ADPH Yorkshire and Humber

Improving Health, Protecting the Planet

Association of Directors of Public Health Yorkshire & the Humber

LONG READ

This document is intended for use by Directors of Public Health and their teams in Yorkshire and the Humber. The document describes the links between climate change, health and health inequalities. The narrative can be used to support local conversations and action in tackling the climate crisis. It does this by highlighting the co-benefits of action on both health and climate, as well as describing the risks to health that we need to prepare for now.

Authors & Acknowledgements

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Improving health

Human health goes hand in hand with the planet's health. But right now society's actions are hurting our health and the planet. It is in our power to make changes and make a difference.

Imagine a world with greater energy security, lower energy bills, and more efficient homes so that no-one worries about whether they can afford to heat their home. The air we breathe will be cleaner; fewer children will experience wheeze and asthma, and need to use inhalers to protect their lungs. Our water will be cleaner, and safe, bringing greater opportunities for play and recreation.

We will all be able to easily access good quality green space wherever we live. It will mean food security for our communities; food will be affordable, accessible, and more locally grown. Everyone will have choices about how they travel; transport will be affordable and accessible, meaning that we can get where we want to safely and conveniently. The end result will be that people are empowered and have choice and control over their lives.

We have the opportunity to redesign our energy system so that we are powered by affordable and clean energy and to help communities prepare for the impacts of climate change that are already happening.

Local communities want to see much more action to save our planet and secure a healthy future. Our politicians work on our behalf so our desire for change matters. They can and must take the actions that will make the most difference, such as protecting nature and phasing out our dependence on fossil fuels. Change is possible. Our lives could look very different if we are successful. We all want to pass on a healthy planet to our children and grandchildren. We can and must act now to protect and repair our planet. This will also improve our health and wellbeing so that we can thrive right now.

Action on climate change, moving to low carbon, clean energy, provides one of the greatest opportunities to improve health and reduce inequalities. Too often we view action on climate as too restrictive or a sacrifice.

A health-centred response to climate change will deliver huge improvements in the health of our communities through the associated co-benefits of climate action.

For our health this means significantly reduced excess winter and summer deaths, a reduction in early deaths from cancer and cardiovascular disease, fewer cases of diabetes and dementia, fewer children with asthma and wheeze, reduced obesity and improved diets, and more broadly, improved physical and mental health across the life course.

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Climate change is a public health issue

“Climate change is the biggest global health threat of the 21st century… The impacts will be felt all around the world and not just in some distant future but in our lifetimes and those of our children.”

The Lancet, 2009

Climate Change is a Public Health Issue: 6 Key Messages

1. The actions that are good for the planet are good for health.

2. Climate change is already impacting on the health of our communities.

3. The effects of climate change are disproportionately impacting on our most disadvantaged communities, widening inequalities.

4. Prevention is cheaper and better for the planet than the treatment of ill health. Delivering care comes at a financial cost as well as an environmental cost.

5. Climate specific policies and climate in all policies can help us to achieve major health and wellbeing co-benefits, strengthening the case for action on climate change.

6. The health benefits of climate policies resonate strongly with the public and policy makers due to the direct nature of some of the health effects, with benefits evident over shorter timescales, strengthening the case for action on climate change.

The actions that are good for the planet are good for health

The activities that drive climate change are the same things that drive poor health outcomes. By taking steps to tackle climate change we will also improve health and wellbeing. The health benefits accrue quickly, especially in the communities taking action.

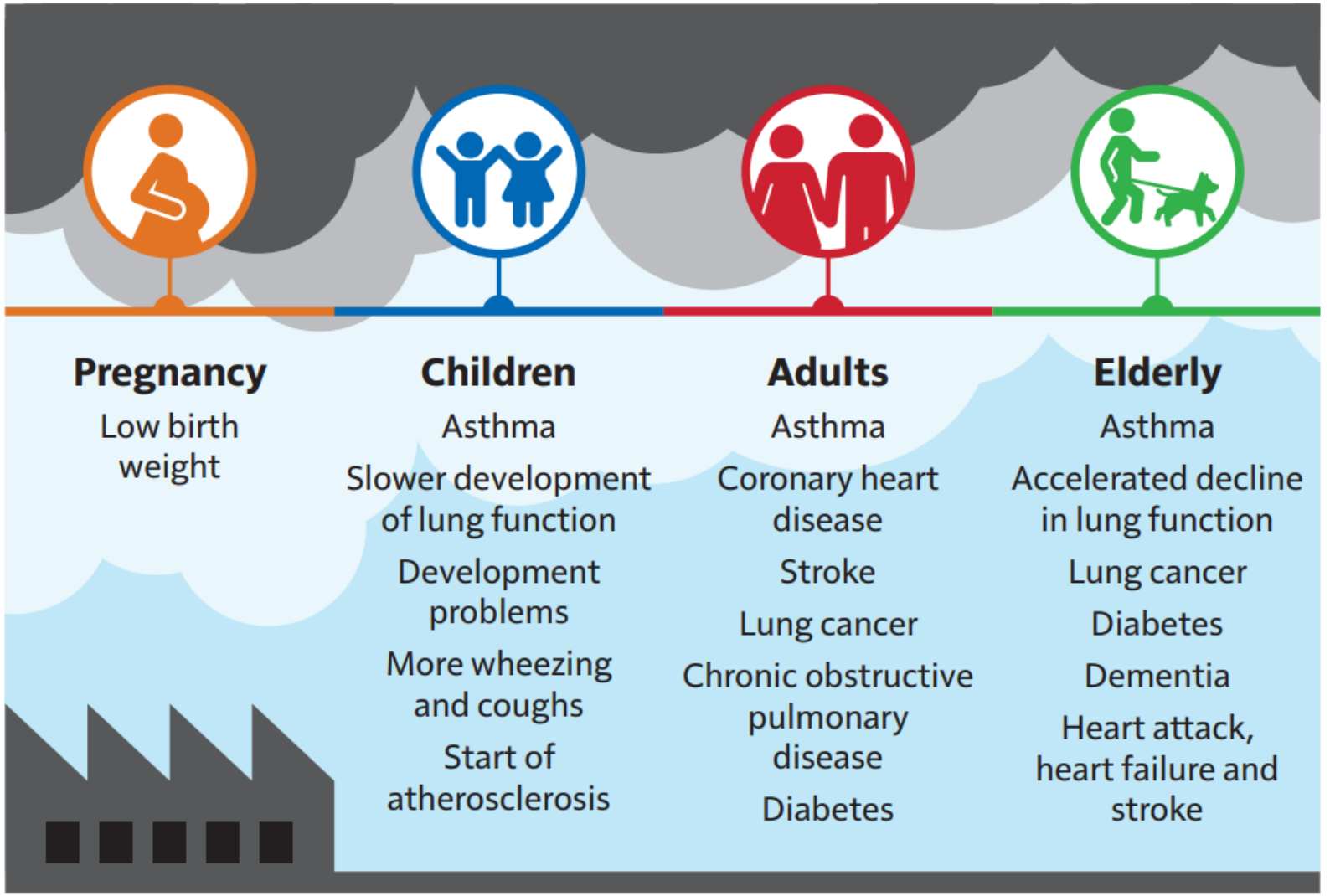
The emissions and gases that are ***warming our planet are also polluting our air*** and are toxic to our bodies. Each year in the UK around 40,000 deaths are attributable to exposure to outdoor air pollution, but air pollution also causes harm to people across all stages of life. There is no recognised safe level of emissions.

Transport is one of the main sources of the warming greenhouse gas emissions in the UK. As the main mode of transport for many, ***frequent car use is not only increasing the greenhouse emissions that drive climate change, but contributes to our increasingly sedentary lives***. We have designed out opportunities for physical activity in our communities in favour of the car. Physical inactivity is associated with 1 in 6 deaths in the UK, yet around 1 in 3 men and 1 in 2 women are not active enough for good health. Chief Medical Officer guidelines state that we should spend more time moving and less time sitting. One way of being more physically active is to spread activity throughout the day, using active forms of travel instead of cars, especially for short journeys.

Living in a cold home that is difficult or expensive to heat increases the ***risk of exposure to cold*** and is associated with a variety of health impacts, especially for children, older people, and those with pre-existing conditions. Improved thermal efficiency will reduce energy bills and will reduce people's exposure to cold homes. As our homes account for around 15% of our total carbon emissions, improved energy efficiency will also benefit the planet.

What we eat and how much we eat has a significant impact on health. Our poor diets are killing us and damaging our quality of life. Our diets are increasingly ***dominated by ultra-processed and calorie dense food. We have an epidemic of obesity, while at the same time families are going hungry because they cannot afford food***. Food has never been more widely available, yet many people struggle to access the good food they need for a healthy diet. For our children, malnutrition puts them at risk of poor brain development, impaired learning and low immunity, whilst the high fat, salt and sugar diets we consume are driving the epidemic of non-communicable diseases such as cardiovascular disease, diabetes and cancer. Commercial practices and how we produce, market and consume food strongly influences our diets. We need to break the junk food cycle to improve our health and reduce the burden of non-communicable disease. This will be good for the planet, reducing the negative externalities embedded within the current system: polluted water and air, greenhouse gas emissions, antibiotic resistance, and biodiversity loss.

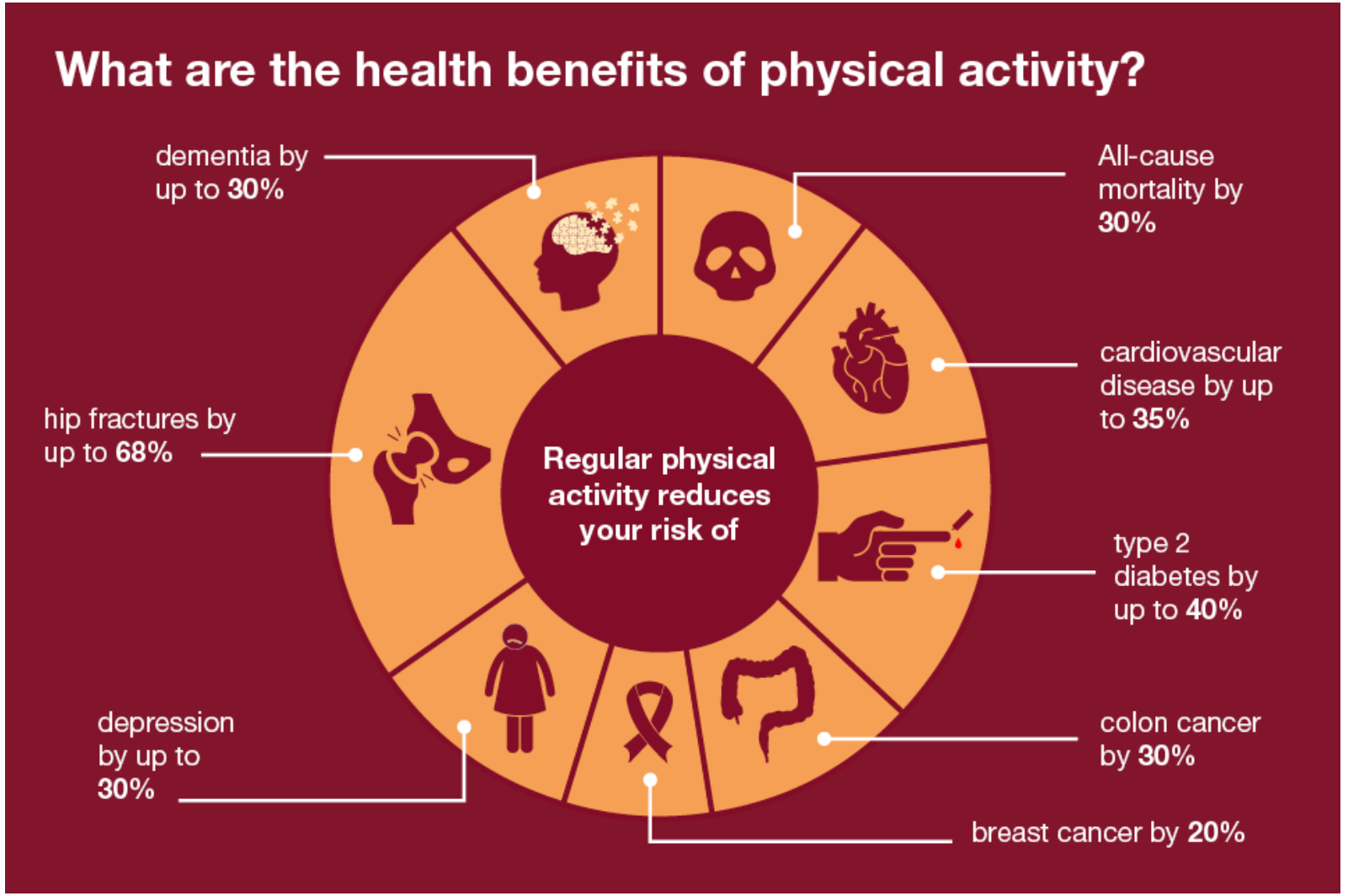
Reducing emissions will improve the quality of the air we breathe, reducing ill health at every stage of life



Source: Adapted from Public Health England (2018)[1]

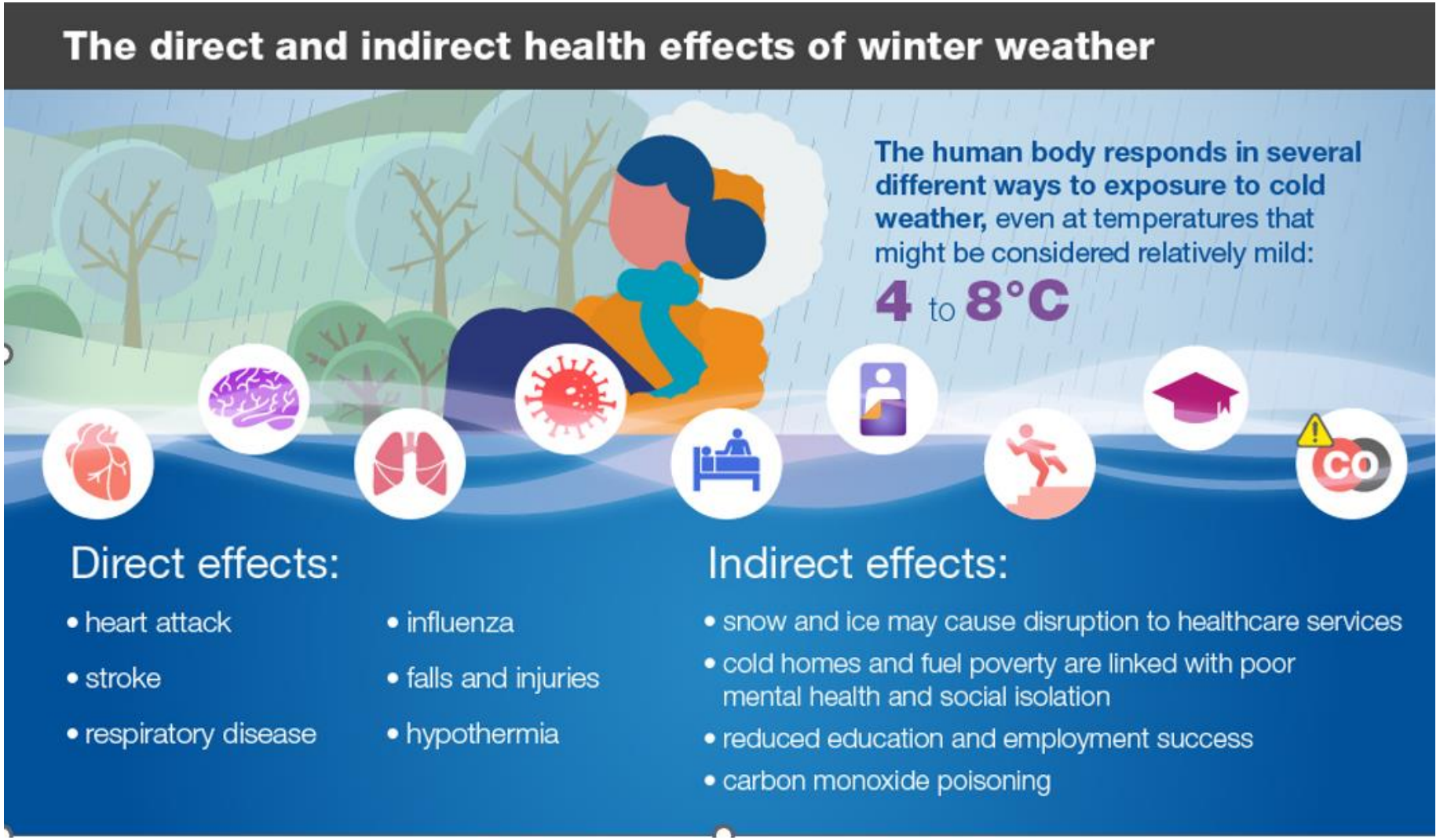
Source: CMO Annual Report

Moving more – including active travel - has significant benefits for health, both physical and mental, and can help to prevent and manage over 20 chronic conditions and diseases



