Climate Change and Health in Wales:
Views from the public

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This document is available in Welsh.

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Climate Change and Health in Wales: Views from the public

Work to understand and mitigate climate change is gaining momentum in Wales. However, there is a lack of information on population views and behaviours around climate change and health that could feed into efforts to find acceptable and effective solutions. To address this, a national public survey was conducted in Wales in 2021/22. Almost 2,300 residents aged 16 years or over in Wales took part.
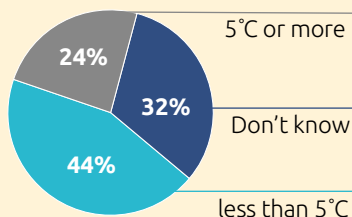
Concerns about climate change

82% fairly or very concerned

Most commonly identified major causes of climate change:
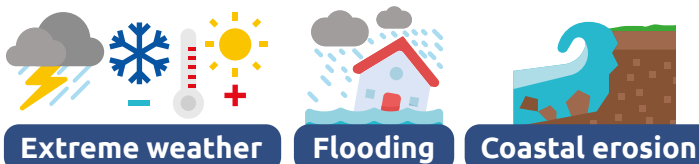
Deforestation

Transport emissions

Perceived impacts of climate change

Views on how much average temperatures will rise in the next 50 years if no action is taken

- 24% 5°C or more
- 32% Don't know
- 44% less than 5°C

61% believe that climate change is already having an impact in Wales, e.g.:

Extreme weather

Flooding

Coastal erosion

56% believe that climate change would have mostly negative effects on population health. Top five concerns:

1. Increased cost of heating a home
2. Increased cost of food
3. Reduced access to health and care services
4. Increased spread of infectious diseases
5. Increased levels of mental ill-health
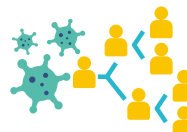
Views on actions to reduce or limit climate change

Views on how much personal influence people think they have on limiting climate change

- 23% None
- 3% Don't know
- 9% A large amount
- 65% Some
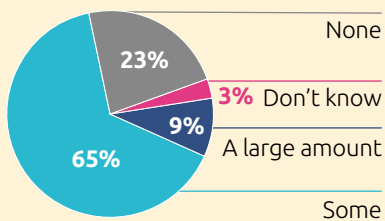
Many people always engage in at least one climate friendly action, e.g.:

88% always recycle

44% always minimise home energy use

38% always try to buy local products

Most popular climate friendly policies:
- Cheaper and more access to renewable energy
- Improving public transport
- Laws to reduce the use of plastic packaging

Least popular climate friendly policies:
- Increasing fuel prices for cars
- Cheaper and more access to nuclear energy
- Reducing taxes for companies protecting the environment

But engagement could be improved, e.g.:

59% never use green energy sources to power their home

46% never avoid or eat less meat or dairy

34% never avoid flying

Some frequently cited ways to encourage climate friendly actions:

Knowing they would help future generations

Seeing big businesses taking action

Knowing they could improve health

Introduction

The sixth and most recent report of the Intergovernmental Panel on Climate Change (IPCC) states that human influence has unequivocally warmed the atmosphere, ocean and land since the mid-1800s[1]. Since the period 1850-1900, global surface temperatures have risen by 1.09°C (2011-2020)[1]. Temperatures are expected to rise further in the longer term, with predicted temperature rises in 2081-2100 ranging from 1.0-1.18°C (lowest emissions scenario) to 3.3-5.7°C (highest emissions scenario) compared to the period 1850-1900[1]. With changes in global temperature influencing climate systems, the frequency and intensity of extreme weather events such as heatwaves, heavy precipitation and droughts is increasing across the globe[1].

In Wales, projections suggest that by 2050, average summer temperatures will have risen by 1.34°C compared to the period 1981-2000 (Box 1)[2]. Estimates from the 2018 UK Climate Projections (UKCP18) predict that by the end of the 21st century in Wales, there is likely to be an increase in: hotter, drier summers; milder, wetter winters; more frequent and intense extreme weather events such as heatwaves and storms; and a rise in sea levels[2]. These changes are likely to impact substantially across Wales, threatening population health, the economy, infrastructure and the natural environment.

Box 1: Projected changes in climate by 2050 in Wales

Average summer temperatures could increase by **1.34°C***.

Rainfall could increase by **5%** in winter and decrease by **16%** in summer*.

Sea levels could rise by around **20cm** or more**.

Adapted from Future Wales[2]. Based on a 1981-2000 baseline.
*Based on a high emissions scenario (RCP 6.0).
**Based on a medium-high emissions scenario (RCP 4.5).

The *Futures for Wales* report sets out that climate change poses risks to health and society within the next two generations including from flooding, drought (with consequences for agriculture, farming and food production), and damage to ecosystems and biodiversity[3]. Evidence from the third UK Climate Change Risk Assessment (CCRA3)[4], along with emerging findings from a comprehensive Health Impact Assessment for climate change conducted by Public Health Wales[5], identifies a wide range of risks to public health, including potential:

- Impacts on physical and mental health and well-being;
- Disruption to transport networks;
- Disruption to education and outdoor sport and play;
- Disruption to the delivery of health and social care services;
- Displacement from home and support networks;
- Disruption of food production and supply.

It is likely that these impacts will disproportionately affect disadvantaged and vulnerable groups, who may have fewer resources or capacity to deal with the consequences of climate change, contributing to, and potentially worsening, existing health inequalities. In Wales, disadvantaged and vulnerable groups include: children and young people, older adults, people on low incomes and people with disabilities and long-term health conditions[5].

Identifying and implementing methods to reduce emissions and increase resilience across Wales will be vital in protecting the future of both environmental and population health. This is enabled through: 1) *The Wellbeing of Future Generations (Wales) Act 2016*, which provides a legal obligation for public bodies to consider future generations in their decision-making, and includes *A Resilient Wales* as one of its seven well-being goals; and 2) The *Environment (Wales) Act 2016* that ensures sustainable management of natural resources. In the national *Stay Well in Wales*[6] survey conducted in 2017, 67% of respondents agreed that companies and individuals should be made to adopt behaviours to reduce climate change. In 2019, a
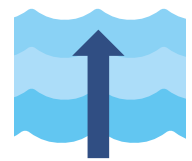
climate emergency was declared in Wales and the first plan to transform Wales into a low carbon nation was published (*Prosperity for All: A Low Carbon Wales*[7]). In October 2021, Welsh Government published *Net Zero Wales: Carbon Budget 2 (2021-2025)*[8]. This second plan sets out 123 policies and proposals that set the foundations for Wales to become net zero[i] by 2050.

Whilst work to understand and mitigate climate change is gaining momentum in Wales, there remains a lack of information on population views and behaviours. Such data are critical for the co-creation of effective and acceptable approaches to climate change that help protect public health; the targeting of key messages and information; and the establishment of long-term solutions across Wales that will continue to be supported across multiple generations. To address this gap, a public survey was developed to seek the population's views about climate change, its relationship with health, their current climate friendly behaviours, their willingness to engage in action, and views on policy solutions. This report presents initial findings from the survey, providing population-level views on climate change among adult residents in Wales.

Methodology

Residents of Wales aged 16 years and over were eligible to take part in the survey (Box 2). To overcome disruption of data collection due to COVID-19, three methods of data collection were necessary. These were face-to-face, telephone and online methods. From October to December 2021, data were collected face-to-face via a nationally representative household survey. A stratified random sample of households was used with lower super output area (LSOA) as the sampling unit, stratified by Health Board area and deprivation quintile (using the Welsh Index of Multiple Deprivation). Selected households were sent an introductory letter prior to data collection, which outlined the survey purpose and content. Households were then visited by trained interviewers and invited to participate, utilising Computer Assisted Personal Interviewer (CAPI) technology to collect responses. Only one individual from each household was eligible to take part. A total of 947 surveys were conducted face-to-face, from a total of 2,298 households with whom contact was made, providing a compliance rate of 41%[ii].

