

Article

Climate change insights, health and well-being, UK: May 2023

Quarterly publication bringing together the latest climate change-related statistics and analysis from a range of sources.

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Notice

1 June 2023

We have made a slight amendment to Section 3 under the sub-heading "UK greenhouse gas emissions on a residence basis" to clarify that health sector emissions figures are produced on a territorial basis, but that 2021 figures are not yet available.

The previous version read, "While health breakdowns are not available from territorial emissions statistics produced by the Department for Energy Security and Net Zero, they are from Office for National Statistics (ONS) residence-based emissions statistics."

Table of contents

1. [Main points](#)
2. [Moving to net zero \(attitudes and behaviours\)](#)
3. [Emissions and drivers](#)
4. [State of the climate in the UK](#)
5. [Impacts and signs of adaptation](#)
6. [Climate change insights data](#)
7. [Glossary](#)
8. [Data sources and quality](#)
9. [Related links](#)
10. [Cite this article](#)

1 . Main points

- Almost two-thirds (64%) of adults in Great Britain said they were worried (somewhat or very) about the impact of climate change in the past 12 months.
- Of those who said they were worried, around three-quarters (74%) said that they were concerned about the impact on future generations; this was highest among those aged 70 years and over (83%).
- The most recent decade, 2013 to 2022, has seen an increase of 26% in the annual average number of summer days and a 16% decrease in icing days (days where the air temperature does not go above freezing) in the UK compared with the 1991 to 2020 average.
- There were 3,271 excess deaths in England and Wales during the five heat-periods between June and August 2022.
- Greenhouse gas emissions, on a residence basis, from the UK's human health and social work sector have fallen by 11% between 1990 and 2021.

This is the fifth edition of Climate change insights, bringing together UK official statistics. This quarter's theme is health and well-being.

We publish this alongside an update to our [Quality of life in the UK](#) bulletin and [quarterly gross domestic product \(GDP\)](#) figures, as part of our continued commitment to [measuring progress across the UK beyond GDP](#).

2 . Moving to net zero (attitudes and behaviours)

Concern about climate change

The latest estimates from our Opinions and Lifestyle Survey (OPN) from 5 April to 1 May 2023 show that in the past 12 months, 64% of adults in Great Britain said they were somewhat or very worried about the impact of climate change.

This figure was higher among adults in London (75%) and lower in the North East (53%). Adults living in the most deprived areas of England were less likely to be worried (54%). Women were more likely to be worried about climate change than men: almost 7 in 10 women (68%) compared with 6 in 10 men (60%).

Of those who reported being somewhat or very worried about the impact of climate change, around three-quarters (74%) said they were most concerned about the impact on future generations (Figure 1). This was highest among those aged 70 years and over (83%). Other common worries among those expressing concern included:

- the loss of natural habitats or wildlife (73%)
- changes to energy and food supplies (68%)
- the direct impact of extreme weather events or rising sea levels on other people (63%)

Adults in Great Britain who did not say they were somewhat or very worried about the impact of climate change were asked why they were not worried. The most common reason given was that there are other more urgent priorities to worry about, with over half (55%) of respondents reporting this.

Some 64% of adults in Great Britain have taken action to help tackle climate change in the past 12 months. Among these, the most common actions were making changes to shopping habits (40%) and travel (31%). People aged 30 to 49 years were more likely to make changes to their shopping habits, while those aged 70 years and over were less likely to do so. Over a third (36%) of adults had not taken any such actions.

Data from the OPN covering issues of concern to the public are updated fortnightly in our [Public opinions and social trends series](#), and include thematic data on opinions and behaviours around climate change on an ad hoc basis.

