

BEIS Public Attitudes Tracker: Technical overview Winter 2021, UK

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Official Statistics

This report covers general information about the Public Attitudes Tracker (PAT) survey completed in Winter 2021. It includes the technical notes, topics included in this survey wave, definitions used throughout the topic reports, and details of further resources and outputs.

Introduction

The BEIS Public Attitudes Tracker (PAT) survey measures public awareness, attitudes and behaviours relating to Department for Business, Energy and Industrial Strategy (BEIS) policies such as energy, climate change, consumer rights, artificial intelligence and workers' rights.

This report presents summary headline findings from the Winter 2021 survey wave which is based on a representative sample of 3,706 adults aged 16 or over in the UK. Data collection ran from 24th November to 22nd December 2021.

This is the second wave in the new PAT series; the first wave was conducted in Autumn 2021 (15th September to 17th October 2021).

Before Autumn 2021, previous tracker surveys had been conducted covering many of the same topics. However, the Winter 2021 wave represents the second wave of the new time series following a change in methodology. Significant changes affecting both survey sample and mode mean that the results from this wave are not directly comparable with results collected via surveys conducted using the previous methodology. A brief explanation of the differences between the previous tracker surveys and the new tracker survey is provided below.

Previous tracker survey series

The Public Attitudes Tracker began in March 2012 and was run on a quarterly basis with a total of 37 waves of data collection conducted between 2012 and 2021.

Until March 2020, the survey was conducted using in-home interviews via the Kantar UK face-to-face Omnibus using a random location quota sampling method. However, in March 2020, the survey methodology changed due to the impacts of Covid-19 when face-to-face fieldwork in the UK was halted¹. Between March 2020 and March 2021, the survey fieldwork was instead conducted via the Kantar online omnibus. Given this break in the time series, no direct

¹ Fieldwork in March 2020 was conducted in two stages. The survey was initially run on the Kantar face-to-face Omnibus but stopped early due to the outbreak of COVID-19 and the start of the lockdown. The findings, based on a truncated face-to-face sample, were published in May 2020 <https://www.gov.uk/government/statistics/beis-public-attitudes-tracker-wave-33>. The remainder of this wave was conducted on the Kantar online omnibus to trial the online omnibus approach and to compare the results with the face-to-face survey.

comparisons were made between the surveys conducted on the Kantar online panel survey and the surveys conducted using the face-to-face omnibus.

The online panel methodology was set up at short notice and was always regarded as an interim methodology given its limitations in terms of sample representativeness and potential panel conditioning. In November 2020, BEIS undertook a review and consultation to plan for the longer-term future of the survey.

New tracker survey series

In Summer 2021, BEIS recommissioned the survey with the aim of creating a new time series based on a methodology which will allow more robust tracking of measures over the longer-term, in the context of continued uncertainty about the feasibility of face-to-face data collection.

The new survey series, beginning in Autumn 2021, uses Address Based Online Surveying (ABOS), a cost-effective method of surveying the general population using random sampling techniques. ABOS is a 'push to web' methodology where the primary method of data collection is online, but respondents are also able to complete a paper version of the questionnaire which enables participation among the offline population. Full details of the ABOS methodology are covered in the Technical Information.

Due to the change in methodology, the results from any surveys in the new tracker series will not be directly comparable with any previous surveys. The Autumn 2021 survey represented the first survey wave in the new time series, and the Winter 2021 survey represents the second.

Winter 2021 survey

The Winter 2021 questionnaire covered the following topics:

- Net Zero
- Climate change
- Renewables
- Heat use in the home
- Home insulation
- Shopping around and switching
- Nuclear energy
- Energy Performance Certificates (EPCs)
- Low carbon heating

Fieldwork ran from 24th November to 22nd December 2021 with a representative sample of 3,706 adults (16 and over) in the UK.

Interpretation of findings and further resources

In this publication, differences between groups are only reported where they are statistically significant at the 95% confidence interval level.

Alongside this report we have also provided individual topic reports covering results from the survey grouped by theme. This is a change compared to the previous format and is intended to help users find results of interest to them. We have also published the online and paper questionnaires and an anonymised version of the raw dataset.

Technical information

Although there have been previous tracker surveys, the Winter 2021 wave is part of a new time series measurement which began in Autumn 2021 following a change in methodology. The new survey series uses a new methodology referred to as Address Based Online Surveying (ABOS). Full details are provided below.