Box 2: About the survey

The survey was developed by Public Health Wales, drawing on questions from existing surveys conducted on climate change in the UK and other countries. Questions covered participant demographics and views on climate change, its potential impact on health, and actions to reduce climate change. The questionnaire was piloted with members of the public and revised for clarity and timeliness before data collection. The survey took approximately 25 minutes to complete and contained mostly closed-ended questions with a limited set of possible answers.

Due to rising cases of COVID-19 in December 2021 and concerns for interviewer and participant safety, methods of data collection were adapted to involve a) telephone and b) online data collection. For telephone surveys, a nationally representative sample of landline and mobile numbers for residents of Wales was used with LSOA as the sampling unit stratified by Health Board area and deprivation quintile. Randomly selected residents were called up to five times to invite them to participate in the survey. A total of 620 telephone interviews were conducted between January and February 2022, from a total of 3,536 residents invited to take part, providing a compliance rate of 18%.

The online survey was disseminated to a nationally representative sample of residents of Wales, stratified by age and gender, using an online panel (individuals who are paid to take part in online surveys) accessed through a commercial provider. Those wishing to participate completed the survey online in their own time. A total of 702 surveys were obtained online. It was not possible to calculate a compliance rate for online surveys. Across all data collection methods, 2,269 completed surveys were obtained (Box 3).

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i   This means that the greenhouse gases taken from the atmosphere are in balance with the greenhouse gases emitted.

ii   The compliance rate has been calculated as the number of completed surveys divided by the number of people answering the door/telephone and being invited to take part in the survey.

Box 3: Total number of respondents

2,269 total

947 Face-to-face

620 Telephone

702 Online

Data sources were merged and analysed using SPSS V24. Box 4 presents a summary of participant demographics (see Appendix for a detailed breakdown). Data were weighted on gender, age group and deprivation quintile to achieve a more accurate representation of the Welsh population.

Box 4: Who responded?

Gender

55% female

Age group

- 16–29: 11%
- 30–49: 26%
- 50–69: 37%
- 70+: 26%

Highest education level

- Secondary: 26%
- College/6th form: 22%
- Higher education/University: 34%
- Professional/work-related: 9%
- None: 8%
- Other: 1%

Employment status

- Employed or self employed: 48%
- Student: 2%
- Unemployed: 4%
- Long term sick/disabled: 5%
- Retired: 36%
- Other: 4%

Area type

70% live in an urban area

Ethnicity

96% white ethnicity

Findings

Views about climate change

Participants were asked about their concerns about, and perceived causes of, climate change.
- The majority (82%) of participants were fairly or very concerned about climate change, although 1% did not believe in climate change, and 1% did not know what climate change was (Figure 1).
- Just under half (49%) thought human activity was the biggest contributor to climate change and another 45% believed that it was an equal mix of human activity and natural processes (Figure 2).
- Destruction of forests/cutting down trees and transport emissions, e.g. from planes and cars, were most commonly identified as major causes of climate change (Figure 3).

Figure 1: How concerned are you about climate change, which is sometimes referred to as global warming? Percentage of participants answering each response.

Main reasons for not believing in climate change
"Weather changes are part of a natural cycle"
"There is not enough evidence to say climate change is happening"
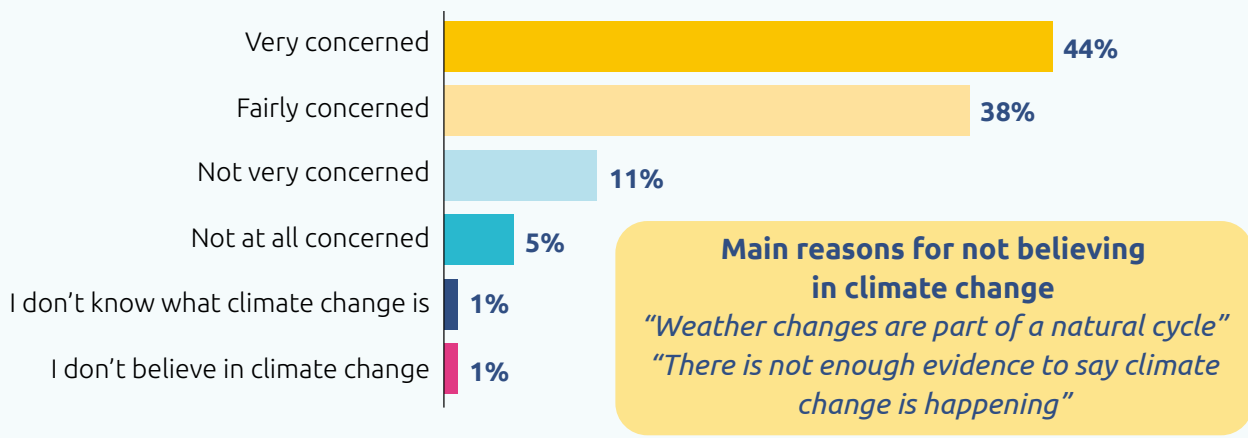
Figure 2: Which of these do you think contributes most to climate change? Percentage of participants answering each response.
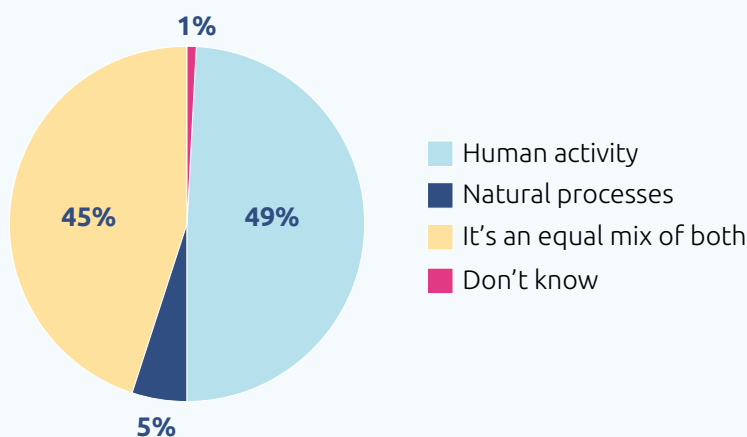
The sixth assessment report of the IPCC[1] states that **human influence on the climate is unequivocal**. Human activity is the leading cause of climate change.

Figure 3: In general, how big a part, if any, do you think the following play in causing climate change? Percentage of participants answering each response.