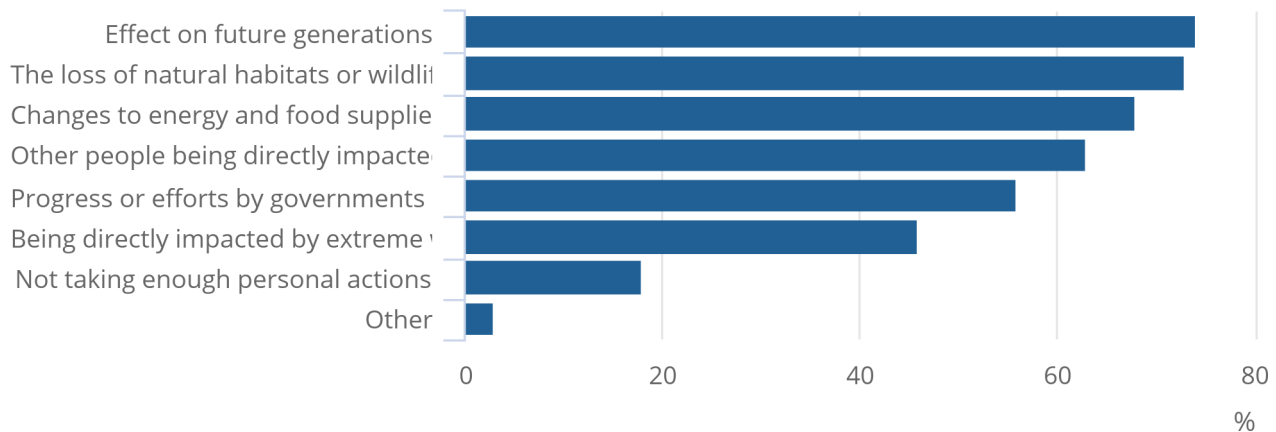
We have previously asked similar questions in the OPN about climate change worries. For more information, see our [Worries about climate change](#) release.

Figure 1: Around three-quarters of adults were concerned about the effects of climate change on future generations

Among all adults who reported being “somewhat” or “very” worried about the effects of climate change in the last 12 months, Great Britain, 5 April to 1 May 2023

Figure 1: Around three-quarters of adults were concerned about the effects of climate change on future generations

Among all adults who reported being “somewhat” or “very” worried about the effects of climate change in the last 12 months, Great Britain, 5 April to 1 May 2023



Source: Opinions and Lifestyle Survey (5 April 2023 to 1 May 2023) from the Office for National Statistics

Notes:

1. Question – In the past 12 months, which aspects of climate change have you been worried about?
2. Base – Adults who responded they were "somewhat" or "very" worried to the question: "In the past 12 months, how worried or unworried have you been about the impact of climate change?"
3. Respondents were allowed to select more than one option so percentages will not sum to 100%.
4. Full breakdowns including confidence intervals for the estimates shown in this chart are available within the dataset published with this release.

Other public and opinion surveys from across the UK show that:

- 82% of people in Wales were concerned (fairly or very) about climate change in 2021 to 2022 ([Climate Change and Health in Wales: Views from the public](#) (PDF, 2.11MB))
- 82% of the Scottish public were concerned (fairly or very) about climate change, and 76% were concerned about its impacts on Scotland specifically ([2022 Ipsos survey for ClimateXchange and the Scottish Government](#))
- "Climate change and ozone depletion" is the second-highest environmental issue of concern for households in Northern Ireland, after illegal dumping ([Northern Ireland Environmental Statistics Report 2022](#))

Public attitudes on climate change and health

According to a survey commissioned by The Health Foundation, [one-quarter \(25%\) of UK adults consider climate change to be one of the biggest threats to human health](#), the same level as for accidents and injuries, and mental health problems.

A Lancet article found that British health professionals who were surveyed expect the [health issues that will become more frequent or more severe over the next 10 years because of climate change](#) include:

- heat-related illnesses (81% of respondents)
- physical or mental harm from storms and flooding (82%)
- anxiety, depression, or other mental health conditions (69%)

Over half (56%) of respondents to Public Health Wales's [Climate Change and Health in Wales: Views from the public \(PDF, 2.11MB\)](#) survey believe climate change will have a mostly negative impact on human health in Wales. Some of the highest concerns about the potential health impacts of climate change in Wales were increased costs of heating a home (selected by 18% of respondents), greater costs of food (14%) and reduced access to health and care services (14%).

3 . Emissions and drivers

UK greenhouse gas emissions on a residence basis

There are [three main measures of UK greenhouse gas \(GHG\) emissions](#): territorial, residence and footprint (also known as consumption). While 2021 health breakdowns are not yet available from territorial emissions statistics produced by the Department for Energy Security and Net Zero, they are from Office for National Statistics (ONS) residence-based emissions statistics.

In 2021, [UK GHG emissions on a residence basis](#) totalled 506 million tonnes of carbon dioxide equivalent (MtCO₂e), falling more than a third (39%) from 833 MtCO₂e since 1990. These estimates include emissions by UK residents and UK-registered businesses, whether they happen in the UK or overseas. They align with the UK's national accounts and enable direct comparison of emissions by sector of UK industry.

