

Adult smoking habits in the UK: average cigarette consumption methodology

Methodology outlining estimates for average cigarette consumption. This includes how estimates have been calculated, following changes in data collection for cigarette consumption.

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1 . Overview

- Information on average daily cigarette consumption in England and Great Britain is collected in the Opinions and Lifestyle Survey (OPN); during 2018 and 2019, the format of this question changed, and the question was removed during 2020 and 2021, but re-added in 2022.
- We produced adjusted and modelled estimates for the years 2018 to 2021 to complete the timeline of data because of the change in question format and the removal of the question.
- Average daily cigarette smoking consumption in 2022 was 10.6 cigarettes in Great Britain and 10.7 cigarettes in England; this is similar to the consumption reported since 2015, but lower than 2000.

2 . Smoking consumption

Adult smoking habits in the UK

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 cigarettes 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 our annual [Adult smoking habits in the UK bulletin series](#).

Opinions and Lifestyle survey

Data on smoking and e-cigarette use for Great Britain (GB) for those aged 16 years and over, used in the bulletin, come from the OPN. More information can be found in our [Opinions and Lifestyle Survey QMI](#).

In March 2020, the OPN was changed from a monthly to weekly omnibus survey, to help us understand how the coronavirus (COVID-19) pandemic affects life in GB.

From 25 August 2021, when coronavirus (COVID-19) restrictions were lifted across GB, the OPN covered periods that were roughly every fortnight. It had an increased sample size of around 5,000 adults in each period to help ensure the survey remained sustainable.

While the sample size increased, the number of questions relating to smoking and vaping habits were greatly reduced. Conclusions from a pilot study on the move to mixed mode in the OPN, are available on our [Opinions and Lifestyle Survey: mixed mode pilot analysis web page](#).

Changes to smoking consumption question

The OPN collects information on average cigarette consumption, specifically asking how many cigarettes (excluding e-cigarettes) the respondent smokes on a given day.

During 2018 and 2019, the design of the consumption question was revised to allow for the change in mode from face-to-face to mixed mode (online and telephone) data collection.

The change in question format was introduced following extensive cognitive user testing to assess question comprehension, consistency, and accuracy. However, because of the pandemic, OPN collection of smoking consumption was paused in 2020 and 2021. During this pause in collection, the consumption question design was reviewed after discontinuity had been observed with the recently revised question. After split sample dual run testing and consultation with users, the question design was changed back to the previous April 2018 design for future collection and reintroduced in 2022.

The original smoking consumption questions (and questions from 2022 onwards) asked participants:

- "How many cigarettes a day do you usually smoke on weekdays?"
- "How many cigarettes a day do you usually smoke on weekends?"

The altered smoking consumption question for 2018 to 2019 asked participants:

- "How many cigarettes a day do you usually smoke Monday to Sunday?"

The respondent is requested to enter a number for each day, or select:

- don't know for each day
- prefer not to answer

Given the changes and interruptions in the delivery of this question, current smoking consumption estimates cannot be reliably compared from year to year between 2018 and 2021. Estimates from the altered format of the question require adjustments to improve comparability, and projected estimates are required to complete the missing data for 2020 and 2021.

3 . Handling the change in question format

Adjustments to 2018 and 2019 data

To adjust estimates from 2018 and 2019 where the format of the smoking consumption question was altered, a design of experiment approach was taken. Two test groups from a split sample provided responses to either the original (pre-April 2018) and altered (April to December 2018 and 2019) question. The difference between estimates calculated from responses of the two test groups were then used to produce an adjustment factor that was applied to 2018 and 2019 responses, based on original design levels.

It is important to note that the adjustment factor is based on estimates for the entire year of 2018 to 2019, rather than excluding the impact of January, February and March 2018 estimates, where the original format question was asked.

Handling missing data for 2020 and 2021

For years where the smoking consumption question was not included in the Opinions and Lifestyle Survey (OPN), missing years of data were modelled to complete the entire time series of data. These estimates were predicted by applying a univariate state space model.

