

**Climate  
Change,  
Nature and  
Health**

**A collaborative  
approach for  
a sustainable  
future**

**Public Health  
Annual Report  
2019**

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# Glossary

<b>Air quality management areas (AQMA)</b>	A geographical area where air pollution exceeds the national air quality regulations. Improvements in air quality must be implemented through an air quality management plan.
<b>Anthropological</b>	The study of humans, human behaviour and society. Anthropological climate change therefore refers to climate change as a result of human behaviour and society.
<b>Atmosphere</b>	The layer of gases that surround the Earth and are retained by gravity.
<b>Biodiversity</b>	The variety of life that can be found on Earth, and the habits within which they live.
<b>Carbon footprint</b>	The amount of greenhouse gases, and specifically carbon dioxide, which is emitted and released into the atmosphere by an individual, organisation or community, which may be over a specified time period.
<b>Carbon sequestration</b>	The process of capturing and storing atmospheric carbon dioxide.
<b>Communicable disease</b>	Infectious diseases which are transmissible through direct person-to-person contact or indirectly (e.g. through a vector such as a mosquito).
<b>Ecosystem</b>	A community of living organisms in conjunction with the non-living components of their environment (e.g. air, water and soil) which interact as a system.
<b>Ecosystem services</b>	The tangible and intangible benefits that humans obtain from ecosystems, which contribute to supporting human life.
<b>Global warming</b>	The long-term rise in the average temperature of the Earth's climate.
<b>Green infrastructure</b>	An inter-connected network of open, green spaces that provide a range of ecosystem services (e.g. parks and gardens, allotments, urban green space).
<b>Greenhouse effect</b>	The process by which radiation from the atmosphere warms the planetary surface to a temperature greater than what it would be without the atmosphere.
<b>Habitat</b>	The type of natural environment within which a species lives.
<b>Heat island effect</b>	The term given to localised higher temperatures in urban areas compared to surrounding green spaces. Primarily caused by the replacement of natural surfaces with hard impenetrable surfaces that absorb large amounts of solar radiation.
<b>Index of multiple deprivation (IMD)</b>	The official measure of relative deprivation for small areas or neighbourhoods in England, taking into account multiple different measures of deprivation (e.g. income, employment and education).
<b>Natural capital</b>	The world's stocks of natural assets which include geology, soil, air, water and all living things. From this natural capital we can derive ecosystem services (see above).
<b>Non-communicable diseases</b>	A disease which is not transmissible from one person to another. E.g. diabetes, cardiovascular disease, and cancer.

# Introduction

2019 has perhaps been the year that the world finally woke up to the threat of climate change. It has risen up the public and political agenda like never before, with worldwide mass demonstrations calling for action, two thirds of local councils declaring climate emergencies, and all major UK political parties making serious and credible commitments for change.

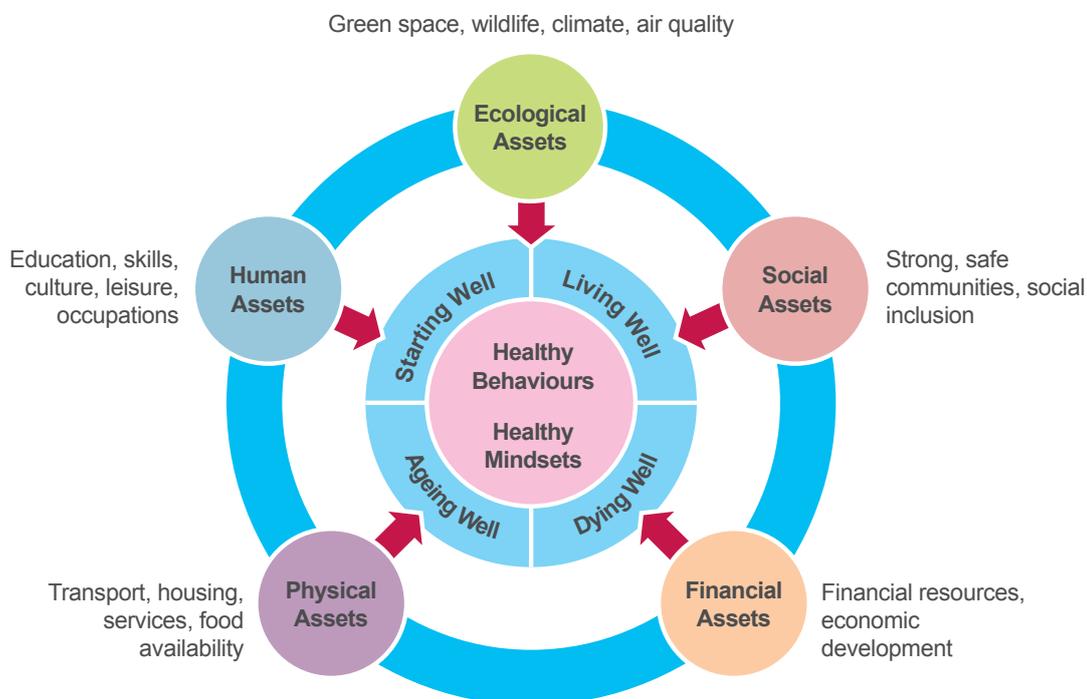
But climate change is not only an environmental threat. Climate change, the natural environment, and public health are intimately linked, with the World Health Organization (WHO) and the Lancet commission citing climate change as the biggest threat to global health in the 21st century (1) (2). Climate change topped the WHO list of the ‘Ten threats to global health in 2019’ (3), and both professionals and the public are becoming increasingly aware of the need to act.

In early 2019, Cumbria County Council and all six District Councils formally endorsed the Cumbria Joint Public Health Strategy (4). This strategy set a wide range of ambitions to improve the social, economic and environmental determinants of health and wellbeing (Figure 1). As part of the vision for the future contained within that strategy, Cumbria has agreed that:

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***“Cumbria’s natural environment, from our world-class landscapes to the centre of our towns, will be protected and enhanced. Sustainability will be at the heart of future development and Cumbria will reduce its ecological footprint even as it develops economically.”***

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As part of the section focused on Cumbria's ecological assets, the Joint Public Health Strategy commits us to the following key aims:

- **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.**

It is these ecological concerns, particularly climate change, that are the subject of this year's Public Health Annual Report. As the report shows, the impact of climate change on public health is substantial and enduring, and it is also widely thought that we have exceeded planetary boundaries in terms of safe levels of biodiversity loss (5). However, it is not too late to take action – and the good news is that the action that we need to take to tackle climate change has substantial co-benefits for health and wellbeing directly, again as described in this report.

Climate change is an issue now, but fundamentally this is about the future – about leaving a better world for today's children and young people. If we were to achieve the Paris Agreement to limit climate change to well below 2 degrees (aiming for 1.5 degrees) above pre-industrial levels, a child born in Cumbria in 2019 would grow up in a country where burning coal for power ended when she was six; where by the age of 21 no new petrol or diesel cars were for sale; and which would be carbon neutral by the time she turns 31 (2). Such a world would have cleaner air, a better transport infrastructure, sustainably heated housing, and a healthier food system, all leading to healthier people. If we could go faster, and achieve carbon neutrality by 2040 rather than 2050, that world really would be a 21st birthday present worth having.



**Colin Cox**  
Director of Public Health, Cumbria.

# Chapter 1: Our planet in crisis

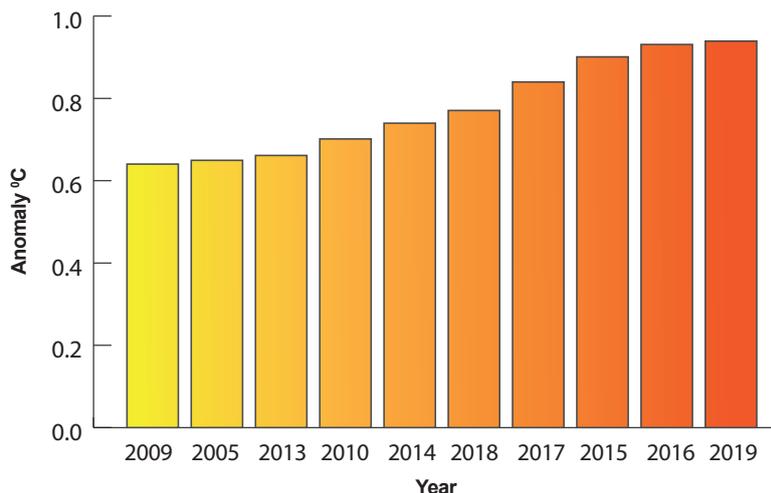
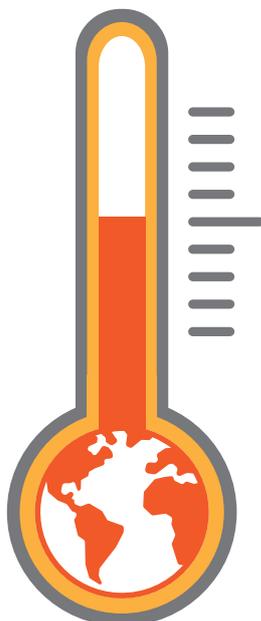
## 1.1 Climate change: an overview

Our planet offers a unique environment which can sustain life: breathable oxygenated air, an abundance of water, light, sun – and a moderated climate, supported by our atmosphere. The sun emits solar radiation onto the earth, which is then released as heat back into the atmosphere. Gases in the atmosphere trap this heat, a process which is known as the ‘greenhouse effect’ (6). This greenhouse effect is a natural phenomenon which maintains liveable temperatures on earth. However, if more greenhouse gases are released than can be sequestered by natural processes on earth (e.g. through photosynthesis), more heat becomes trapped, compromising this system. Since the industrial revolution the burning of fossil fuels and other activities which emit large amounts of greenhouse gases, most notably carbon dioxide, has resulted in an increase in the heat trapping effect (6) (7). This has resulted in the earth getting warmer, commonly referred to as ‘global warming’.



In the twentieth century, world average surface temperature increased by approximately **0.6°C**, with approximately two-thirds of that warming occurring since 1975 (8).

As things stand, by the year 2100, the average global temperature is expected to have increased between **1.8** and **4.0°C** (10).



The ten warmest years on record have all occurred since 1998, with nine of the ten occurring since 2005 (9).



Because the earth operates in a fine balance, this disruption will have major consequences. Warmer air carries more water, so rainfall and storms will increase in frequency and intensity. Ice sheets will melt, causing sea levels to rise and a further warming effect by reducing the planet's reflective capacity.

The term 'climate crisis' emerged in the 1980s and 1990s, but has gained increasing recognition in the last decade (11) (12). This language reflects the emergency we face, and the urgency of the situation. The effects of climate change on health will be far-reaching and dramatic, and could undermine the gains in development and global health that have been achieved in the last half century (2). These threats to health – both direct and indirect, global and local – are described below.