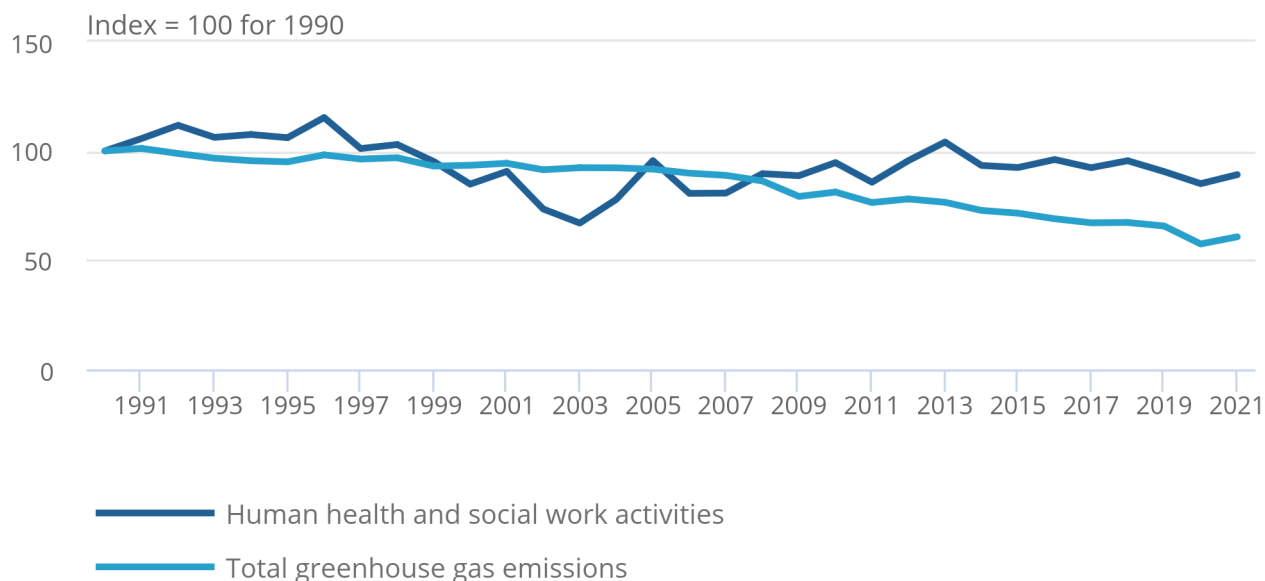
Human health and social work activities accounted for 5.1 MtCO₂e, 1% of UK emissions on this measure in 2021 (provisional figures, with final figures available in the summer). Emissions from this sector have fallen by 11% since 1990 (Figure 2), a slower pace than the decline in total UK GHG emissions (39%).

Figure 2: UK greenhouse gas emissions (residence-based) from human health and social work activities have fallen, but by less than overall emissions since 1990

UK, 1990 to 2021

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UK, 1990 to 2021



Source: Atmospheric emissions: greenhouse gases by industry and gas from the Office for National Statistics

Notes:

1. Greenhouse gases under the Kyoto Protocol include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).
2. The Air Emission Accounts include only direct emissions, defined as "Scope 1" under the GHG protocol guidance.

Consumption-based emissions

The Department for Environment, Food and Rural Affairs (Defra) produce a [measure of UK emissions based on consumption](#). These account for emissions associated with the consumption of goods and services by UK residents, regardless of where in the world these arise along the supply chain, and direct emissions from UK households. Emissions generated in the production of goods that are then exported are not included.

UK consumption emissions totalled 774 MtCO₂e in 2019, a reduction of 2% from 2018 and of 14% since 1996.

On this measure, the health sector, covering medical products, appliances and equipment, outpatient services and hospital services, accounted for 1% of [England's consumption emissions in 2019](#), at 7.9 MtCO₂e.

Human health services accounted for 3.3% of [Scotland's consumption emissions in 2019](#), at 2.5 MtCO₂e. Compared with 1998, this is a rise of 15.5% in Scotland's emissions from the consumption of healthcare, in the context of a fall of 23.6% in total Scottish consumption emissions. Consumption emission figures for healthcare in England and Scotland may not be directly comparable.

Comparable figures are not available for Wales or Northern Ireland.

NHS emissions

At an organisational level, consumption-based emissions are captured under three “scopes”, which are:

- Scope 1: direct emissions from owned or directly controlled sources, on site
- Scope 2: indirect emissions from the generation of purchased energy, mostly electricity
- Scope 3: all other indirect emissions that occur in producing and transporting goods and services, including the full supply chain

Public healthcare organisations for each country within the UK produce their own emissions estimates. Health is a devolved matter, so is it not possible to directly compare healthcare provision emissions figures across the UK because of differences in timeliness, coverage, accuracy and dimensions. NHS emissions figures are not directly comparable with figures on emissions from the health and care sectors, which have a broader definition.