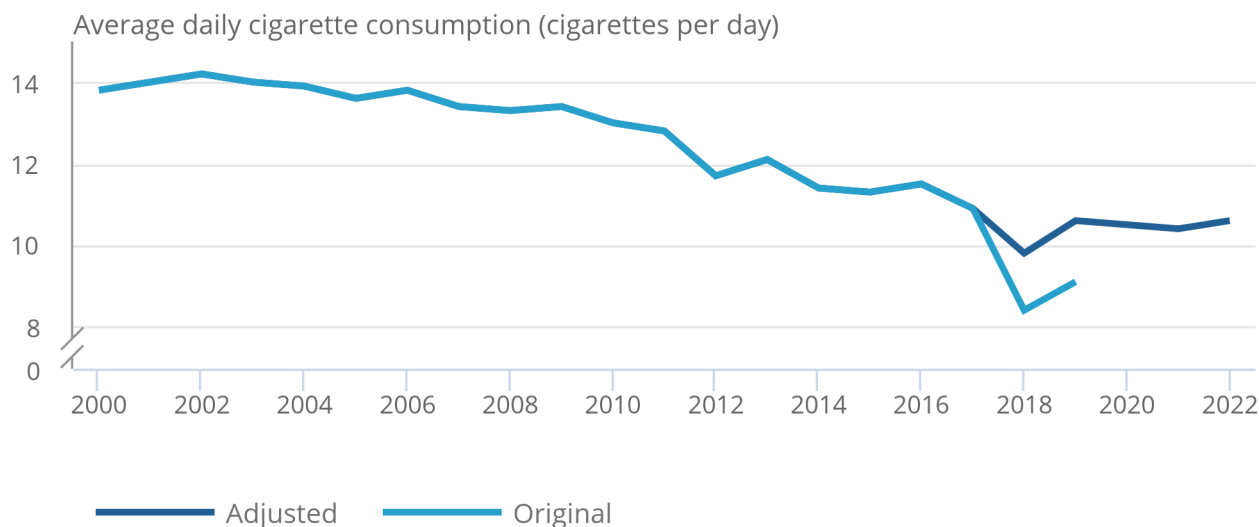
The nature of the model means it is suitable for dealing with output gaps where unobserved variables describe the variability of the time series. State space modelling assumes there is error attached to previous observations provided and an unobserved true value. The model then works to minimise this gap with a smooth path and predict values for the 2020 and 2021 estimates.

Figure 1: Average daily cigarette consumption in Great Britain, between 2018 and 2021, is comparable with prior and subsequent years

Time series for average daily cigarette consumption showing original and adjusted figures for Great Britain, 2000 to 2022

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Source: Opinions and Lifestyle Survey from the Office for National Statistics

Notes:

