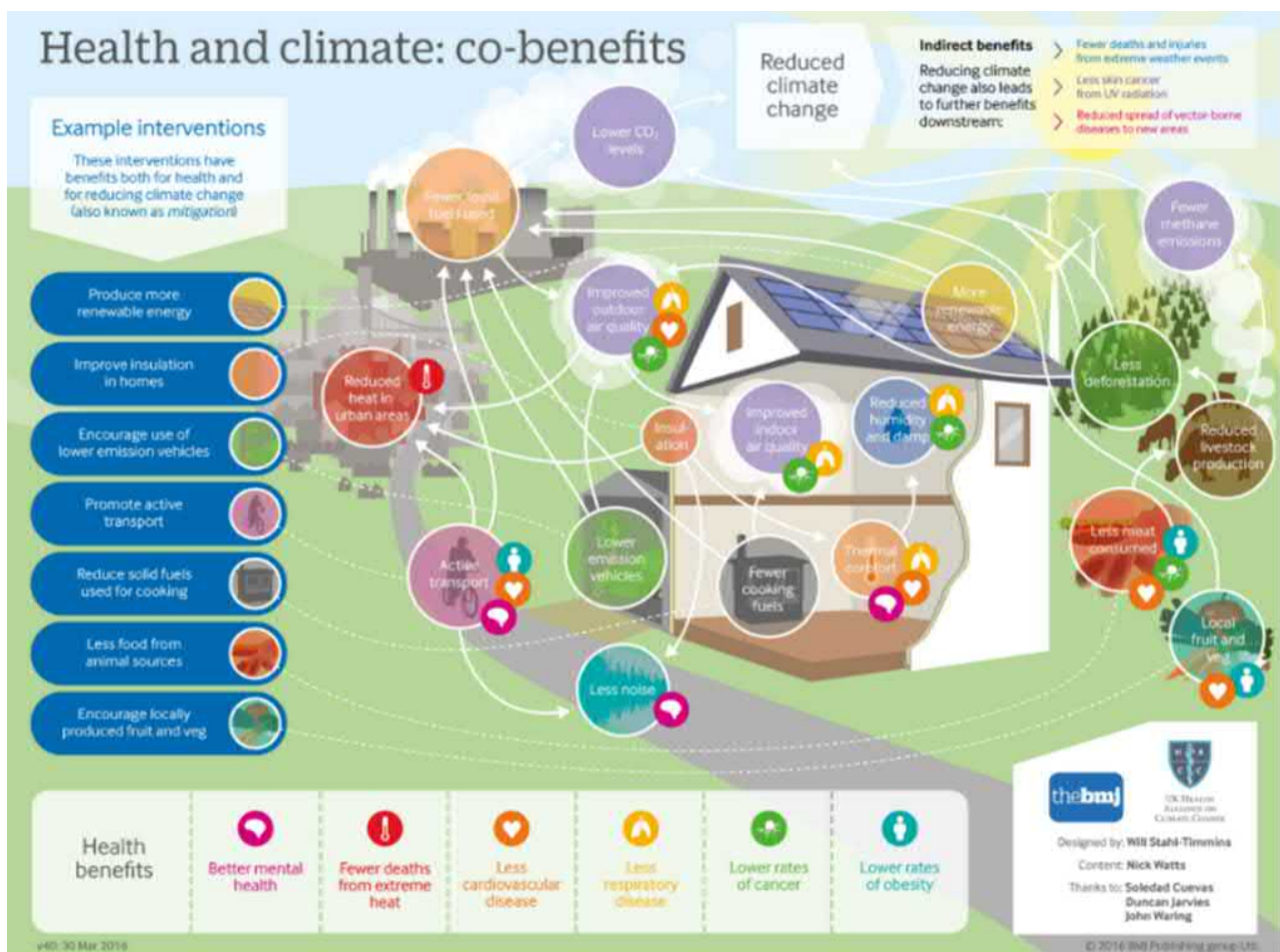
Restoring and protecting biodiversity, and green and blue spaces, not only safeguards wildlife and supports human health through ecosystem services, it also promotes greater mental and physical health through providing pleasant areas to relax, exercise, socialise and enjoy^(30,33,34).