Introduction to the Address Based Online Surveying (ABOS) data collection model

ABOS is a type of 'push-to-web' survey method.

The basic ABOS design is simple: a **stratified random sample of addresses** is drawn from the Royal Mail's postcode address file and an invitation letter is sent to each one, containing username(s) and password(s) plus the URL of the survey website. Sampled individuals can log on using this information and complete the survey as they might any other web survey. Once the questionnaire is complete, the specific username and password cannot be used again, ensuring data confidentiality from others with access to this information.

It is usual for at least one reminder to be sent to each sampled address and it is also usual for an **alternative mode** (usually a paper questionnaire) to be offered to those who need it or would prefer it. It is typical for this alternative mode to be available only 'on request' at first. However, after nonresponse to one or more web survey reminders, this alternative mode may be given more prominence.

Paper questionnaires ensure coverage of the offline population and are especially effective with sub-populations that respond to online surveys at lower-than-average levels. However, paper questionnaires have measurement limitations that constrain the design of the online questionnaire and also add considerably to overall cost. For the BEIS PAT, **paper questionnaires are used in a limited and targeted way**, to optimise rather than maximise response.

The specifics of the design for the BEIS PAT are given below.

Details of the sample design

Sample design: addresses

The address **sample design is intrinsically linked to the data collection design** (see below) and was designed to yield a respondent sample that is representative with respect to geography, neighbourhood deprivation level, and age group. This approach limits the role of weights in the production of unbiased survey estimates, narrowing confidence intervals compared with other designs.

First, a **stratified master sample of 110,000 addresses** in the UK was drawn from the Postcode Address File (PAF) 'small user' subframe. Before sampling, the PAF was stratified by

NUTS1² region (12 strata) and, within region, by neighbourhood deprivation level (5 strata). A total of 60 strata were constructed in this way. Furthermore, within each of the 60 strata, the PAF was sorted by (i) local authority, (ii) super output area, and finally (iii) by postcode. This ensured that the master sample of addresses was geographically representative within each stratum.

This **master sample of addresses was then augmented by data supplier CACI**. For each address in the master sample, CACI added the expected number of resident adults in each ten-year age band. Although this auxiliary data will have been imperfect, Kantar’s investigations have shown that it is highly effective at identifying households that are mostly young or mostly old. Once this data was attached, **the master sample was additionally stratified by expected household age structure based on the CACI data**: (i) all aged 35 or younger (15% of the total); (ii) all aged 65 or older (21% of the total); (iii) all other addresses (64% of the total).

From this master sample, Kantar drew two stratified random sub-samples to cover the Autumn and Winter 2021 waves of the PAT. The Winter 2021 subsample comprised 23,520 addresses. The addresses that were not allocated to either waves formed a reserve pool (used for the Autumn 2021 wave but not for the Winter 2021 wave). The **conditional sampling probability in each stratum was varied to compensate for any (expected) residual variation in response rate that could not be ‘designed out’**, given the constraints of budget and timescale. The underlying assumptions for this procedure will be updated wave by wave as more evidence is obtained about how the PAT works in practice, as opposed to ABOS studies in general.

Figure 1 shows the (initially issued) sample structure with respect to the major strata³.

Figure 1: Initial address issue by Area deprivation quintile group and Expected household age structure, Winter 2021 wave

Expected household age structure	Most deprived	2 nd	3 rd	4 th	Least deprived
All <=35	1,566	988	676	549	384
Other	5,049	3,288	2,871	2,633	1,900
All >=65	656	687	809	709	755

Sample design: individuals within sampled addresses

All resident adults aged 16+ were invited to complete the survey. In this way, the PAT avoided the complexity and risk of selection error associated with remote random sampling within households.

² The classification mirrors the International Territorial Level (ITL) geocode standard.

³ In addition, higher sampling fractions were applied to the three least populous NUTS1 regions (NE England, Wales and N Ireland) so that the expected number of completed questionnaires was at least 220 in each one.

However, for practical reasons, the number of logins provided in the invitation letter was limited. The **number of logins varied between two and four**, with this total adjusted in reminder letters to reflect household data provided by prior respondent(s). Addresses that CACI data predicted contained only one adult were allocated two logins; addresses predicted to contain two adults were allocated three logins; and other addresses were allocated four logins. The mean number of logins per address was 2.8. Paper questionnaires were available to those who are offline, not confident online, or unwilling to complete the survey this way.