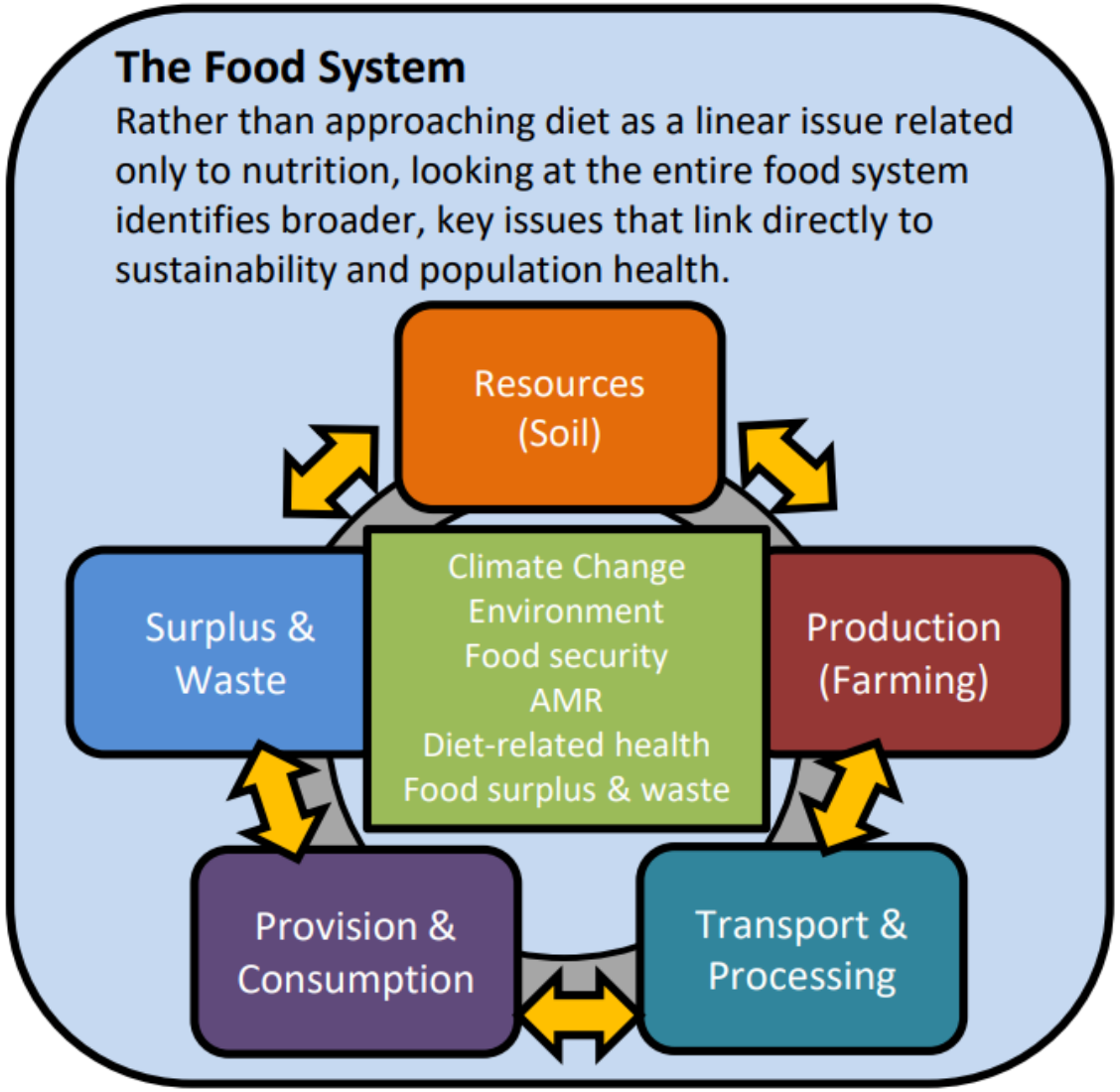
Source: OHID

Clean and affordable energy can reduce the number of people living in cold homes which are associated with a range of poor health outcomes



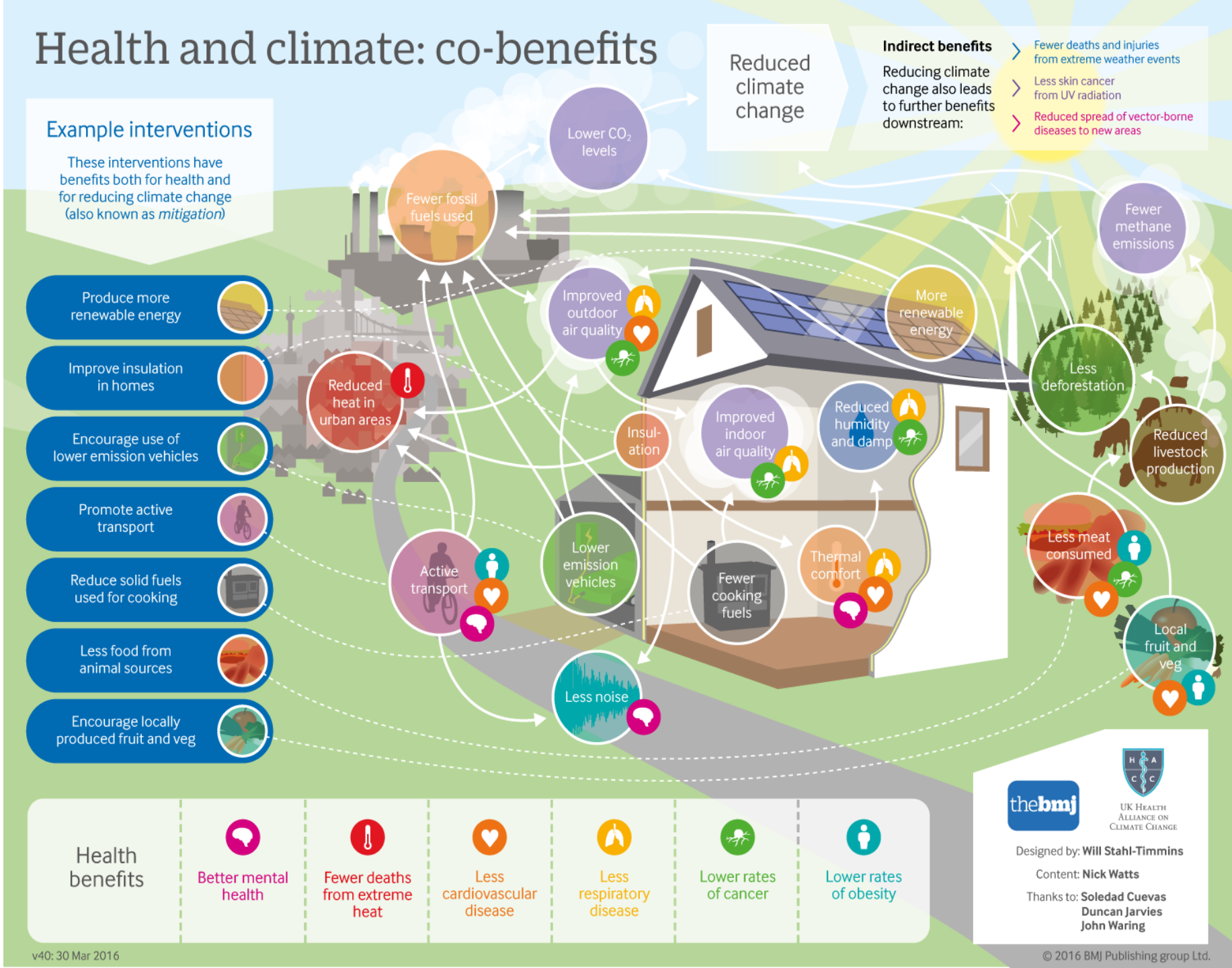
Source: Public Health England

Access to locally grown, affordable, healthy food has the potential to reduce food insecurity and reduce dietary related illness, including those conditions associated with obesity, such as diabetes, cardiovascular disease and a number of cancers.



Source: Faculty of Public Health Special interest group-sustainable development

The health and climate co-benefits mean that tackling climate change represents one of the best opportunities to improve the region's health



Source: BMJ

The effects of climate change are impacting on our health now

The consequences of climate change are bad for health. **The UK's 3rd Climate Change risk assessment independent report by the Climate Change Committee sets out the direct, and indirect ways in which climate change can negatively affect our health.**

A warming climate affects health in 3 main ways:

1. Effects of extreme weather, such as heatwaves, flooding, wildfires, storms and drought on physical and mental health (for example injuries and trauma, heat-related illness).
2. Effects on the planet's life-support systems, such as rising sea levels and safe water availability, changing patterns of zoonotic and vector-borne disease (for example malaria, dengue fever), reduced pollination and crop failure leading to food shortages.
3. Effects mediated by social systems, such as livelihood loss, rising prices of food and fuel, supply chain disruption, pressure on health and care services, conflict or forced migration.

UK Health Security Agency

COLD WEATHER

The direct and indirect effects of cold weather

Exposure to cold weather can affect your health in different ways, even at temperatures as mild as 4 to 8 °C

Direct effects

- **heart attack**
- **stroke**
- **increased risk** of respiratory disease
- **weakened lung function** causing an increased risk of influenza
- **falls** and injuries
- **hypothermia**

Indirect effects

- **disruption to healthcare services** caused by snow and ice
- **carbon monoxide** poisoning
- **poorer mental health** and reduced educational and employment attainment have been linked to cold homes and fuel poverty

UK Health Security Agency

HOT WEATHER

The direct and indirect effects of hot weather

Increasing temperatures in excess of 25°C are associated with severe illness and excess heat-related deaths in vulnerable people. **Higher temperatures** can affect your health in different ways.

Direct effects

- **dehydration**
- **heat cramps**
- **heat rash**
- **dizziness** and **fainting**
- **heat exhaustion**
- **heart attacks**
- **heatstroke**
- **increased risk** of lung illnesses and other diseases

Indirect effects

- **Increased demand** on healthcare services
- **Power outages**, affecting homes and healthcare services
- **Wildfires,** and by association smoke inhalation

UK Health Security Agency

FLOODING

The direct and indirect effects of flooding

Flooding can cause significant impacts on health, both immediate impacts on physical health and long-term effects on mental health and wellbeing.

Direct effects

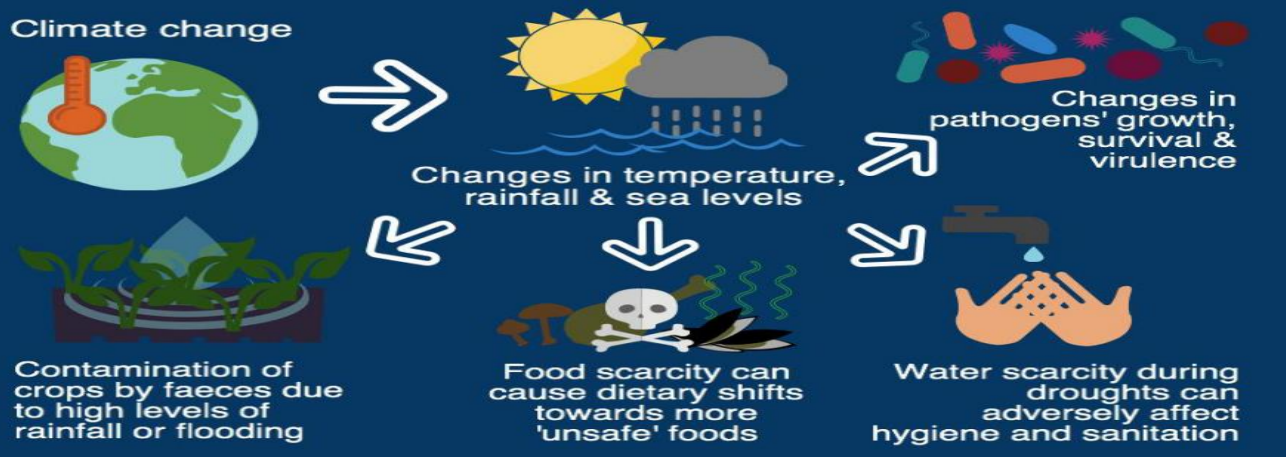
- **drowning**
- **physical trauma,** caused by displaced objects, electrocution or fire

Long term effects

- **carbon monoxide poisoning** due to inappropriate use of generators
- **respiratory disease** from mould and damp
- **exposure to rodent-borne disease**
- **impacts on mental health**
- **homelessness** and displacement
- **water shortages**
- **disruption to access of healthcare**

How Does Climate Change Affect Food Safety?

Climate change can increase food- and water-borne disease risks in many ways. Many pathogens, such as those responsible for cholera, are sensitive to changing temperatures, rainfall and extreme weather. This diagram summarises some of the main mechanisms:



THE GLOBAL CLIMATE & HEALTH ALLIANCE

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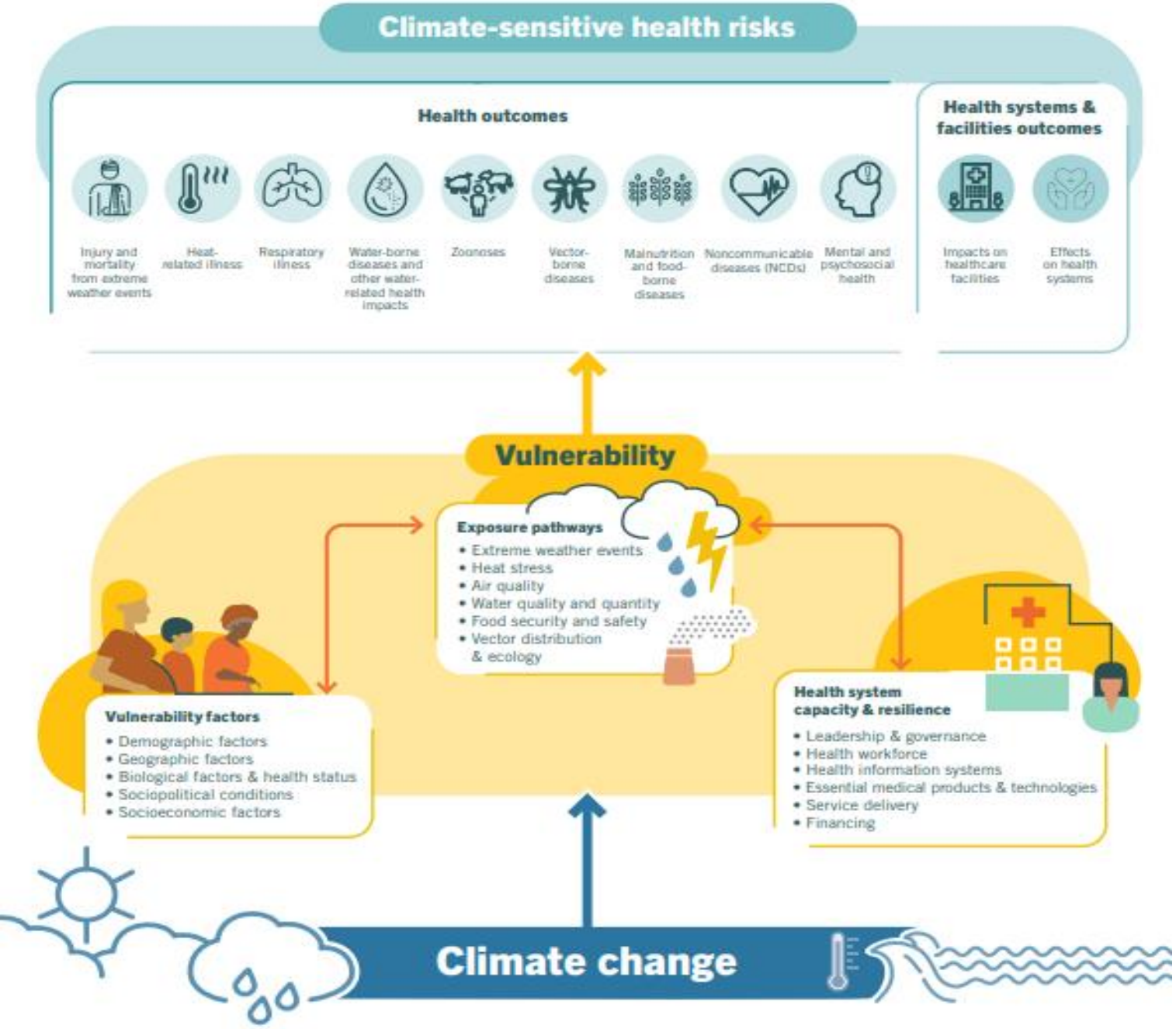
Smith, K.R., et al, 2014: Human health: impacts, adaptation, and co-benefits. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 709-754.



Climate change impacts health both directly and indirectly, and is strongly mediated by environmental, social and public health determinants.

Source: [World Health Organisation, 2021]

The effects of climate change are widening health inequalities

'Despite being the least likely to cause climate change, disadvantaged populations are more likely to be exposed to its health threats' The Sustainable Development Commission, 2010

Health inequalities are a matter of social justice – addressing inequalities is about fairness and equality. Equality in the distribution of wealth and opportunities in society. Often climate change policy is viewed and developed separately to policies that aim to tackle social vulnerability, poverty and disadvantage. However, climate justice and social justice are inextricably linked.

Social inequalities in resource use drives climate change; more affluent communities and economies have a much larger environmental footprint that the most deprived. The communities that have contributed the least to the climate crisis are also the most vulnerable to the impacts of climate change, worsening health and socioeconomic inequalities within the UK and also globally.

Climate justice goes further than the drivers of climate change. There is the injustice in the way the costs and benefits of climate change policy are distributed.

The effects of climate change are widening health inequalities

For example, lower-income groups may potentially pay proportionally more for policy and benefit less from some carbon reduction measures.

The health impacts of climate change are also not evenly distributed. Health inequalities due to the impact climate change will increase for those most vulnerable including older people, those socially disadvantaged, people with long term health issues (physical and mental) and those with disabilities.

Research from the Joseph Rowntree Foundation highlights how vulnerability to the effects of climate change is determined by a combination of personal, social and environmental factors, alongside institutional practices such as planning rules, consultation processes and the distribution of the costs and benefits of policy measures.

The Institute for Health Equity highlights that actions to combat climate change, done in the right way, could improve health and health equity. Further, actions to improve health and health equity have the potential to reduce greenhouse gas (GHG) emissions.

The development of fair climate change policy is an opportunity to create a fairer society as a whole. Furthermore, evidence suggests that populations are more likely to support climate change policy when they perceive it to be fair.

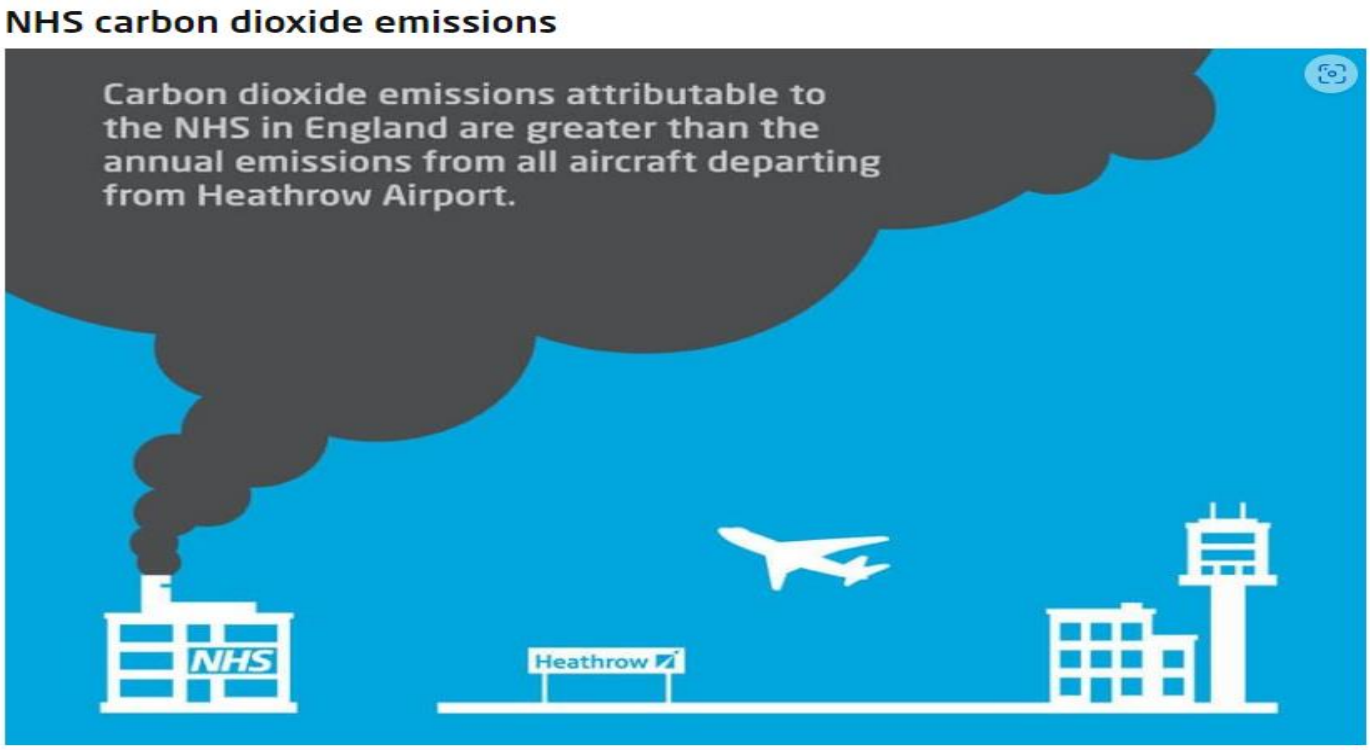
Accordingly, strategies and actions to achieve net-zero emissions should have health equity – the fair distribution of health – as specific policy ambitions.