The health benefits of tackling climate change in Cumbria

“Tackling climate change could be the greatest global health opportunity of the 21st century” (35p1882)

Given the considerable impact of climate change on physical and mental health, acting to reduce GHG emissions and limiting global warming, will result in substantial improvements in health and wellbeing. In addition, many of the interventions aimed at addressing climate change, are directly beneficial to our health (Figure 4)⁽³⁵⁾. These include improving home insulation, using lower emission cars, active transport, and eating more locally produced plant-based foods. Furthermore, climate action could go some way to addressing problems such as eco-anxiety, by providing people with a sense of hope, empowerment and control⁽³⁶⁾.

Figure 4: Health and climate co-benefits of action⁽³⁷⁾



Source: BMJ

Greener transport

Greener transport options (electric cars, public transport, active travel and remote working) reduce GHG emissions as well as reducing road casualties and minimising air and noise pollution^(8,38). Although air and noise pollution levels are generally lower in Cumbria than the rest of the UK⁽³⁹⁾, there are several Air Quality Management Areas (places where national air quality objectives are unlikely to be achieved), meaning that action to reduce air pollution is still needed. Poor air quality is the largest environmental risk factor to public health in the UK, causing up to 36,000 deaths annually⁽¹⁴⁾. Even a small reduction (1 µg/m³) in fine particulate air pollution in England could prevent around 50,900 cases of heart disease, 16,500 strokes, 9,300 cases of asthma and 4,200 lung cancers over an 18 year period⁽¹⁴⁾.

In addition to the impact on emissions, active travel such as walking and cycling, increases physical activity; potentially reducing levels of obesity, diabetes and heart disease, lowering death rates and improving mental wellbeing^(36,38) (Figure 5). It is estimated that if the proportion of the population in England who cycle regularly increases to 25%, and there is widespread use of electric bikes, death rates could drop by 11%^(40,41).

Figure 5: The benefits of physical activity



Source: Active Cumbria

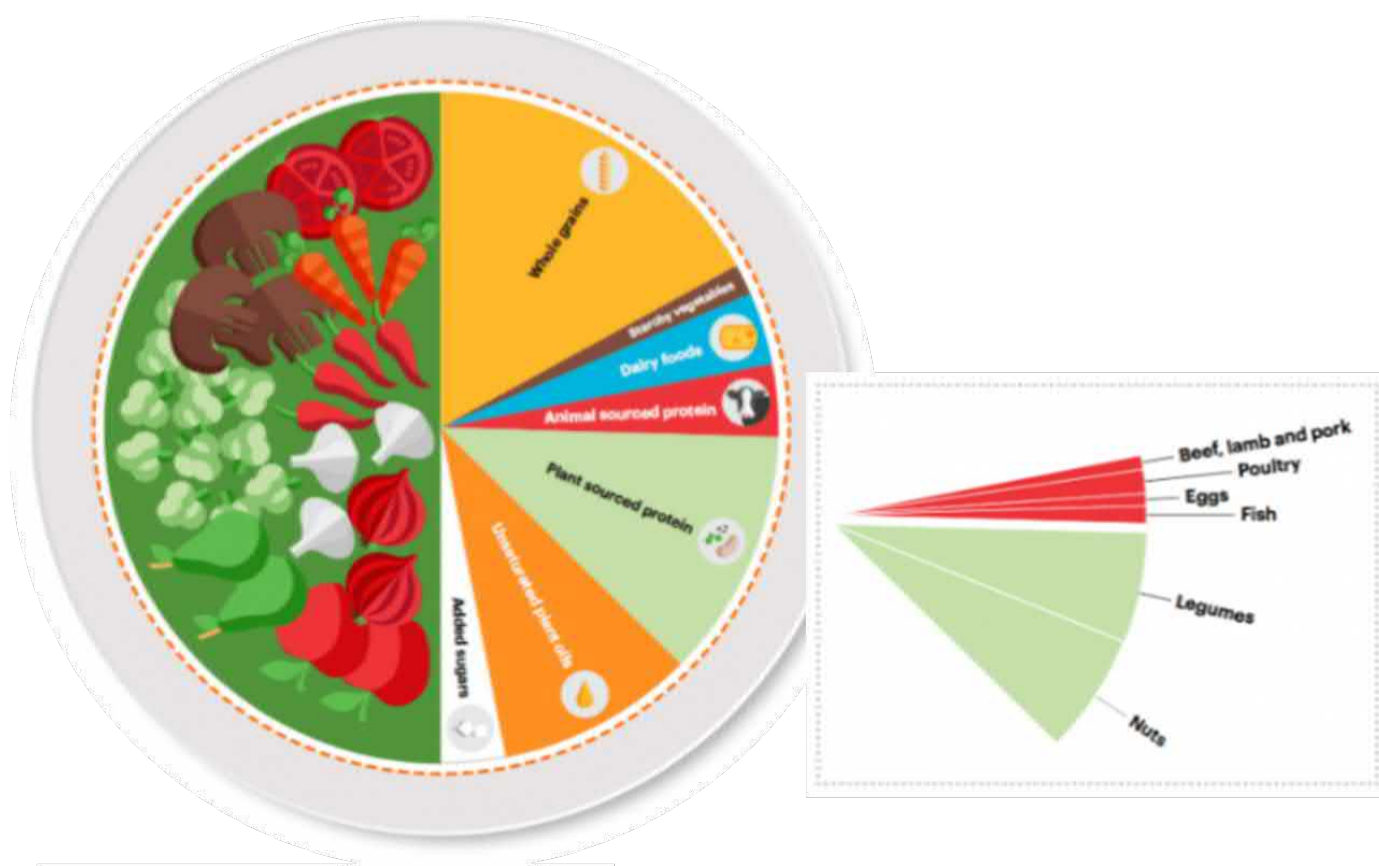
Supporting active travel in Cumbria is particularly important, since nearly a quarter (22%) of adults in the county are physically inactive, and nearly two thirds (61%) are overweight or obese⁽³⁹⁾. Furthermore, the estimated prevalence of problems such as diabetes and premature deaths from preventable heart disease, are higher than the national average⁽³⁹⁾.