	A lot	A little	None	Don't know
Destruction of forests/cutting down trees	83%	12%	2%	2%
Transport emissions from planes, cars, etc	79%	18%	2%	1%
Mass production and use of clothing, household and luxury goods	60%	30%	4%	5%
Household use of gas, electric and other fuels	58%	36%	3%	2%
Farming meat and dairy products	32%	48%	13%	7%
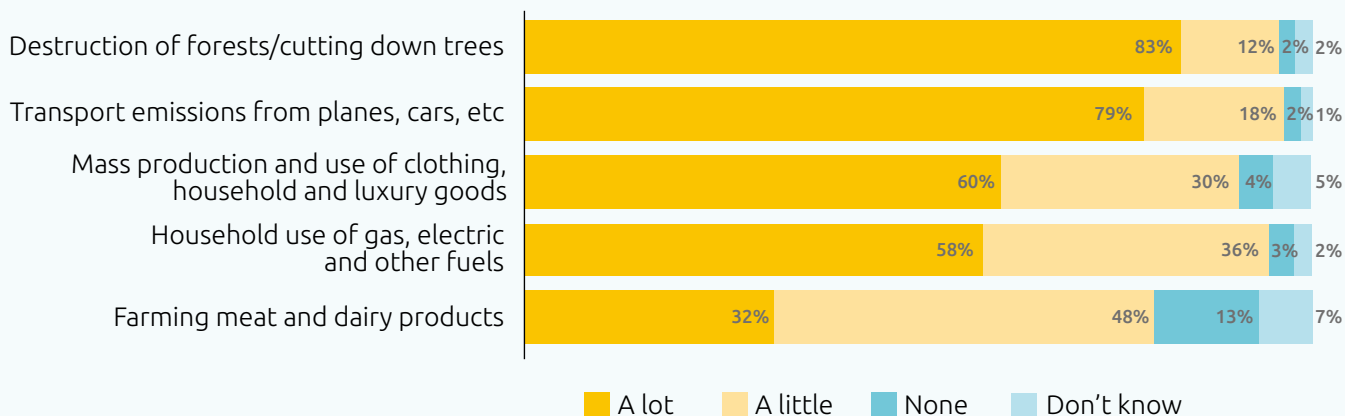
Whilst our categories cannot be matched exactly, the IPCC has estimated how much each sector contributes to the emission of greenhouse gases[9]. **Electricity and heat production** (including, but not limited to household use) is estimated to account for 25% of emissions; **agriculture, forestry and other land use** for 24% (including deforestation and farming); **industry** for 21% and **transportation** for 14%. A separate study estimated that global greenhouse gas emissions from animal-based foods such as meat and dairy are twice those of plant-based foods[10].

The perceived impacts of climate change

Participants were asked for their opinions on the impacts of climate change on global temperatures, and on the impacts of climate change in Wales that they are most concerned about.

- Almost a third (32%) of participants did not know how much average global temperatures would rise in the next 50 years if no action was taken. Of those that answered, 24% thought that temperatures would rise by 5°C or more (Figure 4).

- Six in ten (61%) people believed that climate change is already having an impact in Wales. Around one in ten (13%) believed that climate change is not yet having an impact but would do in their lifetime, and one in five (21%) that climate change would only have an impact for future generations (Figure 5).

- The most often cited impacts of climate change already occurring in Wales were extreme weather such as storms, flooding, and coastal erosion due to rising sea levels (Figure 6).

- Over half of people (56%) thought that the effects of climate change on the health of people in Wales would be mostly negative, whilst 29% thought they would be equally positive and negative and 8% only positive (Figure 7).

- Participants were asked whether climate change would increase, have no impact on, or reduce a range of health and social factors in Wales. The cost of food and insurance costs were most frequently cited as likely to increase. Access to health and care services and opportunities for outdoor activities were most frequently cited as likely to reduce (Figure 8).

- The most frequently cited concerns about the impact of climate change were the cost of heating a home (cited by 18%), the cost of food (14%), access to health and care services (14%) and the spread of infectious diseases (12%) (Figure 9).

Figure 4: If no action is taken, by how many degrees do you think average temperatures will rise within the next 50 years? Responses* have been categorised. Percentage of respondents that fall into each of the calculated categories.

>10°C — 5%
6–10°C — 8%
5°C — 11%
4°C — 5%
3°C — 10%
2°C — 16%
1°C — 5%
I don't think they will increase — 8%
I don't know — 32%

24% thought that temperatures would rise by 5°C or more
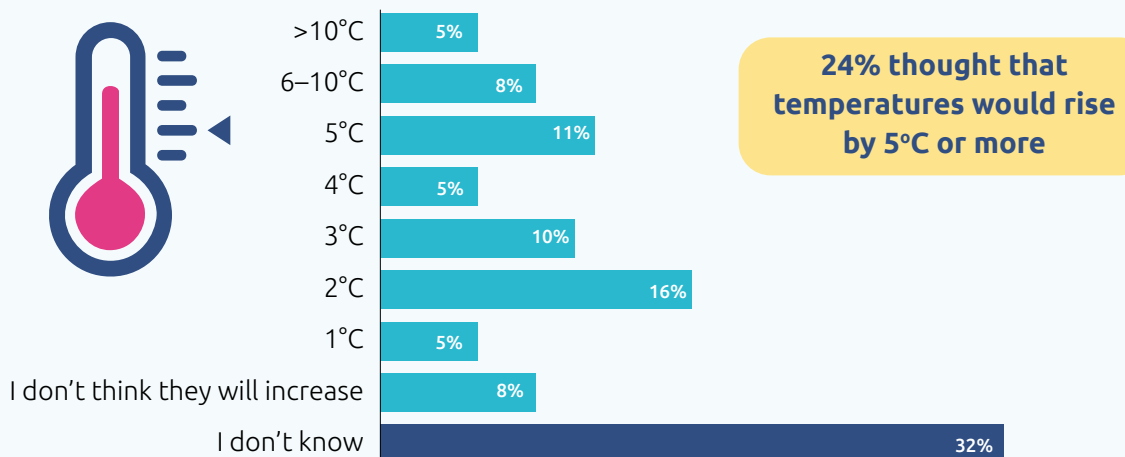
* This question was open-ended. Participants could provide answers in either Celsius or Fahrenheit. All answers have been converted to Celsius for analysis.

The sixth assessment report from the IPCC bases global temperature rise predictions on multiple scenarios with varying greenhouse gas and CO_2 emission levels[1]. Compared to the period 1995-2014, long-term temperature rise estimates for 2081-2100 for the **highest emissions scenario*** range from **2.45–4.85°C**. This is in contrast to the lowest emissions scenario** which ranges from 0.15 – 0.95°C.

*SSP5-8.5; very high greenhouse gas emissions and CO_2 emissions that double current levels by 2050.
**SSP1-1.9; very low greenhouse gas emissions and CO_2 emissions declining to net zero around/after 2050.

Figure 5: Which of these describes your views about the impact of climate change in Wales?
Percentage of participants answering each response.

Climate change…

…is already having an impact	61%
…is not yet having an impact, but will do in my lifetime	13%
…will only have an impact for future generations	21%
…will never have an impact in Wales	3%
Don't know	3%
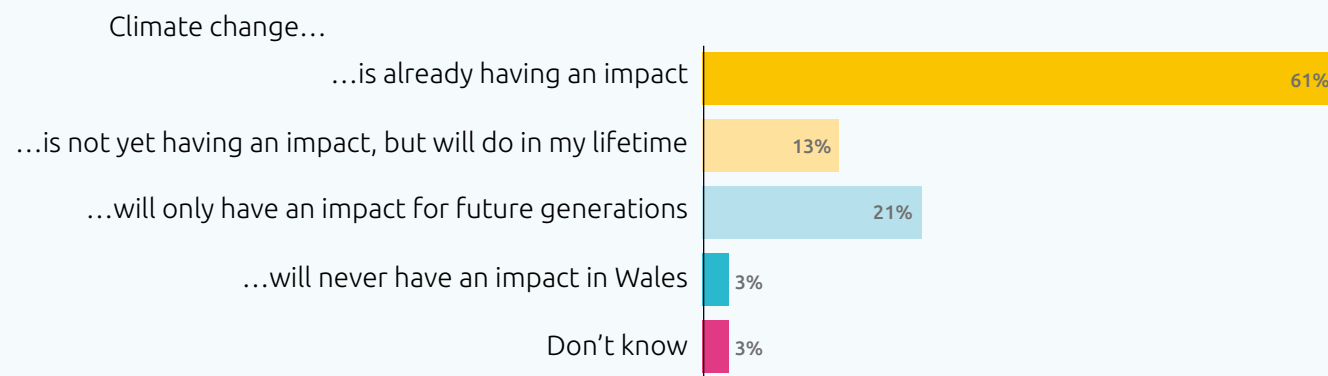
The 2018 UK climate projections (UKCP18) indicate that **climate change is already having an impact** in the UK, including in Wales. Average temperatures for the period 2009-2018 were 0.3°C higher than those in 1981-2010, and 0.9°C higher than those in 1961-1990[11]. Between 2009 and 2018, UK winters were 5% wetter than those from 1981-2010 and 12% wetter than those from 1961-1990[11]. Since the early 1900s, the average UK sea level has risen by approximately 17cm[11].