## 1.2 The health consequences of a changing climate

### 1.2.1 Global health consequences

At a global level, climate change can have both direct and indirect effects on health. The most well-known direct effects are extreme weather events. These can be heatwaves, droughts, wildfires, floods and storms, and are expected to increase in duration, frequency and severity as the climate crisis intensifies. These events can directly cause death or injury, poor mental health, and result in populations being displaced. Researchers have suggested that such climate-related disasters caused 2.52 million global deaths between 1980 and 2013, with the least developed countries being disproportionately affected (13). These numbers are expected to climb. Developed countries are also not immune to climate related catastrophes – it is estimated that in the European heatwave in the summer of 2003, climate change increased the risk of heat-related mortality by approximately 70% in Paris and 20% in London (14). In Paris, a lack of social cohesion and support for vulnerable populations contributed to a particular high death toll (15). Urban areas may feel temperature rises most strongly due to the intensifying "heat island" effect, increasing the risk of heatstroke in cities (16) (10). Climate change can also have direct effects on chronic, non-communicable diseases (NCDs) as increased heat exposure can cause physiological changes (17) (18). This can be most directly seen during extreme heat waves, where increases in both deaths and emergency admissions to hospital have been demonstrated (17) (19) (20) (21) (22).

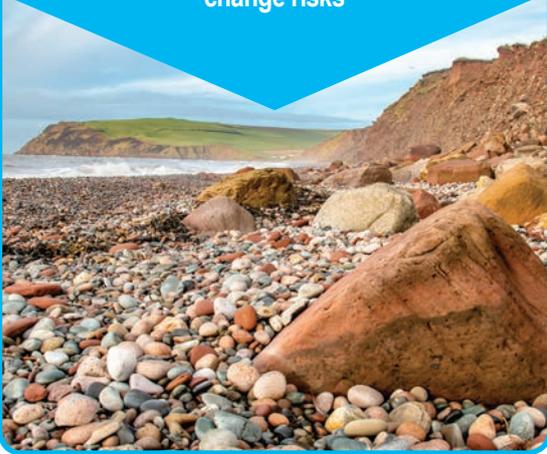
The indirect effects of climate change on health are many and include worsening air pollution, the spreading of disease vectors (such as mosquitos), food insecurity, migration and displacement of populations, and mental illness (2). More frequent summer droughts and heatwaves will be associated with higher ozone episodes: a vicious cycle, as ozone acts as a greenhouse gas (23). Increasing ground level ozone can directly worsen air pollution and will increase respiratory disorders, heart disease and cancers (24) (25) (17). The precise impact of climate change on vector-borne diseases is difficult to predict, but millions of people could suffer from its effects, such as widening transmission of malaria (26). Climate change will also affect agriculture, forestry and fishery, affecting food security on all levels (27). It is important to remember that all of these direct and indirect effects on health will be mediated by social conditions, dynamics, and individual behaviours – and that different countries and communities will all face their own challenges.

### 1.2.2 In the UK and Cumbria

Climate change is already having impacts on the UK climate, with rising temperatures, changes in rainfall and sea level rises (28). From the UK climate change risk assessment (28), priority areas are:

1

**Flooding and coastal change risks**



2

**Domestic and international food production and trade (see Figure 2).**



3

**High temperatures**



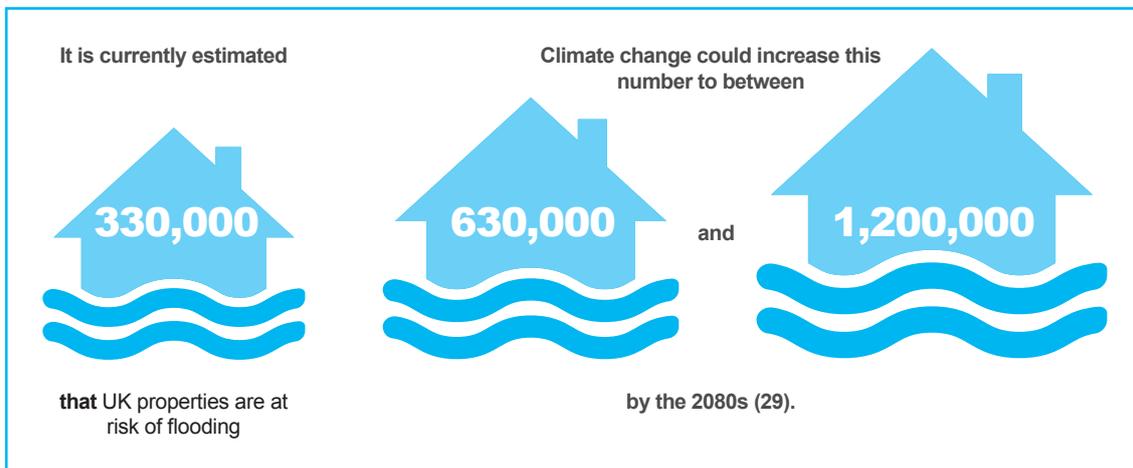
4

**Shortages in public water supply, risks to natural resources (including terrestrial, coastal, marine, freshwater, soil)**



Out of these, the top two risks to UK health are from flooding and high temperatures. Cumbria will face these national effects, alongside our own unique challenges, consequences, and opportunities. Predicting likely impacts locally from a changing climate is difficult. We are likely to get summers which are slightly drier and hotter, and winters which are warmer and wetter. But broad predictions can be misleading; while summers may be drier overall, some areas may experience very heavy rainfall events that cause severe but localised impacts. They often occur at short notice, giving areas little time to prepare. Furthermore, due to a compromised regulatory climate system, extreme weather events are likely to increase, which will include cold events such as the “Beast from the East”.

In the UK and Cumbria, extremely wet winters are projected to increase, with greater risks of flash flood and river flooding (29).



The risk of flooding already impacts on Cumbrian residents. Our geography means that there is high annual rainfall: Seathwaite at the Southern edge of Borrowdale has been named as the wettest place in England (31) (32). In 2015, Storm Desmond flooded over 7000 homes in Cumbria, causing devastating consequences, and long-term physical, mental and financial effects for many. Mental health symptoms increased by two to five times amongst those whose homes experienced flooding (33), in line with previous research on flooding effects (34) (35). The psychological impact of flooding is therefore a growing public health concern with an increasingly wet climate. Flooding can also overwhelm sewage systems and cause water supplies to become contaminated, increasing water-borne diseases, such as cryptosporidiosis (36) (37) (38). Rodents disrupted by floods can also cause an increased risk of disease transmission (38).

Managing local flood risk requires a collaborative approach, with district councils, the Environment Agency, commercial water companies (currently United Utilities) and Cumbria County Council all working together. The Local Flood Risk Management strategy aims to reduce the flood risk, increase knowledge and awareness on flooding and build resilience, and ensure that flood risk management is integrated with the planning process (31). However, Cumbria remains vulnerable to extreme flooding events, and these are likely to increase with climate change and increasingly higher winter rainfall.

High temperatures are the other major risk in the UK. 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 (39). Our last summer fit this trend, with July 2019 setting a new record for the hottest UK temperature on record (38.7°C) (40). Projections suggest that heat related deaths would be expected to rise by over 250% by the 2050s (from a current baseline of around 2000 annually). 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, our temperature may increase between one and two degrees (41). However, it is possible that an unmitigated climate change scenario could see a 4°C increase in summer temperatures (42). One report on summertime temperature and overheating risk in English homes has found that the incidence of warm bedrooms is concerning, especially given the trend towards better home insulation (43). In hospitals, unpublished reports suggest that 90% of wards may be prone to overheating, and there have been news reports of wards reaching dangerously high temperatures (39) (44). However, cold winters are likely to remain a problem and winter mortality is projected to remain high (45). In Cumbria, there were 317 excess winter deaths from 2016-2017 - 18% more deaths in winter compared to the non-winter period (46). This is approximately equal to the North West and slightly better than England as a whole, which may represent some good prevention

work going on locally (see Section 2.4) (46). These numbers show us that while it will be increasingly necessary to protect the population from hot weather, reducing the impact of the cold will still be important; UK winter mortality rates are projected to fall just 2% by 2050. It is the elderly population who will be most at risk of heat and cold related mortality, which is important given that the age of the population is increasing, and that Cumbria's ageing population is more pronounced than is seen nationally (45).

The global indirect consequences of climate change – such as an increase in vector-borne disease and reduced food security – may also be experienced in the UK and in Cumbria. Climate change may result in the earlier seasonal appearance of aeroallergens (pollen and fungal spores), so those who suffer with allergies may have to cope with a longer pollen season and more severe symptoms (38). Most food, water-borne and enteric pathogens have seasonal variation which may be influenced by climate change. Warmer weather will favour pathogens such as Salmonella, allowing them to grow more readily in food and cause infections (47). Warmer weather and mild winters may also change human behaviours around food and will also increase the numbers of flies and pests that affect food safety (38). The UK may become more vulnerable to vector-borne diseases, such as those carried by ticks. The Lake District is known to have a high population of ticks, which are more frequently found in the countryside and may carry vectors for Lyme disease (48). This represents an additional public health risk.

### 1.3 Natural capital

Alongside this, human destruction of nature and loss of biodiversity has been described as being as destructive as climate change (49). We need to have an increased awareness of our planet's natural capital; the stock of natural assets, including geology, soil, air, water and the abundance of living things that make human life possible (50). Biodiversity is the variety of life in all its forms: the richness and variety of species and habitats that surround us. These species and their ecosystems support the foundation of our life on earth, and are critical for the livelihood and wellbeing of people across the world (49). Ecosystem services refers to the many services we derive from natural capital, on which human health depends. These include more obvious services such as food, and less obvious services such as natural flood defences and crop pollination. Loss of biodiversity can have significant direct human health impacts if ecosystem services are no longer adequate to meet our needs. In addition, we might lose potentially significant medical and pharmacological discoveries through the knowledge found in flora and fauna (51).

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 60% (52) (53). The State of Nature report highlights the ongoing threats to nature in the UK - of the 7,615 species found in England, 13% currently face extinction, and there has been an average 13% decline in species abundance UK-wide (53). Looking more locally, data from the Lake District National Park on protected sites can provide proxy measures for monitoring ecosystems and habitats: only 21.6% of the area of protected sites is in favourable condition (54). Declining ecosystems and species numbers are linked to a number anthropogenic (human) factors, including agricultural intensification, man-made pollution, urban and infrastructure development, mineral extraction, cultural persecution, invasive species and diseases spread by mankind. Climate change is also a significant factor behind species loss; many species will struggle to adapt to rising temperatures and extreme weather events. However natural solutions exist in order to mitigate climate change (e.g. tree planting, wetland and peatland restoration, restoring natural processes and ecosystem function) which will not only contribute to the conservation of natural ecosystems but also promote greater mental and physical health and wellbeing in our societies (49) (55) (56).

