

Hospital admissions for alcohol-related harm: Technical Information and Definition for Vital Signs Indicator VSC26, National Indicator Set NI39 and Public Service Agreement Indicator 25.2

Introduction

This document provides a description of the methodology for the indicator of *Hospital admissions for alcohol-related harm*, which is included in three key indicator sets and performance management frameworks:

- Vital Signs Indicator VSC26
The Vital Signs framework provides a series of indicators from which PCTs may select a number that reflect the priorities for health in that area.
[\[www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_082542\]](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_082542)
- National Indicator Set NI39
The national indicators form part of a new performance framework for local authorities and local authority partnerships.
[\[www.communities.gov.uk/localgovernment/performanceframeworkpartnerships/nationalindicators\]](http://www.communities.gov.uk/localgovernment/performanceframeworkpartnerships/nationalindicators)
- Public Service Agreement Indicator 25.2
PSAs set out the key priority outcomes the Government wants to achieve in the next spending period (2008-2011). [\[www.hm-treasury.gov.uk/pbr_csr/psa/pbr_csr07_psaindex.cfm\]](http://www.hm-treasury.gov.uk/pbr_csr/psa/pbr_csr07_psaindex.cfm)

The methodology was revised in November 2008 from that used when the indicator was first launched. This document sets out the methodological changes that have been made, the background to those changes, and the effect that they have had on the indicator.

The production of measures of admission to hospital related to alcohol is dependent upon identifying all conditions known to be either wholly or partially attributable to alcohol (ie. there is a risk associated with the consumption of alcohol) and the proportion of the population who might be affected (Box 1).

Box 1: Attributable Fractions (AF)

The epidemiological concept of attributable risk (AR) is defined as the absolute difference in risk of developing a disease between exposed and unexposed individuals. The concept can be extended from individuals to a population in the form of an attributable fraction (AF). The AF is defined as the proportion of cases arising in a population that can be attributed to exposure to a given risk factor, or alternatively as the proportionate reduction in cases that would be expected if the exposure were removed from the population. This measure is also known as the *population* attributable fraction (PAF), or the population attributable risk percent (PAR%).

The attributable fraction can be estimated directly from a representative case series if it is possible to identify those cases that arise as a direct result of exposure. More commonly, the AF is obtained indirectly by combining information on relative risk (RR) from epidemiological studies with estimates of exposure prevalence in the target population. Alcohol attributable fractions are specific to the population being studied, since alcohol consumption levels are expected to vary across populations.

Revised for Nov 08 refresh NWPHO draft (18th December 2008)

The alcohol attributable fractions (AAFs) now used to calculate hospital admissions for alcohol-related harm match the fractions published by the North West Public Health Observatory (NWPHO) in July 2008, following a review commissioned by the Department of Health¹.

Briefly, *Alcohol-attributable fractions for England* identified relative risk estimates from a number of epidemiological reviews and studies of the health impacts of alcohol; estimates of different levels of alcohol consumption in the population were obtained from the General Household Survey 2005. From these a set of age group and gender specific AAFs were derived for each alcohol related condition, defined in terms of ICD10 codes. For most alcohol related conditions, relative risk estimates were only available for adults, and the AAF for persons aged 15 or under was set to zero. The exception was conditions for which alcohol is a contributory factor in all cases, e.g. acute alcohol intoxication, where the AAF was set to 1 for all age groups.

Indicator definition for VSC26 and NI39: Hospital admissions for alcohol-related harm

1. Identification of hospital admissions with alcohol related diagnoses

- Data source: Hospital Episode Statistics [www.hesonline.org.uk]
- The list of alcohol related ICD10 codes and associated age group and gender specific attributable fractions (AAFs) was taken from the findings of the recent DH review *Alcohol-attributable fractions for England* published in July 2008. Negative attributable fractions are not used (that is, they are set to zero).
- The following criteria were used to select records for analysis. The text in square brackets shows how the selection criteria were defined in terms of HES dataset fields. Further information can be found in the HES data dictionary [www.hesonline.org.uk/Ease/servlet/ContentServer?siteID=1937&categoryID=571]:
 - It was a finished episode [*epistat* = 3]
 - It was an admission episode [*epiorder* = 1]
 - The primary diagnosis or any of the 13 secondary diagnoses [*diag_01* to *diag_14*] contained an ICD10 code that was in the list of alcohol related codes in Table 1.
 - The sex of the patient was valid [*sex* = 1 or 2]
 - A valid age at start of episode was recorded [*startdate* between 0-120 or between 7001-7007]
 - The admission was an ordinary admission, day case or maternity [*classpat* = 1, 2 or 5]
 - The region of residence was one of the English regions, no fixed abode or unknown [*resgor* <= K or U or Y]