Figure 6: Which of these do you think are currently occurring or likely to occur in Wales in the future as a result of climate change? Percentage of participants providing each response.
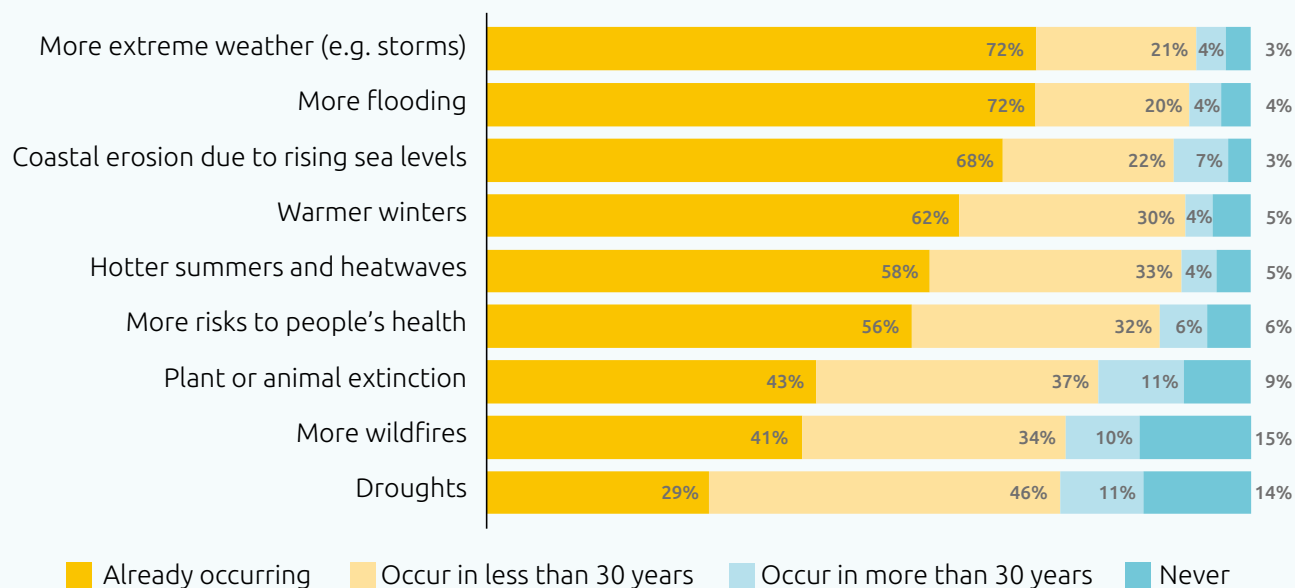
	Already occurring	Occur in less than 30 years	Occur in more than 30 years	Never
More extreme weather (e.g. storms)	72%	21%	4%	3%
More flooding	72%	20%	4%	4%
Coastal erosion due to rising sea levels	68%	22%	7%	3%
Warmer winters	62%	30%	4%	5%
Hotter summers and heatwaves	58%	33%	4%	5%
More risks to people's health	56%	32%	6%	6%
Plant or animal extinction	43%	37%	11%	9%
More wildfires	41%	34%	10%	15%
Droughts	29%	46%	11%	14%

■ Already occurring ■ Occur in less than 30 years ■ Occur in more than 30 years ■ Never

Estimates from the 2018 UK Climate Projections (UKCP18) predict that by the end of the 21st century in Wales, there is likely to be an increase in: **hotter, drier summers**; **milder, wetter winters**; more **frequent and intense extreme weather events** such as heatwaves and storms; and a **rise in sea levels**[2]. Rising sea levels and more frequent storms mean that risk of **coastal erosion** and **flooding** is likely to also increase, whilst hotter and drier summers will increase the risk of **droughts**[2]. A range of **risks to people's health** in Wales have been identified[5], including increased risks of poorer physical health and decreased mental well-being. The State of Nature, 2019 report identifies that 15% of wildlife species in Great Britain are now **threatened with extinction** and 2% are already **extinct**, due in part to climate change and rising temperatures[12].

Figure 7: How positive or negative do you think the effects of climate change will be on the health of people in Wales? Percentage of participants answering each response.

- Mostly negative — 56%
- Equally positive and negative — 29%
- Mostly positive — 8%
- Don't know — 7%
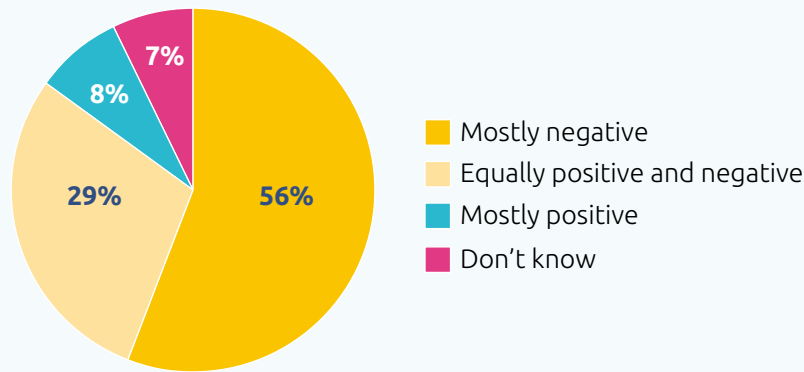
Figure 8: In Wales, do you think climate change will increase, reduce or have no impact on the following? Percentage of participants providing each response
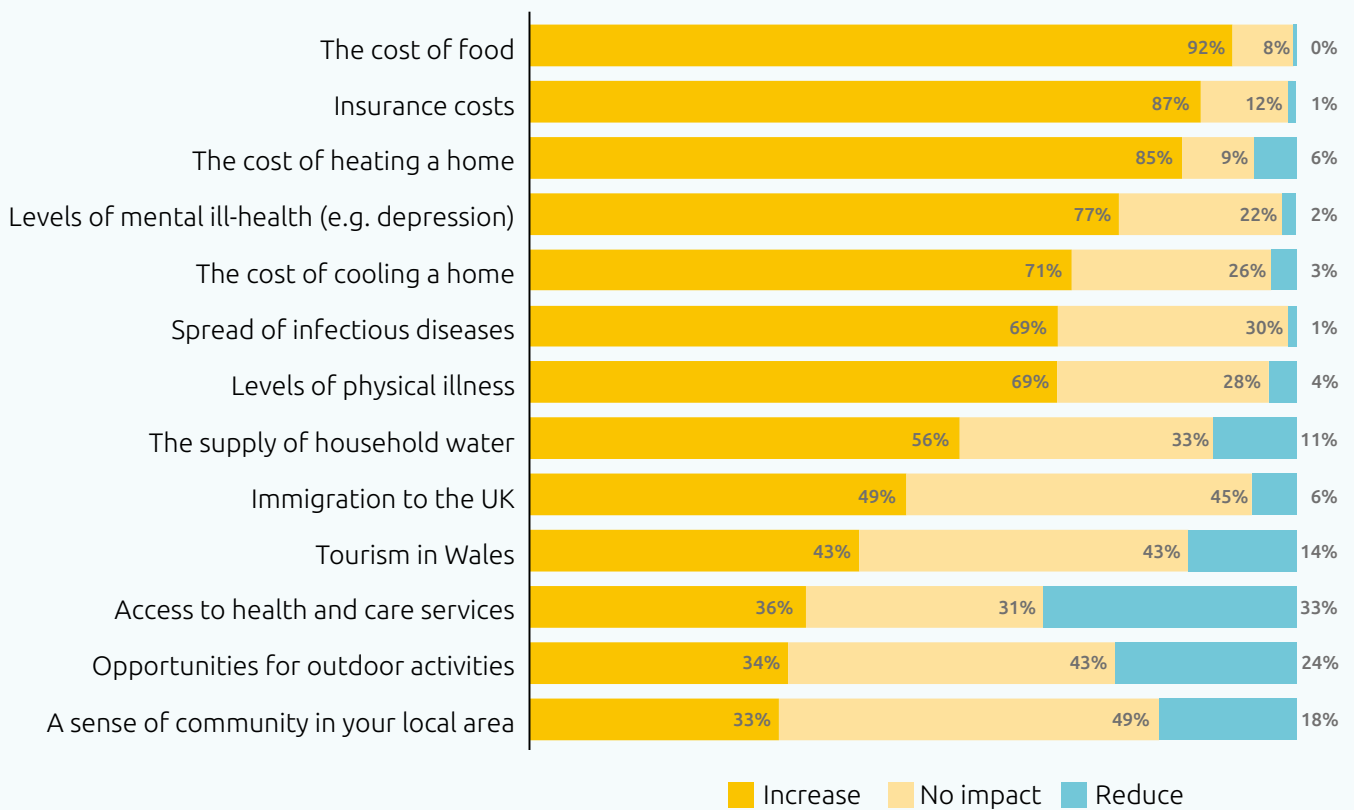
	Increase	No impact	Reduce
The cost of food	92%	8%	0%
Insurance costs	87%	12%	1%
The cost of heating a home	85%	9%	6%
Levels of mental ill-health (e.g. depression)	77%	22%	2%
The cost of cooling a home	71%	26%	3%
Spread of infectious diseases	69%	30%	1%
Levels of physical illness	69%	28%	4%
The supply of household water	56%	33%	11%
Immigration to the UK	49%	45%	6%
Tourism in Wales	43%	43%	14%
Access to health and care services	36%	31%	33%
Opportunities for outdoor activities	34%	43%	24%
A sense of community in your local area	33%	49%	18%