# Chapter 2

## 2.1 Responding to the climate crisis

Climate scientists and experts all over the world are in almost universal agreement about anthropogenic global warming (57). We need to listen to their expert advice, and take urgent action on mitigation and adaptation. Failure to do so could send the climate change process into an irreversible downward spiral. We would be at risk of passing a 'tipping point', where self-reinforcing feedbacks will accelerate warming and risk a cascading climate disaster (58). This could leave us powerless to act in the future. Mitigation means to reduce or prevent greenhouse gas emissions, in order to reduce the severity of climate change (59), whereas adaptation refers to the actions taken to manage the impact of climate change. We need to do them both, together. There is a clear need to be adapting for the effects of climate change, for example the more frequent and extreme weather events such as flooding. At the same time, we also need to be taking sustained, collaborative action to reduce our carbon footprint. In this way we can work towards mitigating the highest emissions and prevent the 'worst case scenario' for our warming planet.

The Paris Agreement, signed in 2015, brought together 195 countries in a legally binding global climate deal (60). The global action plan is based on limiting global temperature rise to well below 2°C, and aiming to limit it to 1.5°C, above pre-industrial levels, in order to significantly reduce climate change risks (61). It is recognised that global emissions need to peak as soon as possible, and then rapidly reduce, committing the international committee to reduce emissions. As well as signing up to the Paris Agreement, the UK is leading the way with a legally binding target to reduce carbon emissions to net zero by 2050 (62). 'Net zero' or 'zero carbon' means that any emissions would be balanced by schemes to absorb greenhouse gases from the atmosphere.

It is important that we engage with this agenda and work to support the transition to zero carbon. Climate change, further degradation and loss of nature will have a vast impact on our county, our health, and on what makes Cumbria a wonderful place to live and work. But we also need to recognise that our position is complicated. Off the coast from Barrow we have the largest offshore wind farm in the world, producing enough clean energy to power 590,000 homes (63). At the same time, a new colliery has been opened near Whitehaven in West Cumbria – the first new deep coal mine in the UK for the last 30 years (64). Whilst this will bring important new job opportunities to the area, it does so at a time when the UK is striving to reduce its fossil fuel consumption. These contrasts also exist more widely; for example, our economy is largely built on tourism. This brings money and employment to our county, and could be a positive for national carbon zero targets if domestic visitors opt to come here as opposed to flying abroad. On the other hand, an influx of tourists can have negative consequences for natural ecosystems, create areas of high traffic density, and cause a surge in travel-related carbon emissions. Another example is our relationship with food and agriculture; reducing the amount of meat and dairy we eat is good for the environment, but what does this mean for a county with such strong links to farming?

These issues represent how complicated the overall picture of climate change can be. We must push for clean energy, and embrace climate change solutions which work with, and not against, our natural assets. At the same time we must maintain an awareness of what can be reasonably done, balancing short and long term goals and the needs of the local population. There are many positive opportunities here. As recently recognised in the Lancet, the changes to support a zero carbon transition are positive for health and could result in cleaner air, more nutritious food, closer communities and improved housing and infrastructure (65). They are therefore actions which co-benefit both individuals and the planet – and in many cases will build resilience and wellness into our local communities. We must strive for sustainability, aiming to "meet the needs of the present without compromising the ability of future generations to meet their own needs." (66) The way in which we eat, make a home, travel, work and play, can all be done in a sustainable way. This means that as well as enjoying considerable personal benefits now, the changes we make can enable future generations to enjoy healthy and happy lives in Cumbria.

A move towards renewable sources of energy, rather than fossil fuels, is an important part of reducing carbon emissions working towards net zero. Over 70% of UK energy is still sourced from non-renewable sources (67). Significant actions could be taken across Cumbria to reduce unnecessary energy use and shift towards renewables, including off-grid energy solutions. There is no doubt that this will require a change in thinking across all sectors and organisations. Consideration should be given to how procurement and investment decisions could be changed to reduce emissions. Strong leadership and partnership working will be critical. At the same time, there needs to be a focus on planning for extreme weather and helping communities and business be ready and adaptable to the impacts they will face.

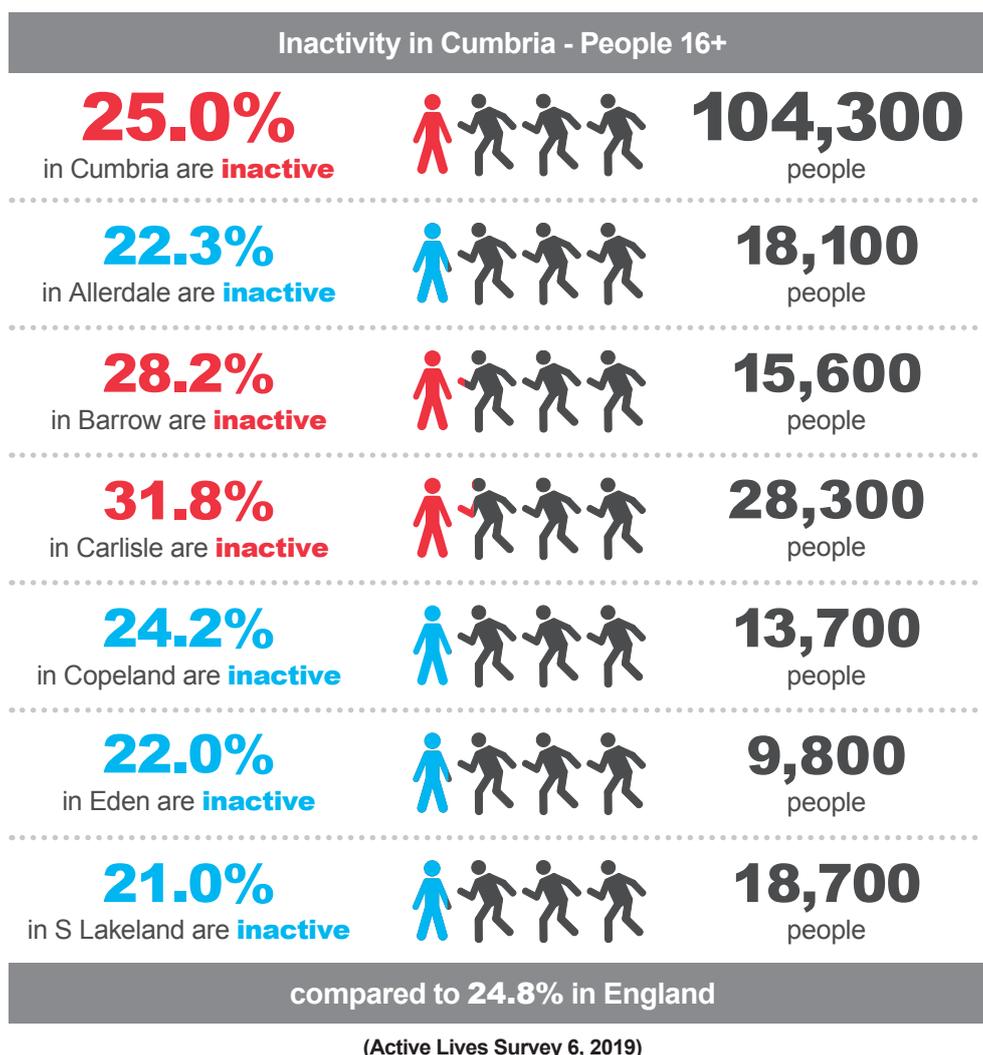
As well as having significant opportunities to lead and develop through innovation, Cumbria also has the potential to off-set emissions through natural solutions. A catchment wide approach to land management could deliver multiple wins for farm productivity, improved soil health and biodiversity, and better flood protection (68; 69). Natural strategies will be required to reach a net zero position and contribute to climate change adaptation, and could bring a myriad of benefits through supported ecosystem services. It will be important for organisations to demonstrate leadership around the climate agenda, particularly where these multiple benefits can be delivered. They will need to work together and break down traditional ways of thinking and working. This will help galvanise communities and support community action. For example, tree planting schemes can reduce carbon emissions, act as a carbon offset, re-establish habitat corridors and at the same time provide improved countryside access and improvements to public health. Such co-benefits will be explored in the following sections.

## 2.2 Active travel

In Cumbria, transport accounted for an estimated 40% of carbon emissions in 2017, the second largest emitting sector after industry and commercial emissions. Transport is also the largest emitting sector in the UK, accounting for approximately 33% of emissions (including domestic but not international flights) (70). The vast majority of these emissions occur from road transport, as we have become increasingly reliant on fossil fuelled cars. Across the UK, transport carbon dioxide emissions peaked in 2007, and have since fallen back to 1990 levels, mainly due to improvements in car fuel efficiency (71). But progress to reduce travel emissions has a long way to go. In Cumbria, total transport emissions were only slightly lower in 2017 (1514.5 kt CO<sub>2</sub>) compared to in 2005 (1550.2 kt CO<sub>2</sub>). The highest transport emissions come from Eden, followed by South Lakeland. This reflects emissions from the M6 motorway that runs through the districts, as well as A roads (see Appendix 1 for more details). Our county is large and rural, and consequently people may be more reliant on cars than they would be within cities.

When there are a high number of cars on the road, air pollution can become a problem. Air pollution is an additional public health concern - it increases the risk of acute and chronic diseases and can reduce life expectancy. The long-term equivalent to anthropological air pollution is estimated at approximately 28,000 to 36,000 annual deaths in the UK (72), with the health impact cost estimated at between £8 to 20 billion (73). People living in more highly polluted areas, particularly older people, children, pregnant women, and those with pre-existing heart or respiratory problems are more likely to be affected, as well as those from deprived backgrounds. Therefore addressing air pollution can help to reduce health inequalities (72). In general, as a rural county Cumbria enjoys good air quality, and the mortality attributed to air pollution is lower than the national figure (3.1% compared to 5.1% in England) (74). However Air Quality Management Areas (AQMAs) do exist in Cumbria; one in South Lakeland (Kendal) and six in Carlisle. These are places where national air quality objectives are not likely to be achieved. However there are other areas in Cumbria with levels of air pollution nearing threshold levels, and the use of biomass boilers, wood-burning stoves and solid fuel in rural areas have led to concerns that levels may be rising. There are also issues with air quality in the Lake District, such as ammonia emissions from agriculture.

When travelling shorter distances, travelling actively - walking or cycling - instead of taking the car can significantly reduce both carbon emissions and air pollution. There are also significant co-benefits for health. Active travel gives us the benefits of physical activity which include reduced rates of obesity, improved cardiovascular, metabolic and musculoskeletal health, as well as reducing the risk of depression and dementia (75). Despite these benefits, most people do not get the recommended level of physical activity, and those from poorer areas are more likely to be inactive (76) (77). This can be seen in Cumbria, where 25% of people are physically inactive, approximately the same as the England average. This rises to 28.2% in the more deprived district of Barrow-in-Furness, in contrast to 22.0% in the relatively more affluent district of Eden.



Travelling actively to work can incorporate exercise into daily routine, and is also positively associated with wellbeing, and improved concentration (78). Approximately 4.4% of full-time workers in England usually walk or cycle to work - Cumbria does slightly better, with 5.3% travelling actively (largely walking) to work (79). This is encouraging given the size of our county, meaning that some people might have long distance commutes. The number of people walking or cycling to work by district is shown in **Table 1** (79). In Barrow-in-Furness, 7.6% of the adult population usually walk or cycle to work. This reflects that this district is predominantly urban, but still shows a higher proportion commuting actively than any other urban centres in the North West. These figures are particularly important given the greater levels of physical inactivity in Barrow. Building on this good work and normalising active commuting to work could further increase numbers and help to reduce inequalities in physical activity.