Treating poor health increases demand for health and care services which in turn contributes to carbon emissions

Prevention is cheaper and better for the planet than the treatment of ill health. The health and care system is associated with resource use and carbon emissions, comprising around 4-5% of England's total carbon footprint.

In England, the NHS accounts for 4.4% of the country's greenhouse gas emissions.

59% of NHS carbon emissions are linked to procured goods, 24% to direct energy use in buildings and 17% to patient and staff travel. Pharmaceutical production alone accounts for 22% of NHS emissions.



Source: Naylor C, Appleby J (2012). Report. Sustainable health and social care: Connecting environmental and financial performance

Poor health means increasing demand on our health and care services. More demand and more treatment comes with both a financial and a carbon cost, as healthcare services tend to be highly resource-intensive.

By investing in health, by preventing people from becoming sick in the first place, and by early intervention when people do become unwell, can improve health outcomes for our population, but can also reduce carbon emissions from the NHS.

If people in lower socio-economic groups enjoyed the same level of health as those in the most affluent areas, fewer people would require healthcare, thus helping to reduce healthcare costs and the carbon footprint of the NHS.

Investing in health and scaling up prevention, is a fundamental requirement of a sustainable health and care system, and in supporting the UK to meet its legal requirements on emissions.

The relationship between our health and care services, health, and emissions is not just one way. In the long term, reducing emissions from health and social care will also help to mitigate the consequences of climate change, minimising the health risks.

Taking action: adaptation and mitigation

We need to act now to prevent the worst impacts of climate change from being realised at the same time as taking steps to prepare for and adapt to the negative effects that are already happening

Adaptation and Mitigation

Mitigation means making the impacts of climate change less severe by preventing or reducing the emission of greenhouse gases into the atmosphere.

Mitigation is achieved by:

- reducing the sources of these gases, for example by phasing our fossil fuels and increasing clean and renewable energy sources;
- enhancing the storage of greenhouse gases, for example by increasing the size of forests or through carbon capture.

In short, mitigation is a human intervention that reduces the sources of greenhouse gas emissions and/or enhances the sinks.

Adaptation means anticipating and preparing communities for the adverse effects of climate change, and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. Protecting people now saves more lives and reduces risks moving forward. It makes financial sense. The longer we wait, the more the costs will escalate. In short, adaptation can be seen as the process of adjusting to the current and future effects of climate change.

We must do both – mitigate and adapt - at the same time.

Adaptation and Mitigation

Mitigation

- We need to rapidly phase out fossil fuels
- We need a greener and fairer approach to transport
- We need affordable, safe and energy efficient homes
- We need access to affordable, healthy and sustainably produced food
- We need to value biodiversity to protect health

Adaptation

- We need to prepare for increased temperatures and more heatwaves
- We need to prepare for periods of extreme rainfall and more flooding
- We need to prepare for disrupted food supplies and food insecurity
- We need to prepare for changing vector patterns and infectious disease
- We need to prepare for changing the way in which we deliver our services

Community centred and equity in all policies

Taking action: mitigation

We need to rapidly phase out fossil fuels

‘Health is at the mercy of fossil fuels.’ We need to rapidly address our dependence on fossil fuels which is undermining our health through increased climate change as well as through volatile energy markets and fragile energy supply chains.

The Lancet

Rapid phase out of fossil fuels: 6 key messages

1. We cannot stop or reduce the scale of climate change without addressing the powerful fossil fuel industry. A rapid phase out of fossil fuels is essential.
2. Our reliance on fossil fuels harms our health in many ways; its not just a result of the release of particulate matter into the air when they are burnt, but through cold homes as a result of unaffordable energy, and through the impacts of climate change.
3. The fossil fuel industry have tried to shift the responsibility for action onto individuals, but in public health we have seen that when the harm is shared across society – as it is for smoking and climate change - then ONLY the state can act effectively and at the scale required.
4. We are vulnerable to the volatile and unpredictable fossil fuel markets, as the cost of living crisis has demonstrated, and this is impacting on health.
5. We need a long term approach to protect our essential energy needs and reduce bills for households and businesses.
6. This means protecting our communities from unstable energy prices for good by shifting to affordable clean power and the certainty it can give us.

Increasingly the things that kill us and make us sick are the products and practices of commercial organisations, especially transnational corporations. There is a growing body of evidence to show that the 'strategies and choices used by the private sector to promote products and choices are detrimental to health.' We know these as the commercial determinants of health. The fossil fuel industry can be considered a commercial determinant of health in the same way as we recognise tobacco and gambling related harm as industries whose products and practices are harmful to health.

'The fossil fuel industry is built on harm, violence, and pollution across the entire lifecycle, killing millions of people each year. In the UK, there have been record numbers of people in fuel poverty in recent winters and record profits for energy companies.' (BMJ)

The role of fossil fuels in driving climate change is undebatable. The science is clear. This, however, has not stopped the fossil fuel industry lobbying for favourable policy for the industry at the expense of action on climate change.

We expect this. Their profits and their future survival depends upon it. There is a sophisticated and well used playbook of tactics used by the industry which have stopped us from: (1) recognising that climate change is happening and is devastating our planet; and (2) have stopped our governments from taking the action needed to reduce the scale of climate change and biodiversity breakdown.

The fossil fuel industry damages health and drives inequalities through a number of mechanisms:

- Burning fossil fuels releases greenhouse gases and particulate matter into the air which is harmful to health at all stages of the life course.
- The profit driven unstable and volatile energy market contributes to expensive and unaffordable household energy bills and in turn cold homes. This increases the risks of a number of health conditions, including cardiovascular disease.
- Burning fossil fuels drives climate change, warming our planet, which has a negative impact on health through: the effects of extreme weather; the negative effects on the planet's life-support systems, such as rising sea levels and the availability of clean water; and the effects mediated by social systems, such as livelihood loss, supply chain disruption, pressure on health and care services, conflict or forced migration.

A rapid phase out of fossil fuels is essential

We must proactively respond. We cannot stop or reduce the scale of climate change without addressing the powerful fossil fuel industry. The public want action to reduce our reliance on fossil fuels.

Despite public opposition, the fossil fuel industry continues to be heavily subsidised by governments, with the UK having one of the highest levels of subsidies compared to the EU. Pension and investment funds continue to be directed to the fossil fuel industry. Despite generating record breaking profits year after year, including through a cost of living crisis, at the expense of communities, the industry's narrative continues to be focused on how expensive it is to implement change for them as companies and their shareholders.

The costs to our health now and in the future are, however, much greater. If we don't take action now the public will be paying the costs in terms of their health. Treating this ill health will ultimately be paid for by taxpayers. **The costs of inaction on our communities is too great to ignore.**

Unfair tactics: The public recognise the harm that the fossil fuel industry has caused, and the tactics that they continue to use to hide this harm. The public want them to take responsibility for this harm now and prevent further damage to our planet and to our health.

One of the consequences of the strong influence that the industry exerts globally is that they have successfully shifted the focus to individual behaviour change at the expense of comprehensive system wide action. We have seen these tactics before. The tobacco industry is just one example where the industry deflected, denied, delayed and shifted responsibility. This slowed down progress in protecting our communities from tobacco related harm. The carbon footprint, now so ingrained in our understanding of climate action, is just one example of an incredibly successful campaign developed by the fossil fuel industry to individualise a corporate problem and blame individuals, deflecting attention away from the political and corporate actions needed to tackle climate change.

It is easier to shift the responsibility to individuals – fly less, recycle more – than it is to implement structural change. **This framing dilemma is not new for public health**.

The wealthy tobacco industry spent decades building their brand and promoting a highly addictive product to people which it knew would harm. They highlighted individual responsibility with the onus on choice and willpower. Behavioural support to help people to stop smoking was not enough; we needed regulation, taxes and other state interventions to counterbalance the tactics of the powerful tobacco corporations. The same approach is needed to tackle the fossil fuel industry and phase out fossil fuels.

When the harm is shared across society – as it is for smoking (second hand smoke) and the fossil fuel industry - then ONLY the state can act effectively and at the scale required to protect the public.

We need a long term approach to protect our energy needs and reduce bills for households and businesses

The current energy system is broken. In 2022 and 2023 we have seen first hand just how vulnerable we are to the volatile and unpredictable fossil fuel markets, and the fragility of supply chains, coupled with geopolitical conflicts. Furthermore, we have seen the unfairness of the system; everyone in the UK has seen their energy bills rise significantly though the cost of living crisis. Many people have struggled to heat their homes because they have been unable to afford to. Yet at the same time, fossil fuel companies have generated record breaking profits, thriving, when our communities have suffered.

Energy price rises since 2003 have meant that more people are now experiencing fuel poverty. In 2022, an estimated 13.4% of households (3.26 million people) were in fuel poverty in England, under the Low Income Low Energy Efficiency metric. We need to address the way we generate electricity, and heat and power our homes as this affects us all, but mostly those on the lowest incomes.

The system isn't just unfair and unaffordable for families and households, but it is damaging our economy. Businesses have struggled to cope with rising prices, affecting our local economies, our services, and the amenities that we have access to. Bus routes which are often a lifeline for promoting social connectedness in our communities, have been reduced, as some are no longer affordable or cost effective to operate.

The public sees that the answer to the unfair and unpredictable energy system is a move away from fossil fuels. 76% of people support renewable energy projects in their areas, and 81% think its important that we shift away from fossil fuels to more sustainable and climate friendly alternatives. People see renewables and insulation as solutions to the ***CURRENT*** energy challenges, not just future ones. Research also shows that people like clean energy and want more of it, and they want it nearby.

We need to protect our communities from unstable energy prices forever by shifting to affordable clean power and the certainty it can give us. The only way to be free from the unpredictable and unaffordable energy prices permanently is to move away from expensive oil and gas, and towards cheaper and cleaner renewables.

If we don't tackle the root causes of expensive fuel now, we'll be in the same situation every year.

We need a greener and fairer approach to transport

We need better choices for our communities, affordability and accessibility, as well as improving our health and caring for the planet. Better cars and vehicles but less driving and cleaner air.

Greener and fairer transport: 6 key messages

1. Good transport has the ability to transform the lives of people and places, reducing inequalities.
2. Our current approach to transport is too often, bad for the planet, its harmful to our health, and it can exclude some of our most disadvantaged communities.
3. We need better cars but less driving. This means more choice and better alternatives for all of our communities to thrive.
4. Less driving and more active travel means fewer harmful emissions, better air quality, less noise pollution, fewer road traffic accidents, better health and longer lives.
5. We need an EQUITABLE approach to decarbonisation, public transport and active travel.
6. More choice means investing in and scaling up healthy and green infrastructure to promote active travel and public transport to deliver more friendly, connected and liveable places.

Good quality, reliable, affordable, accessible and convenient transport is essential for healthy and thriving communities. Our ability to access the services that we need, to make social connections, to work, to learn, to study, and to experience life, depends upon it. Good transport has the ability to transform people and places, improving the lives of everyone.

Our economy cannot function and prosper without it.

Too many people across our region are excluded from the economy and from society as a result of poor transport options. Too many people experience poor health as a result of the air and noise pollution caused by motor vehicles which are the dominant form of transport. Together this contributes to income and health inequalities. Evidence shows that the lack of accessible public transport options disproportionately impacts people with disabilities, those with caring responsibilities, and those on low incomes; whilst the burden of poor air quality is highest in our most disadvantaged communities. As transport is the largest source of greenhouse gas emissions in the UK, we cannot achieve net zero without change.

Quite simply, transport is essential for our health, our wellbeing, our economy and our planet.

We need better cars but less driving

The way in which we travel within and around our communities is dominated by the car. On average we make 429 trips per year by car, compared to 20 by bike and 22 by bus (DfT, 2021). Our car focused approach to transport is bad for the planet, its bad for our health, its economically expensive, unsustainable, and it is unfair for too many people in our communities. Cars once offered convenience and greater mobility, but that view is increasingly challenged, and the costs of convenience considered too high.

Unfair and inequitable: Internal combustion engine vehicles (petrol and diesel) are expensive to run and maintain. Fuel prices are high and volatile, which affects all car users but especially the most disadvantaged in our communities. We have seen record prices after the pandemic and the invasion of Ukraine, leading to the government to reduce fuel duty. This has been costly for the taxpayer and will have been funded by diverting government spend from elsewhere. All whilst protecting and increasing the huge profits generated by the fossil fuel industry. Petrol and diesel prices will always be volatile and driven by a need for industry to maximise profits, leaving many vulnerable to price increases, with too few alterative options for travel.

Unsustainable: our population is increasing. Every year there are more car users on the roads than the year before. Employment opportunities are concentrated in urban centres. Despite the growing need to travel, we have failed to adequately invest in our public transport infrastructure at scale. We have an automotive industry whose profits depend on growing car use, leading to attractive car financing and advertising. It is unsurprising that car ownership is increasing and there are more cars on our roads. This has led to more pollution, more congestion, and longer journey times. The government have explored ways to increase capacity on our roads. Smart motorways have not worked.

Sustrans estimates that congestion alone could cost the economy £25 billion by 2025. However, we cannot keep expanding the road network to accommodate the growing number of cars. Roads are incredibly expensive to build and maintain, an issue which will become increasing complex and expensive as we experience a more extreme and erratic climate in the UK. This will affect the durability of our roads. History shows us quite clearly that increasing capacity does not solve the problem. We need a different approach that makes economic sense and works for our communities.

Bad for the planet: Greenhouse gases such as carbon dioxide, methane and nitrous oxide, are causing climate change. Transport is the largest source of greenhouse gas emissions in the UK. In 2019 122 million tonnes of carbon dioxide equivalent was produced by the domestic transport sector. Road transport accounted for 23% of the UK's domestic nitrogen oxide emissions. Accordingly, mitigating against the affects of climate change and meeting government targets on net zero can only be achieved by significantly reducing emissions from the transport sector.

Bad for our health: The environmental effects are not just seen at a national or global level, but are evident on every street, in every community. Road vehicles are a source of some of the most important air pollutants, especially PM2.5 and NO2 – this is a combination of tailpipe emissions, emissions from brakes, tyre wear, and road abrasion. PM2.5 and NO2 cause harm to people at all stages of their life. We are all exposed to air pollution. There is no safe level and even people living in the least polluted areas are affected.

Air pollution has been shown to affect foetal development during pregnancy and could cause low birth weight and miscarriages, as well as a low sperm count in men. It can stunt lung growth in children, cause asthma, and affect blood pressure, cognitive abilities and mental health. Estimates show that up to 43,000 people a year are dying in the UK because of air pollution, and that it could cost as much as £18.6 billion by 2035.

Traffic noise pollution is an under-recognised health harm, associated with increased risk of stroke and premature death. We have designed our streets and communities to support and enable car use, meaning we have designed out opportunities for everyday physical activity. Car travel increases sedentary time and is a major opportunity cost in terms of the physical and mental health gains that could have been achieved by walking or cycling instead.

The solution has to include decarbonising our transport system, but the evidence is clear; decarbonising is not enough. We must aspire to fewer cars, less driving, more choice and better alternatives to the car, for all of our communities to thrive.

Electric vehicles: we must replace our diesel and petrol vehicles with electric vehicles (EVs), but any policy that centres on the shift to EVs will widen inequalities. Even if we convert every petrol/diesel vehicle to electric on a 1:1 ratio, this will not be enough to reduce the emissions from the transport sector to meet climate change targets.

There is not enough lithium needed for the batteries to power this many cars, and there are increasing concerns around the environmental impacts of lithium mining, including water shortages, indigenous land loss, food shortages and biodiversity loss, mostly impacting on developing countries. The lithium market is finely balanced, with global supply chain bottlenecks. A better solution is to protect our communities from market volatility now and in the future, with more transport options; active forms of travel becoming the norm and the easiest option, mass transit systems, and high quality affordable and accessible public transport for all.

EVs might be less harmful for health, but there are still associated harms. EVs still pollute through the manufacturing processes and tyre and brake wear, and so a shift on a 1:1 ratio will not eliminate the significant negative health impacts associated with emissions, even if the energy source is renewable. A shift to EVs will not reduce the almost 25,000 people killed and seriously injured on our roads each year.

A shift to EVs will not solve the parking, congestion and space challenges that we face today because there are simply too many vehicles on our roads. If anything the problem will get worse and will be more expensive to solve.

We will have to continue to invest billions to increase capacity and maintain our roads, as well as the necessary parking infrastructure. This diverts funding from more sustainable and more cost effective solutions which do the most public good; they are better for health, better for the planet, and promote equity. EVs don't reduce the time we lose sitting in congestion.

We need to recognise that the problem isn't just polluting vehicles, but too many vehicles. We must provide ***choices for our communities***. The only way to provide meaningful choice and address the negative economic, planetary and health impacts, is to create the infrastructure that supports non-car modes of travel. This includes public transport, and opportunities for walking, cycling and other forms of active travel. This is the only way to reduce the emissions that are harming our planet and our health. It also makes economic sense and provides new opportunities to make much better use of our public realm.

We need to improve choices for communities by investing in and scaling up public transport

The public strongly supports efforts to encourage public transport use instead of driving a car to reduce carbon emissions, but currently there are too many barriers to making the switch from driving to public transport. Too many people are forced into car ownership because of poor public transport.

The carbon emissions from public transport are significantly lower than private vehicles - According to the International Transport Forum emissions from buses and trains are a third lower than private vehicles. Lower emissions are not only good for the planet, but our health, with lower levels of PM2.5 and NO2 which are so harmful across the life course. Furthermore, places with good public transport have been shown to be safer with fewer road traffic accidents.