2. Estimating alcohol attributable admissions

- For each episode identified in step 1 above, an attributable fraction was applied, based on the diagnostic codes, age group and gender of the patient. Where there was more than one alcohol related ICD10 code among the 14 possible diagnostic codes, the one associated with the largest attributable fraction was selected. In the event of two or more codes with the same attributable fraction, the code from the earliest diagnostic position was used ['diagnostic position', takes an integer value between 1 and 14, corresponding to the 14 diagnosis fields *diag_01* to *diag_14*].
- Children aged under 16 were only included if they had an alcohol specific diagnosis i.e. where the attributable fraction = 1, meaning that alcohol consumption is a contributory

¹ Jones L, Bellis MA, Dedman D, Sumnall H, Tocque K. Alcohol-attributable fractions for England: Alcohol-attributable mortality and hospital admissions. Centre for Public Health, Liverpool John Moores University. 2008. (see www.nwph.net/alcohol/lape/nationalindicator.htm)

Revised for Nov 08 refresh

NWPHO draft (18th December 2008)

factor in all cases. For other conditions, estimates of the alcohol attributable fraction were not available for children.

- In some cases, the PCT of residence is recorded in the Hospital Episode Statistics data set but the Local Authority is not. To ensure that the figures for coterminous PCTs and LAs are the same, details of the Local Authority were added where this information could be ascertained from PCT residency.

3. Standardised rate calculation

- Alcohol attributable admissions from step 2 above were aggregated by age group (5-year age bands to age 84, and 85years and over), gender and area of residence.
- Mid-year population estimates were used to derive age group and gender specific rates for each area.
- The directly age standardised rate is obtained as a weighted sum of the age-group and gender specific rates, where the weights are the proportion of the European Standard Population in each age and gender group.

[www.nchod.nhs.uk/NCHOD/Method.nsf/0/19bd7f5d961a822f65256cd2001eae50?OpenDocument]

Revised for Nov 08 refresh
NWPHO draft (18th December 2008)

Table 1: List of ICD codes used and attributable fractions for VSC26/NI39/PSA25.2 indicator: Rate of hospital admissions for alcohol related harm per 100,000 population.