Details of the data collection model

The **four-week timescale of each wave of the PAT** – as well as the available budget – **limited the maximum number of mailings to each address to two, a fortnight apart**. There was also a limit on the number of mailings that included a paper questionnaire alternative. They were included in one of the mailings to sampled addresses where the CACI data indicated that every resident would be aged 65 or older. These addresses comprised 15% of the sampled total for wave 2.

Figure 2 summarises the data collection design within each stratum, showing the number of mailings and type of each mailing: push-to-web (W) or mailing with paper questionnaires (P). For example, 'WP' means a push-to-web first mailing and a second mailing with paper questionnaires included alongside the web survey login information.

Figure 2: Data collection design by stratum (Area deprivation quintile group and Expected household age structure)

Expected household age structure	Most deprived	2 nd	3 rd	4 th	Least deprived
All <=35	WW	WW	WW	WW	WW
Other	WW	WW	WW	WW	WW
All >=65	WP	P	P	P	P

Weighting the data

The PAT is largely used to collect data at the person-level but there are a small number of questions where the respondent is asked about the household as a whole or is asked to give an opinion on a household-level matter. For these specific questions, the data are weighted by, are reported on, by household. The details of these two types of weights are provided below.

Individual weight

A three-step weighting process was used to compensate for differences in both sampling probability and response probability:

Step 1: An address design weight was created equal to one divided by the sampling probability; this also served as the individual-level design weight because all resident adults could respond.

Step 2: The expected number of responses per address was modelled as a function of data available at the neighbourhood and address levels. The step two weight was equal to one divided by the predicted number of responses.

Step 3: The product of the first two steps was used as the input for the final step to calibrate the sample. The responding sample was calibrated to the August-October 2021 Labour Force Survey (LFS) with respect to (i) sex by age, (ii) educational level by age, (iii) ethnic group, (iv) housing tenure, (v) region, (vi) employment status by age, (vii) the number of co-resident adults, and (viii) internet use by age.⁴

It should be noted that the weighting only corrects for observed bias (for the set of variables included in the weighting matrix) and there is a risk of unobserved bias. Furthermore, the raking algorithm used for the weighting only ensures that the sample margins match the population margins. There is no guarantee that the weights will correct for bias in the relationship between the variables.

Finally, because the new PAT employs a random sampling technique, the weighting procedure is different from those used for the face-to-face surveys (up to wave 33) and online panel surveys (waves 33-37) in the original PAT series. However, the objective – elimination of sample bias – was the same.

Household weight

The household weight is used for questions which are best interpreted at a household level, for example factual questions such as main method of heating the home.

To analyse household-level survey data, it makes sense to convert the weighted sample of adults aged 16+ into a weighted sample of households.

This was achieved in two steps:

Step 1: The person-level weight of each respondent was divided by the reported number of adults aged 16+ in that respondent's household (that is, the number of survey-eligible residents). This provisional weight was used as the input weight for step 2.

Step 2: A household-level calibration procedure was carried out using the July-September 2021 LFS household-level dataset as the benchmark. Household totals are obtained for (i) housing tenure, (ii) region, and (iii) the number of adults aged 16+ in the household.

This approach to constructing the household-level weight has the advantage of making use of data from all respondents. The unweighted base is therefore the same for both person-level and household-level estimates. However, multiple respondents reporting about the same household are likely to provide very similar answers. The practical consequence is that the *statistically effective sample size* for household-level estimates will be *smaller* than for person-level estimates, even if the unweighted base is the same.

⁴ Internet use by age was based on LFS data from January-March 2021, as this data is only collected in these months.

Comparisons with previous waves

It should be noted that any change in methodology can lead to both selection effects (that is differences due to the different sampling methods employed) and measurement effects (that is differences due to the different interview modes). Although attempts have been made to reduce the selection effects between surveys, the results from the Winter 2021 PAT should not be directly compared with previous waves where data was collected either face-to-face (waves 1 to wave 33) or via an online panel (waves 33 to 37). For this reason, the results from this survey wave have only been compared with previous waves from the new PAT survey series starting in Autumn 2021, and we have not made any direct comparisons with longer-term tracking measures collected via different methodologies.

When it comes to **measurement effects**, differences in results could be caused by a number of factors (see below). Measurement effects cannot be ameliorated by weighting, although it is sometimes possible to estimate their direction and scale and (at least partially) account for them in analysis.