There are also economic benefits. Good public transport is fundamental to our economy in Y&H. Done well, it will provide more equitable access to jobs, education, services and other economic opportunities; this is especially true for our most disadvantaged communities for whom transport is a significant barrier to engaging in the economy.

The public transportation sector is a significant employer and through investment and expansion will bring green jobs to the region's economy (both directly and indirectly).

We need commitment and investment to improve local public transport options for our communities. We must also prioritise equitable access when planning public transport. This requires identifying areas where gaps in access exist, working with communities to do so; and making targeted improvements in services such as frequency, reliability and capacity in those areas.

Over the years we have seen increased fragmentation, unreliability, and higher costs in our public transport system, particularly for multi-mode and cross-boundary trips. Some communities report feeling let down, excluded and have no other option than to use a car.

Using the public transport system for key journeys is often not convenient. This needs to change to provide a viable alternative to the private car. For those who have no choice but to rely on public transport and active travel, it leads to poorer access to key destinations. All of our public transport services need to be fully integrated across boundaries and modes.

We need to improve choice for communities by investing in infrastructure to support active travel

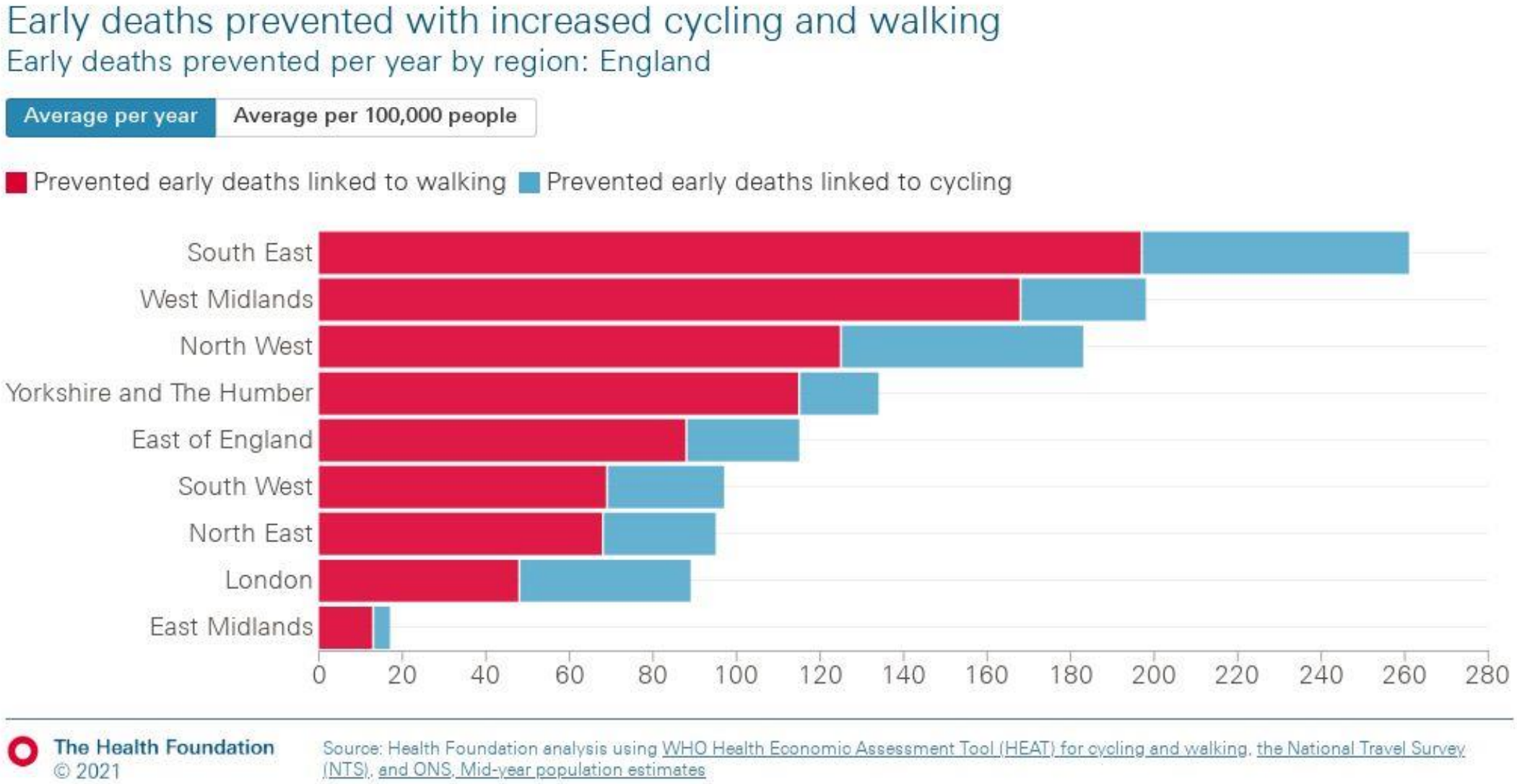
Active travel means getting about in a way that makes you physically active, like walking or cycling. Around half of journeys in towns and cities under 5 miles were made by car in 2021, with around a quarter of all car trips in England less than 2 miles. Many of these journeys could be walked or cycled.

Active travel is good for the planet because it is a low carbon alterative to car journeys. It is estimated that active travel can deliver between 1MtC02 emissions and 6MtCO2 emissions savings from 2020 to 2050 in the transport decarbonisation plan. In cycle share schemes, an average of 53kg of CO2 emissions are saved per cycle share user each year according to CoMoUK's 2021 bike share report. Fewer emissions means better air quality, which in turn leads to improvements in physical and mental health.

Longitudinal studies including UK Biobank have also reported benefits. Biobank found that after five years, bicycle commuters had a 41% and 52% reduced risk of all-cause mortality and cardiovascular disease respectively.

The health benefits don't only come from the improved air quality, but from higher levels of physical activity. Regular commuting by cycle is linked to a lower risk of cancer or heart disease compared to other forms of transport. In the 2021 bike share report, CoMoUK found that 20% of cycle share scheme users said that if formed 'all' or a 'major part' of the physical activity they undertook.

If walking and cycling rates in all regions in England increase to the same level as the regions with the highest average daily miles walked and cycled per person, around 1,190 early deaths could be prevented each year.



Local economies benefit from increased levels of active travel too. Living Streets' Pedestrian Pound report outlined a range of economic benefits of walking, including that well-planned walking improvements can lead to a 40% increase in shopping footfall; and there are the benefits of reduced congestion.

Despite the benefits, for too many active travel is not a realistic option. People report being scared to cycle due to fear of accidents, personal safety, a lack of facilities, tension with other road users combined with heavy traffic flow and a lack of separate safe lanes and paths.

The best way to give people a genuine choice over how they travel is to invest in better infrastructure; making it a safer, more pleasant and a more convenient way to travel. Whilst we have seen improvements in providing local cycling and walking routes, to increase active travel there must be sustained revenue and capital investment in cycling and walking infrastructure, strong partnership working with local people and citizens, and the voluntary and community sector to build local commitment.

Active travel infrastructure, such as cycling lanes and pedestrian pathways, requires fewer resources and emissions during construction compared to building and maintaining roads for vehicles. By investing in active travel infrastructure instead of expanding road networks, carbon emissions associated with manufacturing materials and constructing roads can also be reduced.

The public supports investment in active travel infrastructure. The National Travel Attitudes Survey reported that 64% of respondents supported the creation of dedicated cycle lanes, at the expense of road space for cars. When planned well, better cycling and walking infrastructure can also improve public realm; they can free up streets for children and families to play and people of all ages to interact with each other and create inclusive and pleasant places to live, so the infrastructure changes in favour of active travel have the potential to benefit us all, no matter how we travel.

It is not, however, just about infrastructure; evidence shows that it is more effective to develop behaviour change and infrastructure projects together, rather than in isolation. Longstanding perceptions that cycling takes longer compared to other forms of transport need to be debunked. In urban areas, over short distances, cycling is often faster.

Policies to improve opportunities for active travel must pay due regard to inequalities through all lenses, including age, disability, rural/urban location and socio-economic inequalities. For too many cycling and bike ownership is not an option. The BikeAbility funding, for example, only reaches only half of UK school children.

In developing active neighbourhoods we must ensure that interventions don't increase inequalities for groups who have less choice over what transport they can use e.g. people on a low income or with less flexible/less supportive working conditions, women, and people with disabilities and sensory impairment.

Low traffic neighbourhoods (LTNs) are schemes that seek to reduce through traffic in residential areas, using traffic management measures such as filters which prevent cars from using certain streets, while leaving them open to pedestrians and cyclists. LTNs have been shown to reduce the number of motor vehicles within their area boundaries without appearing to push traffic on to roads around their edges.

There is a growing body of evidence demonstrating the benefits to the health and wellbeing of communities of LTNs by reducing air and noise pollution, reducing accidents through the reduction of through traffic (short cuts), whilst encouraging people to walk and cycle in a safe environment, and get to know their area. It also increases social capital, thus strengthening local connectivity and reducing isolation.

The places where we live, work and play shape our daily living choices and, as such, impact on our opportunity to be fulfilled and healthy. The concept of a ***15-minute city*** (or neighbourhood) is simply the idea of making it a target that most things that people need are within a 15-minute walk or cycle of their home. YouGov data shows that the majority of the public (62%) would support their local authority making it a target to make their area a 15-minute neighbourhood.

This is about urban design, access to amenities and planning for healthy places. The health benefits arise in a similar way to as described for low traffic neighbourhoods; for example from increased social capital and connection, from access to services and amenities, less driving leading to fewer emissions and better air quality; and from increased levels of physical activity due to walking and cycling.

By bringing neighbourhoods closer, people do not have to rely on cars to access the services and amenities that they need. Fewer cars means reduced carbon emissions and improved air quality. Space can be freed up for more green space, which also eases urban heat-island effects, reduces flood risk and improves biodiversity. It also encourages social and community cohesion across multiple generations which have been shown to reduce demand on health and social care.

We need affordable, safe, and energy efficient homes

UK homes are not fit for our changing climate. Greenhouse gas emission reductions from UK housing have stalled, and efforts to adapt the housing stock for higher temperatures, flooding and water scarcity are falling far behind the increase in risk from the changing climate.

Committee on Climate Change

Affordable, safe and energy efficient homes: 6 Key Messages

1. Everyone should be safe and comfortable in their home, yet too many people do not have this and this has a negative impact on health.
2. The UK's legally-binding climate change targets will not be met without the near-complete elimination of greenhouse gas emissions from UK buildings.
3. We need to reduce demand for energy in our homes by improving and enforcing energy efficiency and ventilation standards.
4. This can only be achieved through retrofitting at scale but we MUST target this activity at the households with the lowest incomes and least efficient homes first to prevent widening health inequalities.
5. Retrofitting at scale also has the potential to reduce inequalities through supporting the redistribution of sustainable skilled jobs, lifting people out of poverty.
6. The design of any new homes and communities should be low carbon and water efficient from the outset, taking into consideration the infrastructure needed to support healthy lives, including active travel and green spaces.

A healthy home is the foundation for a healthy life and essential for people and communities to thrive. To address health inequalities through housing, our homes need to be:

- Decent, safe, and suitable, and part of complete, connected, and healthy communities.
- Affordable for everyone, including people on the lowest incomes. This also includes the cost to run and maintain a home.
- Secure and stable where people feel in control at home and can lay down roots.
- Within a non-discriminatory housing system that does not perpetuate wealth and social inequality or discriminate, including by age, ethnicity or disability.

Everyone should be safe and comfortable in their home, yet too many people do not have this and this has a negative impact on health, be it through mould and damp, cold homes or the mental health impacts of overcrowding.

Our homes are not fit for our changing climate. Our homes make up around 25% of the country's total energy use and account for around 15% of our total carbon emissions. This means that the UK cannot meet its legally binding climate change targets without decarbonising and improving our homes.

This means that we need to make adaptations to ensure that our existing housing stock can withstand the impacts of climate change; this includes higher average temperatures as well as flooding and water scarcity.

Insulating our homes

'Housing retrofit is an investment in both public health and planetary health. We can improve the wellbeing of our population while stopping our depletion of nature's resources. It should be a win-win strategy, but it will only be so if done fairly.' (JRF)

Too many people in Yorkshire and the Humber don't have a warm home. Before the cost of living crisis (2021) 13.1% of households in Yorkshire and Humber were living in fuel poverty. Around a half of adults say that they find it difficult to pay their energy bills. We know that the answer to this is a move away from fossil fuels towards cleaner, affordable energy. But it also means better insulated homes. Nobody wants to pay for warmth, only for it to leak out of poorly insulated buildings.

The health problems (physical and mental) caused by cold, damp, poorly ventilated or insulated housing are a major concern for public health, with the effects concentrated in our most deprived communities. The Energy Saving Trust estimates that each year 10,000 people die as a result of poor health caused by living in a cold home. We will also see more heath issues associated with not being able to cool our homes during heatwaves.

Retrofitting is the process of making changes to existing buildings so that energy consumption and emissions are reduced.

Tackling inequalities needs to be at the heart of any approach to insulating our homes. *'Mitigation measures to improve energy efficiency and ventilation may widen inequalities, depending on who the beneficiaries are*" Marmot 2021. The huge rises in fuel poor households mean we absolutely MUST target this activity and the households with the lowest incomes and least efficient homes first. This means balancing support for housing associations, the private rental sector, and owner occupied homes. Where these groups intersect (for example low income households in the private rented sector) we will need to significantly scale up our efforts.

There are wider benefits to investing in retrofitting. Retrofitting programmes delivered at scale not only benefit us all in the form of having safe, warm homes, but it has the potential to create skilled jobs and to support the redistribution of jobs (as a result of a just transition, and responding to challenges such as AI and automation). This can avoid some of the damage caused to health and social outcomes in communities who have suffered disproportionately during previous industrial changes.

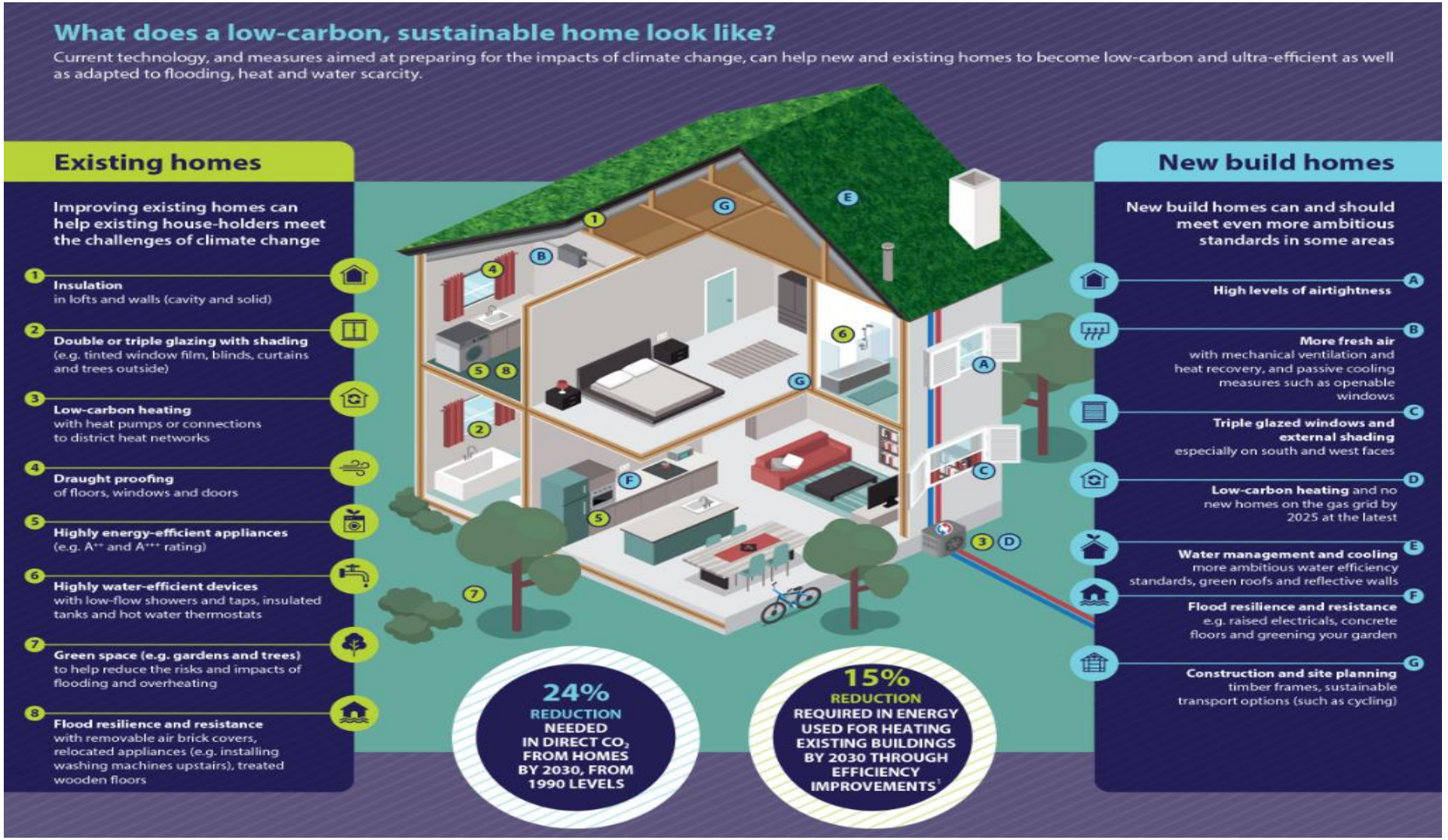
A booming housing retrofit industry could boost skills and boost jobs, creating many thousands of sustainable, skilled jobs. However, there is currently a huge gap between the minimum 19 million homes the UK needs to retrofit to reach net zero, and the size of the workforce with the skills to carry this work out.

A strategic approach to skills and training is needed to ensure there are enough skilled workers to carry out the necessary retrofit across the social gradient. With jobs, education and training appropriately targeted to those communities who have historically been excluded from good work, we can create decent and well paid jobs. This will improve health and address inequalities by reducing the significant health impacts associated with being out of work, low income jobs and insecure work.

Retrofitting for the public is confusing due to attempts to boost or accelerate energy efficiency measures in homes often being either extremely short lived or scrapped before they could achieve their goals. The public want warmer homes and help to achieve this. We know that the installation of insulation in lofts and cavity walls has plummeted since 2012, when grant support for households via the Green Deal was scrapped by the government.

The financial support that is available for retrofitting and energy efficiency also varies hugely in its comprehensiveness and it is confusing for local policymakers with very little budget to act on locally. Schemes like the Better Homes Yorkshire hub will help with building trust and engaging local communities. We need sustainable finance supported by robust plans to adapt our existing housing stock in an equitable way at the scale required.