ICD code	ICD name	Alcohol Attributable Fraction															
		0-16		16-24		25-34		35-44		45-54		55-64		65-74		75+	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
E24.4	Alcohol-induced pseudo-Cushing's syndrome	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
F10	Mental and behavioural disorders due to use of alcohol	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
G31.2	Degeneration of nervous system due to alcohol	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
G62.1	Alcoholic polyneuropathy	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
G72.1	Alcoholic myopathy	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
I42.6	Alcoholic cardiomyopathy	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
K29.2	Alcoholic gastritis	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
K70	Alcoholic liver disease	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
K86.0	Chronic pancreatitis (alcohol induced)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
T51.0	Ethanol poisoning	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
T51.1	Methanol poisoning	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
T51.9	Toxic effect of alcohol, unspecified	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
X45	Accidental poisoning by and exposure to alcohol	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
C00-C14	Malignant neoplasm of lip, oral cavity and pharynx	0.00	0.00	0.50	0.40	0.50	0.35	0.49	0.36	0.53	0.35	0.50	0.33	0.44	0.26	0.36	0.20
C15	Malignant neoplasm of oesophagus	0.00	0.00	0.32	0.23	0.31	0.20	0.30	0.20	0.34	0.20	0.32	0.18	0.26	0.14	0.20	0.10
C18	Malignant neoplasm of colon	0.00	0.00	0.05	0.03	0.05	0.03	0.04	0.03	0.05	0.03	0.05	0.03	0.04	0.02	0.03	0.01
C20	Malignant neoplasm of rectum	0.00	0.00	0.08	0.06	0.08	0.05	0.08	0.05	0.09	0.05	0.08	0.05	0.07	0.03	0.05	0.03
C22	Malignant neoplasm of liver and intrahepatic bile ducts	0.00	0.00	0.16	0.11	0.15	0.10	0.15	0.10	0.17	0.10	0.16	0.09	0.13	0.07	0.10	0.05
C32	Malignant neoplasm of larynx	0.00	0.00	0.34	0.25	0.33	0.21	0.32	0.22	0.36	0.21	0.34	0.20	0.28	0.15	0.22	0.11
C50	Malignant neoplasm of breast	0.00	0.00	0.00	0.09	0.00	0.08	0.00	0.09	0.00	0.09	0.00	0.08	0.00	0.06	0.00	0.04
G40-G41	Epilepsy and Status epilepticus	0.00	0.00	0.56	0.64	0.58	0.59	0.58	0.61	0.61	0.61	0.61	0.57	0.51	0.45	0.42	0.35
I10-I15	Hypertensive diseases	0.00	0.00	0.34	0.24	0.33	0.19	0.32	0.20	0.37	0.20	0.34	0.18	0.27	0.13	0.20	0.09
I47-I48	Cardiac arrhythmias	0.00	0.00	0.35	0.36	0.36	0.35	0.37	0.35	0.38	0.35	0.37	0.33	0.34	0.27	0.30	0.22
I50-I51	Heart failure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I60-I62, I69.0-I69.2	Haemorrhagic stroke	0.00	0.00	0.31	0.20	0.30	0.15	0.27	0.15	0.34	0.15	0.30	0.13	0.24	0.10	0.16	0.06
I63-I66, I69.3, I69.4	Ischaemic stroke	0.00	0.00	0.16	0.03	0.13	0.00	0.08	0.00	0.18	0.00	0.12	0.00	0.06	0.00	0.00	0.00
I85	Oesophageal varices	0.00	0.00	0.77	0.67	0.76	0.59	0.74	0.60	0.79	0.59	0.77	0.57	0.71	0.48	0.61	0.38
K22.6	Gastro-oesophageal laceration-haemorrhage syndrome	0.00	0.00	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
K73, K74	Chronic hepatitis, not elsewhere classified and Fibrosis and cirrhosis of liver	0.00	0.00	0.77	0.67	0.76	0.59	0.74	0.60	0.79	0.59	0.77	0.57	0.71	0.48	0.61	0.38
K85, K86.1	Acute and chronic pancreatitis	0.00	0.00	0.27	0.19	0.27	0.16	0.26	0.16	0.30	0.16	0.27	0.14	0.22	0.10	0.16	0.07
L40 excluding cirrhosis L40.5	Psoriasis	0.00	0.00	0.34	0.33	0.34	0.33	0.35	0.33	0.36	0.32	0.35	0.31	0.33	0.26	0.30	0.22
O03	Spontaneous abortion	0.00	0.00	0.00	0.23	0.00	0.21	0.00	0.22	0.00	0.21	0.00	0.20	0.00	0.15	0.00	0.12
§§	Pedestrian traffic accidents	0.00	0.00	0.35	0.16	0.45	0.19	0.46	0.21	0.46	0.21	0.23	0.03	0.23	0.03	0.23	0.03
§	Road traffic accidents (driver/rider)	0.00	0.00	0.21	0.09	0.33	0.15	0.24	0.12	0.24	0.12	0.09	0.03	0.09	0.03	0.09	0.03
V90-V94	Water transport accidents	0.00	0.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
V95-V97	Air/space transport accidents	0.00	0.00	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
W00-W19	Fall injuries	0.00	0.00	0.22	0.14	0.22	0.14	0.22	0.14	0.22	0.14	0.22	0.14	0.12	0.04	0.12	0.04
W24-W31	Work/machine injuries	0.00	0.00	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
W32-W34	Firearm injuries	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
W65-W74	Drowning	0.00	0.00	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
W78-W79	Inhalation of gastric contents/Inhalation and ingestion of food causing obstruction of the respiratory tract	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
X00-X09	Fire injuries	0.00	0.00	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
X31	Accidental excessive cold	0.00	0.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
X60-X84, Y10-Y33	Intentional self-harm/Event of undetermined intent	0.00	0.00	0.34	0.35	0.34	0.33	0.35	0.34	0.37	0.34	0.36	0.32	0.31	0.25	0.27	0.20
X85-Y09	Assault	0.00	0.00	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27

