Local Tobacco Control Profiles

Smoking related ill health

Area type County & UA Filter indicators

Indicator Smoking attributable hospital admissions

Indicator Definitions and Supporting Information

Indicator ID	1207
Date updated	03 Feb 2018
Indicator number	8.
Indicator full name	Directly standardised rate of Smoking Attributable Admissions in people aged 35 and over
Rationale	Smoking is the biggest single cause of preventable death and ill-health within England. This indicator aims to highlight the size of preventable smoking-related conditions on inpatient hospital services as well as inequalities between local authorities in England. High smoking attributable admission rates are indicative of poor population health and high smoking prevalence. Smoking accounts for approximately 5.5% of the NHS budget. Admissions to hospital due to smoking related conditions not only represent a large demand on NHS resources, but can also be used as a proxy for variations in smoking related ill health in the general population across England.
Definition	Total number of hospital admissions for diseases that are wholly or partially attributed to smoking in persons aged 35 and over
Data source	NHS Digital - Hospital Episode Statistics (HES), Office for National Statistics (ONS) - mid-year population estimates and ONS Integrated Household survey/Annual Population Survey. Indicator calculated by PHE Knowledge and Intelligence Service.
Indicator production	PHE - Risk Factors Intelligence Team
Definition of numerator	The total number of smoking attributable admissions defined as the sum of the Smoking Attributable Fractions (SAF) for all of the admissions with a smoking attributable diagnoses.
Source of numerator	Hospital Episodes Statistics (HES) extract, 2009/10, 2010/11, 2011/12, 2012/13, 2013/14, 2014/15, 2015/16 and 2016/17: NHS Digital. All rights reserved. Smoking and ex-smoking prevalence estimates from the Integrated Household Survey, 2009/10, 2010/11, 2011/12, 2012, 2013 and 2014. From 2015 onwards these smoking prevalence estimates are derived from the Annual Population Survey, ONS. Relative risks from NHS Digital, Statistics on Smoking: England 2013 http://digital.nhs.uk/catalogue/PUB11454.
Definition of denominator	Mid-year population estimates based on Census 2011, aged 35+, 2009, 2010, 2011, 2012, 2013 (revised), 2014, 2015 and 2016.
Source of denominator	ONS population estimates
Value type	Directly standardised rate

Methodology	The Smoking Attributable Fractions are calculated using the formula from NHS Digital's report, Statistics on Smoking: England, 2013 http://digital.nhs.uk/catalogue/PUB11454. Relative risks of death/illness from a range of diagnoses ("Statistics on Smoking: England, 2013") and estimates of the prevalence of smoking and ex-smoking are used alongside age and sex to calculate the proportion of each hospital admission which can be attributed to smoking (SAF). The SAFs were applied to all admission episodes with the following ICD-10 codes as the primary diagnosis (Disease Category (ICD-10)): • Malignant neoplasms: Lip, Oral cavity, Pharynx (C00-C14), Oesophagus (C15), Stomach (C16), Pancreas (C25), Larynx (C32), Trachea, Lung, Bronchus (C33-C34), Cervix uteri (C53), Kidney and renal pelvis (C64-C66, C68), Urinary bladder (C67), Acute myeloid leukaemia (C92), Unspecified site (C80), • Cardiovascular Diseases: Ischemic heart disease (I20-I25), Other heart disease (I00-I09, I26-I51), Cerebrovascular disease (I60-I69), Atherosclerosis (I70), Aortic aneurysm (I71), Other arterial disease (I72-I78) • Respiratory Diseases: Pneumonia, Influenza (J10-J18), Bronchitis, Emphysema (J40-J43), Chronic airway obstruction (J44) • Diseases of the digestive system: Stomach ulcer, Duodental ulcer (K25-K27), Crohn's disease (K50), Periodontal disease (K05) • Other diseases: Age related cataract (H25), Hip fracture (S72.0-S72.2), Spontaneous abortion (O03). The method requires estimates of smoking and ex-smoking prevalence by age and sex; *2015/16 onwards* Local authority smoking prevalence is calculated from the Annual Population Survey (3 year dataset). Regional figures are calculated from the sum of the corresponding local authorities and England figures from the sum of the regional values. *2009/10 - 2014/15* Age and sex specific smoking prevalence was not available at upper or lower tier local authority level. Therefore regional proportions of smokers and ex-smokers by age and sex were applied to the local authority prevalence. (Estimates of smoking prevalence are taken from the Integrated Household Survey). Where a patient's local authority of residence is not known but their region of residence is contained within the data they have been included in the regional figures. Therefore the sum of the local authority numerators within a region will not necessarily be the same as the regional figures. Regional smoking prevalence figures were used for City of London and isles of Scilly due to reliability issues around smoking prevalence for these local authorities. For the calculation method for direct standardised rates see APHO (Association of Public Health Observatories) Technical Briefing 3 on commonly used public health statistics, available at http://www.apho.org.uk/resource/item.aspx?RID=48457.
Unit	per 100,000
Standard population/values	European Standard Population
Age	35+ yrs
Sex	Persons
Year type	Financial
Frequency	Hospital admissions and population data are updated on an annual basis. This indicator is generated at local authority level as part of the Tobacco Control Profiles, but not routinely published elsewhere.
Benchmarking method	Confidence intervals overlapping reference value (95.0)
Benchmarking significance level	95%
Confidence interval method	Dobson & Byar's methods

