

# Adult smoking habits in the UK methodology

Methodology information for the Adult smoking habits in the UK annual statistical bulletin

Contact:

health.data@ons.gov.uk  
+44 1329 444110

Release date:

6 December 2022

Next release:

To be announced

## Table of contents

1. [About this methodology](#)
2. [Data included in Adult smoking habits in the UK bulletin](#)
3. [Data collection changes during the pandemic](#)
4. [Analysis of data for the Adult smoking habits in the UK bulletin](#)
5. [Method of weighting adjustment for the APS](#)
6. [Related links](#)
7. [Cite this methodology](#)

# 1 . About this methodology

This methodology article contains information on the data included and the methods used to produce our annual Adult smoking habits in the UK statistical bulletin.

The information in this article will provide:

- an overview of the data used in our bulletin from the Annual Population Survey (APS) and Opinions and Lifestyle Survey (OPN)
- changes to data collection methods in recent years
- details of the analysis used in the annual Adult smoking habits in the UK publication
- an explanation of the adjustment to weighting method for correction of discontinuity in survey data in 2020

## 2 . Data included in Adult smoking habits in the UK bulletin

The Office for National Statistics (ONS) collects data on adult smoking habits using two surveys. The Annual Population Survey (APS) provides indicators of the number of adults aged 18 years and over who smoke in the UK, and the Opinions and Lifestyle Survey (OPN) collects more detailed information on smoking habits and e-cigarette users aged over 16 years in Great Britain. Data from both surveys are collated and analysed as part of the annual publication that reports on [Adult smoking habits in the UK](#).

### Annual Population Survey (APS)

The data on smoking habits in the UK come from the APS. The survey covers residents of the UK aged 18 years and over. [Further information on the Annual Population Survey and survey methodology](#) is available.

In March 2020, the data collection method for the APS changed from mixed mode (face to face, telephone) to telephone only.

From April 2021, a field strategy referred to as "knock to nudge" was introduced, which involved interviewers visiting sampled addresses where no phone numbers could be obtained through either telematching or the online portal. The interviewers encouraged residents at the address to provide their phone number and arrange a telephone appointment. This field strategy proved to improve response rates as well as follow-up on those people that are otherwise harder to reach. However, this change in data collection mode also resulted in a potential bias in survey response, which is discussed later in this article.

### Opinions and Lifestyle Survey (OPN)

Data on smoking and e-cigarette use for Great Britain for those aged 16 years and over used in the bulletin come from the OPN. [Further information on the Opinions and Lifestyle Survey and survey methodology](#) is available.

In March 2020, the OPN was transformed from a monthly to weekly omnibus survey to understand how the coronavirus (COVID-19) pandemic is affecting life in Great Britain.

From 25 August 2021, as we moved to a period where COVID-19 restrictions had been lifted across Great Britain, the OPN covered roughly fortnightly periods with an issued sample size of around 5,000 adults in each period to help ensure the survey remained sustainable. Consequentially, the number of questions relating to smoking and vaping habits were greatly reduced. As such, caution is recommended when interpreting trends over this period from OPN data used in the [Adult smoking habits bulletin](#). Conclusions from a [pilot study](#) on the move to mixed mode in the OPN are available for reference.

### 3 . Data collection changes during the pandemic

As noted in our release [Smoking prevalence in the UK and the impact of data collection changes: 2020](#), the change in the mode of data collection for the Annual Population Survey (APS), introduced at the end of March 2020, affected the comparability of our smoking prevalence estimates with previous years.

Because of the coronavirus (COVID-19) pandemic, data collection for the APS moved from mixed-mode (face to face and telephone) to telephone-only data collection. This resulted in a potential bias in the sample and meant our estimates for April to December 2020 were not comparable with previous years.

When looking at pre-coronavirus data, the proportion of adult cigarette smokers has always been lower when responses were recorded on the telephone compared with face to face. In addition, the number of face-to-face interviews was always higher than the number of telephone interviews.

With the change to telephone-only interviews in 2020, there was a sudden drop in the proportion of adults who smoked cigarettes, in APS data (see Figure 1). This may be related to [the move to telephone-only response type](#), which has also been shown in previous research. One explanation for this effect could be because of social desirability, where respondents under-report smoking behaviour over the telephone in order not to be negatively viewed by others. However, another explanation may be that in 2020, people may have given up smoking because of health concerns, or lack of access to tobacco while isolating and no longer smoking socially.