Some examples of measurement effects:

- Face-to-face and telephone interviewers can provide motivation or clarification when required; this cannot truly be replicated online.
- People who would not disclose sensitive personal information or socially undesirable opinions/behaviours to an interviewer may be more willing to provide this information online.
- Where a response scale is used (for example, running from “strongly agree” to “strongly disagree”), interview respondents are generally more likely to select a ‘strong’ response – at either end of the scale – than they would if they were completing the survey online.
- For logistical reasons, the questionnaire has to be adapted slightly for each mode and this can affect measurement:
 - Long questions or response lists are not suitable for smartphone presentation and will need to be edited in some cases.
 - Unprompted questions (‘do not show screen’) have to be converted into prompted versions for online presentation which will limit compatibility.
 - Presentation of “don’t know” answer codes: In interviewer-assisted modes (face-to-face and telephone) these are usually collected as spontaneous codes, meaning the interviewer will only select these if the respondent mentions it. However, on paper and CAWI these codes have to be available more explicitly for respondents.

Fieldwork dates and sample sizes

Figure 3 summarises the fieldwork dates and sample sizes by data collection method at each wave.

Figure 3: Fieldwork dates and sample sizes

Wave	Fieldwork dates	Total sample sizes (adults aged 16+)	CAWI completes	Paper completes
Autumn 2021	15 September to 17 October 2021.	5,560	3,806	1,754
Winter 2021	24 November to 22 December 2021	3,706	3,020	686

Definitions

The table below sets out the key terms used within this report and gives a brief definition for each term.

Term	Definition
ABOS (Address Based Online Surveying)	A ‘push to web’ survey methodology where letters are sent to a sample of home addresses inviting household members to complete the survey online. However, householders are also given the option to complete a paper version of the questionnaire which enables participation among the offline population.
Artificial intelligence	Technologies with the ability to perform tasks that would otherwise require human intelligence, such as visual perception, speech recognition, and language translation.
Base	The number of people answering a survey question. In the PAT, the base number varies slightly between questions asked to equivalent subgroups. This is because of the ABOS methodology which includes a mixture of online and paper responses. On paper it is possible to leave a question blank or answer multiple responses at a single-coded question; in these situations, the answers are removed from the overall base.
CAWI	Computer-assisted web interviewing.
Climate change	Long-term shift in the planet’s weather patterns and rising average global temperatures.
Consumer dispute resolution services	Independent organisations which help people resolve a consumer dispute, such as an ombudsman.
Energy infrastructure	A term used to capture a range of different energy sources that are covered by the survey and the interconnections between them. This includes a range of renewable sources (on-shore and off-shore wind, solar, wave and tidal, and biomass), nuclear, shale gas, and carbon capture and storage as well as the pipeline and other interconnectors between them.
Energy Performance Certificate (EPC)	An Energy Performance Certificate (EPC) measures the energy efficiency of a property and is paperwork needed whenever a property is built, sold or rented. The certificate includes recommendations on ways to improve the home's energy efficiency.

Term	Definition
Fieldwork	The period of time over which data are collected for a survey (whether by face-to-face interviews, online completions or paper-based questionnaire completions).
Fusion Energy	Fusion energy is an experimental technology that works by fusing together atoms in order to release energy. The UK is exploring whether this technology could be used to generate zero carbon electricity.
Low carbon heating systems	Heating systems that use energy from low-carbon alternatives such as hydrogen, the sun, or heat pumps which draw heat from the ground, air or water to heat homes.
Net Zero	<p>Net zero means that the UK's total greenhouse gas (GHG) emissions would be equal to or less than the emissions the UK removed from the environment. This can be achieved by a combination of emission reduction and emission removal.</p> <p>A new Net Zero target was announced by the government in June 2019, which requires the UK to bring all greenhouse gas emissions to net zero by 2050.</p>
NS-SEC	<p>National Statistics Socio-Economic Classification. The PAT survey uses the self-coded method of deriving NS-SEC which classifies people into six categories:</p> <ol style="list-style-type: none"> 1. Managerial, administrative and professional occupations 2. Intermediate occupations 3. Small employers and own account workers 4. Lower supervisory and technical occupations 5. Semi-routine and routine occupations 6. Never worked
Nuclear Energy	<p>Nuclear power is the use of nuclear reactions to produce electricity. This source of energy can be produced in two ways: fission – when nuclei of atoms split into several parts; or fusion – when nuclei fuse together.</p> <p>Fission is the process which occurs in nuclear power stations across the UK. Fusion is an experimental technology which the UK is exploring as a possibility to produce zero carbon electricity.</p>
Omnibus survey	A method of quantitative survey research where data on a variety of subjects submitted by a range of funders is collected during the same interview.
Privacy notices	Information provided by a service provider to inform users how they will use their personal information.