	Adults who work full time that usually cycle to work % of all adults aged 16+	Adults who work full time that usually walk to work % of all adults aged 16+
Allerdale	0.7	3.3
Barrow-in-Furness	2.5	5.1
Carlisle	1.3	5.2
Copeland	0.8	2.2
Eden	0.6	4.4
South Lakeland	1.2	5.0

**Table 1.** From 2011 census [www.gov.uk/government/statistical-data-sets/cw090-cycling-to-work-at-local-authority-level](http://www.gov.uk/government/statistical-data-sets/cw090-cycling-to-work-at-local-authority-level)

The benefits of active travel are so great that NICE have published specific guidelines on promoting walking and cycling (80). Roads need to be safe and pleasant environments, to reduce fear of cycling and make it more accessible for everyone. When active travel is not possible, staff should be supported to attend meetings remotely, and expanding digital infrastructure will support this. Additionally, normalising active travel from a young age is important. This forms positive habits and reduces the risk of obesity in children.

**The Active Travel team in Cumbria promotes and facilitates safer and sustainable travel to and from school, with funded initiatives across the county. The aims are to reduce car use and emissions, help keep children and families fit, and teach children safety skills for life so that they may continue to travel actively.**

**Sustainable school travel initiatives:**

- **Feet First:** Year round reward scheme for infant, junior & primary schoolchildren, delivered to 58 schools and 8000 children.
- **Bikeability:** Level 1 & 2 training to all primary and junior schools & level 3 advanced training to 13 secondary schools, delivered to 6000+ children annually.
- **Walk to School Week:** 45 schools provided with classroom resources to promote the national walking to school week in May.
- **The Big Pedal:** 44 schools competing in the Sustrans national event. In 2019 there were 35,817 cycling, scooting & walking journeys to and from school logged in 5 days.
- **Scooter Skills:** Scheme which 48 schools deliver promoting safer scooting.
- **Cycle Smart Helmet Initiative:** Enabling families/schools to purchase low-cost helmets at subsidised prices.
- **School Travel plans:** Assisting development.
- **Other initiatives:** Park & Stride/Ride/Walking Buses/Bike to School Week/Road Safety Week



Where travelling actively is not practical or feasible, the next best alternative for the planet is to take public transport. While not providing the same physical health benefits, this reduces the number of vehicles on the road and therefore reduces emissions. Having good public transport networks can also promote social cohesion and connectivity for people who are not able to drive. Unfortunately, public transport is a considerable challenge in Cumbria, where the majority of the population live rurally in multiple small communities, and there has been a struggle to make rural routes financially viable. This also suggests a lack of carbon viability: one of two people travelling a route in a diesel bus would result in higher emissions than using a small car.

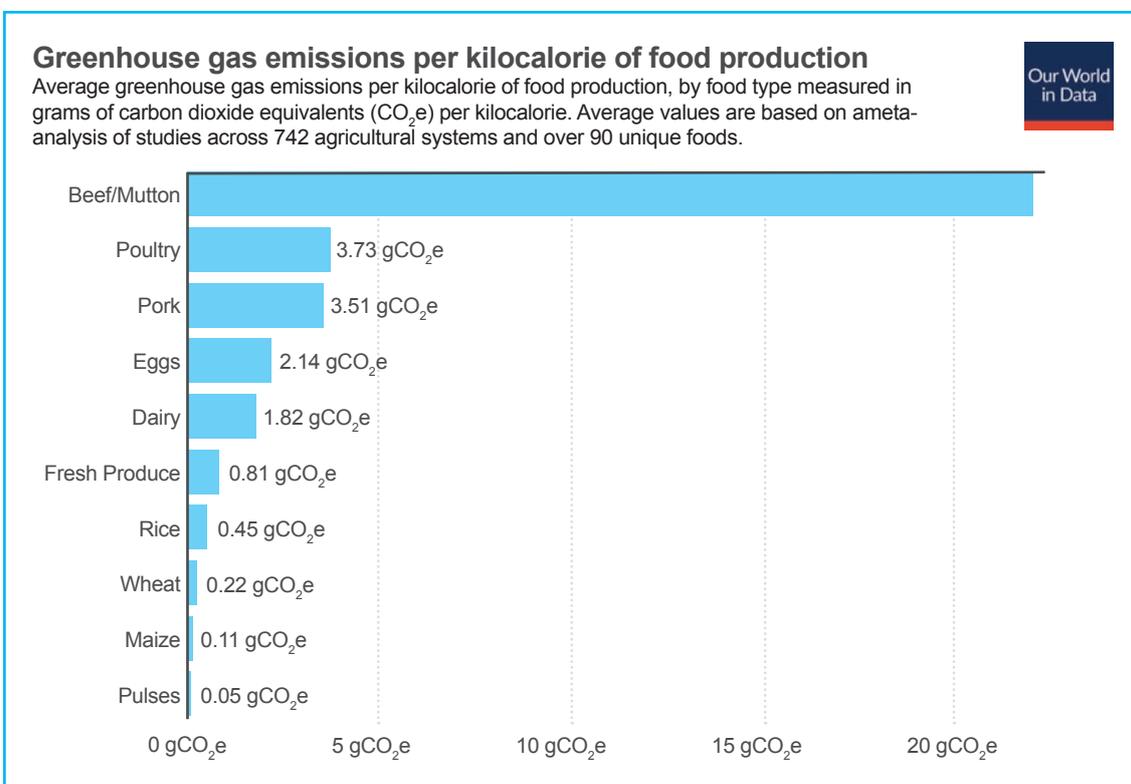
Another option for reducing emissions is switching to an electric car. The government offers a grant of £3,500 for fully electric cars, and (while still expensive) the price of electric vehicles is becoming increasingly competitive, particularly when fuel savings are considered. In Cumbria, investment into charging infrastructure is thought to be accelerating growth; in 2017, there were 413 electric cars, compared to just ten in 2012 (82). There are now approximately 60 charging points across Cumbria, with nine charging locations provided by the County Council, and it is critical to continue this investment in electric car infrastructure. Local organisations can explore funding and investment opportunities to increase the number and distribution of electric charging points in the county. Planning authorities can lead by exploring on-street charge points that enable residents to charge their vehicles at home, and by incorporating charge points into planning guidance.

Collective lobbying of government for the transition to a lower carbon transport system will be a crucial in decarbonising the transport sector. Both domestically and commercially, certainty about the future vehicle market is needed so that people and businesses can make informed decisions about their next vehicle purchase. At the same time, we should consider other ways to reduce travel emissions. For example, community hub centres could provide a greater numbers of services in smaller settlements, decreasing the need to make journeys into urban centres – this in turn increases accessibility to services and promotes community resilience and social connectivity.



## 2.3 Food and farming

The WHO has stated that one of the greatest risks to planetary and human health is a globalised and poorly regulated agri-food system, which has become geared towards selling cheap, highly processed convenience food (83). Of particular importance for climate change and sustainability is the amount of meat that we eat. Meat consumption has gone from being a treat to a staple part of most people’s diets, and global meat production has been predicted to double by 2050 (84) (85). This is important because the production of meat, and particularly beef, produces significantly more greenhouse gases than vegetables and grains (see Figure 1 for the equivalent amount of CO<sub>2</sub> produced per kilocalorie of food). The land needed for beef and lamb production also results in deforestation, which removes the ability of trees to pull carbon from the atmosphere and destroys natural ecosystems (86). While today this is usually seen as an issue for developing countries such as Brazil, this is true only because the deforestation of the UK has already happened; our Cumbrian landscape is the result of deforestation in previous centuries.



**Figure 1.** Greenhouse gas emissions per kilocalorie of food production. Clark and Tilman (2017)  
 Source: [ourworldindata.org/meat-production](http://ourworldindata.org/meat-production)

In the UK, farming accounts for 11% of greenhouse gas emissions and 83% of ammonia emissions that contribute to air pollution (83) (87). In Cumbria, 5.3% of 2017 carbon emissions were from agriculture (88). Our rural county is the second largest in England, and covering a sparsely populated area. Farming is a way of life and livelihood for many, a significant part of the rural economy, and provides social cohesion in rural areas. There are over a thousand commercial farm-holdings within the Lake District National Park (54). Agriculture also continues to shape the natural environment of Cumbria, which underpins the economy, including the tourist economy. Future food and farming policy therefore has significant implications for the longer term economic performance of Cumbria and the sustainability of rural communities. Currently, many of the upland areas are seen as being suitable only for growing

grass and farming sheep, which is largely dependent on subsidies from the government and the European Union (89). But by shifting the balance of subsidies to support ecosystem services (such as carbon sequestration, water retention, flood risk reduction and eco-tourism), farmers and landowners could manage the environment differently to produce public good as well as agricultural products. This may also include some 'rewilding' of the uplands (see section 2.7) (90) (91). As the UK leaves the European Union and the Common Agriculture Policy, the UK government has signalled its intention to reform subsidies to focus on payments for such "public goods" not just food production (92). This is an opportunity for environmental protection and enhancement that must not be wasted.

As well as playing a crucial role in environmental sustainability, the food system directly impacts on public health. The co-benefits of planet- and people-friendly diets were explored by the international EAT-Lancet commission. The commission highlighted food as the strongest lever to optimise human health and sustain our environment for future generations, and called for a shift towards a plant-based diet (93) (see **Figure 2** for a recommended plate). A healthy, balanced diet should involve more fruits and vegetables, nuts and wholegrain foods. Livestock products should be eaten more sparingly, be good quality and sustainably produced. A healthy diet significantly influences health and wellbeing.