Confidence interval methodology	A confidence interval is a range of values that is used to quantify the imprecision in the estimate of a particular indicator. Specifically it quantifies the imprecision that results from random variation in the measurement of the indicator. A wider confidence interval shows that the indicator value presented is likely to be a less precise estimate of the true underlying value. Dobson & Byar's method is used for calculating confidence intervals for directly standardised rates. A confidence interval is calculated for the observed total count of events using Byar's method,[1] which gives very accurate approximate confidence intervals for counts based on the assumption of a Poisson distribution and is sufficiently accurate for counts as low as 5 (below 5, an exact method should be used, based on Poisson tables or the Chi-squared distribution). This interval is then weighted and scaled to give the interval for the standardised rate using the method described by Dobson.[2] The method is described in detail in APHO Technical Briefing 3: Commonly used public health statistics and their confidence intervals.[3] [1] Breslow NE, Day NE. *Statistical methods in cancer research, volume II: The design and analysis of cohort studies.* Lyon: International Agency for Research on Cancer, World Health Organization; 1987:69. [2] Dobson A et al. *Confidence intervals for weighted sums of Poisson parameters.* Stat Med 1991;10:457-62. [3] Eayres D. *APHO Technical Briefing 3: Commonly used public health statistics and their confidence intervals* York: APHO; 2008.
Disclosure control	The number of smoking related admissions is a synthetic estimate, however, all numerators are larger than 5 and therefore there is no need for direct disclosure control.
Caveats	Not all smoking related conditions require inpatient services so this indicator is only one measure of the smoking-related health problems in each local area. However, inpatient admissions are easily monitored and this indicator provides local authorities with a routine method of monitoring the health impacts of smoking in their local populations. The method relies on the use of estimates of the contribution of smoking to a range of causes of death as published by NHS Digital in Statistics on Smoking: England, 2013 (http://digital.nhs.uk/catalogue/PUB11454). These data are derived from the American Cancer Prevention Society II study (1982-88) and assume that the contribution of smoking to deaths in Americans in the 1980's is generalisable to the current English population. Estimates of smoking and ex-smoking rates are derived from the Integrated Household Survey (2009/10-2014/15)/Annual Population Survey (2015/16 onwards) and there is a risk of responder bias. Smoking status is self-reported. Uncertainty in the smoking estimates is not reflected in the confidence limits on the results. Hospital Episode Statistics overall is well completed. However, year-on-year variations exist due to poor completion from a proportion of trusts. When geographic codes, such as postcode, Local Authority of residence, etc are missing, they are derived from other variables. The smoking attributable fraction is based on the primary diagnosis of the admission episode (i.e. the SAF of the admission diagnosis). Subsequent episodes which relate to smoking but the admission episode is not related to smoking have not been included in this analysis. Therefore this is likely to be an underestimate of the number of smoking related admissions. The SAFs prior to 2014/15 were recalculated using a three year weighted average prevalence to smooth out large fluctuations in smoking prevalence in some areas.
Notes	From 2013-15 the attributable fractions are based solely on local authority estimates, rather than the previous method. As a result, the sample size for the lower tier data is too small to get reliable estimates for the different age groups required. NHS Digital has identified a data quality issue affecting HES data for Nottingham University Hospitals Trust (NUH) in 2016/17. Over 30% of records from this trust did not have a valid geography of residence assigned. Therefore PHE have not published values for indicators based on HES data for areas that had more than 20% of patients from that area treated at NUH in the previous year (2015/16). Areas where 10%-20% of the previous year's patients were treated at NUH have been flagged and should be treated with caution. For more details of the issue, see http://content.digital.nhs.uk/article/1825/The-processing-cycle-and-HES-data-quality
Copyright	Hospital Episodes Statistics (HES) extract, 2016/17: NHS Digital. All rights reserved.
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