## Figure 1: Smoking prevalence has been higher when measured through face-to-face interviews than telephone

Proportion who were current smokers by interview type, all persons aged 18 years and over, UK, 2015 to Quarter 1 (Jan to Mar) 2020

### Figure 1: Smoking prevalence has been higher when measured through face-to-face interviews than telephone

Proportion who were current smokers by interview type, all persons aged 18 years and over, UK, 2015 to Quarter 1 (Jan to Mar) 2020



Source: Office for National Statistics - Annual Population Survey

#### Notes:

1. Quarter 1 2020 is based on data where most were collected before the UK-wide lockdown (January to March) and has been weighted to produce estimates comparable with previous years.

To account for the discontinuity in APS data because of pandemic survey changes, we have updated our weighting methodology in the 2021 release of Adult smoking habits in the UK to improve the comparability of our smoking prevalence estimates for 2020 and 2021. We have updated our weighting methodology to remove the effect of the mode change by [calculating a new weighting variable](#).

## 4 . Analysis of data for the Adult smoking habits in the UK bulletin

## How we analyse and interpret the data

The analysis reported in the Adult smoking habits annual release uses survey weights to make estimates representative of the population. Survey weights take into account non-response and attrition as well as the distribution of population characteristics such as sex and age, where someone lives and socio-economic characteristics.

From the 2021 release of Adult smoking habits in the UK, an adjusted weighting methodology has been implemented to correct for discontinuity in data as a result of survey response changes in the Annual Population Survey (APS). This update is detailed in [Section 5](#) of this article.

All data presented in the Adult smoking habits UK release are proportions of observed values calculated from APS and Opinions and Lifestyle Survey (OPN) data.

In addition, 95% [confidence intervals](#) are calculated for each proportion. This is done by first calculating [standard error](#). As values provided from the OPN and APS are taken from a sample of the population, they are likely to be different to the "true" unknown population value.

Standard errors are a way to estimate the sampling error, or the error related to the difference between the sample population and the true population. The method used to calculate the standard error is a "linearised jackknife" variance estimator ("glinjack").

Further information can be found in a [guide to calculating standard errors](#) for Office for National Statistics (ONS) social surveys. This guide also contains more information of the effect of sampling design on standard error calculation. Once the standard error is calculated, lower and upper 95% confidence limits can be obtained, which form an interval that is a measure of statistical precision of an estimate. Further information on the calculation of confidence limits and uncertainty can be found in [ONS statistical concepts guidance](#).

## How we disseminate the data

Main findings from the data are published as an [annual bulletin](#) and all data related to adult smoking habits, cigarette and e-cigarette uses are provided in the [accompanying datasets](#). You may re-use the data in the publication (not including logos) free of charge in any format or medium, under the terms of the [Open Government Licence](#).

## 5 . Method of weighting adjustment for the APS

First, the size of discontinuity effect because of the changes in survey response was estimated by calculating the year-on-year trend for each of the four responses given at the smoking prevalence question in the Annual Population Survey (APS).

The year-on-year trend was obtained by using a three-year moving average for data from 2011 to 2021. A three-year moving average ensured that for 2019 and 2020 - the years impacted by discontinuity - annual data trends were correctly captured and calculated. It should be noted that respondents under the age of 18 years are omitted from the usual calculation of national estimates and were therefore also omitted from this method of adjustment.

Once the trends were identified, the change in trend between 2019 and 2020 was then able to be calculated. From this, the effect of the discontinuity as the overall change in national estimates minus the change in the trend was obtained. This calculation relies on the assumption that the discontinuity is responsible for the entirety of the non-trend movement in data during this period, with no other irregular component.

From this, a scaling factor was created using the formula:

$$sf = \frac{\Delta\hat{y} - \Delta t}{\hat{y}_{20}}$$

Where:

y = the change in estimated value

t = the change in trend value

y<sub>20</sub> = the estimated value in 2020

This scaling factor was then applied to the existing weight to produce a new weighting variable that removes the assumed effect of the discontinuity. The new weight has been applied to our current weighting procedures for our national estimates for both 2020 and 2021.

As the discontinuity occurred in 2019 to 2020, the scaling factor adjustment to the weight is then carried forward to subsequent years in the data time series.

## 6 . Related links

[Adult smoking habits in the UK: 2021](#)

Bulletin | Released 6 December 2022

Cigarette smoking habits among adults in the UK, including the proportion of people who smoke, demographic breakdowns, changes over time and use of e-cigarettes.

[Smoking prevalence in the UK and the impact of data collection changes: 2020](#)

Bulletin | Released 7 December 2021

Impact that the coronavirus (COVID-19) pandemic has had on data collection, how this has influenced estimates of smoking prevalence and the comparability of these estimates.

# 7 . Cite this methodology

Office for National Statistics (ONS), released 6 December 2022, ONS website, methodology, [Adult smoking habits in the UK methodology](#)