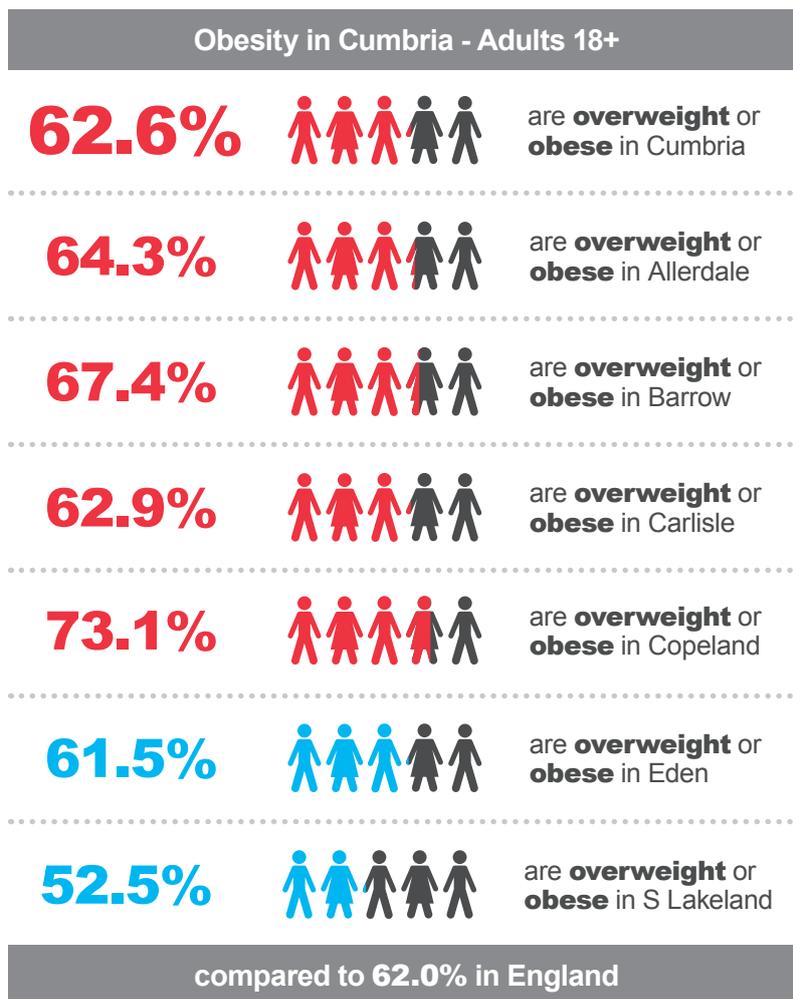


**Figure 2.** Recommended plate for planetary health. EAT-Lancet commission.  
Source: [www.sdg2advocacyhub.org/news/eat-lancet](http://www.sdg2advocacyhub.org/news/eat-lancet)

Currently, **58.1%** of adults in Cumbria are meeting their ‘five a day’ (94).



This is above the English average, but there is considerable room for improvement. Obesity continues to be a major problem, with 62.6% of adults in Cumbria being overweight or obese (comparable to the England average) (95). There are also significant inequalities within the county, with 52.5% of adults overweight or obese in South Lakeland, compared to 73.1% in Copeland.



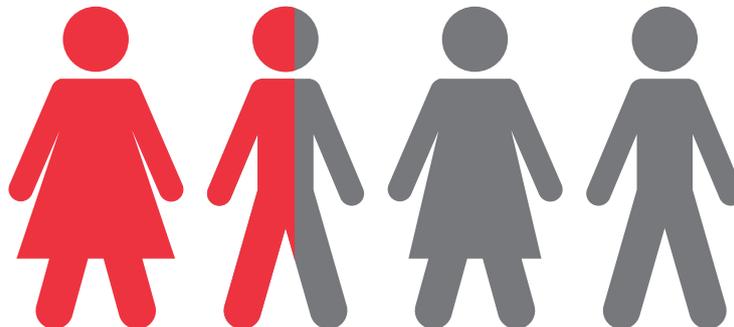
(PHE Public Health Profiles 2017/18)

Higher rates of obesity are associated with areas of increased deprivation, and individuals from these areas are more likely to be vulnerable to obesity-related health complications (96). Focusing on increasing intake of plant-based foods in Cumbria, particularly in more deprived areas, will help improve health while being a sustainable option for the environment.

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**One in four children** in Cumbria start school above a healthy weight



but by the time they are in year 6 (aged 10-11), **35.3%** percent of children are overweight or obese (97), slightly higher than the England average.

Exposure to marketing of high fat, high sugar processed food influences children's preferences and eating habits, with children who engage with food brands online being more likely to consume unhealthy food. Stronger regulation of the food industry is needed to stop the disproportionate promotion of unhealthy products. Diet and health should be a central and important part of the school curriculum, with school catering providing sustainable healthy food. Schools could work closely with parents and carers to equip them with the skills to produce healthy, cost-conscious, low-waste meals. We must equip our future generation early to make healthy choices, and to understand the links between the food we eat and the effects on our bodies and planet.

As well as reducing our carbon footprint by eating less meat and more plant-based foods, eating locally produced foods is generally more sustainable (98). Focusing on local and particularly seasonal produce can also deepen our connection with the land, build social capital (99), and help to reduce food insecurity.

**In Cumbria, we are lucky to have some fantastic local community projects are based on local fresh vegetables, such as Growing Well in South Lakeland (described further in Section 2.6) (100) and VistaVeg in Eden. This is an example of a co-op scheme in which people receive locally grown vegetable boxes. The scheme also supports the reduction of inequalities by offering the healthy start discount for low income families, and runs schemes with schools and children's groups to promote healthy eating (101). A number of other local fruit and vegetable box schemes exist across Cumbria, providing an excellent way of supporting local communities, connecting with food growth and seasonal products, and enjoying healthy delicious food.**

Ensuring good access to local healthy food is vital in creating healthy places. There should also be a focus on reducing food waste; one third of food globally produced is lost from farm to fork, and if food waste was a country its global carbon emissions would be the third highest in the world, behind the U.S. and China (102). Increasing awareness can encourage people to make consumer choices that reduce waste; such a writing a shopping list, purchasing only what is needed and using expiring or leftover food items creatively (102). This can also be cost saving for individuals.

There is an opportunity to promote good public health through the procurement of local fresh food for schools and hospitals, as well as boosting local horticultural production. Quality food production is critical to the health of individuals across Cumbria and more widely. Resilient rural communities and agricultural sectors are vital to this, to ensure that the countryside will be managed effectively.

## 2.4 Housing

Government statistics suggest that approximately 18% of carbon emissions come from residential sources (70). The majority of these emissions come from heating our homes. From 2017 to 2018, there was a small increase in residential emissions, and this coincided with a colder winter. We can all take simple measures to avoid turning up the heating so high in the house; such as wearing multiple layers of clothing, drinking hot drinks and staying active. Having an energy efficient home can also help to maintain comfortable temperatures, while reducing unnecessary energy consumption and therefore reducing greenhouse gas emissions.

However, while we try and reduce emissions, at the same time there are thousands of people living in Cumbria who cannot afford to heat their homes to safe levels. In many cases, this is because Cumbrian homes are not sufficiently energy efficient. Advice from Public Health England is that homes should be heated to at least 18 degrees, with elderly or unwell people likely to need a slightly higher indoor temperature to stay comfortable and well (103). Over 28,000 people in Cumbria are living in fuel poverty, meaning that they cannot afford to heat their homes to these temperatures. Those living in rural areas are more likely to be living in fuel poverty. The districts of Allerdale, South Lakeland, Carlisle and Eden all have a higher proportion of winter deaths than the England or North West average (104). The proportion depends on the temperature, the level of disease in the population, and how well equipped people are to cope with lower temperatures. Most excess winter deaths are due to circulatory and respiratory diseases, and the majority occur amongst the elderly (46; 105). Many of those living in fuel poverty are older, and may live in privately owned or rented, poorly insulated homes in apparently affluent areas (106): i.e. they may be ‘asset rich’, but ‘income poor’. In Cumbria, this situation is exacerbated by the high incidence of old, stone-build, solid-wall construction dwellings, especially in rural areas (106). There is a major need for solid wall insulation if homes are to be brought up to effective insulation levels (107).

Making homes energy efficient has multiple benefits. It can reduce the amount of carbon emissions needed to heat the homes, reduce fuel poverty, improve health and wellbeing, generate economic growth and create employment opportunities (108) (109). The Cumbria Housing Group brings together district councils, the Lake District and Yorkshire Dales National Park authorities, with a shared vision: “Working together to drive housing and economic growth, regenerate poor housing and help people to live independently.” (110) The group recognises that a major priority is to accelerate the rate of housing growth, to generate affordable and energy-efficient homes in order to meet local need. Within the Lake District, 24% of housing is second home ownership and in some locations up to 59% of houses may be being used as second or holiday homes (54). Building an increased stock of good quality and affordable homes will also contribute to local economic sustainability (described in the following section). Affordable home schemes assist people living and working in Cumbria who cannot afford to buy a home on the local market. Planning systems have a role to play in setting out expected targets and guidance to developers on affordable homes and energy efficiency, possibly drawing on the Code for Sustainable Homes (an environmental assessment tool for new homes) (111). Regenerating poor quality housing will provide the same co-benefits: directly helping to reduce excess winter deaths, and increasing energy-efficiency.

**Schemes which regenerate poor quality housing exist in Cumbria. Homelife Carlisle has fully funded home improvement grants in order to help households keep safe and warm. This includes energy efficient grants for insulation, heating upgrades, and draught-proofing (112). The ‘Cold to Cosy Homes’ cross-Cumbria scheme provides a local energy and advice service: making homes more energy saving, helping people to change energy tariffs and making referrals for additional assistance. These scheme aims to help prevent vulnerable households from falling into fuel poverty. Such interventions improve the health of people now, and also help our existing housing stock become more sustainable.**

Ultimately, there is a need for a government-driven programme of mass insulation and draught-proofing the most poorly performing homes, which are more likely to be those of deprived households. Improving the housing stock can therefore contribute to reducing health inequalities, as improved living environments can play a significant part in improved overall health status.

As well as staying warm over winter, we need to be aware that with climate change our summers will get hotter and drier. With heatwaves becoming more frequent, our homes also need to protect us from this. The building of new homes, and the adaption of existing homes, needs to ensure that summer temperatures are not amplified. Insulation can protect homes from rising temperatures but needs to be done carefully; external insulation appears to be the most effective in keeping detached properties cool, but may cause additional over-heating in flats and terraced houses (113).

It is also important to remember that one of the best ways of reducing our carbon emissions is by moving to renewable sources of energy, and the housing sector provides an opportunity for this. Last year, approximately 7% of UK energy was from solar power (67). Installing solar panels either onto existing roofs or during development of new housing increases renewable energy production, and drastically reduces household energy costs after the initial installation. Ground- and air-source heat pumps, when combined with renewably generated electricity, can provide low carbon heating. Planning guidance should in future ensure that new housing developments incorporate solar and heat pump technologies, and local businesses and individuals should be incentivised to do the same.



## 2.5 Strengthening and sustaining our local communities

Action on climate change can go hand in hand with strengthening our local communities, growing local economies and building resilience. The world is becoming increasingly globalised, bringing us a dynamic global market, the power to trade with other countries, and the opportunity to welcome people from all over the world and share in different cultures. However, there are also negatives. The global economy is currently very dependent on using fossil fuels and natural resources which contribute to carbon emissions and climate change.

If we want to move away from high energy, high carbon emitting economies, we need to move towards smaller scale locally based economies. This means developing sustainable work environments that people can enjoy now, and for many years. In addition, building resilience is key. Some of the consequences of climate change, such as flooding, can have devastating consequences for businesses, as we have seen in recent years. We need to ensure that communities and local businesses remain strong enough to face these challenges.

When considering local growth and economy, we must consider the population demographics of our county. In Cumbria we have a population with a lower proportion of younger residents and a higher proportion of older residents (114). By 2050 it is projected that one in four people in the UK will be aged 65 years and over (115). It is important that we value and support our elderly population. However, we are also aware that the younger and working-age population in Cumbria is projected to fall, and we need to counteract this. We must ensure that there are plenty of opportunities in Cumbria for the younger generations to learn, work, raise families and buy affordable housing. Engaging the younger population in our county with the climate change agenda will also ensure that this is driven forward over the next generations.