NHS England

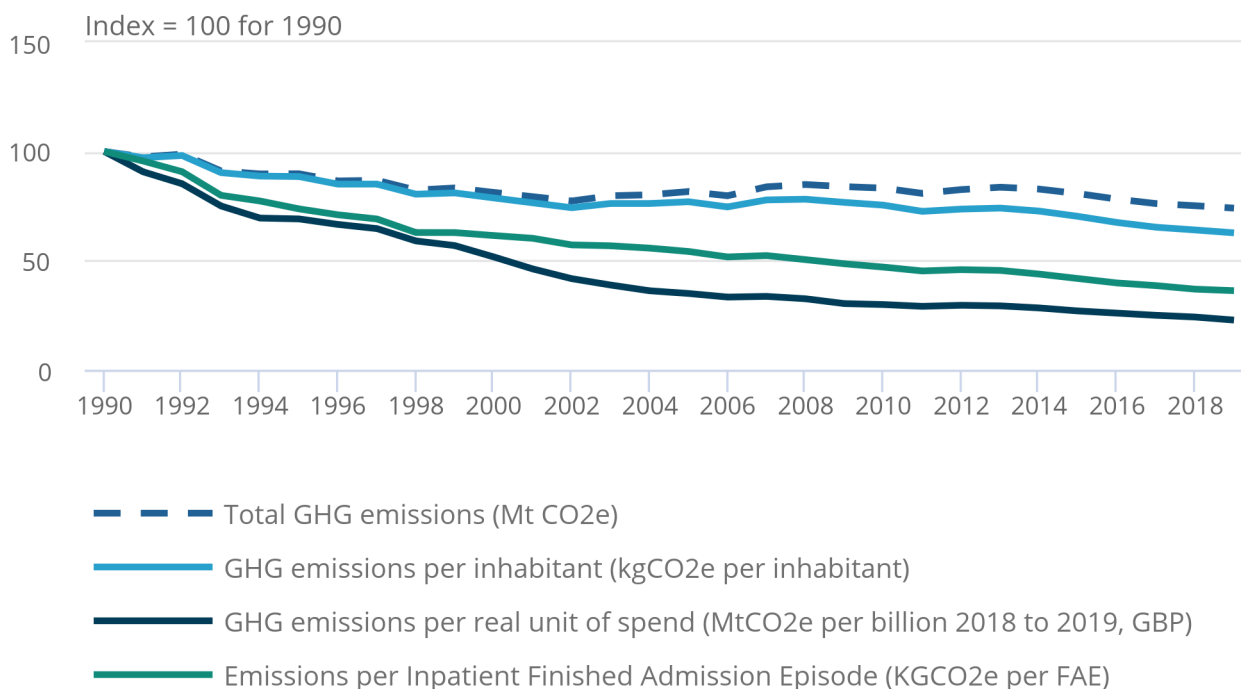
A study in the Lancet found [a fall in total NHS England greenhouse gas emissions](#) of just under 2% in 2019 compared with 2018, and by more than a quarter (26%) compared with 1990. Emissions per inhabitant fell by more than a third (37%) and emissions per real unit of spend fell by more than three-quarters (77%).

Figure 3: Greenhouse gas emissions from NHS England have fallen by more than a quarter since 1990

England, 1990 to 2019

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England, 1990 to 2019



Source: Health care's response to climate change: a carbon footprint assessment of the NHS in England from The Lancet Planetary Health

Notes:

1. Covers GHG emissions under Scopes 1, 2, and 3, as well as patient and visitor travel emissions.
2. Real unit of spending is calculated in terms of Great British pounds for the financial year ending 2019.

For this measure of NHS England's emissions in 2019, more than half (52%) came from acute services, around a quarter (23%) from primary care, and the remainder from non-clinical support (12%), mental health (6%), community services (5%) and ambulances (2%).

NHS Scotland

The latest [NHS Scotland climate emergency and sustainability strategy: 2022 to 2026](#) shows that in financial year ending 2021, there was a fall of 4% in NHS emissions from heating and electricity in Scotland from financial year ending 2020, and a fall of emissions from health boards of nearly two-thirds (64%) since financial year ending 1990.

A complete emissions methodology for NHS Scotland is still in development to build on these emissions figures and fill gaps in Scope 3 reporting, and visitor and patient travel. Of the seven categories for which Scotland's NHS emissions are known, emissions from building energy use are estimated to account for the vast majority (71%) of the total emissions on this measure in Scotland in financial year ending 2021. Metered dose inhaler propellant was the second-largest contributor (13%).