Evidence from the third UK Climate Change Risk Assessment (CCRA3)[4], along with emerging findings from a comprehensive Health Impact Assessment for climate change conducted by Public Health Wales[5], suggests that there is the potential for an increase in Wales for: **food costs; mental ill-health; new and emerging diseases; physical illness** such as heat-related deaths and respiratory conditions; **disruption to health and care services; tourism;** and **opportunities for outdoor activities**. There is also the potential for a reduction in: the **costs of heating a home**, the **supply of household water**, and **physical illnesses** such as cold-related deaths.

Figure 9: Which of these potential impacts of climate change in Wales are you most concerned about? Percentage of participants selecting each impact (participants could select one option only).

Impact	Percentage
The cost of heating a home	18%
The cost of food	14%
Access to health and care services	14%
Spread of infectious diseases	12%
Levels of mental ill-health (e.g. depression)	11%
Levels of physical illness	11%
Immigration to the UK	4%
The supply of household water	3%
Insurance costs	2%
The cost of cooling a home	1%
Opportunities for outdoor activities	1%
Tourism in Wales	1%
A sense of community in your local area	<1%
None of these	5%
Don't know	4%

Figure 10: Have you experienced any of the following in the last five years? Percentage of participants responding 'yes' to each experience.

| Experience	Percentage
Flooding in my home	4%
Flooding in my local area	47%
Travel disruption due to extreme weather	55%
Ill-health caused by extreme weather	20%
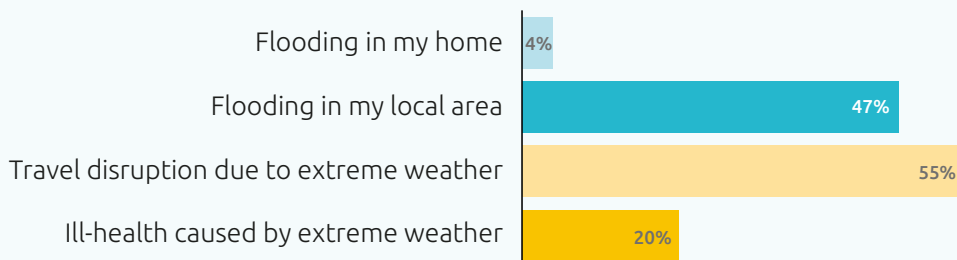
Over two thirds (68%) of people had experienced at least one of these effects.

Actions to reduce or limit climate change

Participants were asked about any climate friendly actions they engaged in, their willingness to engage more in these actions, and their opinions on policy options for the future.

- Only 9% of people thought they could have a large personal influence on climate change. Two thirds (65%) thought they could have some influence and 23% thought they could have no influence (Figure 11).

- Only 4% of participants were involved in local programmes to protect the environment, although 13% were occasionally involved and 40% would be interested in getting involved (Figure 12).

- The most commonly cited climate friendly action was recycling glass, paper and plastic (98% of people always or sometimes do this). The least commonly cited action was using green energy sources to power the home (40% always or sometimes do this) (Figure 13).

- A large proportion of participants would consider doing more climate friendly actions in the future, such as using brands/companies that invest in protecting the environment (59%, but 21% always do this anyway) or avoiding buying goods/products with unnecessary packaging (54%, but 33% always do this anyway). However, some options were not as popular; 41% would not be willing to avoid/eat less meat or dairy (only 12% always do this anyway) (Figure 14).

- The most frequently cited reason for encouraging people to adopt or engage in climate friendly actions was knowing they would help future generations (Figure 15).

- Over 70% of people strongly agreed that big businesses needed to do more to help people change their behaviour, whilst just under a third (31%) strongly agreed that it was their individual responsibility to do something about climate change (Figure 16).

- The most popular policies to help reduce climate change were cheaper and more access to renewable energy from solar, wind and sea power; improving public transport; and laws to reduce the use of plastic packaging. Over six in ten people (63% for each) strongly agreed with these policy options (Figure 17).

Figure 11: How much influence, if any, do you think you personally can have on limiting climate change? Percentage of participants providing each response

- A large influence
- Some influence
- No influence
- Don't know
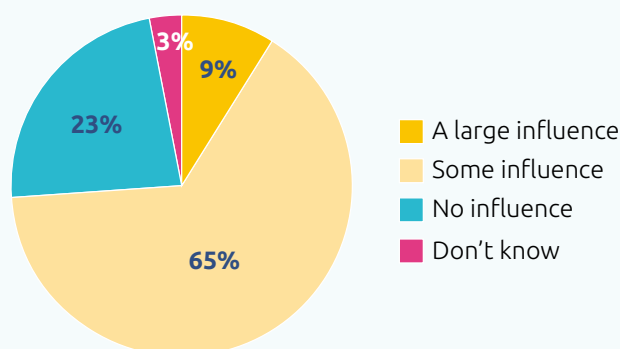
Evidence from the Faculty of Public Health suggests that **individual actions do make a difference**. The four most effective actions for individuals to take to reduce their greenhouse gas emissions are: 1. Having fewer children; 2. Going car free; 3. Eating a plant-based diet; 4. Avoiding air travel. Collectively these actions can result in systemic change[13].