What does a low carbon sustainable home look like?



Source: [Committee for Climate Change 2019]

Building new homes

As we build new homes we need to ensure that they are low carbon, as well as energy and water efficient. Getting the design right at the outset is better than expensive retrofitting later. Reduce demand for energy in homes by improving and enforcing energy efficiency and ventilation design standards will also improve health by reducing mould and damp, and ensuring everyone can heat their home to an adequate temperature. It also means preventing homes from overheating as heatwaves become more common.

Consideration also needs to be given to the emissions from building and construction, as well as the wider supply chain. This may include minimising waste, supporting and incentivising the re-use and re-purposing of materials and strengthening local supply chains, whilst ensuring existing buildings operate as efficiently as possible.

Planning and building new homes goes beyond the bricks and mortar. Consideration must be given to the infrastructure that supports active travel, facilitates connections within and between communities, and be well connected to employment opportunities through public transport networks. This will ensure that the health benefits are maximised.

We need equitable access to affordable, healthy and sustainably produced food

Worried about biodiversity loss? Focus on food. Worried about freshwater supply? Focus on food. Worried about deforestation? Focus on food. Worried about overfishing? Focus on food. Worried about climate change? Focus on food.

Richard Waite, World Resources Institute, 2021

Equitable access to healthy & sustainable food: 6 key messages

1. Our food system is harming our health and harming the planet; eating a healthy diet is unaffordable and unattainable for too many, driving an epidemic of non-communicable disease, whilst at the same time harming the planet through greenhouse emissions and other routes.
2. It is the people living in our most disadvantaged communities for whom the impacts are greatest including higher levels of food insecurity, obesity and diet related ill health. We know the impacts of climate change will also have a greater impact on these same communities.
3. Reforming our food system means escaping the junk food cycle; reducing diet related inequality, making the best use of our land; and creating a long term shift in our food culture.
4. We can improve health, increase choice, reduce food poverty and reduce environmental harm by making changes to the types of food we eat, and reforming how this food is produced and consumed, including reducing waste.
5. In the midst of a climate emergency, it is recognised that meat-heavy diets and food production are major contributors to climate change. Including more plant based products in our diets has the potential to reduce emissions by up to 80% (by 2050) whilst at the same time reduce diet related disease.
6. In the coming years, climate change will increasingly influence the quality and quantity of food which can be produced, and so will also have very real implications for people's health and food security in the long term, including driving up prices.

Everyone should have access to healthy and sustainably produced food that improves our health and doesn't compromise the health of our planet. However, the food system is harming our health, and it is harming the planet**.**

Unaffordable, and unhealthy: the public want and need to have good access to fresh, healthy and affordable food. The cost of living crisis has highlighted that the system does not work for our communities: eating a healthy diet is unaffordable and unattainable for too many; we have failed to turn the curve on the levels of obesity which have been rising for decades; our children are shorter than their peers in all other Western countries; at the start of 2023 food prices were rising faster than any other time in history, meaning people are spending more of their income on food; we are experiencing food shortages at the same time as seeing surpluses in unhealthy processed foods; and the number of people experiencing obesity related ill health is increasing, damaging our economy.

Non-communicable diseases contributed to more than 70% of total deaths worldwide in 2017, with suboptimal diet accounting for 15% of disability adjusted life years (GBD).

People were struggling to pay for food before the cost of living crisis. According to the Department for Work and Pensions' Households Below Average Income survey, in 2020/21, 4.2 million people (6%) were in food insecure households.

In the UK we have historically had (by far) the cheapest food supply of pretty much any high-income country. Inflation clearly is a problem and is increasing food insecurity levels (together with rise in other cost-of-living pressures) but it's because people's budgets were adjusted to very cheap food, and this is a shock to the system for many of us.

About 3% of families in the UK - at least 2.1 million people - used a food bank in the year to March 2022. That rose to about one in nine (11%) for families receiving state income-related benefits. One in five households would have to spend almost half of their disposable income on food to achieve the government recommended healthy diet, leaving little money for other bills.

Healthy nutritious food is nearly three times more expensive than unhealthy products and so its not surprising that ultra-processed foods make up an increasing proportion of our diets. Ultra-processed foods account for 56.8% of total energy intake and 64.7% of total free sugars in the UK diet. Ultra-processed foods are fundamentally unsustainable products and have been associated with poor health and social outcomes. Latest data shows that 63.8% of adults aged 18 years and over in England were estimated to be overweight or living with obesity.

The food system also impacts on our health in indirectly.

Antimicrobial resistance: Antimicrobial drugs are commonly used. The more we use antimicrobial medicines, the less effective they become against their target organisms, and the less they work at making us better when we need them. A global review of AMR and its future impact estimated that there would be 10 million global AMR deaths annually from the year 2050 if we do nothing to preserve our current effective antibiotics or do not develop new ones.

The use of antibiotics is still common in our food systems, low doses of antibiotics are still delivered through animal feed to prevent disease. Manure is another way both antibiotics and antibiotic-resistant bacteria enter the environment, contaminating water and spreading to residential areas. With huge quantities of manure routinely sprayed onto fields surrounding concentrated animal feeding operations both antibiotics and antibiotic-resistant bacteria can leach into surface and groundwater.

Emissions: Ammonia is the most important air pollutant emitted from agriculture. Ammonia has negative effects on ecosystems, but importantly leads also to the creation of secondary particulate matter (PM 2.5) which can have an effect on health over wide areas. Globally, food system emissions are responsible for 22% of mortality to poor air quality.

Intensive farming methods: Intensive farming harms public health by: producing excessive animal waste and harmful agricultural runoff that degrades air, water and soil quality; producing and widely distributing inexpensive low-nutrient foods, reducing the availability of more sustainable options and contributing to poor nutrition among disadvantaged population; using large quantities of fertilizers and pesticides that are dangerous to the health of the farmers and farm workers who apply them to the fields.

Bad for the planet: we cannot protect the environment without considering the food system. The way in which we produce our food has a significant environmental impact. Our Food systems are important contributors to global emissions of air pollutants. Food system emissions are responsible for about 22.4% of global mortality due to poor air quality and 1.4% of global crop production losses.

Water: our current system needs large amounts of fresh water, taking it from other areas where there is increasing water stress due to dryer seasons and flooding. Waste water can also pollute rivers, lakes and oceans by releasing nutrients and effluents such as methane, ammonia and fertilisers that are harmful and destructive to ecosystems and biodiversity.

Emissions: agriculture is responsible for around one-quarter of the world's greenhouse gas emissions and thus a crucial driver of climate change.

Land use: our food system has a massive impact on the world's environment due to the large proportion of the global land mass dedicated to farming. Half of the world's habitable land is used for agriculture. Large swathes of the world that were once covered by forests, prairies and wildlands are now gone and instead used for agriculture. This loss of natural habitat has been the main driver of the decline in biodiversity. Wildlife can rebound if we reduce agricultural land use and allow natural lands to restore.

Food waste is responsible for 6% of global greenhouse gas emissions. Food losses and waste – in supply chains and by consumers – account for around one quarter of greenhouse gas emissions from food (6% of total global emissions). Around one-quarter of the calories the world produces are thrown away; they're spoiled or spilled in supply chains; or are wasted by retailers, restaurants and consumers. To produce this food which is not even consumed, we need land, water, energy, and fertilizer inputs. This comes at a significant environmental cost.

Food packaging: after our food packaging it is used, it is sometimes recycled where possible, or discarded either by being buried in landfill or litter that is carried along by wind and water into local environments, damaging ecosystems.

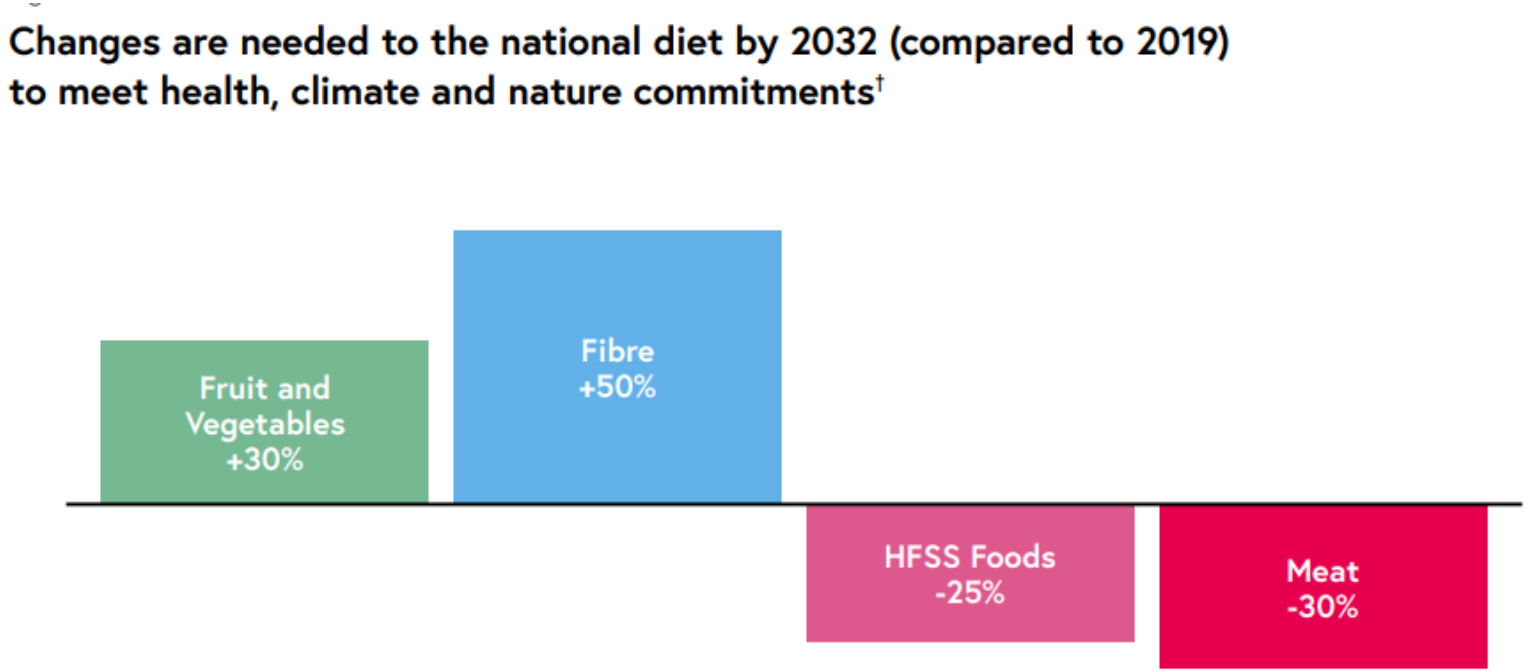
Most packaging that is sent to landfills, particularly those made from plastics doesn't degrade quickly or, in some cases at all. Harmful chemicals from the packaging materials/labels leach into the groundwater and soil.

Litter- especially of the plastic variety that our food is stored and distributed often makes its way to the furthest reaches of the planet, where it threatens human, avian and marine life. In the oceans, the problem has become so acute that the United Nations chief of oceans has declared plastic pollution of our oceans a “planetary crisis".

The severe impacts of plastic on the environment are not limited to ocean pollution. One study estimated that one third of all discarded plastic ends up in soil or in freshwater. Microplastics in soil have a number of detrimental effects, including impacting the behaviour of soil fauna like earthworms and carrying disease. Once in the soil and waterways, degrading plastics absorb toxic chemicals like PCBs and pesticides. The contaminated pieces eventually make their way through the food chain and into humans through ingestion of seafood. The breakdown of plastics in soil and water also releases toxic chemicals like phthalates and Bisphenol A (BPA).

We need a food system which makes us well instead of sick; is resilient to withstand global threats; helps to restore nature and halt climate change; and meets the standards the public expect, on health, environment, and animal welfare.

The National Food Strategy led by Henry Dimbleby sets out the scale of the challenge in reforming the food system. This means: escaping the junk food cycle; reducing diet related inequality, making the best use of our land; and creating a long term shift in our food culture.



To improve nutrition and to ensure that everyone has access to affordable, healthy and sustainable food, will require a coordinated effort between farmers, manufacturers, health organisations and government, and for government to have the political and social licence to intervene where the market is not moving in the right direction or at sufficient pace.

Improving our diets will help reduce the burden of non-communicable diseases. If the average UK diet met WHO nutritional guidelines, greenhouse gas emissions from diets could be reduced by 17% (Marmot 2021).

A 30% increase in fruit and vegetables would bring us in line with the Eatwell recommendation to eat five pieces of fruit and vegetables per day. A 30% reduction in meat is required to achieve the 5th Carbon budget.

Making the best use of our land will help protect our planet and secure our food supplies.

1. Escape the junk food cycle and protect the NHS

Recommendation 1
Introduce a Sugar and Salt Reformulation Tax. Use some of the revenue to help get fresh fruit and vegetables to low-income families.

Recommendation 2
Introduce mandatory reporting for large food companies.

Recommendation 3
Launch a new "Eat and Learn" initiative for schools.

2. Reduce diet-related inequality

Recommendation 4
Extend eligibility for free school meals.

Recommendation 5
Fund the Holiday Activities and Food programme for the next three years.

Recommendation 6
Expand the Healthy Start scheme.

Recommendation 7
Trial a "Community Eatwell" programme, supporting those on low incomes to improve their diets.

3. Make the best use of our land

Recommendation 8
Guarantee the budget for agricultural payments until at least 2029 to help farmers transition to more sustainable land use.

Recommendation 9
Create a Rural Land Use Framework based on the three compartment model.

Recommendation 10
Define minimum standards for trade and a mechanism for protecting them.

4. Create a long-term shift in our food culture

Recommendation 11
Invest £1 billion in innovation to create a better food system.

Recommendation 12
Create a National Food System Data programme.

Recommendation 13
Strengthen Government procurement rules to ensure that taxpayer money is spent on healthy and sustainable food.

Recommendation 14
Set clear targets and bring in legislation for long-term change.

National Food Strategy

There is no single approach to both reducing the environmental impact of our food system, and improving health by improving diets. A combination of approaches is required, including regulatory, fiscal and legislative changes by central government, as set out in the Food Strategy.

For local places the development of a local food strategy can be a useful way to consider the actions that can be best led by places and communities. The Sustainable Food Cities Framework identifies six key areas of action:

- Promoting health and sustainable food to the public
- Tackling food poverty, diet related ill health and access to healthy food
- Building community food knowledge, skills resources and projects
- Promoting a vibrant and diverse sustainable food economy
- Transforming catering and food procurement
- Reducing waste and the ecological footprint of the food system

In the coming years, climate change will influence the quality and quantity of food which can be produced, meaning that local food strategies are key to climate adaptation approaches.

We need to value biodiversity and nature to protect health

“Our economies, livelihoods and wellbeing all depend on our most precious asset: nature.”

The Dasgupta Review, 2021

Valuing biodiversity and nature: 6 key messages

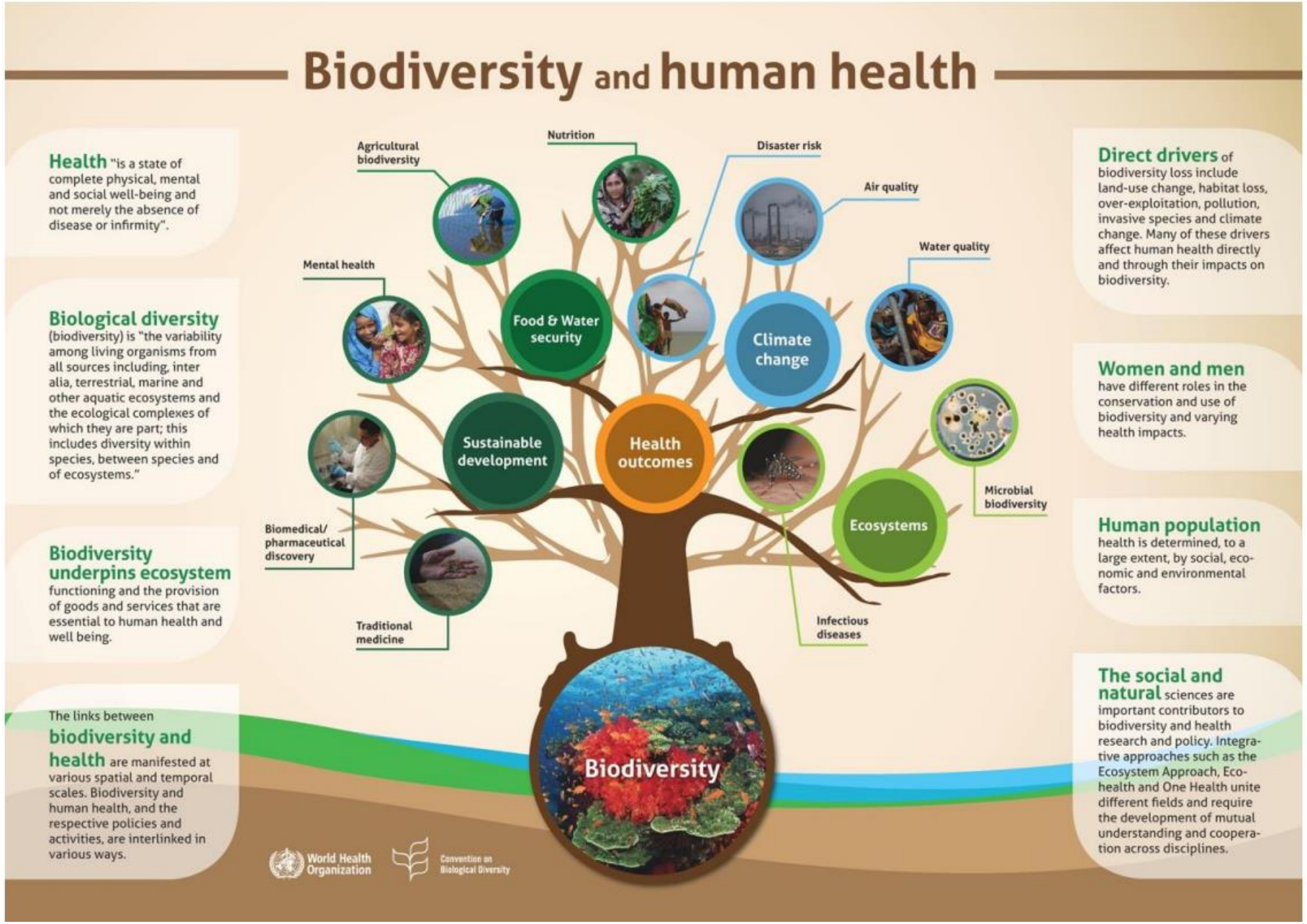
1. Biodiversity and nature are our most precious assets, with our economies, livelihoods and wellbeing dependent upon them.
2. Biodiversity is rapidly declining globally and in the UK and this will have a significant impact on health and inequalities.
3. Valuing and protecting biodiversity and nature is good for health; it reduces the transmission of infectious diseases, it protects against food insecurity; it contributes to better mental health and is a protective factor for our wellbeing.
4. Valuing and protecting biodiversity and nature will also help to protect us from the inevitable impacts of climate change through cooling our cities, and reducing the likelihood of flooding associated with extreme rainfall.
5. We must take action now to protect nature and reverse trends in biodiversity loss.
6. This will require action from all of our institutions and systems, recognising the economic value of nature and the costs associated with our demands upon it.