Building a sustainable local economy also has co-benefits for health. Our rapidly industrialised and globalised world has also led to socio-economic inequalities which are detrimental to everyone, including those who are better off (116). Such inequalities are rife in the UK, and we must work hard in Cumbria to improve the socio-economic conditions for everyone. This will help to close the healthy life expectancy gap, as it is well recognised that deprivation is linked with poorer health outcomes. At the same time, having a more equal society can build connectedness and social capital at a local level, which has been shown to promote health and wellbeing (117) (118).

**Local community initiatives can build social capital, and be used to promote both mental and physical health. A good example in Cumbria can be seen through the Walking for Health scheme, which has set up inclusive walking groups across Cumbria. The scheme trains walk leaders, who can then go on to set up walks in their local areas. The walks aim to promote physical activity amongst more deprived groups, while allowing people to explore their local areas and make social connections.**

As centres of economic growth, cities have a major role to play in the developing climate agenda. In Cumbria, the city of Carlisle has WHO Healthy City status – meaning that it is conscious of health and is striving to improve it (119). The Carlisle District Local Plan sets out a series of strategic objectives which are important in the fight against climate change: including reducing emissions of greenhouse gases and avoiding developing settlements in areas which are at high risk of flooding. There is also a focus on sustainable development and energy efficient homes (120). The health of Carlisle and our Cumbrian towns can also be improved by promoting green infrastructure, described further in the following section.

## 2.6 Embracing and protecting our natural environment

In Cumbria we are lucky to have some of the most beautiful landscapes in the UK, including the famous World Heritage Site, the Lake District National Park. The high fells of the Lake District are some of the most biologically diverse upland areas in England, with a mosaic of different wildlife habitats. Where water quality is good the lakes and tarns also provide habitats for a number of rare plant, fish and invertebrate species. Elsewhere in Cumbria are other important habitats such as limestone pavements and wildflower-rich limestone grasslands, areas of lowland peatland and wetlands, and expanses of salt marsh. Unfortunately many of these wildlife areas have been damaged or destroyed through past activities including peat extraction, air and water pollution, overgrazing, herbicide and fertiliser use and building infrastructure. Hence although Cumbria appears to be a very green and natural county there is much to be done to restore nature.

These biodiverse landscapes attract visitors from all over the world, making up an important part of the economy. In 2018, over 47 million people visited Cumbria and the Lake District, bringing £3 billion into the economy and supporting nearly 38,000 full-time equivalent jobs (121). But we need to be aware of the carbon footprint that is directly left by such visits (for example, the travel emissions to and within the Lake District) and the impact on tourism on our local environment, including local air pollution and recreational damage to wildlife.

It is therefore particularly important that we protect and nurture our natural environment and habitats. This will ensure that Cumbria remains a location where people aspire to live, work and visit. At the same time, we can utilise nature as a powerful tool in the fight against climate change. Plants get their energy through photosynthesis, which draws carbon out of the atmosphere and uses it for growth. The dead plant material along with carbon not used for growth is deposited into the soil, where it can remain locked for thousands of years (122) (123). Healthy soil therefore mitigates climate change, and restoring degraded soils can help balance towards net zero emissions. The use of land and the type and condition of habitat has a significant effect on the amount of carbon taken from the atmosphere (carbon sequestration), and the amount that is released back.

The most carbon rich soils are peatlands. These peatlands include the blanket bogs of our uplands, our lowland bogs, marshes, fens and other wetlands. Healthy peatlands can fix carbon from the atmosphere and store it for millennia. They are the UK's largest carbon sink, storing approximately 3.2 billion tonnes of carbon (124). But climate change is a vicious cycle, and increasingly hot dry summers can cause peatlands to dry out, releasing carbon into the atmosphere. Despite their importance, 80% of British peatlands are in a damaged state (127). Damaged peatlands have become a significant net source of greenhouse gases, emitting over 20 million tonnes of CO<sub>2</sub> equivalents each year - around 4% of the UK's total annual emissions (128). Preventing further damage and restoring healthy ecosystem function can play an important role in climate regulation.

**In Cumbria there are approximately 42,000 hectares of peatlands, storing approximately 28.5 million tonnes of carbon, and actively fixing around 15,000 tonnes a year (125) (126). These peatlands also support good water quality and unique biodiversity, and play an important role in climate change defences: they can hold water upstream for longer, helping to reduce flooding risk during heavy rainfall. In Cumbria, the Wildlife Trust's Lake District survey confirmed that most peatlands have been damaged (consistent with the state of peatlands across the UK), which has prompted partnership action (163). Nearly 5,000 hectares of peatlands have been restored since 2015 and we must continue to support this work (54).**

Woodlands are another habitat which play a significant role in carbon sequestration. Currently, Cumbrian woodlands cover only 8% of the county (126), compared to an overall UK figure of 13% (10% for England alone) (130). However, our 8% of woodland holds approximately 35 million tonnes of carbon and fixes 650,000 tonnes a year (126). If we were to double the woodlands and restore the peatlands, the emissions of nearly half the resident population of Cumbria would be offset. Other habitats also hold large quantities of carbon. UK grasslands hold as much as 2 billion tonnes of carbon and less intensive management in terms of lighter grazing and adding less fertiliser results in more carbon being stored (131).

The large-scale restoration of both individual wildlife habitats and wider ecosystems is now seen as a priority for both government and conservation organisations. This is considered to be a key approach to protect our wildlife, as well as providing a range of ecosystem services.

**The government's 25 year plan for the environment has an ambitious target to create 500,000 hectares of wildlife habitat (132). In addition it seeks to restore nature across England as part of a large 'Nature Recovery Network', aiming to make nature 'bigger and more joined up'. Larger wildlife habitats will be more resilient to climate change and 'joining them up' helps species to move around the country and adapt to new climatic conditions. Nature Recovery Networks will also help to bring nature to people, by developing links between nature in the countryside and the greenspaces in our towns and cities. The draft Environment Bill 2019 will also require local authorities to develop 'Local Nature Recovery Strategies' which will highlight how nature will be restored both for the benefit of wildlife and people (133).**

One option currently being considered is 're-wilding'. Re-wilding is the process of reducing or removing much of man's impact on wildlife habitats (e.g. removing livestock) which allows nature to 'take care of itself'. Careful rewilding is currently showing successful results in Cumbria; a partnership approach in Ennerdale gives an example of how landscapes could evolve more naturally (134). In areas of lower scenic quality and cultural heritage, re-wilding or afforestation (planting trees when there were none before) may be the best option from both an economical and sustainability perspective. Planting trees also helps us adapt for climate change consequences, as well as mitigate them, by reducing the incidence of flooding (135) (136) (137). The relationship between forests and flooding is complex, as water flow issues can worsen if forests are not properly managed (138). Strategic afforestation and other natural flood management strategies therefore require rigorous planning and modelling to minimise adverse consequences.

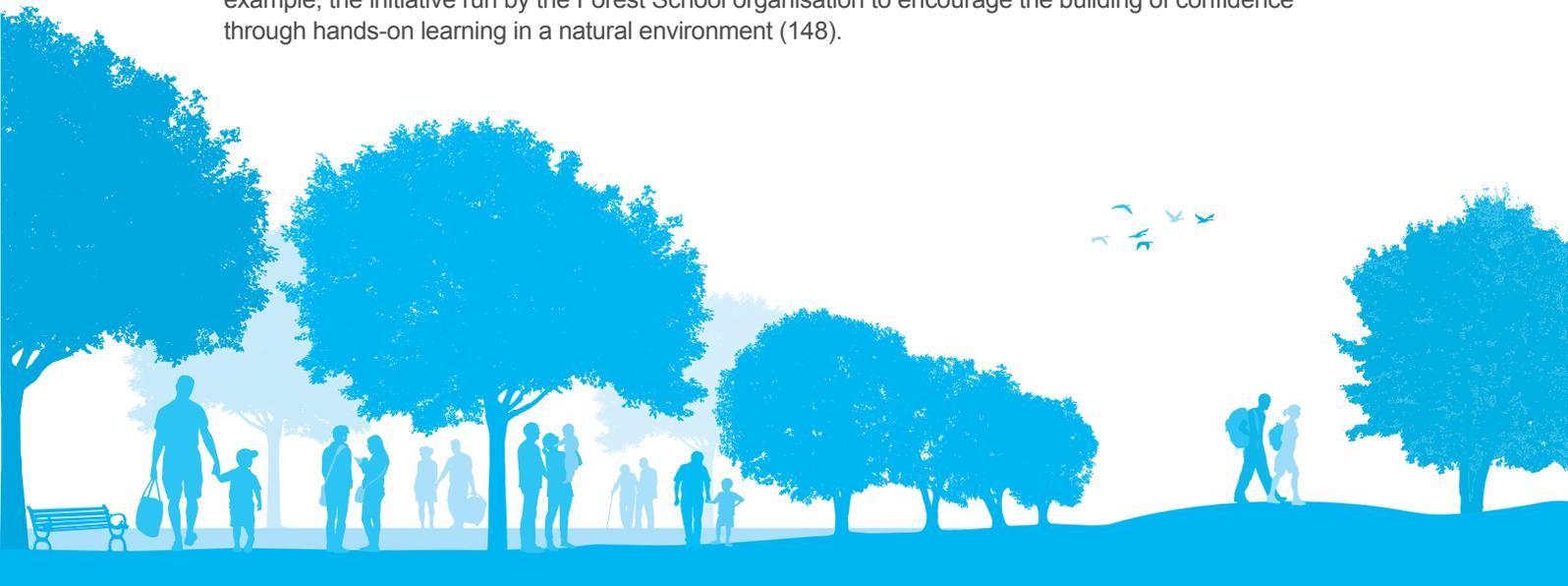
As well as helping us to mitigate and adapt to climate change, working more closely with nature also brings us significant health benefits. A recent study found that those who spend at least two hours a week in nature are more likely to report good mental health and wellbeing (139). This is really important, because mental illness is the single largest source of disease burden in the UK (140) (141). In Cumbria approximately 16.3% of adults have a common mental health disorder, similar to the average in England (142). Mental health services are increasingly struggling to meet demands, so it crucial that we focus on prevention and building good public mental health in innovative ways. 'Social prescribing' describes the way in which GPs and other healthcare professionals can refer patients into community groups and activities that can improve their wellbeing and mental health. This includes nature-based interventions, or 'eco-therapy' which could be a potential solution for mental health care, as well as teaching people how to value and nurture the environment (143).