Figure 12: Are you involved in any local programmes to protect the environment and help reduce climate change? Percentage of participants providing each response

- Yes, on a regular basis — 4%
- Yes, occasionally — 13%
- No, but would be interested — 40%
- No, and would not be interested — 43%
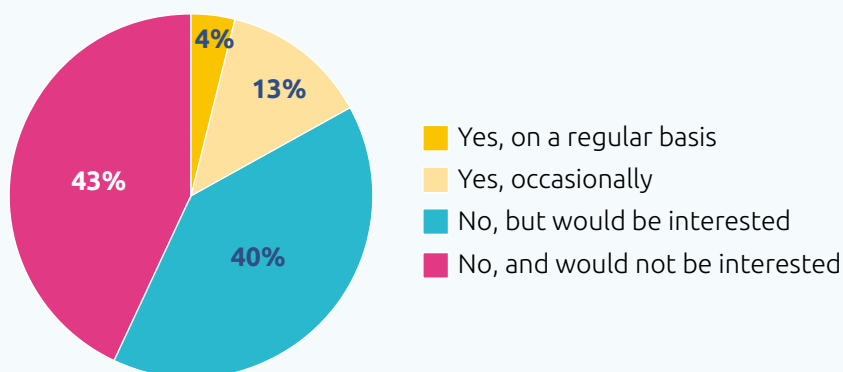
Figure 13: Thinking about your current everyday life, do you do any of these things that may help reduce climate change? Percentage of participants providing each response

	Yes, always	Yes, sometimes	No, never	Not applicable
Recycle glass, paper and plastic	88%	10%	2%	0%
Minimise energy use at home	44%	44%	12%	0%
Try to buy local products	38%	48%	14%	0%
Avoid buying food/products with unnecessary packaging	33%	48%	19%	0%
Avoid buying new goods (e.g. buy second hand/mend)	22%	52%	25%	0%
Use brands/companies that invest in protecting the environment	21%	51%	27%	0%
Use green energy sources* to power your home	20%	20%	59%	1%
Walk, cycle or use public transport	20%	48%	27%	5%
Avoid flying	20%	29%	34%	18%
Avoid/eat less meat or dairy products	12%	40%	46%	2%

* Such as solar panels, wind turbines or a green energy supplier.

Figure 14: Which of these climate friendly behaviours would be something you would consider doing, or doing more of in the future? Percentage of participants answering each response

Behaviour	I always do this anyway	Yes	No	Not applicable
Recycle glass, paper and plastic	88%	10%	2%	0%
Minimise energy use at home	44%	44%	12%	0%
Try to buy local products	38%	51%	11%	0%
Avoid buying food/products with unnecessary packaging	33%	54%	12%	0%
Avoid buying new goods (e.g. buy second hand/mend)	22%	50%	28%	0%
Use brands/companies that invest in protecting the environment	21%	59%	19%	0%
Use green energy sources* to power your home	20%	53%	26%	1%
Walk, cycle or use public transport	20%	51%	24%	5%
Avoid flying	20%	26%	36%	18%
Avoid/eat less meat or dairy products	12%	44%	41%	2%

* Such as solar panels, wind turbines or a green energy supplier.

Figure 15: How important would the following be in encouraging you to adopt or increase climate friendly actions? Percentage of participants providing each response

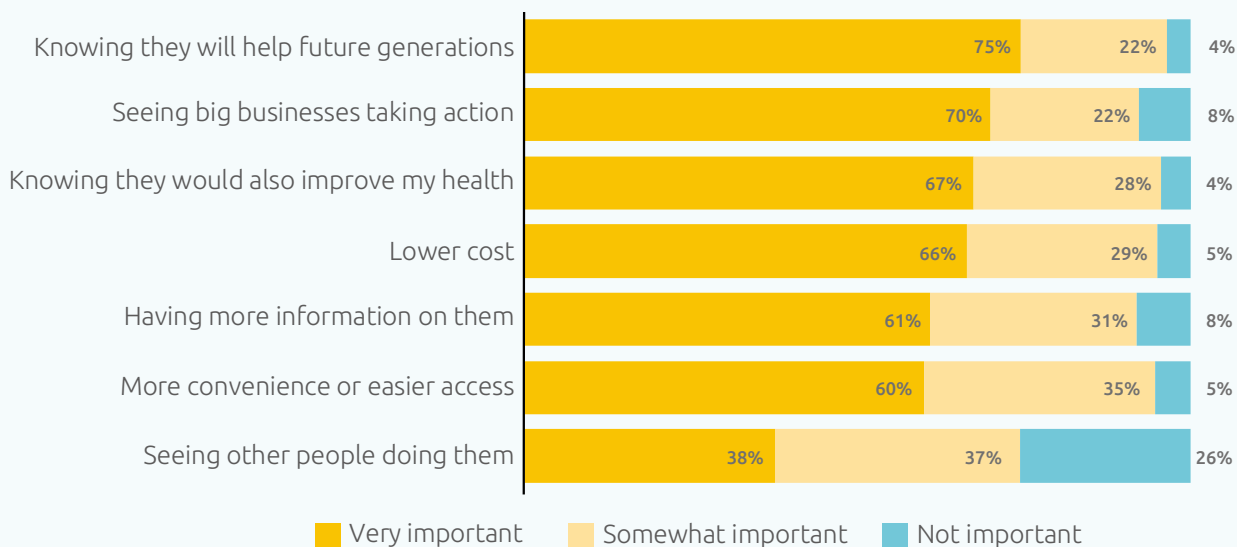| Factor	Very important	Somewhat important	Not important
Knowing they will help future generations	75%	22%	4%
Seeing big businesses taking action	70%	22%	8%
Knowing they would also improve my health	67%	28%	4%
Lower cost	66%	29%	5%
Having more information on them	61%	31%	8%
More convenience or easier access	60%	35%	5%
Seeing other people doing them	38%	37%	26%

Figure 16: How much do you agree or disagree with the following statements? Percentage of participants providing each response