NHS Wales

Welsh health boards and trusts accounted for around a third of [Welsh public sector emissions](#) in the financial year ending 2022. Of these, around 70% were associated with supply chains, while buildings accounted for around 20%.

Northern Ireland Health and Social Care (HSC)

There are no comparable emissions figures available for Northern Ireland HSC.

4 . State of the climate in the UK

Figures from the Met Office show that this has been a warmer than average year so far for the UK, with provisional mean temperatures of 0.4 degrees Celsius and 1.7 degrees Celsius above the 1991 to 2020 averages for [January \(PDF, 5.19MB\)](#) and [February \(PDF, 4.85MB\)](#) respectively.

Most areas received [above-average rainfall during March 2023 \(PDF, 6.09MB\)](#), with only north-western Scotland drier than average. With rainfall of 119.2 millimetres in England and 206.5 millimetres in Wales, many parts of southern England and South Wales experienced rainfall at least double the long-term average.

Summer days and icing days

There has been a 28% increase in the annual average number of “summer days”, those with a maximum temperature above 25 degrees Celsius, averaging 8.8 days in the most recent decade (2013 to 2022), compared with 6.9 days for the period 1991 to 2020 (Figure 4). England had the highest number of summer days in 2022.

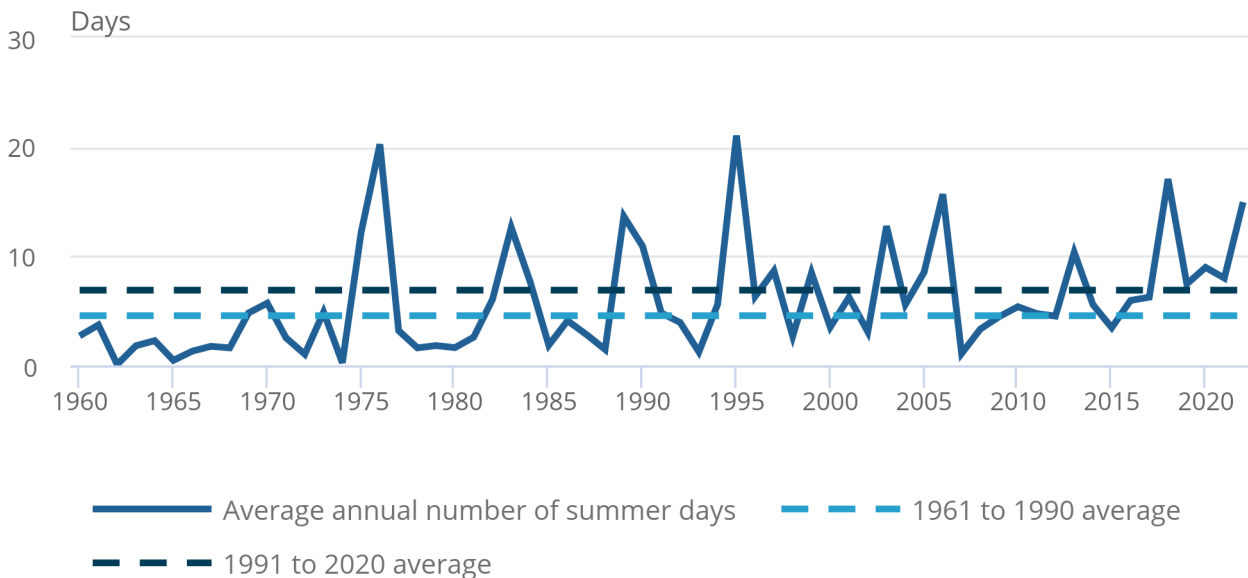
Over the same period, the annual average number of “icing days”, where the maximum daily temperature is below 0 degrees Celsius, decreased by 16% from 2.7 days to 2.2 days (Figure 5). Scotland had the highest number of icing days in 2022.