§ V12-V14 [.3 - .9], V19.4-V19.6, V19.9, V20-V28 [.3 - .9], V29-V79 [.4 - .9], V80.3-V80.5, V81.1, V82.1, V82.9, V83.0-V86 [.0 - .3], V87.0-V87.9, V89.2, V89.3, V89.9
 §§ V02-V04 [.1, .9], V06.1, V09.2, V09.3

Revised for Nov 08 refresh NWPHO draft (18th December 2008)

Indicators of *Hospital admissions for alcohol-related harm* for 2002/03 to 2006/07 at various geographies: Government Office Region/Strategic Health Authority, Local Authority (Unitary, Upper and Lower Tier) and Primary Care Trust are available at www.nwph.net/alcohol/lape.

Revisions from the previous version of the indicator

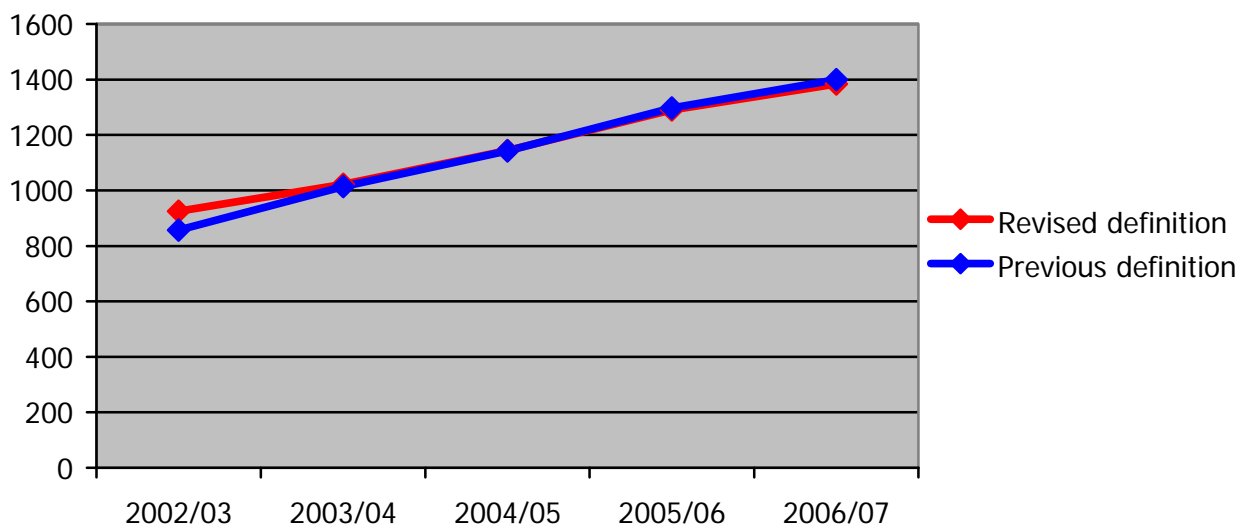
The methodology used to construct this indicator was revised in November 2008 from that used when the indicator was first launched. The changes were as follows:

- The conditions and attributable fractions used for the indicator were brought into line with the set published in July 2008 that resulted from the review undertaken for the Department of Health by the NWPHO. When the indicator was first launched, the review had not completed and it was necessary to use the conditions and fractions as they stood at the time. The published set have been adopted to avoid conflicting information, to reduce confusion and because they represent the current sum of epidemiological evidence.
- The indicator counts finished admissions, rather than finished in-year admissions as before. This follows standard practice recently adopted by the Information Centre.
- Conditions are no longer excluded if the all-ages attributable fraction for both men and women is less than 0.2, although negative attributable fractions are still not applied. The threshold of 0.2 was introduced in order to reduce the degree of confounding (the extent to which change in the indicator results from factors other than alcohol harm). However, it transpired that only about four per cent of admissions were excluded. Because the effect is so small, the use of a threshold is considered to add unnecessary complexity.
- Children under 1 are now included.
- Maternities are now included in addition to ordinary and day cases – again, in line with IC practice.
- All non-residents of England are now excluded, whereas before those resident outside the UK/Isle of Man/Channel Island were included in the national totals (although not in the figures for individual PCTs, Local Authorities or regions).

