

Ready Reckoner Methods

January 2025

This document explains the process of estimating smoking-related figures at the regional, local, combined authority, constituency and ICB levels of England from national figures. For an explanation of how the national figures were derived, see the CBPF model January 2025.

In the Ready Reckoner, 'Local Authority' or 'LA' means Upper Tier Local Authorities (i.e. county councils, unitary authorities, metropolitan boroughs and London boroughs). The Isles of Scilly and the City of London are removed as populations are very low and data are rarely available for them. Where a Local Authority value is unavailable, which is rare, the most recent year in which the value is available is used instead.

Boundary changes occur frequently for LAs, Combined Authorities and constituencies, and data is not always available at the most up-to-date geographies. It is important to use consistent geographies when making calculations. Where sources are only available using older boundaries, these are mapped to the new areas as closely as possible. For example, the LA of Cumbria has recently split into 'Cumberland' and 'Westmorland and Furness' and its districts have been retired. Proportions (e.g. smoking prevalences) may be estimated using the older Cumbria boundaries, and counts (e.g. number of economically active people) by splitting the areas according to population or by adding figures for the constituent districts (Lower Tier Local Authorities).

Most ward-level information is not yet available following the major boundary changes in 2024. Ward boundaries from before the major boundary changes in 2024 are used collectively to model the new constituency boundaries. Wards are not shown directly on the Ready Reckoner because they are so small that accuracy is very low. As a result, there are likely to be large but meaningless year-on-year fluctuations.

For the Ready Reckoner, ICB geographies are estimated using LA boundaries. Where (Upper Tier) LA boundaries do not cross an ICB's boundaries, the LA statistics are assigned to the ICB. Where LAs do cross ICB boundaries, the proportion of the LA in a given ICB is approximated using the proportion of the LA's LSOAs that are inside vs outside of the ICB. That proportion is applied to the overall LA total and assigned to the ICB. The ICB figures are the sum of these assignments, referred to in this document as 'LA level'. This is a slightly simplified process compared with previous versions of the RR, where Lower Tier Local Authority boundaries were sometimes used.

Regions, Local Authorities, Combined LAs and ICBs

First, methods are explained for regional, local, combined authority and ICB levels. Ward and constituency methods are explained afterwards.

Smoking prevalence and spend stats

	Regional level	Local level	Combined Local Authority level	ICB level
Smoking prevalence	Directly available from APS ¹	Directly available from APS ²	Directly available from APS ³	Directly available from APS ⁴
Total adult population	Directly available from ONS pop. estimates (adding together ages 18+) ⁵	Directly available from ONS pop. estimates (adding together ages 18+) ⁵	Not used	Not used
Number of adults who smoke	Smoking prevalence x Total adult population	Smoking prevalence x Total adult population	Found at LA level summed to CA level	Found at LA level summed to ICB level
Average spend per smoker	National figure from CBPF model	National figure from CBPF model	National figure from CBPF model	National figure from CBPF model
Annual spend on tobacco	National figure from CBPF model x Number of people who smoke in this region/ Total number of people who smoke in all regions	National figure from CBPF model x Number of people who smoke in this region/ Total number of people who smoke in all regions	Found at LA level summed to CA level	National figure from CBPF model x Number of people who smoke in this region/ Total number of people who smoke in all regions
Estimated revenue from cigarette and HRT taxation	National figure from CBPF model x Number of people who smoke in this region/ Total number of people who smoke in all regions	National figure from CBPF model x Number of people who smoke in this LA/ Total number of people who smoke in all LAs	Found at LA level summed to CA level	National figure from CBPF model x Number of people who smoke in this ICB /Total number of people who smoke in all ICBs

Healthcare and Health stats

	Regional level	Local level	Combined Local Authority level	ICB level
Smoking prevalence in aged 35+	Cut of data provided directly to ASH by OHID	Cut of data provided directly to ASH by OHID	Not used	Not used
Total population aged 35+	Directly available from ONS pop. estimates (adding together ages 35+) ⁵	Directly available from ONS pop. estimates (adding together ages 35+) ⁵	Not used	Not used
Number of people who smoke aged 35+	Smoking prevalence 35+ x Total population 35+	Smoking prevalence 35+ x Total population 35+	Found at LA level summed to CA level	Found at LA level summed to ICB level
NHS costs	National figure from CBPF model x Number of people who smoke aged 35+ in this region/ Total number of smokers aged 35+ in all regions	National figure from CBPF model x Number of smokers aged 35+ in this LA/ Total number of smokers aged 35+ in all LAs	Found at LA level summed to CA level	Found at LA level summed to ICB level
QALY cost of death	National figure from CBPF model x Number of smokers aged 35+ in this region/ Total number of smokers aged 35+ in all regions	National figure from CBPF model x Number of smokers aged 35+ In this LA/ Total number of smokers aged 35+ in all LAs	Found at LA level summed to CA level	Found at LA level summed to ICB level