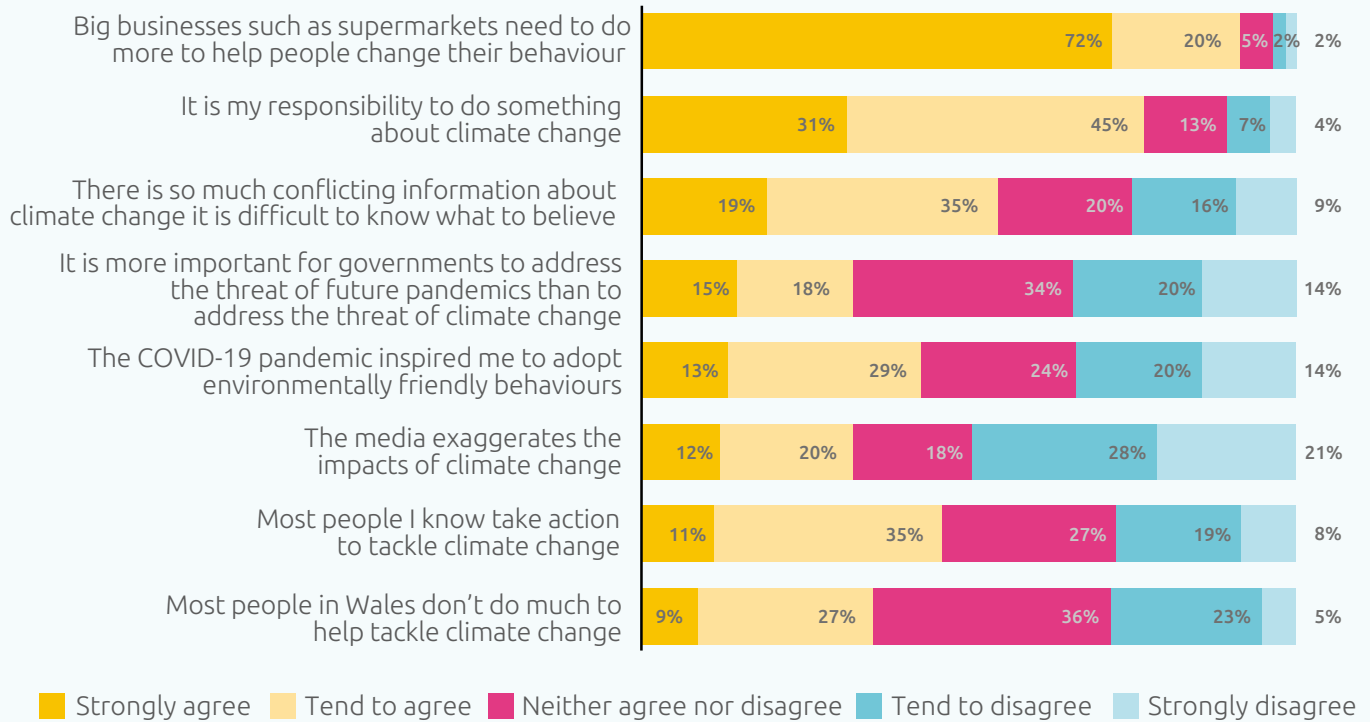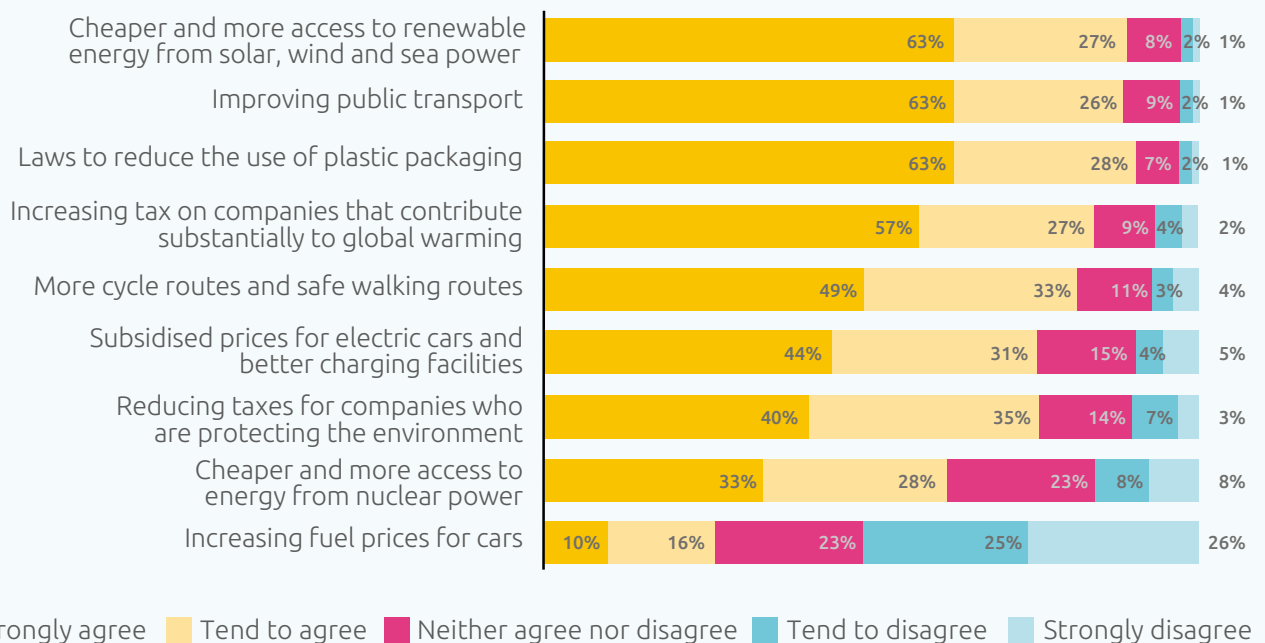| Statement	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree
Big businesses such as supermarkets need to do more to help people change their behaviour	72%	20%	5%	2%	2%
It is my responsibility to do something about climate change	31%	45%	13%	7%	4%
There is so much conflicting information about climate change it is difficult to know what to believe	19%	35%	20%	16%	9%
It is more important for governments to address the threat of future pandemics than to address the threat of climate change	15%	18%	34%	20%	14%
The COVID-19 pandemic inspired me to adopt environmentally friendly behaviours	13%	29%	24%	20%	14%
The media exaggerates the impacts of climate change	12%	20%	18%	28%	21%
Most people I know take action to tackle climate change	11%	35%	27%	19%	8%
Most people in Wales don't do much to help tackle climate change	9%	27%	36%	23%	5%

Figure 17: To what extent would you agree or disagree with the following policies? Percentage of participants providing each response

Policy	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree
Cheaper and more access to renewable energy from solar, wind and sea power	63%	27%	8%	2%	1%
Improving public transport	63%	26%	9%	2%	1%
Laws to reduce the use of plastic packaging	63%	28%	7%	2%	1%
Increasing tax on companies that contribute substantially to global warming	57%	27%	9%	4%	2%
More cycle routes and safe walking routes	49%	33%	11%	3%	4%
Subsidised prices for electric cars and better charging facilities	44%	31%	15%	4%	5%
Reducing taxes for companies who are protecting the environment	40%	35%	14%	7%	3%
Cheaper and more access to energy from nuclear power	33%	28%	23%	8%	8%
Increasing fuel prices for cars	10%	16%	23%	25%	26%

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Conclusions

Evidence is unequivocal that climate change is occurring. In Wales, increasing temperatures pose significant risks to health and society now and in the future from heatwaves, storms, flooding, drought (with consequences for agriculture, farming and food production), and damage to ecosystems and biodiversity. With policies and proposals in place across Wales to reduce greenhouse gas emissions, and plans for adapting to climate change, there is much valuable work already underway that will help to protect both the environment and future generations in Wales. Previous research has identified the potential public health risks of climate change in Wales, which will aid our ability to mitigate its impacts. This survey with adult residents in Wales contributes to this work by developing greater understanding of the perceived impacts of climate change, as well as highlighting public knowledge and understanding of climate change, concerns for the future, climate friendly behaviours and public acceptance of different policy options. These data are critical for: the co-creation of effective and acceptable approaches to climate change that help protect public health; the targeting of key messages and information; and the establishment of long-term solutions across Wales that will continue to be supported across multiple generations.

There are a number of positive and encouraging findings to take away from this survey, with many people in Wales both concerned about climate change and engaged in some form of action to help. A large proportion are also willing to engage further in action to mitigate climate change. For instance:

- The vast majority (82%) of the Welsh public were concerned about climate change;
- Around 60% of people thought that climate change was already having an impact in Wales, therefore appreciating the immediacy of the issue;
- Although only a small percentage of people (4%) were regularly involved in local programmes to protect the environment, 13% were occasionally involved and a further 40% would be interested in getting involved;
- Around a third of participants (31%) strongly agreed that it was their responsibility to do something about climate change and a further 45% tended to agree;
- The majority of people were regularly engaging in at least one climate friendly action. However, the most frequently cited action was recycling (88%). Far fewer were regularly engaged in other actions, ranging from 44% for minimising energy use at home to 12% for avoiding or eating less meat or dairy products;
- A high percentage of people said they would consider doing more climate friendly actions in the future. Excluding recycling, this ranged from 26% for avoiding flying (20% always did this anyway) to 59% for using brands or companies that invested in protecting the environment (21% always did this anyway).

However, work to engage people in climate friendly attitudes and actions is a journey, and there is still a long way to go. For instance:

- Almost a quarter of people (23%) believe that they can have no personal influence on climate change;
- Aside from recycling, the percentage of people never engaging in particular climate friendly actions ranged from 59% (using green energy sources to power the home) to 12% (minimising energy use at home).
- Aside from recycling, the percentage of people saying they would not consider doing, or doing more of, a particular climate friendly action ranged from 41% (avoiding or eating less meat or dairy products) to 11% (trying to buy more local products).