Why does biodiversity matter?

Biodiversity is the variety of all life on Earth - animals, plants, fungi and micro-organisms like bacteria and how they all fit together in the web of life, bringing oxygen, water, food and countless other benefits. Animals and plants provide humans with everything needed to survive - including fresh water, food, and medicines.

Biodiversity is so important because it is essential for the processes that support all life on earth, including humans. It matters because it has a big effect on the productivity and stability of natural ecosystems. Biodiversity and nature will also help to protect us from the inevitable impacts of climate change, for example by helping to cool our cities, and protecting our communities from flooding.

Biodiversity is rapidly declining globally and in the UK: in 2022 the living planet report WWF found global populations of mammals, birds, fish, amphibians and reptiles declined by 68%, on average, between 1970 and 2016. The UK has experienced some of the biggest declines in biodiversity globally due to pollution, rapid industrialisation and over use of water. It is a severe warning that the rich biodiversity that sustains all life on our planet is in crisis, putting every species at risk – including us. Clearing land for food production is one of the main drivers.



WHO and Conservation on Biological Diversity led [State of Knowledge Review, Connecting Global Priorities Biodiversity and Human Health] describes some of the interconnections between biodiversity and health.

Why does biodiversity matter?

The Dasgupta Review sets out a compelling body of evidence demonstrating why *'nature is our most precious asset,'* with our economies, livelihoods and wellbeing dependent upon it.

Spending time outdoors in green spaces, and nature more generally, has been linked to reduced stress, improved mood, and better mental health, but the health benefits of nature and the consequences of biodiversity loss are much broader. Loss of crop diversity, and subsequent reliance on agrochemicals to compensate for lowered plant resilience and poor soil, exposes people to health damaging pollutants. Loss of biodiversity will lower crop yields and affect food supplies. It could also negatively impact on the development of new medicines with 50% of modern drugs derived from nature. Biodiversity can also reduce rates of infectious disease transmission, lowering disease risk for human beings, wildlife, livestock, and plants.

Water conservation is another important element of nature; water conservation reduces the risk of waterborne diseases, and can help to protect water quality by reducing the amount of pollutants/effluents in the water supply, and reduce the risk of severe water shortages.

We must take action now to protect and promote nature and biodiversity.

Currently our demands of nature outstrip its capacity to supply. We need to recognise that nature is an asset; it needs to be valued and protected. Dasgupta calls for action in reversing the trend of biodiversity loss now, highlighting the co-benefits of this, including addressing climate change and alleviating poverty. The review identifies three broad ambitions:

- We must ensure that our demands on nature do not exceed its supply, and that we increase nature's supply relative to its current level;
- We must change our measures of economic success to guide us on a more sustainable path;
- We must transform our institutions and systems – in particular our finance and education systems – to enable these changes and sustain them for future generations.

Food production is the most significant driver of biodiversity loss and so all of the actions described as part of sustainable food systems section are relevant.

Adaptation to climate change: increasing resilience for a changing climate

"Climate change is landing blow after blow upon humanity and the planet, an onslaught that will only intensify in the coming years even if the world begins to bring down greenhouse gas emissions."

UNEP's Adaptation Gap Report 2022

Increasing resilience to a changing climate: 6 key messages

1. Further warming is now unavoidable and we need to plan and prepare to for the impact of the climatic changes which are now inevitable.
2. Whilst these impacts may be inevitable, adaptation can help to reduce exposure and reduce vulnerability, thus protecting health.
3. Adaptation plans should identify the communities and populations most at risk from the [health] impacts of climate change and seek to increase resilience and reduce risk and vulnerability in these populations.
4. Equity should be embedded in all policies to ensure that adaptation policies do not widen inequalities, and where possible reduce inequalities.
5. Local communities must be part of the solution - they have a powerful voice in ensuring the process of decarbonisation is equitable and empowering for all places. Adaptation is local.
6. Nature based adaptation offers co-benefits, protecting against the impacts of climate change, whilst improving health and wellbeing and providing economic opportunities.

We need to anticipate and prepare for the adverse effects of climate change

Adaptation seeks to reduce the risks posed by climate change. Further warming is now unavoidable and adaptation will be needed to deal with the climatic changes which are now inevitable. The LGA states that '*adaptation is sometimes known as resilience. Adaptation is how we adjust and implement measures to adjust to the changing climate and our response to increasing frequency and severity of weather events. Resilience is the ambition, adaptation is the method.*'

In May 2023 researchers reported that there is now a 66% chance we will pass the 1.5C global warming threshold between now and 2027. The impact of this for our communities in Yorkshire and the Humber means:

- **More heatwaves**
- **More frequent flooding**
- **Declining air quality (exacerbated by extreme heat)**
- **Changing vector profiles and infectious diseases**
- **Disrupted food and drinking water supply chains**
- **Further biodiversity and habitat loss**
- **Migration as a result of displaced populations (nationally and globally)**

We need to prepare for these impacts now.

Whilst these impacts may be inevitable, adaptation can help to reduce exposure and reduce vulnerability, thus protecting health.

The FPH Special Interest Group recommends:

1. Carrying our a climate vulnerability assessment to identify local priorities for action based on need and potential impacts. Understanding of vulnerable populations, locations and services through risk assessment and local intelligence will be needed to inform local actions.
2. Developing an adaptation plan. Adaptation planning is an opportunity to identify and assess available options, including evaluation. There are many tools to support such planning.

Inequalities needs to be at the centre of our adaptation plans.

We know that the ***impacts of climate change will not be distributed equally***; some populations will be at greater risk, particularly in terms of the negative effects on health and adaptation plans should reflect this.

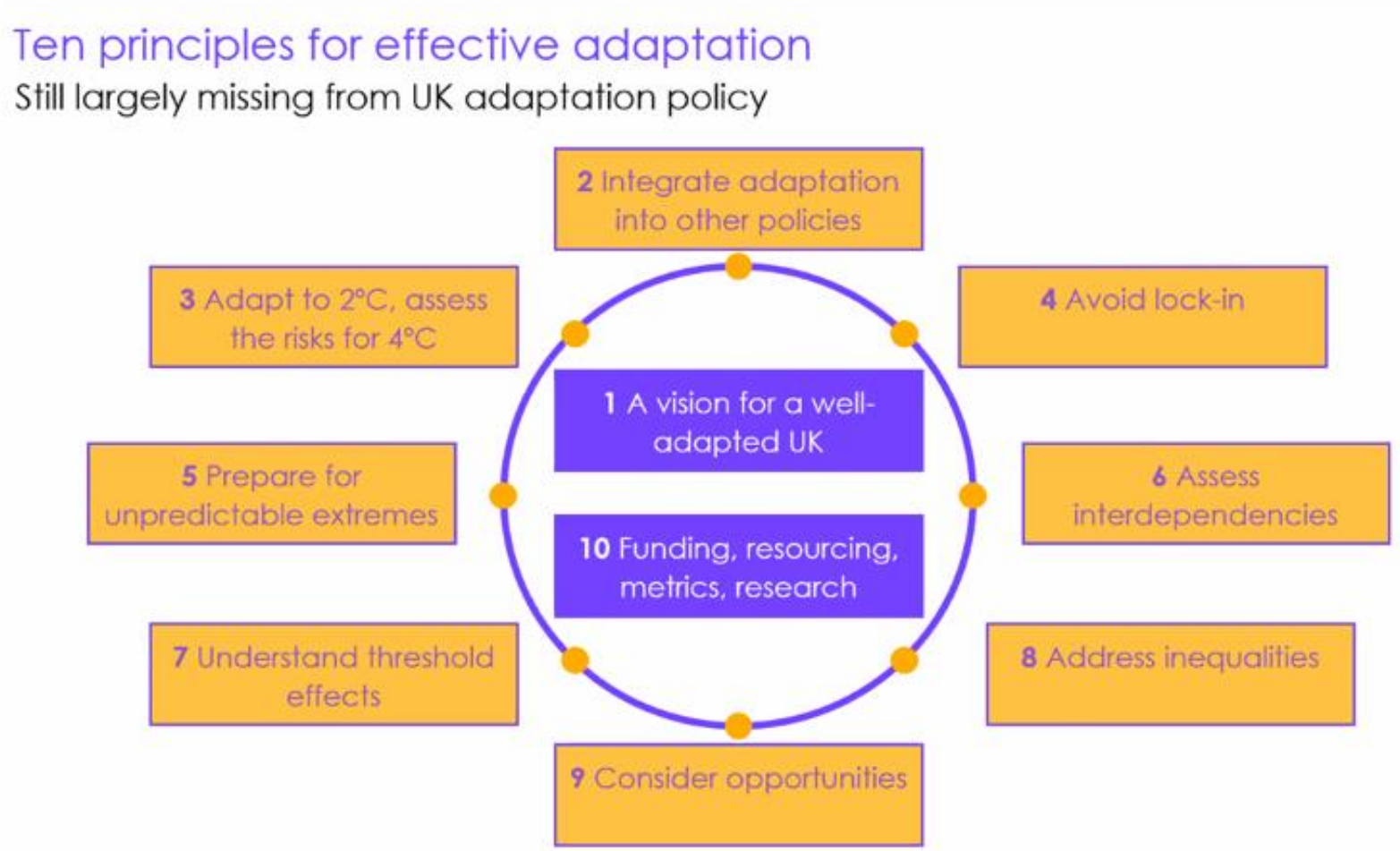
Equity in all policies: there is also a risk that without due consideration and planning at the outset, adaptation policies may widen inequalities. Equity should be considered in all climate mitigation and adaptation policies.

Nature should also be at the centre of our adaptation plans.

Nature-based solutions can contribute to climate change adaptation, but can also help to reverse biodiversity loss, thus benefiting both human and planetary health.

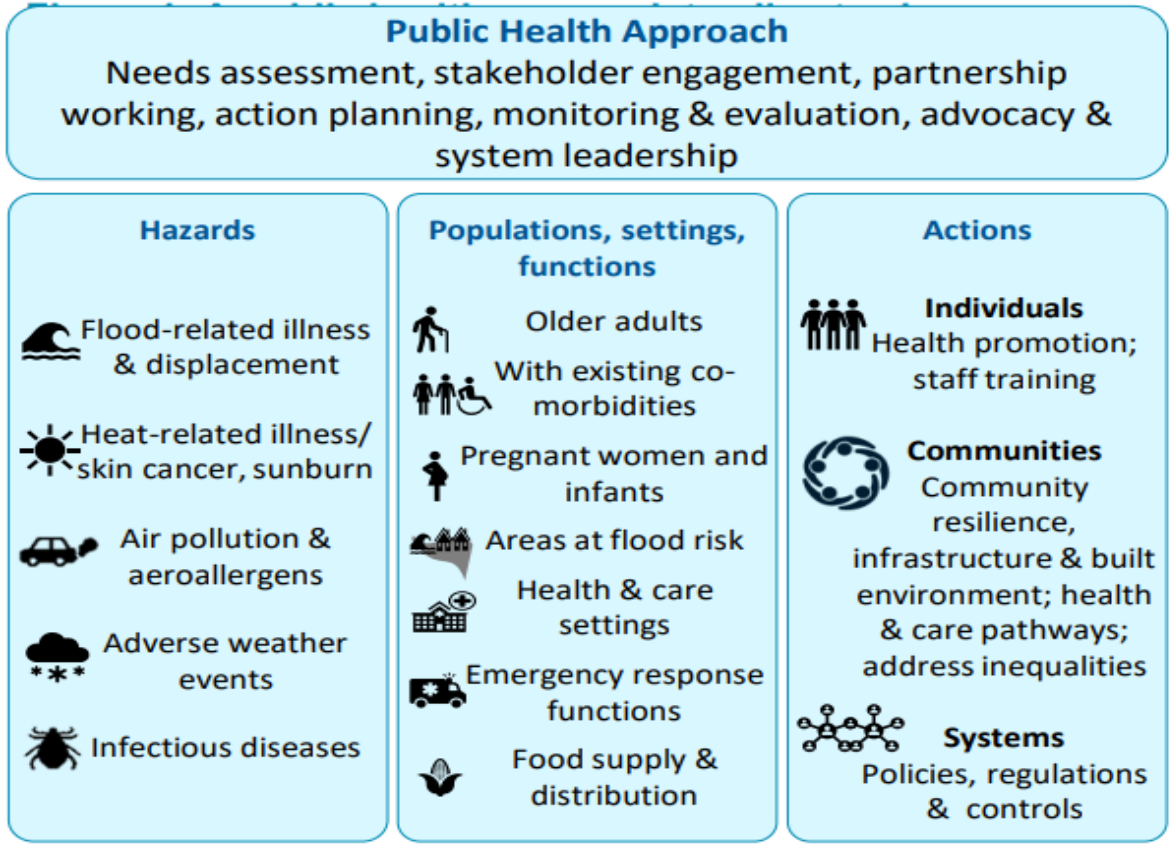
Ecosystem based adaptation is a nature-based solution that harnesses biodiversity and ecosystem services to reduce vulnerability and build resilience to climate change. This report from the University of Oxford, WWF, and other partners, describes the key advantage of such approaches is that they deliver multiple benefits for people and nature. They tackle both the causes and effects of climate change, not only protecting against different climate impacts such as floods and heatwaves, but also storing and sequestering carbon in soils and vegetation, and sometimes enabling reductions in greenhouse gas emissions from other sources such as fertilisers and fossil fuels. They can provide attractive, nature-rich places for recreation, education and interaction with nature, supporting human health and wellbeing, and can provide new business opportunities such as through eco-tourism.

As sea levels rise, saltmarshes, dunes and seagrass meadows are helping to protect against coastal flooding and erosion. Woodlands, hedgerows, heathlands and semi-natural grasslands intercept rainwater, prevent soil erosion and reduce flood risk to communities and infrastructure downstream, while restoring rivers, floodplains and wetlands to their natural functions is slowing the flow of floodwater.



These 10 principles set out the different elements of robust decision making for effective adaptation.

Source: CCC(2021) Independent Assessment of UK Climate Risk



The risks and populations affected shown here are not exhaustive.

Adaptation Sub-Committee's assessment of the top 6 areas of inter-related climate change risks for the UK

The scale and complexity of climate impacts means adaptation presents a significant challenge requiring immediate action. However , the approach needed to tackle these impacts is no different from that of any other public health risk. This visual developed by the Faculty of Public Health sets out a simple framework for taking a public health approach to adaptation.

Source: Faculty of Public Health Special Interest Group

We need to prepare for increased temperatures and more heatwaves

Preparing for increasing temperatures: 6 key messages

1. High temperatures are a threat to health and wellbeing. Severe heat compromises the body's ability to regulate temperature and can disrupt sleep, it impairs cognitive performance and can lead to heat exhaustion and heatstroke.
2. Some people are at *higher risk of the health consequences associated with heat*. This includes people with chronic conditions, children, older people, and people living in built up cities.
3. We need to plan ahead and be prepared for all scenarios that are heat related and understand how we build on the things that make a difference that we can do now and keep people well.
4. We need *climate resilient communities* including more *green spaces and vegetation* to reduce urban heat islands and provide cool places and shade for people.
5. We need to consider *early warning systems*, working with partners across the health and care system to communicate with our communities about the risk of heat.
6. We need to ensure that *heat is considered as part of retrofits*, particularly in the social housing sector, as well as being considered in the design and building of new homes.

We need to prepare for increased temperatures and more heatwaves

As the region’s climate changes, periods of high temperatures will become more common and more intense. 2022 was the UK's warmest year on record with the region experiencing 40° for the first time. We also had excess deaths associated with the heat. We are entering a warming El Nino phase and global and regional temperatures may be even hotter in future years.

As recent heatwaves have demonstrated, high temperatures are a threat to health and wellbeing. Extreme heat can also have an economic impact, reducing our ability to work, particularly for those working outside, undertaking manual work. Proactive adaptation will help to limit overheating and the subsequent health and wellbeing impacts.

As the weather gets hotter, our bodies have to work harder to keep our core temperature down. Severe heat compromises the body's ability to regulate temperature and can disrupt sleep, it impairs cognitive performance and can lead to heat exhaustion and heatstroke. It is associated with increased risk of suicide and hospital admission for mental illness as well as cardiovascular mortality.

Some people are at ***higher risk of the health consequences associated with heat***. This includes people with chronic conditions such as cardiovascular disease, respiratory diseases, diabetes, and hypertension.

Air quality decreases during times of hot temperatures because the heat and sunlight interact with the particulate matter in the air it and increase concentrations of ground level ozone. The health impacts associated with poor air quality also need to be considered in the context of extreme heat.

Drought and extreme heat can also result in more frequent wildfires which will also contribute to declining air quality.

Where people live also matters. Built up urban areas often experience higher temperatures than surrounding areas due to the increased capacity of the roads, building and pavements to absorb and trap heat. This is often known as the ***urban health island effect*** and can see night time temperatures 4-5C higher than surrounding areas. 83% of the population lives in urban areas; with city centre living remaining popular.

While everybody is at risk from the health consequences of heat, there are certain factors that increase an individual's risk during a heatwave. These include:

- **older age: especially those over 75 years old, or those living on their own and who are socially isolated, or those living in a care home**
- **chronic and severe illness: including heart or lung conditions, diabetes, renal insufficiency, Parkinson's disease or severe mental illness**
- **inability to adapt behaviour to keep cool: babies and the very young, having a disability, being bed bound, having Alzheimer's disease**
- **environmental factors and overexposure: living in a top floor flat, being homeless, activities or jobs that are in hot places or outdoors and include high levels of physical exertion.**

Source: UKHSA

We need to prepare for increased temperatures and more heatwaves

Homeless populations are a specific group at greater risk of being hospitalised as temperatures rise and we should not wait for extreme weather conditions before we then take action. They already have very poor health outcomes making the likelihood of any health related conditions worsen. Exposure also increases the risk of dehydration and heatstroke. We must plan now and focus on preventative measures. It is important that homeless populations and those with housing precarity are not overlooked in public health protection measures.