Term	Definition
Random location quota sampling	<p>A hybrid form of sampling that combines elements of quota sampling and random probability sampling. The principal distinguishing characteristic of random location sampling is that interviewers are given very little choice in the selection of respondents.</p> <p>A random sample of geographical units is drawn (usually postcode sectors) and respondents in each interviewer assignment are then drawn from a small set of homogenous streets within these. Quotas are set in terms of characteristics which are known to have a bearing on individuals' probabilities of being at home and so available for interview. Rules are given which govern the distribution spacing and timing of interviews.</p>
Renewable energy	Renewable energy technologies use natural energy resources that are constantly replaced and never run out to make electricity. Fuel sources include wind, wave, biomass and solar.
Representativeness	Similarity of the sample profile to benchmark population statistics, such as the Office for National Statistics mid-year population estimates.
Sample size	The number of people included in the sample (a subset of the population).
Shale gas and fracking	Shale gas is natural gas found in shale, a non-porous rock which does not allow the gas to escape. Hydraulic fracturing or “fracking” is a process of pumping water at high pressure into shale to create narrow fractures which allow the gas to be released and captured. The gas can then be used for electricity and heating.
Shopping around	Comparing different products, services, deals or providers.
Small Modular Reactors	These are a type of nuclear fission reactor, similar to existing nuclear power stations, but on a smaller scale. They can be used for electricity generation, to provide industry with heat and power, or to provide energy to UK communities. not connected to the national gas grid.
Statistical significance	A statistical test to determine whether relationships observed between two survey variables are likely to exist in the population from which the sample is drawn. We only report on findings that are statistically significant at the 95% level.
Switching	Changing provider or contract for products or services.

Further information

Future updates to these statistics

Results from the Public Attitudes Tracker are published quarterly. The next release is scheduled to be published in June 2022. Note that not all tracker questions are included in each wave.

Revisions policy

The [BEIS statistical revisions policy](#) sets out the revisions policy for these statistics, which has been developed in accordance with the UK Statistics Authority [Code of Practice for Statistics](#).

Related Statistics

There are various other surveys which seek the general public's opinion on topics related to those covered by the BEIS Public Attitudes Tracker. These include:

[Public Attitudes to Science](#)

A collection of studies looking at the UK public's attitudes to science, scientists and science policy.

[National Travel Attitudes Study \(NTAS\)](#)

The department for transport publishes a wide range of reports on the public's attitude to various modes of transport.

[Transport and Transport Technology: Public Attitudes Tracker](#)

The Department for Transport also publishes an attitudes tracker to monitor trends in public attitudes to and awareness of transport technologies in England

[The English Housing Survey](#)

The English Housing Survey is a continuous national survey commissioned by the Department for Levelling up, Housing and Communities (formerly Ministry of Housing, Communities and Local Government). It collects information about people's housing circumstances and the condition and energy efficiency of housing in England.

BEIS also publishes a wealth of energy statistics which provide context for the attitude data collected by the PAT. These are available on the [Statistics at BEIS](#) website.

Uses of these statistics

These statistics are used by BEIS to guide BEIS policy, by many academics in their related studies, by ministers and by the general public. Some examples on the uses of previous waves of the PAT include:

- Monitoring attitudes towards fracking by policy makers, the media and local groups to understand how this is changing over time and the reasons why people support or oppose it.
- Understanding public awareness of key BEIS policies such as the concept of Net Zero.
- Monitoring public attitudes to climate change and government policies associated with this and understanding how concern varies between demographic groups.
- Understanding public acceptability of different renewable energy sources which contribute to the government's aim to reduce the dependence on fossil fuels.

User engagement

Users are encouraged to provide comments and feedback on how these statistics are used and how well they meet user needs. Comments on any issues relating to this statistical release are welcomed and should be sent to: BEISPAT@beis.gov.uk.

The BEIS statement on [statistical public engagement and data standards](#) sets out the department's commitments on public engagement and data standards as outlined by the [Code of Practice for Statistics](#).

Pre-release access to statistics

Some ministers and officials receive access to these statistics up to 24 hours before release. Details of the arrangements for doing this and a list of the ministers and officials that receive pre-release access to these statistics can be found in the [BEIS statement of compliance](#) with the Pre-Release Access to Official Statistics Order 2008.

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