The survey findings highlight potential areas for future action. These include:

The need for clear and trusted information

Over half of participants (54%) agreed with the statement that *there is so much conflicting information about climate change it is difficult to know what to believe*, whilst around a third of people (32%) agreed with the statement that *the media exaggerates the impact of climate change*. Furthermore, almost a third of participants (32%) were not able to estimate how much average global temperatures may rise in the next 50 years. These answers suggest a need for clear and trusted information on climate change, its potential impacts and what this may mean for Wales to help promote greater knowledge of and action on climate change. Importantly, around a quarter of participants (24%) estimated that temperatures would increase by 5°C or more over the next 50 years, which is likely to be an overestimation of temperature rise. This could mean that, without context on the impacts of a small rise in temperature, the use of lower, scientifically modelled estimates in public information may reduce people's perceptions of climate change risk (i.e. they may become more relaxed about climate change if modelled temperature rises are lower than they expected).

Addressing public concerns about climate change

The cost of heating a home and the cost of food were two of the most frequently cited concerns about the future impacts of climate change. These concerns may in part reflect recent rising costs of gas and electricity[14], and food[15] in the UK. Rises in temperature may offer opportunities to reduce the cost of heating a home in the winter months[5] but may also have the potential to increase costs of cooling a home in the summer months. Health and well-being were also important concerns, including physical illness, mental ill-health and the spread of infectious diseases. Addressing these concerns about climate change within plans for mitigation/adaption, and within future media reporting on climate change, will be helpful.

Shifting beliefs about personal influence and responsibility for action

Only 9% of people thought they could have a large personal influence on climate change, while 23% of people thought they could have no influence at all. This is an important finding since it can relate directly to how much people see the benefit of engaging in climate friendly actions and are willing to engage in those actions. Furthermore, there was a notable gap in beliefs about who is responsible for taking action on climate change; although a third of participants (31%) strongly agreed that it was their responsibility to do something about climate change, a much larger percentage (72%) strongly agreed that big businesses needed to do more to help people change their behaviour. Helping people to appreciate how their individual actions can contribute to a much larger, societal effort towards climate change could be useful in shifting beliefs about the importance of individual contributions and personal responsibility. Highlighting practical ways in which individuals can make a difference on a larger scale could also be helpful (e.g. writing to your Member of Parliament / local councillor to request change).

A focus on actions that are most likely to have an impact

Although the majority of people report that they regularly recycle, the number of people regularly engaging in behaviours that could have most impact, such as avoiding flying, eating less meat and dairy, and walking or using public transport instead of a car[13] are far lower, and the least frequently cited regular actions. Substantial proportions of people report *never* doing these actions, or report being unwilling to consider doing/doing more of these actions in the future. Improving population adoption of the most impactful behaviours is vital. Greater knowledge on the causes of climate change, and on the climate friendly actions that can have most affect, could help to encourage regular climate friendly behaviours in addition to recycling.

Increasing motivators for action

Around four in ten people strongly or somewhat agreed that the COVID-19 pandemic had inspired them to adopt environmentally friendly behaviours. In the UK, reduced travelling, home working, and other restrictions in place during the COVID-19 pandemic in 2020 resulted in a reduction in household greenhouse gas emissions[16], and reduced levels of certain air pollutants[17]. In terms of motivating future change, *knowing that they will help future generations*, and *seeing big businesses taking action* were most often cited as being very important for encouraging their adoption. *Lower cost* and *knowing that they would improve my health* were also frequently cited. Climate friendly actions often have health and other co-benefits (Box 5) that could be emphasised in public messaging on climate friendly actions to increase motivation for change.

Box 5: Some health and wider benefits of climate friendly behaviours

- **Reducing car journeys** by switching to alternative forms of active transport such as walking and cycling can help to reduce local air pollution, improve physical and mental health[18], and reduce the risks of diseases such as cardiovascular disease[19].
- **Improving the energy efficiency of the home** e.g. through increasing insulation, draught proofing, and double glazing, can help to minimise energy use, reduce the costs of heating a home, and reduce exposure to cold and damp living environments that are associated with health problems such as cold-related deaths, asthma and bronchitis[18].
- **Reducing the quantity of red meat and dairy products**, and increasing consumption of (wholegrain) cereals, fruit and vegetables (i.e. having a low-carbon diet) can help to reduce an individual's intake of saturated fat and subsequent risks of obesity and type 2 diabetes[18]. Reduced red and processed meat intake could also reduce the risk of coronary heart disease and colorectal cancer[20].

The need for practical advice

Many people reported that they would be interested in increasing their engagement in climate friendly actions: four in ten people would be interested in getting involved in local programmes to protect the environment, and many would consider doing more climate friendly actions in the future (between 10% and 59% for the various actions enquired about), with the most frequently cited action being *using brands and companies that invest in protecting the environment*. Providing practical information about local programmes to protect the environment, how to get involved, and how to take more climate friendly actions (e.g. how to find out whether a company

invests in the environment) may be a useful step in encouraging people to take up further action. Sharing real-life, inspiring stories of how members of local communities have made changes to their lives and environments, could also help to encourage their adoption.

Utilising windows of opportunities for shifting attitudes

Around 60% of people thought that climate change was already having an impact in Wales, and the most frequent environmental impacts cited as already occurring were *more extreme weather* and *more flooding*. Wales has seen much recent disruption due to storms and floods. Survey data suggested that 4% of people had experienced flooding in their home within the last five years and another 47% had experienced flooding in their local area. These environmental incidents may offer opportunities to sensitively shift attitudes around climate change, helping people recognise the immediacy of climate change effects and encourage greater climate friendly actions in the future.

Future areas of research

This report presents initial findings from a survey of adult residents in Wales on their perceptions of climate change. These findings can feed into the development of effective and acceptable approaches to climate change in Wales. Further analysis will be carried out to identify differences in knowledge, opinions and actions across different demographic groups. For instance, it will be possible to determine whether awareness of and concern for climate change differs by age group or residential level of deprivation. This will help to build a more detailed picture of public understanding and opinion, as well as help identify whether targeted messages or interventions are needed. In particular, it would be useful to identify those sectors of the population that are not concerned about climate change, not engaging in climate friendly actions, and not willing to engage more in the future. Further research could aim to identify any barriers to engagement. The findings presented in this report can also act as a baseline for future climate change surveys, helping to identify any shifts in public perception over time.

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Appendix: A breakdown of demographic data

A Welsh population breakdown has been included where available for comparison.

Demographic		Climate change Survey	Welsh population
Gender[a]	Male	45.2%	48.9%
	Female	54.6%	51.1%
	Transgender	0.1%	-
	Other	0.1%	-
	Prefer not to say	<0.1%	-
Age group[a]	16-29	10.7%	21.2%
	30-49	26.0%	28.7%
	50-69	36.9%	31.3%
	70+	26.1%	18.7%
	Prefer not to say	0.4%	-
Ethnicity[b]	White	95.9%	95.0%
	Asian or Asian British	1.7%	2.3%
	Black/African/Carribbean/Black British	0.5%	0.9%
	Mixed ethnicity	1.2%	0.9%
	Other ethnicity	0.4%	0.8%
	Prefer not to say	0.3%	-
Deprivation (IMD) quintile[c]	1 (most deprived)	19.4%	18.7%
	2	20.5%	19.5%
	3	21.0%	20.9%
	4	19.0%	20.7%
	5 (least deprived)	20.0%	20.2%
Urban/Rural	Rural	30.0%	
	Urban	70.0%	
Highest qualification	Secondary school or equivalent qualifications – level 2	26.0%	
	College/Sixth form or equivalent qualifications - level 3	21.5%	
	Higher education/University qualifications – level 4+	34.6%	
	Professional/work-related qualifications	9.2%	
	None	8.1%	
	Other	0.6%	
Employment status	Employed full-time (35+ hours per week)	30.7%	
	Employed part-time (up to 34 hours per week)	11.1%	
	Self-employed	5.9%	
	Unemployed	4.1%	
	Student	2.4%	
	Long-term sick or disabled	5.2%	
	Retired	36.5%	
	Carer, including those not working for domestic reasons	3.5%	
	Other (please specify)	0.7%	

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