Social care stats

	Regional level	Local level	Combined Local Authority level	ICB level
Smoking prevalence in aged 50+	Cut of data provided directly to ASH by OHID	Cut of data provided directly to ASH by OHID	Not used	Not used
Total population aged 50+	Directly available from ONS pop. estimates (adding together ages 50+) ⁵	Directly available from ONS pop. estimates (adding together ages 50+) ⁵	Not used	Not used
Number of smokers aged 50+	Smoking prevalence 50+ x Total population 50+	Smoking prevalence 50+ x Total population 50+	Found at LA level summed to CA level	Found at LA level summed to ICB level
Social care costs each of: <ul style="list-style-type: none"> • Domiciliary care costs, • Residential care costs • Cost of informal care by family & friends • Cost of unmet care need 	National figure from CBPF model x Number of people who smoke aged 50+ / Total number of people who smoke aged 50+ in all regions	National figure from CBPF model x Number of people who smoke aged 50+ / Total number of people who smoke aged 50+ in all LAs	Found at LA level summed to CA level	Found at LA level summed to ICB level

Employment and Productivity stats

	Regional level	Local level	Combined Local Authority level	ICB level
Median Gross Annual Pay	Directly available from Annual Survey of Hours and Earnings ⁶	Directly available from Annual Survey of Hours and Earnings ⁶	Not used	Not used
Number of employed people	Directly available from Annual Population Survey ⁷	Directly available from Annual Population Survey ⁷	Not used	Not used
Number of Economically Inactive people who want a job	Directly available from Annual Population Survey ⁸	Directly available from Annual Population Survey ⁸	Not used	Not used

Weighting for smoking related lost earnings	Smoking prevalence x Median gross annual pay x Number of employed people	Smoking prevalence x Median gross annual pay x Number of employed people	Not used	Not used
Smoking related lost earnings	National figure from CBPF model x Weighting in this region/ Total weighting in all regions	National figure from CBPF model x Weighting in this region/ Total weighting in all LAs	Found at LA level summed to CA level	Found at LA level summed to ICB level
Weighting for smoking related unemployment	Smoking prevalence x Median gross annual pay x Number of Economically Inactive people who want a job	Smoking prevalence x Median gross annual pay x Number of Economically Inactive people who want a job	Not used	Not used
Smoking related unemployment	National figure from CBPF model x Weighting in this region/ Total weighting in all regions	National figure from CBPF model x Weighting in this region/ Total weighting in all LAs	Found at LA level summed to CA level	Found at LA level summed to ICB level
Cost of early deaths (lost productivity)	National figure from CBPF model x Number of adult smokers/ Total adults who smoke in all regions	National figure from CBPF model x Number of adults who smoke/ Total adults who smoke in all regions	Found at LA level summed to CA level	Found at LA level summed to ICB level
Reduced GVA due to expenditure on tobacco	National figure from CBPF model x Number of adults who smoke/ Total adults who smoke in all regions	National figure from CBPF model x Number of adults who smoke/ Total adults who smoke in all regions	Found at LA level summed to CA level	Found at LA level summed to ICB level

Fire stats

	Regional level	Local level	Combined Local Authority level	ICB level
Fire costs each of: <ul style="list-style-type: none"> • Number of fires • Costs of death • Costs of injuries • Costs of property damage • Fire and Rescue service costs 	National figure from CBPF model x Number of people who smoke in this region/ Total number of people who smoke in all regions	National figure from CBPF model x Number of people who smoke in this LA/ Total number of people who smoke in all LAs	Found at LA level summed to CA level	Found at LA level summed to ICB level

Wards and Constituencies

Estimates are found for the population count and the number of people who smoke in each ward, for ages 18+, 35+ and 50+ as explained below. The number of people who smoke is used to weight the breakdown of national figures, similarly to the process for LAs above.

Smoking related lost earnings and smoking related unemployment both include extra weighting factors. The standard number of people who smoke weighting is normalised so that the sum of the weights within a LA sums to one. Then this is multiplied by the LA cost estimate to create a final estimate.

Fire costs are not estimated for wards or constituencies due to very low average numbers of smoking-related fires per ward (below one per year).