Sustainable diets

Food production contributes 15-30% of total GHG emissions in the UK⁽⁴²⁾. It is also a major cause of deforestation, biodiversity loss and pollution⁽⁴²⁾. Minimally processed plant-based diets, rich in fruit and vegetables, and low in meat and dairy have the lowest environmental impact⁽⁴³⁾. Such diets are also good for our health, creating a 'win-win' situation⁽⁴⁴⁾ (Figure 6). They also support people to eat their recommended five portions of fruit and vegetables a day which is important in Cumbria since only around half (58%) of adults achieve this target⁽³⁹⁾.

It is estimated that if half of UK meat and dairy consumption is replaced with fruits, vegetables and cereals, GHG emissions would be reduced by 19%, and 370,000 premature deaths from heart disease and cancer could be averted each year^(40,45).

Figure 6: The planetary health plate: a healthy diet that is also good for the planet⁽⁴⁴⁾



Source: *Eat Lancet*

Urgent action is needed

“Global warming of 1.5°C will be exceeded during the 21st century unless deep reductions in Carbon Dioxide (CO₂) and other greenhouse gas emissions occur in the coming decades” (1p17)

The Intergovernmental Panel on Climate Change (IPCC) predicts that further global warming will have significant negative impacts on human health⁽⁴⁶⁾. As such countries across the world have committed to limiting the global temperature rise to less than 2°C above pre-industrial levels, and as close as possible to 1.5°C⁽⁴⁷⁾; a target that if achieved could save many millions of lives⁽⁴⁸⁾.

Here in Cumbria, the aim is to become the first carbon neutral county by 2037. This is an ambitious target, and one that will require urgent action at an individual, organisational, regional and national level.

Action now to achieve net zero carbon dioxide emissions, along with significant reductions in other GHG emissions, will lead to improvements in air quality and temperatures within two decades. This will substantially limit further climate change, save lives, improve health, and reduce health inequalities; both now, and for generations to come.

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About the Public Health Alliance

The Public Health Alliance is a sub-group of the Cumbria Health and Wellbeing Board and is comprised of the Cabinet Member for Public Health along with 6 District Council elected representatives, Third Sector and NHS, with recent expansion of membership to include key thematic lead representation. The Alliance is designed to provide co-ordination to the 6 Locality Health and Wellbeing Forums which are central to delivering on the prevention agenda and ensuring that local priorities influence the agreed Cumbria Health and Wellbeing Strategy. More recently the Alliance has served as the County Council's Outbreak Engagement Board, a statutory body introduced by government following the COVID-19 outbreak.



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