Preparing for and mitigating the health risks associated with increased temperatures

We need to plan ahead and be prepared for all scenarios that are heat related and understand how we build on the things that make a difference that we can do now and keep people well. Planning helps us identify and understand health risks and gaps we need to address. We can't do this alone and good partnership working is crucial. The Adverse Weather and Health Plan (AWHP) outlines key areas where the public sector, independent sector, voluntary sector, health and social care organisations and local communities can work together to maintain and improve integrated arrangements for planning and response to deliver the best outcomes possible during adverse weather.

We need to understand ***who is at risk*** of the health impacts of higher temperatures.

We need to prepare for increased temperatures and more heatwaves

The Local Climate Adaptation Tool can help local areas understand the potential impacts of higher temperatures in their areas, identify which groups are most likely to be negatively impacted and suggest adaptations appropriate to the area. UKHSA has produced guidance to assist professionals in protecting vulnerable people from the health impacts of severe heat.

We need ***climate resilient communities*** including more ***green spaces and vegetation*** to reduce urban heat islands and provide cool places and shade for people. There are many examples of this in the U.K

We need to consider ***early warning systems***, working with partners across the health and care system to communicate with our communities about the risk of heat and how to prepare. UKHSA and the Met Office have developed a tool for the health and care sector.

We need to also provide accessible drinking water in local environments and consider active travel options in times of excessive heat. Walking and cycling during heatwaves are not the best option for most and guidance on best practice must be available for all.

As we adapt our homes to become more energy efficient (retrofitting) we need to ensure that ***heat is considered as part of retrofits***, particularly in the social housing sector, as well as being considered in the design and building of new homes.

We need to prepare for increased temperatures and more heatwaves

Its not just our homes that need to adapt to the heat, but health and care services. Heat monitoring in ***health & social care facilities*** can help avoid or alert to overheating in new and existing buildings and identify areas of concern. Cool spots can be identified within buildings for patients and staff . Health and care staff can be supported to be more aware of signs and symptoms of heat-related illnesses, advice for patients and actions to prevent overheating. Some residential and nursing home building may be too hot for staff and patients and support may be needed to ensure that the risk associated with overheating are mitigated as residents are a vulnerable group for heat related deaths. This also applies to acute and mental health settings.

We need to work with employers and businesses to consider the ***impact of heat on working practices***, particularly for people who work outdoors who may not be able to work outside at times of significantly high temperatures.

House of Commons

Environmental Audit Committee

Heatwaves: adapting to climate change

Ninth Report of Session 2017–19

Report, together with formal minutes relating to the report

Ordered by the House of Commons to be printed 18 July 2018

"The Government's new adaptation plan promises no effective action to prevent overheating in buildings. It must change building regulations and planning policies to ensure homes and transport networks are able to deal with extreme heat, and that local authorities and cities have green spaces and heat resilient infrastructure."

Mary Creagh, MP

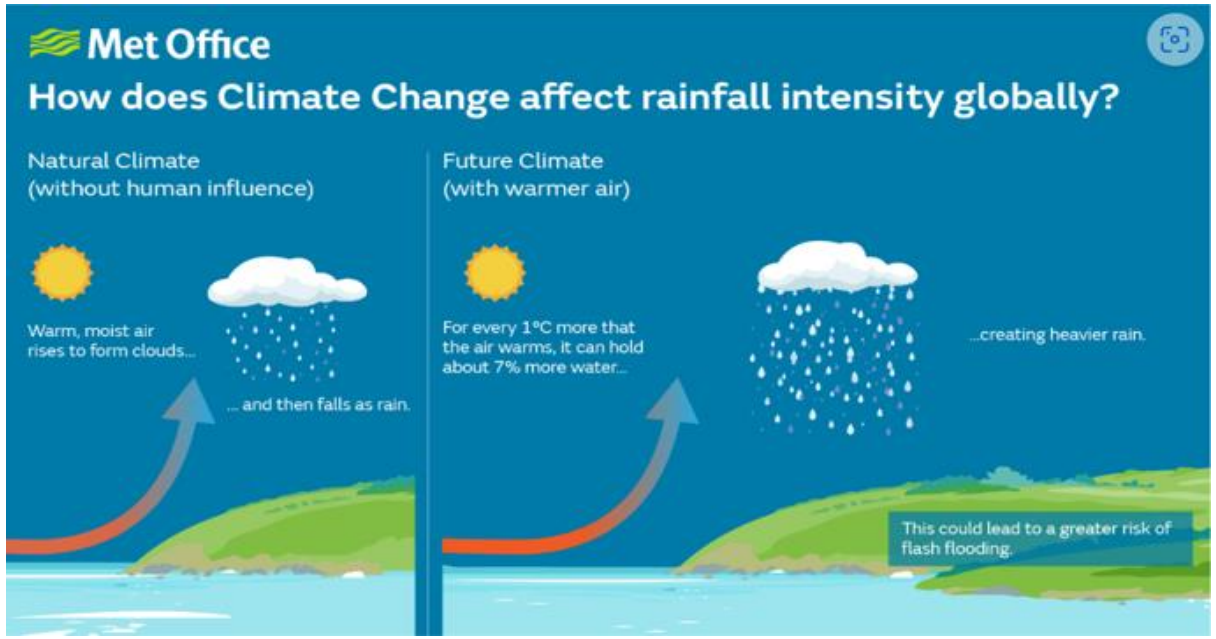
House of Commons Environmental Audit Committee

We need to prepare for periods of extreme rainfall and more flooding

Preparing for extreme rainfall: 6 key messages

1. We are likely to see more frequent and intense rainfall meaning that under all of the climate change scenarios that have been modelled the incidence of flooding is expected to increase.
2. Flooding can disrupt the fabric and functioning of society and can have a long lasting impact on health.
3. Some people are at *higher risk of the health consequences associated with flooding*. This includes people with chronic conditions, children, older people, transient communities, and those living in rental accommodation.
4. We need to protect homes and infrastructure from flooding: whilst flood defences, good spatial planning and sustainable drainage are effective preventative measures, flood protection measures include property flood resilience, preventing flood water entering a property.
5. We need to minimise the impact of flooding on health: a combination of interventions are required to minimise the impact of flooding on health – before, during and for a sustained period after flooding events occur. This should include interventions aimed at *identifying those at highest risk* and most vulnerable to the negative health impacts.
6. Community resilience and social cohesion are recognised protective factors against some of the mental health consequences of flooding.

We need to prepare for periods of extreme rainfall and more flooding



We are likely to see more frequent and intense rainfall meaning that under all of the climate change scenarios that have been modelled the incidence of flooding is expected to increase. Flooding can disrupt the fabric and functioning of society and can have a long lasting impact on health. Short term impacts on health include water shortages and contamination, drowning, electrocution, physical trauma, chemical contamination, fire, carbon monoxide poisoning, and reducing access to health, care and support services. The impact of flooding on mental health and disruption to people's livelihoods and income can be long-lasting. The English National Study of Flooding and Health described significant health effects associated with flooding. This includes long-term detrimental impacts on mental health and general wellbeing. Those experiencing flooding are around six times more likely to experience depression, anxiety and PTSD after one year, and impacts have been shown up to three years later.

UKHSA guidance identifies groups who may be at increased risk of the impacts on mental health and wellbeing following a flood event and should be identified by flood preparedness and response organisations

Older People	May be less likely to receive and respond to flood warnings. Mobility issues may prevent people from leaving their homes
People with pre-existing MH condition	May be more vulnerable to psychological impact of flooding. Personal issues may increase risk e.g. lack of social networks, substance misuse, past trauma.
People with chronic condition	Flooding may worsen or accelerate the deterioration of their health. Flooding may disrupt access to services and medication.
Children	Potential for increased mental and behavioural problems, potentially mediated by disruption of schooling and home life.
People with language and cultural-based vulnerabilities	People who face a language barrier are less likely to receive flood alerts and warnings and, therefore, to be adequately prepared for a flood event.
People who are homeless	May be less aware of flood risk and less able to access services designed to support residents following a flood.
University students	May be less familiar with the local area and therefore, not be signed up to local flood alerts.
Transient communities & people with no connection to a place	People who are not long-term residents of the affected area may not be aware of flood risk in the area and therefore are harder to reach than known residents.
People experiencing temporary vulnerabilities	People who have an illness, injury, have recently been discharged from hospital, are pregnant or have recently had a newborn baby, may face barriers to preparing for or responding to a flood.
People receiving complex healthcare interventions at home	People who are receiving interventions at home such as receiving oxygen, dialysis or palliative care may face barriers to evacuation.
People living in rental accommodation	People living in rental accommodation possibly have a lower income and may lack insurance coverage

We need to prepare for periods of extreme rainfall and more flooding

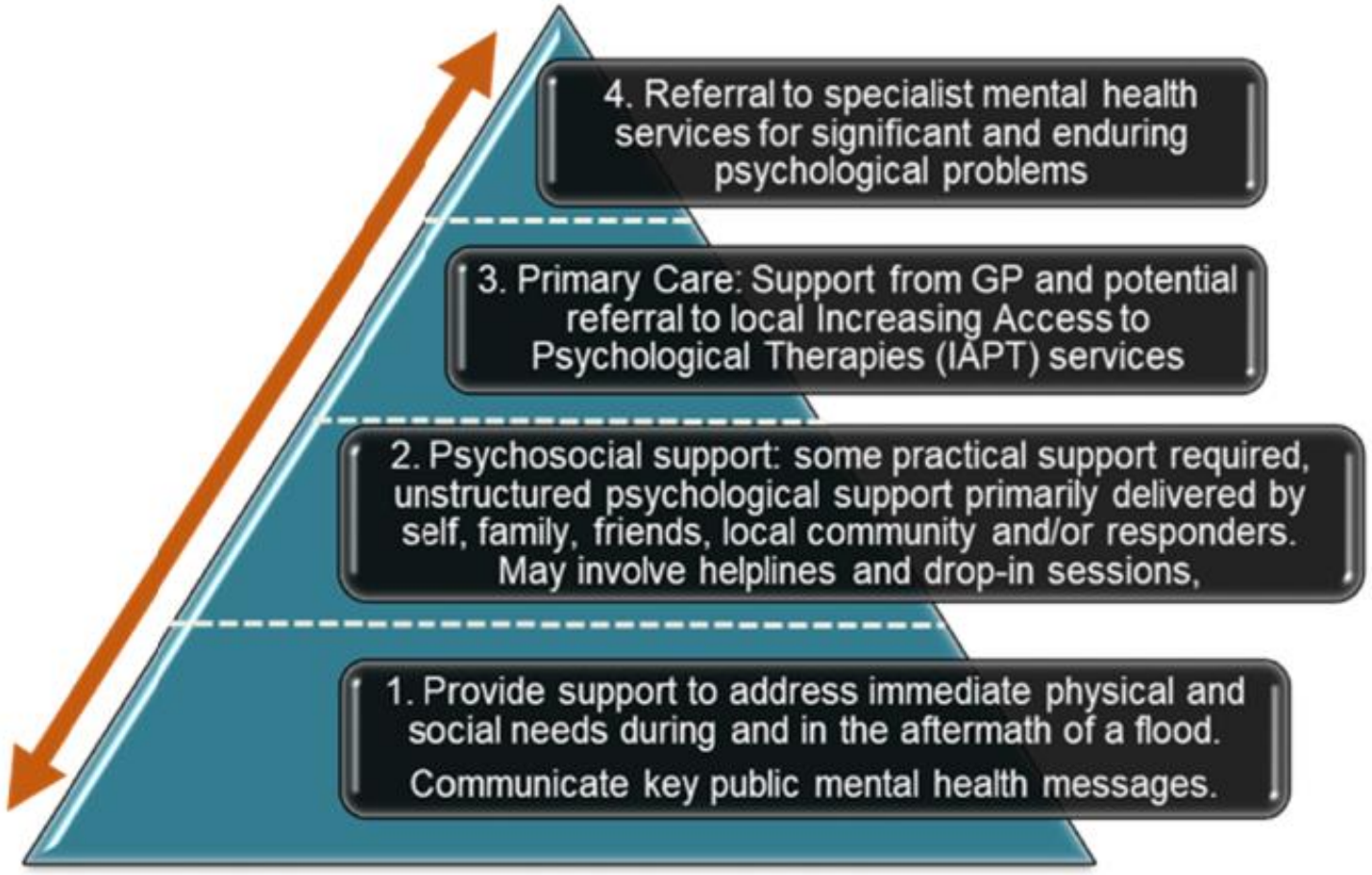
We need to prepare for periods of extreme rainfall and more flooding in the design of our places by adopting flood protection measures. Whilst flood defences, good spatial planning and sustainable drainage are effective preventative measures, flood protection measures include property flood resilience. Prevention of flood water entering a property and minimising the damage to homes is the primary method of prevention of much of the burden of mental ill health. Flood protection measures also include flood resilience and flood recovery.

We need to consider ***early warning systems.*** For people in flood risk areas, the Environment Agency has set up an 'opt-in' process, also known as the Extended Warnings Direct (EWD).

UKHSA guidance suggests that a combination of interventions are required to minimise the impact of flooding on health – before, during and for a sustained period after flooding events occur (preparation, response and recovery) . This should include interventions aimed at ***identifying those at highest risk*** and most vulnerable to the negative health impacts, providing tailored support to individuals who may be disproportionately affected, as well as community-wide action.

Community resilience and social cohesion are recognised protective factors against some of the mental health consequences of flooding. Community action can be fostered as part of preparedness action as well as in the aftermath.

Response: UKHSA advocates for a phased approach; this is based on the principle that support may be required over an extended period and the level of support required may change during that period. Most distress is usually temporary, with the majority of people able to cope with the psychological effects of being flooded by accessing their existing resources. However, a minority of people who are affected by flooding may go on to develop more severe psychological problems.



Source: [UKHSA Flooding and Health]

We need to prepare for disrupted food supplies, price volatility and food insecurity

Preparing for disrupted food supplies: 6 key messages

1. Climate change and biodiversity loss are contributing to food insecurity and are likely to result in greater volatility in domestic food prices.
2. Food insecurity and increased food prices are likely to have a negative impact on health and inequalities.
3. Some communities are at higher risk of experiencing food insecurity than others; people with a limiting disability, people on Universal Credit, households with children and people from Black, Asian and minority ethnic groups are most likely to experience food insecurity.
4. We need to promote health and sustainable food to the public, building community food knowledge, skills and resources.
5. We need to tackle food poverty, diet related ill health and access to healthy food, promoting a vibrant and diverse sustainable food economy.
6. We need to transform catering and food procurement and take action to reduce waste and the ecological footprint of the food system.

We need to prepare for disrupted food supplies and food insecurity

The UK food system is already challenged. 22/23 has seen rapid food price inflation and an increasing number of families facing food insecurity. The Climate Change Committee have identified climate change and biodiversity loss as major contributing factors to food insecurity in the UK and globally. More frequent weather extremes are predicted to cause damage to crops, livestock and fisheries both in the UK and around the world. These weather extremes could damage farming infrastructure, adversely affecting productivity. While the CCC noted increased temperatures might improve yields in the short term for countries in the northern hemisphere, it threatened yields in other parts of the world. The CCC argued climate change was likely to result in greater volatility in domestic food prices, unless the UK was able to adapt to these changes. Estimates suggest that climate change could lead to a 20% (mean) rise in food prices globally by 2050.

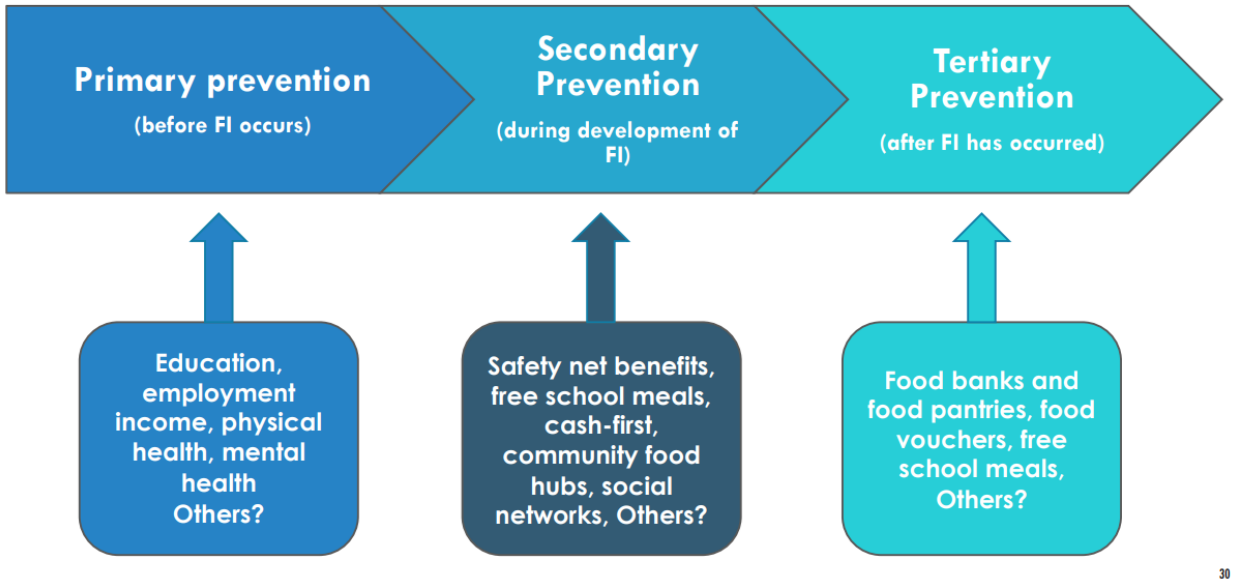
Given that what we eat and how much we eat has a significant impact on health, food insecurity and increased food prices are likely to have a negative impact on health and inequalities.

According to survey data from the Food Foundation over 18% of households in the UK were experiencing food insecurity, a figure that rises to over 25% for households with children (September 2022). Some population groups are at increased risk of experiencing food insecurity. In their surveys the Food Foundation found that people with a limiting disability, people on Universal Credit, households with children and people from Black, Asian and minority ethnic groups were most likely to experience food insecurity.

