Hospital admissions attributable to smoking

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# Introduction

Smoking remains a leading cause of preventable disease and premature death. While it is not possible to class any hospital admission as wholly attributable to smoking, it is possible to estimate what fraction of admissions can be attributed to smoking using estimated prevalence rates of smoking and associated risk of disease.

# Methodology

The method used for calculating smoking attributable admissions to hospital is consistent with the method used by Public Health England. In the absence of direct information on individual smoking histories, a proxy measure is used to calculate the proportion of admissions which are due to smoking. Only admissions for Scottish residents aged 35 years and older are included, as the likelihood of younger individuals being admitted to hospital from smoking is low.

Five categories of diseases related to smoking were defined using the Tenth revision of the International Classification of Diseases (ICD-10). For each of these categories, a smoking-attributable fraction (SAF) was calculated. The following ICD-10 codes were used:

|  |  |
| --- | --- |
| Category | ICD-10 Code |
| Cancers | C00-C14, C15, C16, C25, C32, C33-34, C53, C64-C66, C67, C68, C80, C92 |
| Cardiovascular diseases | I00-I09, I20-I25, I26-I51, I60-I69, I70, I71, I72-I78 |
| Respiratory diseases | J10-J18, J40-J42, J43, J44 |
| Digestive diseases | K25-K27, K05, K50 |
| Others | H25, S72.0, S72.1, S72.2, O03 |

Throughout most of the analysis, the SAF is calculated using only the main diagnosis. In the case that during and admission an individual had multiple main diagnosis related to smoking we selected the first one.

Each disease has its own associated gender and age-specific risk. These can be found in the [Statistics on Smoking in England 2020 publication](https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-smoking/statistics-on-smoking-england-2020/statistics-on-smoking-2020-data-tables) (Excel Table B.2).

Age and sex specific smoker and ex-smoker prevalence data were used in the calculations. These data are taken from the [Scottish Health Survey](https://www2.gov.scot/scottishhealthsurvey), which is used to track the [Scottish Government’s National Indicator to reduce the percentage of adults who smoke](https://www2.gov.scot/About/Performance/scotPerforms/indicator/smoking),

The disease risk and the prevalence information were used to calculate the smoking-attributable fraction (SAF), the fraction of an admission which could be attributed to smoking. The SAF was calculated for Scotland using the following equation:

$$SAF=\frac{(prev\_{current}×\left(risk\_{current}-1\right)+prev\_{ex}×\left(risk\_{ex}-1\right))}{(1+prev\_{current}×\left(risk\_{current}-1\right)+prev\_{ex}×\left(risk\_{ex}-1\right))}$$

The SAFs were added together to obtain the estimated number of admissions attributed to smoking, which gave the numerator value for Scotland.

The denominator used mid-year population estimates from the [National Records of Scotland](http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates). This information was then used to calculate age-sex standardised rate per 100,000 population, using the 2013 European Standard Population.

It is difficult to determine the exact extent to which admissions from certain causes are associated with smoking. These causes of admission include: external causes (including fires, self-harm, and accidents), all other admissions under 35 years, and admissions from cirrhosis of the liver. Therefore, none of these admissions were attributed to tobacco, even though some of them would have been due to smoking.

# Further information

Our statistical practice is regulated by the Office for Statistics Regulation (OSR).

Visit our website for [further information about our statistics and PHS as an Official Statistics producer.](https://publichealthscotland.scot/our-organisation/about-our-statistics/official-statistics/)

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