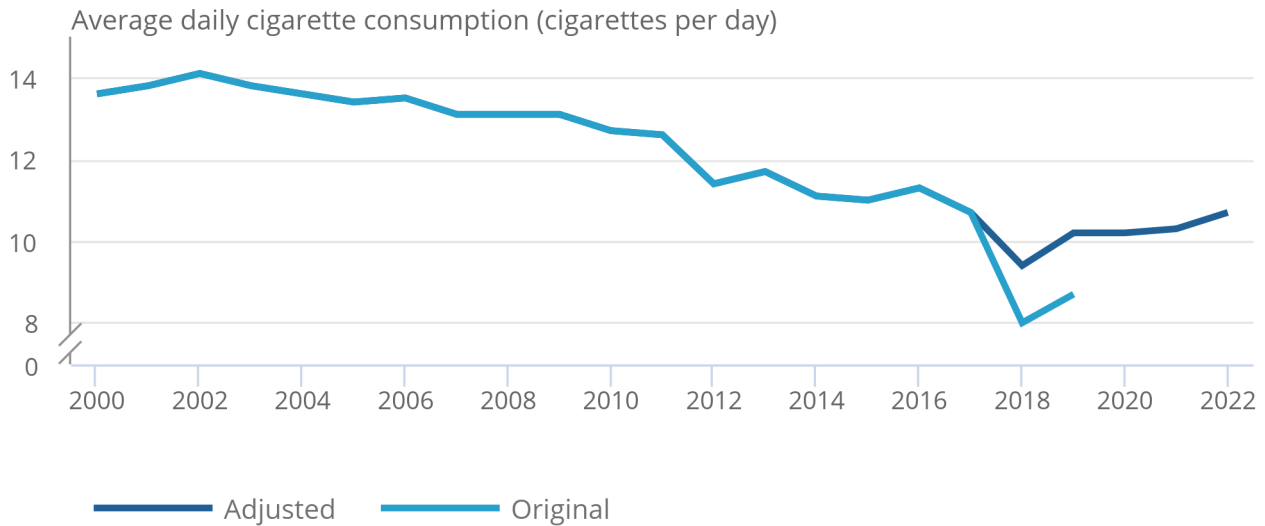
1. "Original" series refers to unadjusted weighted estimates collected between 2000 to 2019
2. "Adjusted" series refers to adjusted estimates to correct for changes in survey question in 2018 and 2019, and modelled estimates for 2020 and 2021.

Figure 2: Average daily cigarette consumption in England, between 2018 and 2021, is comparable with prior and subsequent years

Time series for average daily cigarette consumption showing original and adjusted figures for England, 2000 to 2022

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Notes:

1. "Original" series refers to unadjusted weighted estimates collected between 2000 to 2019
2. "Adjusted" series refers to adjusted estimates to correct for changes in survey question in 2018 and 2019, and modelled estimates for 2020 and 2021.

4 . Average daily cigarette consumption in 2022

In 2022, average daily cigarette consumption in Great Britain (GB) was 10.6 cigarettes, which is similar to average consumption in preceding years. However, this is much lower than in 2000, when weighted estimates began, where average consumption was 13.8 cigarettes.

This is similar to the trend over time in England, where average consumption was 10.7 cigarettes which is similar to preceding years, and much lower than 2000 at 13.6 cigarettes.

The reduction in average daily cigarette consumption is also in line with a general decline in smoking prevalence over time. In 2022 12.9% of people in the UK were current smokers, compared with 20.2% when data collection began in 2011. This is based on our estimates from the Annual Population Survey (APS). This is also the case in England where 12.7% were current smokers in 2022, compared with 19.8% in 2011.

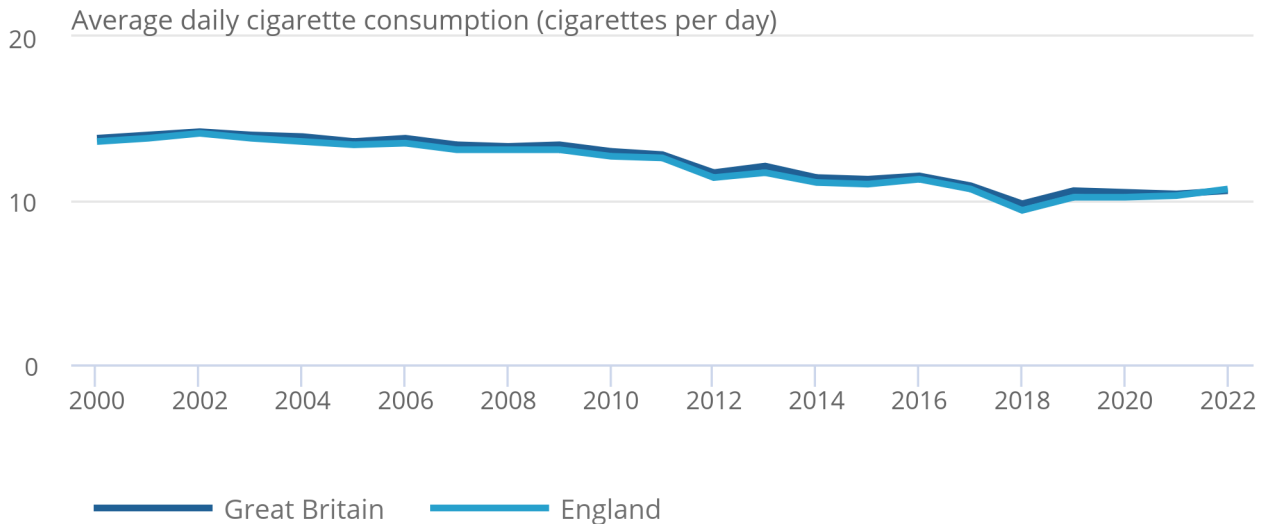
This indicates that current smokers are declining over time, and for those who are current smokers, they are smoking less, on average, over time. For more information about smoking prevalence in the UK see our [Adult smoking habits in the UK bulletin series](#).