Figure 4: The average annual number of summer days across the UK has increased since 1960

UK, 1960 to 2022

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UK, 1960 to 2022



Source: Met Office

Notes:

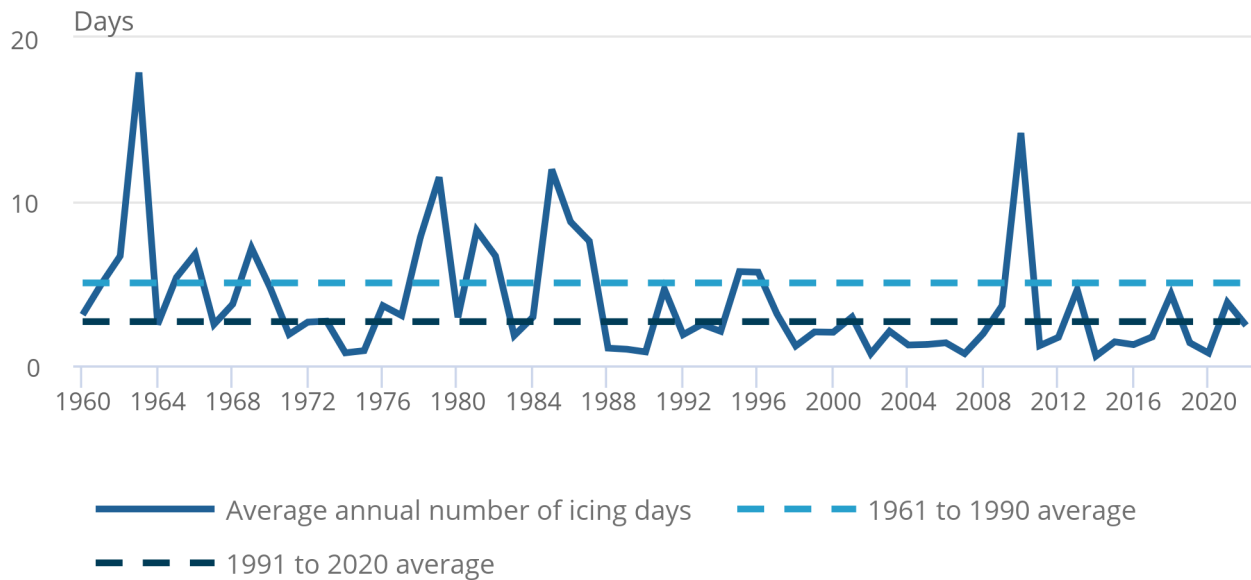
1. Summer days are days where the maximum daily temperature is above 25 degrees Celsius.

Figure 5: The average annual number of icing days across the UK has fallen since 1960

UK, 1960 to 2022

Figure 5: The average annual number of icing days across the UK has fallen since 1960

UK, 1960 to 2022



Source: Met Office

Notes:

1. Icing days are days where the maximum daily temperature is below 0 degrees Celsius.

5 . Impacts and signs of adaptation

Heat

The [Climate Risk Independent Assessment \(CCRA3\) \(PDF, 5.71MB\)](#) predicts that the number of heat-related deaths in the UK could reach 7,040 deaths per year by 2050.

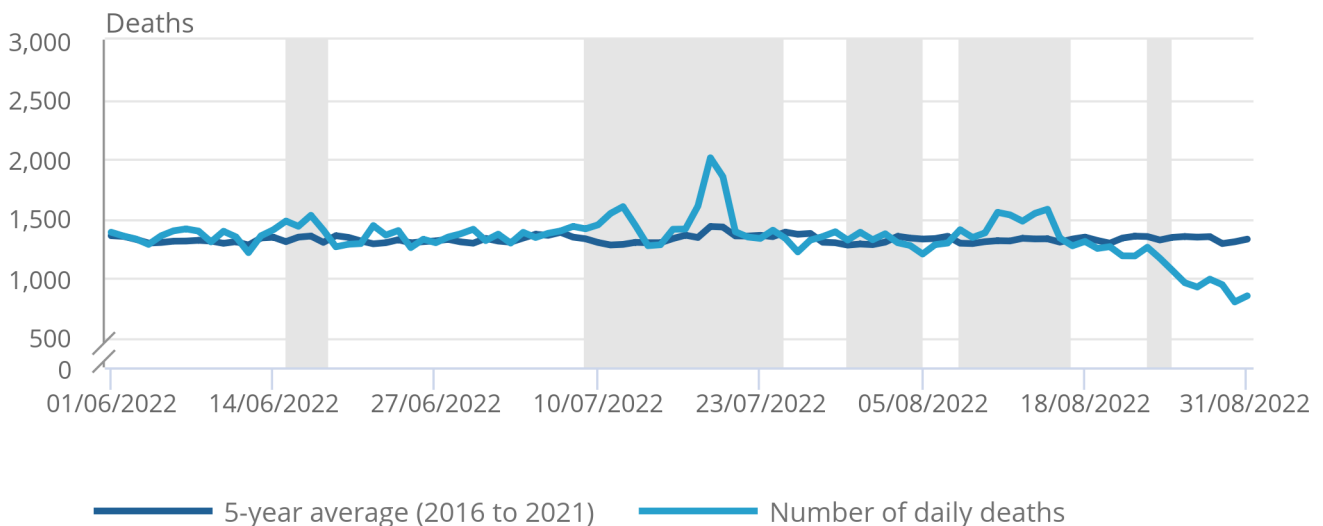
The Office for National Statistics (ONS) found [3,271 excess deaths](#) during the five spells officially classed as "heat-periods" between June and August 2022 (Figure 6). During the second heat-period (10 to 25 July), the [Met Office recorded temperatures above 40 degrees Celsius](#) for the first time ever in the UK. This period saw the largest number of excess deaths (2,227), 10.4% above the five-year average.