Ward population estimates

Experimental ward population estimates are available from the ONS.⁹ These are used to give ward population estimates for ages 18+, 35+ and 50+ and then normalised so that the sum of ward populations match the LA population.⁵

Ward smoker count estimates

The estimation of the number of people who smoke in a ward is done in several steps.

- First, an estimate of the number of people who smoke in a ward is found based solely on its age and gender profile.
- Second, a deprivation factor is calculated, to represent how typical the deprivation level of the ward is for the LA it's in and applied to the age-and-gender based estimate.

- Finally, the estimates of all the wards in a local authority are normalised so that they sum to the established LA total.

Ward number of people who smoke estimate based on age and gender

For the following groups, the ward population estimate⁹ is multiplied by the national (England) smoking prevalence, which is provided directly to ASH by OHID.

Male, 18-34
 Male, 35-64
 Male, 65+
 Male, 50+
 Female, 18-34
 Female, 35-64
 Female, 65+
 Female, 50+

The results are added together to find an estimated number of people who smoke in the ward for each of 18+, 35+ and 50+.

Deprivation factor

A deprivation factor is calculated, to represent how typical the deprivation level of the ward is for the LA it's in.

1. The deprivation level is found at the LSOA (Lower Layer Super Output Area) level geography¹⁰
2. The median rank of the LSOAs in each ward is found
3. The wards are split into deciles, with 1 the most deprived wards (lowest median LSOA rank) and 10 the least deprived (highest median LSOA rank)
4. Deprivation deciles are also calculated for Lower Tier Local Authorities¹¹
5. The national smoking rates by deprivation decile¹² are used to assign the 'expected' smoking prevalence given an area's decile
6. For every combination of LA decile and ward decile, a factor is calculated which can be applied to the LA expected prevalence to get the ward expected prevalence.

For example, the national smoking prevalence at decile 1 is 16.4% and at decile 5 is 12.7%.

For example, for a ward at decile 1 in an LA at decile 5, the deprivation factor is 1.291, because:

$$\begin{array}{rcl} \text{LA decile expected smoking rate} & \times \text{ factor} & = \text{Ward expected smoking rate} \\ 12.7\% & \times 1.291 & = 16.4\% \end{array}$$

7. These factors are recorded for each ward, based on the ward and LA deprivation decile.

8. For each group (age 18+, 35+ and 50+) in each ward, the age- and gender-based estimate is multiplied by the deprivation factor to get a modified estimate.

Local Authority normalisation

The estimated number of people who smoke in a given ward, is divided by the sum of the ward estimates within each local authority to create a ward estimate which is normalised to the LA total. This can be divided by the normalised population estimate found earlier to generate a smoking prevalence estimate.

Constituencies

Constituency values are generated from ward estimates in broadly the same way that CA values are calculated from LA values. However, there is very little population and demographic information for the new 2024 ward geography, so a best-fit match from ward boundaries in 2023 to constituency boundaries in 2024 is used. Where 2023 wards are split between 2024 constituencies, they are divided in proportion to the number of LSOAs in each.

References

¹ Fingertips, Local Tobacco Control Profiles, Smoking Prevalence in adults (aged 18 and over) – current smokers (APS) (1 year range) 2023 Proportion - % - [Region in England](#)

² Fingertips, Local Tobacco Control Profiles, Smoking Prevalence in adults (aged 18 and over) – current smokers (APS) (1 year range) 2023 Proportion - % - [Counties & UAs in England](#)

³ Provided directly to ASH by OHID

⁴ Fingertips, Local Tobacco Control Profiles, Smoking Prevalence in adults (aged 18 and over) – current smokers (APS) (1 year range) 2023 Proportion - % - [ICBs in England](#)

⁵ [ONS Mid-year estimates](#) by country, region and upper & lower tier local authority (2023) MYE2: Persons.

⁶ [Annual Survey of Hours and Earnings - Resident Analysis](#) (2022) Median gross annual pay of full-time workers.

⁷ [Annual population survey](#) (2023/24) Economic activity rate – aged 16 – 64.

⁸ [Annual population survey](#) (2023/4) % of economically inactive who want a job.

⁹ ONS [Ward-level population estimates \(experimental statistics\)](#), mid-year 2022

¹⁰ National statistics, [English indices of deprivation](#), File 1: index of multiple deprivation, IMD rank

¹¹ National statistics, [English indices of deprivation](#) File 10: local authority district summaries, IMD average score

¹² Fingertips, Local Tobacco Control Profiles, Smoking Prevalence in adults (aged 18 and over) – current smokers (APS) (1 year range) [Country & UA deprivation deciles in England](#) (IMD2019, 4/23 geography)