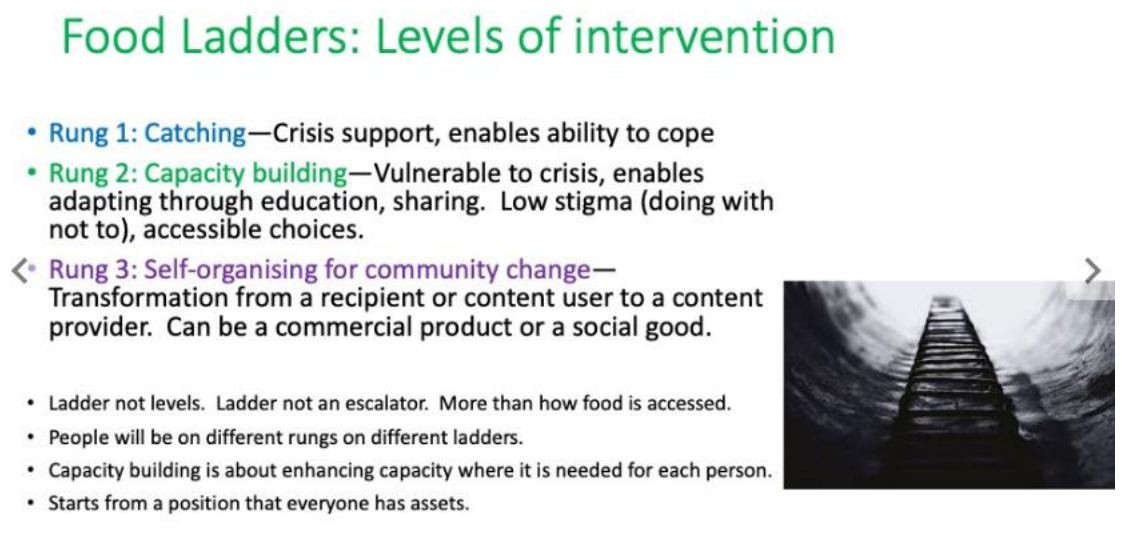
The National Food Strategy sets out clearly the requirements of a sustainable and healthy food system which will not only help to reduce emissions associated with the food system, but adapt to climate change too. The Sustainable Food Cities Framework identifies six key areas of action which can be considered in local places.

- Promoting health and sustainable food to the public
- Tackling food poverty, diet related ill health and access to healthy food
- Building community food knowledge, skills resources and projects
- Promoting a vibrant and diverse sustainable food economy
- Transforming catering and food procurement
- Reducing waste and the ecological footprint of the food system

Protecting the communities at highest risk food insecurity as a result of volatile prices is essential, learning from our experience of the cost of living crisis. Evidence suggests that a range of options that are responsive to local needs and involve the community in their delivery, can be effective at mitigating against some of the negative consequences of food insecurity.



Source: Kristin Bash, FPH Food Special Interest Group Chair



Source: Dr Megan Blake, University of Sheffield

We need to prepare for changing vector patterns and infectious disease

Preparing for changing vector patterns: 6 key messages

1. The distribution of vector such as mosquitoes and ticks is changing across Europe and within the UK; the reasons are complex but climate change plays a key role.
2. Changing vector patterns may see the emergence of diseases transmitted by vectors not previously seen in the UK.
3. In the short term we need to prepare and adapt to the risks posed by changing vector patterns includes developing and establishing surveillance strategies, including citizen science; raising public awareness.
4. Longer term policies will be needed to control any vector borne disease, including vaccine development.
5. An important element in reducing the incidence of vector-borne diseases is behavioural change. This includes helping people know how to protect themselves and their communities from mosquitoes, ticks, bugs, flies and other vectors.
6. Community based approaches will be essential in ensuring all communities have the support and capacity to reduce their risk of exposure to vector borne diseases.

We need to prepare for changing vector patterns and infectious disease

Vector-borne diseases are transmitted by organisms such as ticks and mosquitoes. The distribution of these species is changing across Europe and within the UK. Why this distribution is changing is complex but climate change plays a key role, especially in mosquito distribution. Biodiversity loss is likely to be another contributing factor. Modelling predictions suggest that further climate changes coupled with other factors such as globalisation of trade could increase the UK's susceptibility to some vector borne diseases, although it should be noted that many variables influence vector distribution.

Diseases transmitted by vectors include Lyme disease, Zika, tick borne encephalitis, and malaria, amongst many others. The emergence of mosquito-borne viruses, such as West Nile Virus, is an increasing risk to UK public health due to a warming climate, and we have already seen evidence of this virus in the Netherlands and Germany, and outbreaks in Italy associated with hot spring weather.

Where we see extreme weather and environmental changes that lead to more flooding (and the creation or expansion of wetlands) this affects both the density and distribution of native mosquitoes by providing new habitats for them. But a warming climate could also lead to non-native mosquitoes (such as the tropical species Aedes albopictus which has colonised Europe in recent decades) establishing and then increasing in numbers here in the UK. Ticks are also a public health issue, with Lyme disease already endemic in the UK.

We need to prepare for changing vector patterns and infectious disease

Milder winters and springs will lengthen the periods ticks are active and biting (though it is also the case that warmer summers could limit their activity). Non-native ticks, imported on travelling pets and migratory birds, are now also being found in the UK, particularly associated with heatwave events, and their ability to survive and establish will be enhanced by climate change.

Short term public health action to prepare and adapt to the risks posed by changing vector patterns includes developing and establishing surveillance strategies, including citizen science; raising public awareness. Longer term policies will be needed to control any vector borne disease, including vaccine development.

We do not have a clear picture yet of who is potentially most at risk from vector borne diseases in the UK and how to address vulnerability, prevent inequalities from emerging, and build resilience through community based adaptation. The current burden of vector borne diseases is highest in tropical and subtropical areas; here they disproportionately affect the poorest populations, a pattern which we need to be aware of in the UK. An important element in reducing the incidence of vector-borne diseases is behavioural change. This includes helping people know how to protect themselves and their communities from mosquitoes, ticks, bugs, flies and other vectors. Community based approaches will be essential in ensuring all communities have the support and capacity to reduce their risk of exposure to vector borne diseases.

We need to prepare for changing the way in which we deliver health and care services

We need to prepare for changing the way in which we deliver our services

Health and care system infrastructure and service delivery will be increasingly challenged by the direct and indirect impacts of climate change. This is in the context of an ageing demographic, increasing social care needs, increasing demands on health services and in some cases an ageing health and care estate. The health and care sector must build resilience to prevent disruption to services and manage increasing demand as a result of the expected impacts of climate change.

There may be disruption to supply chains; the supply of medical equipment and medications in a complex international supply chain may be threatened by the increasing frequency of global extreme weather. It may relate to travel disruption as a result of heat or flooding making it difficult for both staff and patients to travel; it may relate to cooling of the health and care estate; or disruption may result from major infrastructure damage (e.g. road networks, energy and IT systems); increased demand on services; or new patterns of disease requiring specialist facilities and workforce to manage.

We need to prepare for changing the way in which we deliver our services

The World Health Organisation describes 10 components for climate resilience health systems which have also be adopted by the Greener NHS. The framework shows the diverse actions that the health and care system must take, including having an adequately informed and trained workforce, to estate planning and management, emergency planning arrangements, understanding inequalities, and using climate and weather information to identify capacity gaps and inform policy and planning decisions.

From an extreme weather perspective UKHSA has developed heat action cards for providers and commissioners linked to the heat health alerts as well as cold weather and flooding.

Climate Resilient Health Systems Framework (WHO)

Taking action: communities at the heart

‘Net zero by 2050 blah blah blah… hope is taking action… hope comes from the people’

Greta Thunberg, 2021

Communities at the heart: 6 key messages

1. Local actions can have impact and reach beyond that of international, national or individual actions.
2. Local communities must be part of the solution; they have a powerful voice in ensuring the process of decarbonisation is equitable and empowering for all places.
3. By unlocking the potential of communities to meaningfully address climate change as it manifests in their lives, we can create an ecosystem of climate action that permits braver policymaking from the top.
4. Climate action is largely shaped by political decision making and more needs to be done to ensure that the voices of our communities is heard. This is perhaps most true for our children and young people, our future generations, who will be most affected by climate change.
5. Young people think that there is a disconnect between climate commitments and climate action. They want to see stronger regulation of the fossil fuel industry and they have criticised the emphasis on personal responsibility as the way to tackle the climate crisis.
6. We need to engage young people in climate policy decisions. This means coproducing engagement strategies with young people to facilitate their meaningful input into climate decisions, and address structural and systemic barriers to political participation.

Net zero cannot be achieved without ambitious government leadership and action (both nationally and globally); however, too often the progress is slower than is needed and is costing us time that we don't have. .

New Local describes how we can '***make the global local***', how local actions can have impact and reach beyond that of international, national or individual actions. Local communities must be part of the solution - they have a powerful voice in ensuring the process of decarbonisation is equitable and empowering for all places.

New Local highlights that '***by focussing on what climate change means for specific places and groups of people, we can begin to shift our view of tackling climate change from a challenge which is overwhelming to something that is more tangible. By unlocking the potential of communities to meaningfully address climate change as it manifests in their lives, we can create an ecosystem of climate action that permits braver policymaking from the top. By thinking locally, we can build an array of small actions that culminate in significant change overall***.'

Responsiveness: Local action can be responsive to conditions on the ground. It can also be flexible as conditions change, in ways that national and international action cannot match.

Legitimacy: Local action has an inherent legitimacy with local people. The transitions that climate change necessitates can be negotiated at this level without creating the pushback that might come from more top-down approaches.

Power over adaptation: Local action is better placed to facilitate adaptation to specific consequences of climate change than national or international actions, because the consequences will be different in every local area.

Community-led action is a powerful force for change. We need to adopt place based approaches to address the climate crisis, recognising that climate change is an opportunity to create new democratic relationships with people and offer a range of routes to participation for our communities.

> **No-one knows for sure what will work, so it is important to build a system that can evolve and adapt rapidly. Decades of research demonstrate that a variety of overlapping policies at city, subnational, national, and international levels is more likely to succeed.**
> – Elinor Ostrom

Source: New Local

Climate action is largely shaped by political decision making and more needs to be done to ensure that the voices of our communities is heard. This is perhaps most true for our children and young people, our future generations, who will be most affected by climate change.

Children have little voice in the shape of their future. Decisions that will affect their lives are taken by parents, local leaders, governments, global economic decision makers, and by commercial interests.

'Even though the climate crisis is a child rights issue that affects children first and worst, children's voices and demands are rarely heard in climate discussions and decisions at all levels.' Save the Children

Research has shown that young people think that there is a disconnect between climate commitments and climate action. They want to see stronger regulation of the fossil fuel industry and they have criticised the emphasis on personal responsibility as the way to tackle the climate crisis. Young people described how governments prioritise corporate interests over planetary health, with current policies permitting harmful fossil fuel industry practices. Young people described how decision-makers have the power to enact strong climate responses, yet young people felt forced to advocate for policy change.

Many of us are becoming increasingly concerned about our changing planet. ***Eco-anxiety*** refers to the chronic fear of environmental breakdown first described in 2017 by the American Psychiatric Association. There is evidence to suggest that eco-anxiety is becoming more common.

There can be an overwhelming feeling of individual hopelessness which has a detrimental impact on our mental wellbeing, with children and young people disproportionately affected.

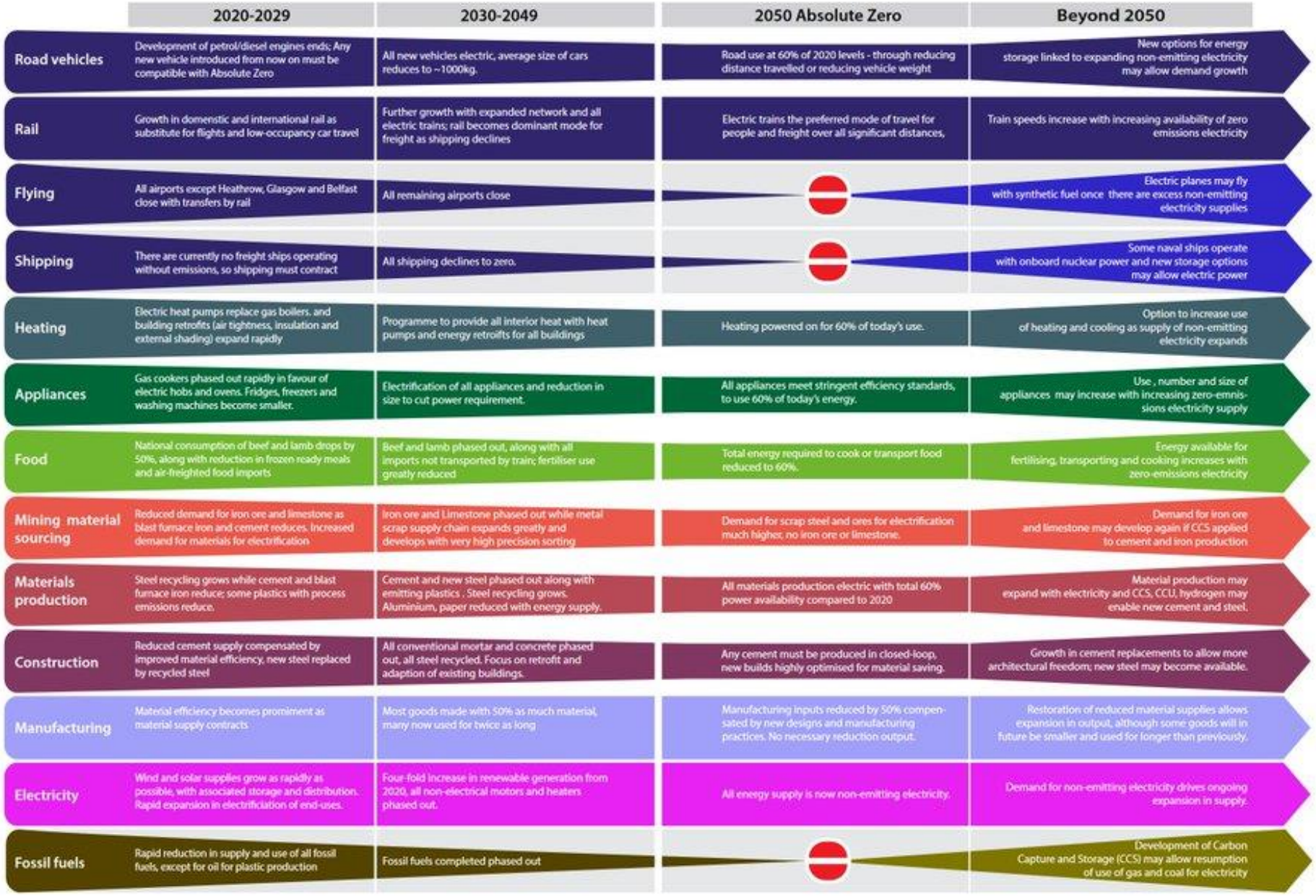
A 2020 survey of child psychiatrists in England found that more than half (57%) are seeing children and young people distressed about the climate crisis and the state of the environment.

We need to ***engage young people in climate policy decisions***. This means coproducing engagement strategies and mechanisms with young people to facilitate their meaningful input into climate decisions, and address structural and systemic barriers to political participation. Promoting meaningful participation of children will also contribute to improved social cohesion, and helps adolescents make a better informed, healthier, and more empowered transition into adulthood.

Research has also shown that children's participation also leads to improved self-esteem and confidence as well as practical and decision making skills, with lasting impacts into adulthood.

Appendix: The Path to Net Zero

What Net Zero means



	2020-2029	2030-2049	2050 Absolute Zero	Beyond 2050
Road vehicles	Development of petrol/diesel engines ends; Any new vehicle introduced from now on must be compatible with Absolute Zero	All new vehicles electric, average size of cars reduces to ~1000kg.	Road use at 60% of 2020 levels - through reducing distance travelled or reducing vehicle weight	New options for energy storage linked to expanding non-emitting electricity may allow demand growth
Rail	Growth in domenstic and international rail as substitute for flights and low-occupancy car travel	Further growth with expanded network and all electric trains; rail becomes dominant mode for freight as shipping declines	Electric trains the preferred mode of travel for people and freight over all significant distances,	Train speeds increase with increasing availability of zero emissions electricity
Flying	All airports except Heathrow, Glasgow and Belfast close with transfers by rail	All remaining airports close		Electric planes may fly with synthetic fuel once there are excess non-emitting electricity supplies
Shipping	There are currently no freight ships operating without emissions, so shipping must contract	All shipping declines to zero.		Some naval ships operate with onboard nuclear power and new storage options may allow electric power
Heating	Electric heat pumps replace gas boilers. and building retrofits (air tightness, insulation and external shading) expand rapidly	Programme to provide all interior heat with heat pumps and energy retrofits for all buildings	Heating powered on for 60% of today's use.	Option to increase use of heating and cooling as supply of non-emitting electricity expands
Appliances	Gas cookers phased out rapidly in favour of electric hobs and ovens. Fridges, freezers and washing machines become smaller.	Electrification of all appliances and reduction in size to cut power requirement.	All appliances meet stringent efficiency standards, to use 60% of today's energy.	Use , number and size of appliances may increase with increasing zero-emnis-sions electricity supply
Food	National consumption of beef and lamb drops by 50%, along with reduction in frozen ready meals and air-freighted food imports	Beef and lamb phased out, along with all imports not transported by train; fertiliser use greatly reduced	Total energy required to cook or transport food reduced to 60%.	Energy available for fertilising, transporting and cooking increases with zero-emissions electricity
Mining material sourcing	Reduced demand for iron ore and limestone as blast furnace iron and cement reduces. Increased demand for materials for electrification	Iron ore and Limestone phased out while metal scrap supply chain expands greatly and develops with very high precision sorting	Demand for scrap steel and ores for electrification much higher, no iron ore or limestone.	Demand for iron ore and limestone may develop again if CCS applied to cement and iron production
Materials production	Steel recycling grows while cement and blast furnace iron reduce; some plastics with process emissions reduce.	Cement and new steel phased out along with emitting plastics . Steel recycling grows. Aluminium, paper reduced with energy supply.	All materials production electric with total 60% power availability compared to 2020	Material production may expand with electricity and CCS, CCU, hydrogen may enable new cement and steel.
Construction	Reduced cement supply compensated by improved material efficiency, new steel replaced by recycled steel	All conventional mortar and concrete phased out, all steel recycled. Focus on retrofit and adaption of existing buildings.	Any cement must be produced in closed-loop, new builds highly optimised for material saving.	Growth in cement replacements to allow more architectural freedom; new steel may become available.
Manufacturing	Material efficiency becomes prominent as material supply contracts	Most goods made with 50% as much material, many now used for twice as long	Manufacturing inputs reduced by 50% compen-sated by new designs and manufacturing practices. No necessary reduction output.	Restoration of reduced material supplies allows expansion in output, although some goods will in future be smaller and used for longer than previously.
Electricity	Wind and solar supplies grow as rapidly as possible, with associated storage and distribution. Rapid expansion in electrification of end-uses.	Four-fold increase in renewable generation from 2020, all non-electrical motors and heaters phased out.	All energy supply is now non-emitting electricity.	Demand for non-emitting electricity drives ongoing expansion in supply.
Fossil fuels	Rapid reduction in supply and use of all fossil fuels, except for oil for plastic production	Fossil fuels completed phased out		Development of Carbon Capture and Storage (CCS) may allow resumption of use of gas and coal for electricity

Source: [UK Fires Project funded by UK Government]

More Information and resources can be found here:

Climate Change and Sustainability Priority ADPHYH Network