Figure 6: The number of daily deaths in the UK were higher during heat-periods in 2022

England and Wales, 1 June to 31 August 2022

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England and Wales, 1 June to 31 August 2022



Source: Office for National Statistics

Notes:

1. Figure shows death occurrences, registered up to 7 September 2022. Death occurrences will increase as more deaths are registered, particularly for later dates.
2. Includes non-residents.
3. The 2016 to 2019 five-year average has been provided for 2022, because of the impact of the coronavirus (COVID-19) pandemic on deaths occurring in 2020.

The cause of excess deaths showing the largest proportional increase during these 2022 heat-periods relative to the days preceding the heat-periods was [cardiac arrhythmias \(17.4%\)](#). Overheating places additional pressure on the heart and lungs, and increases the risk from cardiovascular and respiratory diseases.

NHS Digital's Estates Return Information Collection (ERIC) reported [5,554 overheating occurrences in the financial year ending 2022](#), where temperatures in wards or other clinical areas in NHS Trusts in England exceeded 26 degrees Celsius, triggering a risk assessment. This was an increase of 86% in such overheating incidents since 2016 to 2017, when the data were first available.

Flooding

Flooding events increase the likelihood of mental health problems, according to a [Public Health England study](#). The percentage of people with probable depression (20%), anxiety (28%) or post-traumatic stress disorder (PTSD) (36%) one year after flooding was highest among people whose homes were flooded, compared with both those who were unaffected and those who were disrupted. The increase in mental health problems persisted even three years after the flooding event.

People whose property was flooded and needed, but could not get, access to health and social care services were five times more likely to have depression, seven times more likely to have anxiety, and 10 times more likely to have PTSD than those who were unaffected by flooding.

There are limited data available showing the extent of disruption to health and social care services because of flooding events. The [NHS Digital Estates Return Information Collection \(ERIC\)](#) statistics show there were 176 flooding incidents caused by external weather events that disrupted NHS sites in England in 2021 to 2022.

Green space

ONS natural capital accounts estimated that 20.8 million people, 38% of the UK population, gained [health benefits from recreation in 2020](#). This was an increase of 18% from 17.6 million people (35%) in 2009 when the data time series began. The annual value of the benefits gained from recreation was estimated to be £6.8 billion in avoided healthcare costs in 2020.

Public Health England's [Improving access to greenspace 2020 review \(PDF, 1.18MB\)](#) found that interactions with green space positively impact mental health and well-being. According to recent estimates from our [Opinions and Lifestyle Survey \(19 April to 1 May 2023\)](#), 46% of adults have reported increasing their time spent outdoors to look after their well-being.

A Natural England green social prescribing capacity assessment commissioned by the [Department of Health and Social Care](#) showed there is increasing interest in green social prescribing in England, referring people to engage in nature-based activities to improve their mental health. Over half of the providers of these green activities surveyed reported that at least some of their service users have mild to moderate mental health needs (65.8%) and moderate to severe mental health needs (52.9%).

The proportion of urban green and blue space is declining, as reported in the [Climate Change Committee's Progress in adapting to climate change 2023 report](#). In 2016, green and blue space covered 61.5% of total urban area in England (1,090 thousand hectares), decreasing to 59.5% in 2022 (1,058 thousand hectares).

6 . Climate change insights data

[Public opinions and social trends, Great Britain: climate change worries and actions](#) Dataset | Released 12 May 2023
Opinions and Lifestyle Survey (OPN) findings about people's worries regarding climate change and actions they have taken to help tackle climate change, 5 April to 1 May 2023.

7 . Glossary

Adaptation

Adaptation is actions to adjust to climate change, and the extreme weather that it makes increasingly likely. This includes making homes more resilient to extreme heat and cold weather, and adapting our landscapes to better cope with flooding or drought events, for example.

Carbon footprint

The carbon footprint refers to emissions that are associated with the consumption spending of UK or England's residents on goods and services, wherever in the world these emissions arise along the supply chain, and those that are directly generated by UK or England's households through private motoring and burning fuel to heat homes.