Figure 3: Average daily cigarette consumption was similar to previous years in Great Britain and England in 2022

Average daily cigarette consumption in Great Britain and England, 2000 to 2022

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Average daily cigarette consumption in Great Britain and England, 2000 to 2022



Source: Opinions and Lifestyle Survey from the Office for National Statistics

Notes:

1. Data are weighted from 2000 onwards.
2. Data for 2018 and 2019 are adjusted because of a change in question format for these years.
3. Data for 2020 and 2021 are modelled estimates because of the temporary removal of average consumption question from the OPN during these years.

5 . Future developments

Revisions to modelled estimates

Because of the nature of the state space model, the more information that can be provided (for example additional years of data), the more accurate the modelled estimates for 2020 and 2021 are. This means that estimates for 2020 and 2021 may be revised to increase predictive accuracy when re-run with additional data in future years.

In the future the smoking consumption question, including adjusted and modelled data, will be provided as an additional table in the datasets provided alongside our [Adult smoking habits in the UK annual bulletin](#).

Data measurement in subsequent years

Following the re-introduction of the smoking consumption question in 2022, there are currently no plans to make changes to the format of this question. This means that estimates for subsequent years will continue to be comparable with the rest of the adjusted time series.

6 . Related links

[Adult smoking habits in the UK: 2022](#)

Bulletin | Released 5 September 2023

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.

[Adult smoking habits in the UK methodology](#)

Methodology | Released 6 December 2022

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

7 . Glossary

Adjustment factor

An adjustment factor is a number used to correct a calculation, typically accounting for the influence of external factors on a provisional estimate. It helps to refine or improve the accuracy of the initial calculation by incorporating additional considerations.

State space model

A class of mathematical models which describe the relationship between the observed and the true measurement in a time series. State space modelling is often applied to time series problems that involved unobserved variables.

Time series

A series of data points in time order, usually at equally spaced points in time (for example annually).

8 . Measuring the data

Opinions and Lifestyle Survey

Data on average smoking consumption for Great Britain for those aged 16 years and over come from the Opinions and Lifestyle Survey (OPN). In March 2020, the OPN was changed from a monthly to weekly omnibus survey to understand how the coronavirus (COVID-19) pandemic is affecting life in Great Britain. Because of this change, the number of questions relating to smoking and vaping habits was greatly reduced. More information can be found in our [Opinions and Lifestyle Survey QMI](#).

Annual Population Survey

The data on smoking prevalence on this article come from the Annual Population Survey (APS). The survey covers residents of the UK aged 18 years and over. Further information on the APS can be found in our [Annual population survey \(APS\) QMI](#).

9 . Cite this methodology

Office for National Statistics (ONS), released 6 June 2024, ONS website, methodology, [Adult smoking habits in the UK: Average cigarette consumption](#)