**An excellent example of ‘eco-therapy’ and social prescribing in Cumbria is Growing Well, a mental health charity, organic farm, and training centre based in South Lakeland (144). The charity receives most of its referrals from GPs or health professionals, and supports approximately 80 people a week to work on the farm. Volunteers with a wide range of mental health issues are welcomed. At Growing Well they build confidence and skills while gaining the benefits of working outside, and can even work towards horticultural qualifications. The charity provides a minibus service to and from Kendal and Barrow-in-Furness, and also provides educational visits for primary school children. More third sector organisations like this would be welcomed across the county, and would benefit from NHS support as part of an overall mental illness recovery plan.**

It is not just our mental health that can benefit from spending time outside: walking, running or biking in the countryside are just a few of the ways we can work towards the recommended physical activity of 150 minutes a week (145). However, we need to be aware that people living in the more deprived areas of Cumbria are less likely to be able to be physically active, as well as more likely to suffer from common mental health disorders. People from these areas may be those who would benefit most from spending time in nature, but the national park may be less accessible to them. We need to think about how we can improve access into nature for everyone, and work in partnership with local organisations to facilitate this without increasing overall carbon emissions.

As well as getting ‘people into nature’, we can bring nature to people through improving our green infrastructure. Incorporating more natural and semi-natural features into urban settings, such as green spaces, rivers, street trees and parks, can deliver a wide range of ecosystem services and have multiple benefits for planet and people (146). As well as providing more opportunities for nature to thrive, urban trees can provide a ‘cooling’ effect and help to regulate air temperatures (147). They can promote a greater connection with the natural world, and have the positive effects on mental health and wellbeing. Having towns and cities which are rich in green infrastructure will also encourage active travel, creating a synergistic relationship.

Finally, one of the key ways of promoting and safeguarding biodiversity and wildlife habitats will be through engagement with young people and children. Spending time in nature has been shown to improve children’s wellbeing as well as increasing their pro-environmental values (56). We must continue to develop partnership working with a wide range of conservation, farming and health sector groups, in order to support schools and communities to learn about the outdoors and visit natural places. For example, the initiative run by the Forest School organisation to encourage the building of confidence through hands-on learning in a natural environment (148).



## Chapter 3: Moving forward

Cumbria now has an excellent opportunity to lead by example and embed environmental concerns into our policies and daily practice. In early 2019, the County Council and all six District Councils adopted the Joint Public Health Strategy, which includes key aims on becoming a carbon neutral county, protecting the environment and supporting biodiversity (4). More detailed debates focused on climate change have taken place in most councils, and many have taken the step of declaring a climate emergency. This provides a framework and resources which local authorities can use to develop comprehensive plans to achieve the target of net zero carbon emissions by 2030 (149) (150; 151).

Local councils have undertaken several actions to reduce emissions and pollution from their own estate and operations through low-energy schemes in buildings, low emission vehicles, support for home-working and teleconferencing, and reducing waste to landfill. However, we could be doing more for climate protection in our public policy and, in some respects, we are behind the times. Councils could make progress by ensuring that all energy comes from renewable resources. Similarly, our pension fund currently invests a reported £100 million in fossil fuel industries, which could be entirely divested following the examples of the London Borough of Waltham Forest and the city of Birmingham (152; 153). As well as our infrastructure and financial investments, our workforce is a major asset. We have the opportunity to introduce learning on climate action and sustainability as a contribution to Continuing Professional Development, enhancing awareness of environmental commitments and promoting participation in environmental schemes such as active travel and community food-growing projects.

Preparing for climate change within wider public policy not only improves our future security, but can help to achieve current local priorities. This report has described how flooding is likely to increase with climate change, and our local flood risk management strategy incorporates a detailed analysis of the likely local effects and plans for mitigation (31). However, the flood management plan does not mention the potential for afforestation to reduce the incidence and mitigate the impact of flooding. We need to ensure that we have a joined up approach in our plans for mitigation and adaptation, utilising all available solutions. Leicestershire County Council have collaborated on a 'farming and water for the future' programme, using natural flood interventions such as pond creation, localised ditch watercourse management, and tree planting to limit the impact of flooding on agricultural land (154). Such approaches not only have the potential to increase the security of the general population by reduce downstream flooding, but directly benefit landowner stakeholders by improving drainage and reducing flooding of farmland.

As this report has shown, climate change, nature and health are all closely intertwined. Many of the actions that we can take to mitigate and adapt to climate change can have positive impacts on natural capital and environmental conservation. Public support for conserving nature is growing, with non-governmental organisation (NGO) expenditure up by 24% since 2010/11. But as a proportion of gross domestic product (GDP), public spending on biodiversity has fallen by 42% since a peak in 2008/09 (53). We must find ways of working collectively with partnership organisations to address this, and to prioritise natural solutions to climate change, using a joined up approach. At the same time, many of the actions that we can take to reduce carbon emissions can also improve public health, and a closer relationship between people and nature could greatly improve mental and physical wellbeing. We need to embrace these opportunities and seize every opportunity to make Cumbria an example of a sustainable, healthy, thriving community.

## Key Recommendations

### Overarching recommendations

1. Businesses and local organisations should embrace opportunities for green growth and invest in sustainability at every opportunity
2. Employers should support their staff to develop knowledge and skills around the climate change agenda and to become advocates for tackling climate change and promoting environmental sustainability.

### Active travel and reduced transport emissions

3. Initiatives to promote walking and cycling as active forms of transportation should be strengthened. Employers should be encouraged to promote active travel schemes and embrace the use of digital technology to avoid unnecessary car journeys.
4. There should be ongoing investment into electric car charging infrastructure, with the possibility of free parking for low emission vehicles.

### Food and farming

5. A new County-wide food partnership should be established to co-ordinate action on food and farming. Such action should include working collaboratively with those in the agricultural sector to explore ways of developing more sustainable future farming practices; promoting more plant-based diets and healthy eating more generally; promoting healthier and more environmentally sustainable food in schools, hospitals and the workplace; and supporting improvements in the accessibility of high quality food in more deprived parts of the County.

### Housing

6. Local authorities should promote energy efficiency and renewable heating and electricity generation as part of local planning policy in accordance with the Housing Group and sustainability guidelines.

### Strengthening and sustaining our local communities

7. Through the Local Industrial Strategy, the Local Economic Partnership (LEP) should prioritise sustainable “green growth”, supporting local communities to be resilient for the future.

### Embracing and protecting our natural environment

8. There needs to be increased collaboration with nature and environmental organisations across Cumbria. The County Council should take a more strategic role in providing oversight and facilitating joined-up working to promote environmental diversity and should engage with stakeholder discussion around re-wilding, re-forestation and peatland restoration programmes. NHS organisations should incorporate increased access into nature as a tool for prevention and recovery into models of social prescribing.
9. Investment into green infrastructure should be a priority for city and town developers, to bring nature into our urban areas and make it more accessible for everyone.
10. The County Council should work in collaboration with other organisations and the third sector to promote outdoor education and opportunities for schools, enabling young people to grow up with an awareness and appreciation of nature, and how it must be protected.

# Chapter 4: Looking back: Recommendations from previous report – Adverse Childhood Experiences (ACEs)

## Overarching recommendation

- 1/ *A ‘whole system’ approach is needed for preventing ACEs and mitigating against their effects. Interventions are required across a wide range of organisations (the police, schools, the NHS, councils, community and 3rd sector groups), and as such coordinated and cooperative working is required. Particular attention should be given to ensuring that there is a consistent and joined up approach to tackling ACEs across the county.*

It has been increasingly recognised across Cumbria County Council that a whole system approach is needed in ACEs prevention. Following the publication of the report and the subsequent leadership conference in March 2018, there was an agreement that there should be reporting on ACEs to the Health and Wellbeing Board; a steering group chaired by the Director of Public Health has been established and action plan have been developed.

At the same time, there is work ongoing across the Morecambe bay footprint – into which a member of the cross-Cumbria ACEs group will feed in and out. This will enable joined up working and collaboration across the county. There is also a plan to pull together a South Cumbria ACEs group to tackle this agenda at a more local level, which will include a lot of partnership working. There has also been significant work with the police who are interested in incorporating a public health approach into their work.

## Prevent

- 2/ *Early years contacts between families and healthcare professionals (including midwives, health visitors and early years providers) should be seen as an opportunity to prevent childhood adversity. Particular attention should be given to identifying potentially harmful family environments and to putting strategies in place to protect against these.*

The ACEs action plan highlights the need to work in partnership with those who have access to children and families. Training is needed to enable the workforce to identify potentially harmful family environments at an early stage. Signs of Safety/Wellbeing training is planned will be rolled out across the 0-19 Healthy Child Programme workforce, including health visiting and maternity, and the Child and Family support service to help identify needs early using a strength based approach.

- 3/ *Ensure that all parents have the emotional and practical support that they need to bring up their children in safe, secure, nurturing environments. This is particularly important for families living in the most deprived areas of the county, and for those who are struggling financially.*

Both the Child and Family Support Service and the 0-19 Health Child Programme services (including the Strengthening Families Service) aim to support parents and families across a spectrum of need. The services use an assertive outreach approach, providing services to empower and enable parents and carers to provide a caring and nurturing living environment in which children and young people develop and achieve positive health and wellbeing outcomes. The focus is on the prevention of escalating need as a result of neglect, physical, emotional, sexual abuse, domestic abuse and substance misuse and disadvantage.

The services will increasingly use trauma informed approaches, enabling families to understand what caring and nurturing family relationships are, while providing them with strength based opportunities to aspire to and resiliently implement change. Solihull training will also be rolled out across the same workforce to help build positive attachments and address some of the issues caused by ACES from a parenting perspective and also prevent future ACES as a result of poor parenting.

In addition, the County Council is currently applying for funding to support reducing parental conflict. Scoping work around this is currently ongoing, with the plan being to hold a county-wide strategic workshop for key stakeholders, followed by three area-based workshops aimed at team managers and operational staff. This funding will support and feed into the work on ACEs.

## Detect

- 4/ Steps should be taken to increase ACE-awareness across Cumbria. This should encompass the general public, health and social care organisations, schools and the criminal justice system. There should be support for educational events, e-learning modules and face-to-face training for professionals.**

There have been significant steps taken to increase ACE awareness across Cumbria, starting with the workshop for senior leaders in March 2019 and the subsequent development of the ACEs group. Currently several different e-learning packages are being discussed in order to best deliver effective training to different groups, with higher training levels being considered for frontline workers. This is something that we must continue to drive and see that the e-learning is implemented to those who will most benefit, as well as working towards further educational events.

- 5/ Healthcare professionals who are providing long-term support to adults should be encouraged to routinely enquire about ACEs. This could include GPs and those working in mental health and substance abuse services. Adequate training and organisational readiness would be essential prior to implementation to ensure that this can be done safely and effectively, and that disclosure is responded to appropriately.**

It is recognised that it is difficult to gauge whether health care professionals, including GPs, are routinely enquiring about ACEs. However there is considerable input from clinical staff into the ACEs agenda: the ACEs group is led by a consultant psychologist, and there is senior psychiatrist input into the group, helping to ensure that there is a flow of communication between public health and clinical staff and practice. Drug death groups have looked into dual diagnosis with ACEs, so this is being considered to some degree. However, this is something that needs to be considered and build upon going forwards, and the council should endeavour to work closely with healthcare staff and services.