Consumption basis

Emissions associated with the consumption of goods and services by UK residents, regardless of where in the world these arise along the supply chain, and direct emissions from UK households. Emissions generated in the production of goods that are then exported are not included.

Excess death

Excess deaths are the number of observed deaths above average (the five-years prior to the observed year). The 2016 to 2019 and 2021 five-year average has been provided for 2022, because of the impact of the coronavirus (COVID-19) pandemic on deaths occurring in 2020.

Greenhouse gases

The seven greenhouse gases included in the atmospheric emissions accounts are those covered by the Kyoto Protocol:

- carbon dioxide (CO₂)
- methane (CH₄)
- nitrous oxide (N₂O)
- hydro-fluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulphur hexafluoride (SF₆)
- nitrogen trifluoride (NF₃)

These gases contribute to global warming and climate change. The potential of each gas to cause global warming is assessed in relation to a given weight of CO₂, so greenhouse gas emissions are measured as carbon dioxide equivalent (CO₂e).

Green social prescribing

The practice of supporting people to engage in nature-based interventions and activities to improve their mental health.

Heat-periods

A heat-period is defined as day(s) on which a Level 3 Heat Health Alert is issued and/or day(s) when the mean Central England temperature is greater than 20 degrees Celsius.

Icing days

Days where the maximum daily temperature is below 0 degrees Celsius.

Net zero

Net zero is the UK government's target for at least a 100% reduction of net greenhouse gas emissions (compared with 1990 levels) in the UK by 2050. This can be achieved by a combination of emission reduction and emission removal.

Residence basis

Estimates compiled on a residence basis include data relating to UK residents and UK-registered businesses, regardless of whether they are in the UK or overseas. Data relating to foreign visitors and foreign businesses in the UK are excluded.

Summer days

Days where the maximum daily temperature is above 25 degrees Celsius.

8 . Data sources and quality

More quality and methodology information on the strengths, limitations, appropriate uses, and how the data were created can be found on the original source publication sites:

[Atmospheric emissions: greenhouse gases by industry and gas](#) – Office for National Statistics

[UK Environmental Accounts](#) – Office for National Statistics

[Opinions and Lifestyle Survey \(OPN\) QMI](#) – Office for National Statistics

[Health care's response to climate change](#) – The Lancet Planetary Health

[Excess mortality during heat-periods](#) – Office for National Statistics and UK Health Security Agency (UKHSA)

[Climate Change and Health in Wales: Views from the Public](#) – Public Health Wales

[Understand the Scottish public's views on Climate risks and opportunities](#) – Ipsos Energy and Environment

[Northern Ireland Environmental Statistics Report 2022](#) – Department of Agriculture, Environment and Rural Affairs

[Climate Change and Health survey](#) – Ipsos for The Health Foundation

[Views of health professionals on climate change and health](#) – The Lancet Planetary Health

[Carbon footprint for the UK and England to 2019](#) – Department for Environment, Food and Rural Affairs

[Scotland's Carbon Footprint 1998 to 2019](#) – Scottish Government

[NHS Scotland Climate Emergency and Sustainability Strategy](#) – Scottish Government

[Public Sector Net Zero data and recommendations](#) – Welsh Government

[State of the UK Climate 2021](#) – The Met Office

[Estates Return Information Collection \(ERIC\)](#) – NHS Digital

[Flooding and health: national study](#) – Public Health England

[UK natural capital accounts](#) – Office for National Statistics

[National green social prescribing delivery capacity assessment](#) – Department of Health and Social Care

9 . Related links

[UK Climate Change Statistics Portal](#) GOV.UK portal | Regularly updated with climate change-related data, statistics and insights.

[UK Environmental Accounts: 2022](#) Bulletin | Released 9 June 2022 Measuring the contribution of the environment to the economy, impact of economic activity on the environment, and response to environmental issues.

[UK natural capital accounts: 2022](#) Bulletin | Released 10 November 2022 Estimates of the financial and societal value of natural resources to people in the UK.

[Worries about climate change, Great Britain: September to October 2022](#) Article | Released 28 October 2022 People's worries about climate change, using data from the Opinions and Lifestyle Survey collected between 14 September and 9 October 2022 and based on adults in Great Britain aged 16 years and over.

[Public opinions and social trends, Great Britain](#) Bulletin | Fortnightly Social insights on daily life and events, including the cost of living, and shortages of goods from the Opinions and Lifestyle Survey (OPN).

10 . Cite this article

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