The net effect of these changes has been to reduce the national rate of admission in 2006/07 by 1.2%, from 1400 to 1384 admissions per 100,000 population and to reduce the national number of admissions by 1.5%, from 811 thousand to 799 thousand. The figures for earlier years have been revised by lesser amounts, with the exception of 2002/03, the rate for which has been revised upwards by 7.9%. The change for 2002/03 is greater because it was found that some records were missing from the original extract taken from the Hospital Episode Statistics.

The revisions have also 'dampened' the trend slightly, as can be seen in the chart below:

Revised for Nov 08 refresh NWPHO draft (18th December 2008)



The effect varies between localities. At PCT level, the change in the 2006/07 rate ranges from minus 4.4% to plus 4.7%. In over two-thirds of PCTs, the 2006/07 rate has changed by less than +/- two per cent. The variation is greater for 2002/03, as the issue with missing records affected some localities more than others: twenty four PCTs saw a revision in the rate of twenty per cent or more.

Other indicators of hospital admissions for alcohol-related harm

Details of other sources of statistics and information on alcohol related morbidity and mortality in the UK are presented in Box 2 to provide some context. Note that none of these statistics are directly comparable with the indicator described above, as they are created using different methods and assumptions.

Box 2: Earlier/other work on alcohol attributable health effects

1. The UK Prime Minister's Strategy Unit (PMSU) produced estimates of alcohol attributable health effects [mortality and hospital admission] in their 2003 *Interim Analytical Report* [www.number-10.gov.uk/files/pdf/SU%20interim_report2.pdf]. The estimates were derived using attributable fractions for a set of 53 alcohol-related conditions, which were adapted from the WHO *International Guide for monitoring alcohol consumption and related harm* [2000], using data from the Health Survey for England to estimate alcohol consumption levels in the UK population.
2. Subsequent work by the North West Public Health Observatory [NWPHO] and Northwest Alcohol Strategy Group mapped the PMSU attributable fractions from ICD9 to ICD10 diagnosis codes, and statistics on alcohol attributable deaths and hospital admissions were included in their 2004 report *Taking Measures*.
3. More recently [August 2006] NWPHO has published information and statistics on alcohol attributable hospital admissions in *Local Alcohol Profiles for England* [www.nwph.net/alcohol/lape]. An updated set of 22 indicators was released in August 2007, containing measures of hospital admission related to alcohol presented in terms of persons admitted, ignoring repeat admissions within the same HES year. Thus, these do not directly compare with the VSC26/NI39 data that counts admission episodes.
4. Similar work on alcohol attributable health impacts has been carried out in Scotland [www.alcoholinformation.isdscotland.org] and the USA [www.cdc.gov/alcohol/ardi.htm], with each using a slightly different definition of alcohol related conditions in terms of the ICD10 codes used.

Revised for Nov 08 refresh
NWPFO draft (18th December 2008)

5. The Office for National Statistics publishes statistics on *Alcohol Related Deaths* in the UK, which includes a subset of alcohol-related conditions regarded as 'most directly due to alcohol consumption' [www.statistics.gov.uk/statbase/Product.asp?vlnk=14496]. The list of conditions included in these statistics was revised in 2006 following a consultation exercise [www.statistics.gov.uk/downloads/theme_health/Summary_responses.pdf]
6. The Information Centre for Health and Social Care also publishes *Annual Alcohol Statistics* for England which include information on hospital admissions for three alcohol specific conditions - mental and behavioural disorders due to use of alcohol, alcoholic liver disease and toxic effect of alcohol [www.ic.nhs.uk/statistics-and-data-collections/health-and-lifestyles/alcohol].
7. In 2007/08 the Department of Health commissioned a study to review and update the alcohol attributable fractions from England, taking into account the full range of potential health impacts of alcohol as reflected in the epidemiological literature, and updating the estimates of alcohol consumption levels using data from the General Household Survey (2005). This resulted in production of a revised set of age group and gender specific alcohol attributable fractions. The provisional AAFs from this review are used in the calculation of the VSC26, NI39 and PSA25.2 indicator. A small number of revisions were made to the AAFs following further review, details of which are to be published by The Centre for Public Health, Liverpool John Moores University (June 2008).