- 6/ Services working with vulnerable adults should ensure that they routinely enquire about whether there are any children involved. This could include drug and alcohol, criminal justice, domestic abuse, mental health, and front-line medical services. Children identified as being at risk of harm should be referred to the appropriate support services.**

Services should be routinely enquiring about whether children are involved as a matter of course in daily practice. However, while people may already be doing this, they may not be aware of the fact that they are doing so – and therefore not using the best approach. Introducing e-learning will help to address this, but we must then consider how we can quantify and evaluate the e-learning, and quantify whether this objective is being reached. There therefore remains considerable work to be done here, both on implementation and measurement.

## Protect

- 7/ Building resilient communities and individuals across Cumbria should be prioritised. Children and young people should have access to supportive, stable relationships with the adults around them. Policies should encourage exercise, participation in social groups and other activities which reduce stress.**

Thriving communities is a key driver for Cumbria County Council, aiming to build resilience, strength and sustainability in communities, giving them more control over the support they need; helping them to do more to help themselves; and helping prevent them needing complex and or targeted services in the future. We want to have a more equal relationship where the council proactively works with residents and communities to find solutions to community's issues.

The 0 - 19 Children, Young People and Families Health and Wellbeing System is a complex array of organisations with similar objectives. The system is dynamic and influenced by political, economic, social, technical, legal and environmental factors that collectively result in a system that influences children, young people and families' lives. As part of this system, service delivery aims to use a strength-based approach which looks for opportunities to complement, support and build on existing strengths and capacities. This approach also identifies what works for the child, young person or family, and how it works so that strategies that can be continued and developed to help build resilience. Signs of Safety/Wellbeing is being rolled out across the system including recently commissioned services. This is a solution-focused, strengths-based approach to explore unique characteristics of different family cases, acknowledging their positive aspects that all families have and building strengths into safety.

Looking at building resilience at a wider level can be challenging, as well as the development of policies which can also encourage exercise, stress-reducing activities and participation in social group. Initiative strategies and approaches may be needed to engage the younger generation; the importance of which has been touched upon in this report. Schools and colleges may have a key role to play here and again collaborative working is crucial.

- 8/ *Ensure that the upcoming redesign and recommissioning of public health services for children and young people, and its integration with Early Help services, takes a whole system approach that places families at its centre. The new model should be aligned with the THRIVE framework, support resilience, and be responsive to need.***

The newly commissioned 0-19 Healthy Child Programme and 0-19 Child and Family Support Services were explicitly designed to work as part of a whole system with the THRIVE model at its heart. These services will work in an integrated manner under a shared service delivery model. By further integrating these Council-commissioned services the aim is to develop a whole systems approach, with children, young people and families receiving the right help, at the right time, in the right place, by the right person.

## Manage

- 9/ *Continue to work towards improving the availability of mental health care for children and young people across the county and make it easy for them to access help when they need it.***

Mental health services for children and young people have become increasingly stretched in recent years, with more and more young people across the UK reporting mental health problems. Access to Child and Adolescent Mental Health Services (CAMHS) has substantially improved over the last year, with significant reductions in waiting times across the whole County. Cumbria County Council has a targeted Primary Mental Health Service integrated with specialist CAMHS services via a Single Point of Access, to make it easier for children and young people to access care, and there is an ongoing strategy and objectives to improve access further. This strategy ends in 2020 and there will be the opportunity to review progress and set new goals and objectives for the next few years.

## Recover

- 10/ *Health and social care organisations should adopt a trauma informed approach in order to remove barriers to access and prevent re-traumatisation. Healthcare professionals should also be trained in trauma-informed practice and encouraged to use this as a way of improving patient care and gaining a better understanding of their patients.***

Child and family support services will use a trauma informed approach to work most effectively with families, particularly those who might have experienced ACEs themselves. E-learning will be used to teach staff about trauma informed care, and how to think and incorporate this into their current practice. The public health team is also working at developing a Trauma-Informed Training Offer that we hope to extend to all front-facing staff across a range of multisector providers. Finally, it is noted that in Lancashire, the ACEs group has been re-named to reflect trauma informed care, and we should take every opportunity to embed this approach into our own practice.

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# Appendix 1

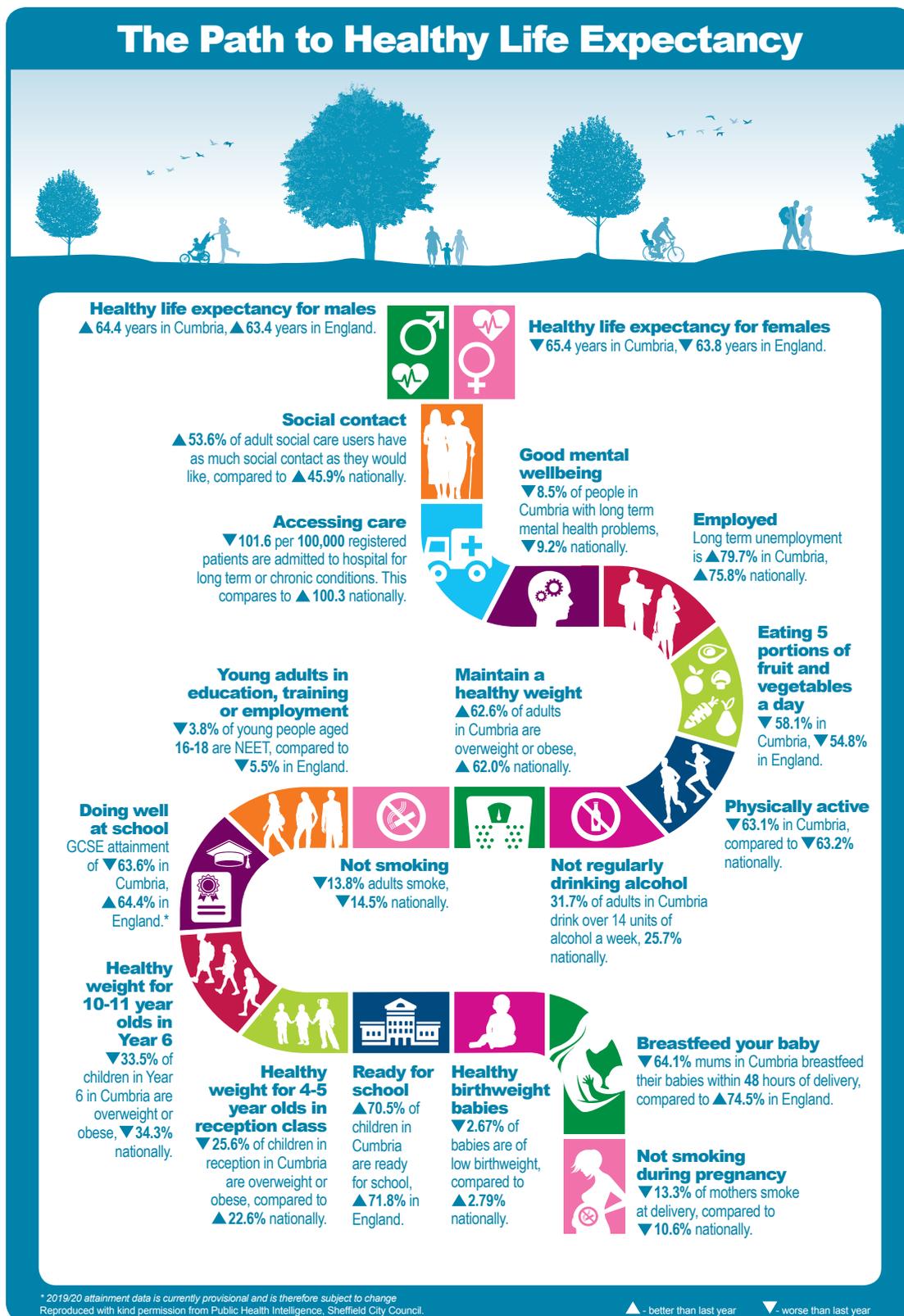
**CO2 emissions in Cumbria.** Source: 2005 to 2017 UK local and regional CO2 emissions – data tables [www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017](http://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017) (88)

	Industry and Commercial Electricity	Industry and Commercial Gas	Large industrial installations	Industrial and commercial other fuels	Agriculture	Industry and Commercial total	Domestic electricity	Domestic gas	Domestic 'other fuels'	Domestic total
Allerdale	73.4	137.0	1.9	32.0	45.0	289.4	44.8	98.2	35.2	178.2
Barrow-in-Furness	85.3	81.9	5.3	96.5	1.5	270.5	26.9	70.4	2.4	99.8
Carlisle	98.7	96.1	0.1	29.0	39.9	263.7	48.5	110.0	38.3	196.7
Copeland	25.5	15.1	2.6	105.1	14.3	162.5	31.6	73.0	10.1	114.8
Eden	62.8	85.1	185.8	26.0	61.4	421.2	31.8	29.1	46.0	106.9
South Lakeland	82.2	118.6	3.1	49.1	39.7	292.7	59.5	107.9	32.4	199.8
<b>Cumbria total</b>	427.9	533.8	198.9	337.7	201.7	1,699.9	243.1	488.6	164.5	896.1
England total	36,787.5	28,336.5	20,606.2	12,942.6	3,374.4	102,047.2	22,943.4	51,272.9	6,565.9	80,782.1
National total	46,415.3	34,466.0	32,273.1	17,169.9	5,732.7	136,057.0	27,546.9	59,875.6	10,678.9	98,101.3

	Road transport (A roads)	Road transport (motorways)	Road transport (minor roads)	Diesel railways	Transport other	Transport total	LULUCF Net Emissions	Grand total	Population ('000s, mid-year estimate)	Per capita emissions
Allerdale	120.9	-	57.8	1.7	0.9	181.4	-19.8	629.1	97.2	6.5
Barrow-in-Furness	22.2	-	13.4	0.9	0.2	36.6	1.0	407.9	67.1	6.1
Carlisle	92.4	138.6	46.1	10.9	4.6	292.6	-152.5	600.6	108.3	5.5
Copeland	46.7	-	24.7	2.2	1.1	74.8	-37.7	314.4	68.7	4.6
Eden	149.7	312.6	49.1	9.0	1.5	521.9	-33.9	1,016.0	52.8	19.3
South Lakeland	181.6	155.6	60.1	5.4	4.3	407.2	-79.4	820.2	104.3	7.9
<b>Cumbria total</b>	613.5	606.8	251.3	30.2	12.7	1,514.5	-322.2	3,788.3	498.4	7.6
England total	45,668.4	26,791.1	31,044.3	1,809.4	1,864.7	107,177.9	-5,086.2	284,921.0	55,619.4	5.1
National total	56,185.5	30,233.8	37,977.9	2,133.1	2,135.9	128,666.3	-11,323.4	351,501.3	66,040.2	5.3

# Appendix 2

In 2017 the Annual Report introduced a new “Pathway to Healthy Life Expectancy” to illustrate important indicators that contribute to a healthy life expectancy across the life-course, and committed to reporting on these figures annually. This figure provides the latest data for Cumbria and England, with an indication of whether figures have improved (▲) or worsened (▼) since the last measurement.



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