

Work-related Chronic Obstructive Pulmonary Disease (COPD) in Great Britain, 2018

Contents

Summary	2
Chronic Obstructive Pulmonary Disease (COPD)	2
Background	3
COPD attributed to occupational exposures	3
Estimated burden of COPD attributable to work	3
Occupational exposures implicated in COPD	3
Compensation claims and other data sources	4
Figure 1: Annual new cases of COPD among former coal miners assessed for IIDB in Great Britain, 2000-2017	4
Annex	5
National mortality data for Chronic Obstructive Pulmonary Disease (COPD) due to all causes (and predominantly smoking)	5
Age standardised COPD mortality rates per 100,000 population	5
Total annual deaths due to COPD, 2006-2016	5
References	6





Chronic Obstructive Pulmonary Disease (COPD)

4,000

Estimated COPD deaths each year where occupational exposures contributed

- COPD is a serious long-term lung disease which is common in later life and mainly caused by smoking. However, past occupational exposures to various dusts, fumes and vapours have also contributed to causing a substantial proportion of current cases.
- Chronic Bronchitis and emphysema are common types of COPD. These are conditions in which the flow of air into the lungs is gradually reduced by damage to the lung tissue and air passages.
- Estimates of the proportion of total COPD cases or deaths where occupational exposures have contributed are uncertain and vary across a wide range of epidemiological studies. A number of reviews have estimated values of around 15%, equivalent to about 4000 deaths per year in GB.
- COPD among former coal miners has been recognised for Industrial Injuries Disablement Benefit (IIDB) for a number of years based on clear evidence of an increased risk.
- Other workplace exposures likely to contribute to COPD include various dusts (including grain and silica) as well as certain fumes and chemicals (including welding fume, isocyanates, and polycyclic aromatic hydrocarbons).

The document can be found at: www.hse.gov.uk/statistics/causdis/

Background

Chronic Obstructive Pulmonary Disease (COPD) is a term used to describe a progressive and irreversible limitation in airflow in the lungs.

COPD includes two main diseases:

- Chronic Bronchitis: a condition in which inflammation narrows the air passages within the lungs (bronchi) and causes chronic bronchial secretions; and
- Emphysema: a permanent destructive enlargement of the airspaces within the lung without any accompanying fibrosis of the lung tissue.

Asthma may also be included within the term COPD if there is some degree of chronic airway obstruction.

COPD is a long-latency disease – meaning that cases tend to develop a number of years after first exposure to the particular causative agents – and in many cases symptoms become manifest during mid-life or later. The most important causative factor is smoking – but others include occupational exposures to fumes, chemicals and dusts, as well as genetic susceptibility and environmental pollution¹.

COPD due to all causes (predominantly smoking) accounts for a substantial number of deaths in Great Britain: over the 10 year period 2007-2016 there were, on average, 28,600 deaths per year with COPD recorded as the underlying cause of death (see Annex).

The number of people suffering from the disease at any given time (prevalence) is difficult to estimate because of different definitions of the disease and under-diagnosis. One estimate suggested that there are currently 900,000 diagnosed cases in England and Wales and that, allowing for under-diagnosis, the true prevalence could be 1.5 million². More recently, the Health Survey for England in 2010 estimated that around 6% of adults have probable airflow limitation consistent with COPD, equivalent to around 3 million cases in Great Britain currently³.

COPD attributed to occupational exposures

Estimated burden of COPD attributable to work

Although smoking is a particularly important factor for COPD, occupational exposures to dusts gases and fumes, environmental air pollution and certain other factors also play a role. Such factors will typically work together to cause cases of disease. This means that individual cases cannot be separated into those due to one cause, say, smoking, and those due to another, say, occupational exposures: in most cases where occupational exposures were a cause, smoking will also have been a cause.

Estimates of the burden of work-related COPD cases can nevertheless be calculated from epidemiological research. Such estimates represent the number of cases that would not have occurred had the workplace exposures not occurred. They should not be taken as representing cases caused solely by workplace exposures rather than other factors such as smoking.

- Although estimates are uncertain and vary considerably, a wide range of epidemiological studies in various countries has consistently shown a substantial proportion of cases are attributed to workplace exposures.
- A recently updated review of the epidemiological evidence derived a best estimate of 15% of cases attributable to work⁴, and this is consistent with an earlier consensus view of the American Thoracic Society⁵.
- The value is also consistent with recent estimates relating to the British context⁶ which used available estimates of COPD risk due to occupational exposures from the research literature and estimates of numbers of exposed British workers; it equates to around 4000 deaths per year currently in Britain.

Occupational exposures implicated in COPD

Various agents and occupational groups have been implicated as being associated with an increased risk of COPD.

Coal dust exposure through mining activities is an established cause of COPD, and cases of chronic bronchitis and emphysema (CBE) in coal workers with a specified level of lung function impairment and at least 20 years underground exposure have been eligible for compensation under the Department for Work

and Pensions Industrial Injuries and Disablement Benefit (IIDB) scheme since 1993. This scheme also compensates those with emphysema arising from exposure to cadmium.

Epidemiological studies have identified associations between a number of other occupational exposures, including cotton dust, grain dusts and endotoxin, flour dust, welding fumes, other minerals - such as silica and man-made vitreous fibres, other chemicals - such as isocyanates, cadmium, vanadium, and polycyclic aromatic hydrocarbons (PAHs) - and wood dust¹. The strength of the evidence for whether these associations indicate causal relationships between exposure and COPD is stronger for some agents than others.

A recent analysis of variation in the prevalence of COPD by current occupational group based on the UK Biobank study – a large population based study of the UK population – identified a number of occupations for which the prevalence of COPD was significantly higher by at least 50% compared with all other occupations, including: seafarers (and other boat operatives), coal mine operatives, industrial cleaners, roofers, packers/bottlers/canners/fillers, and horticultural trades⁷.

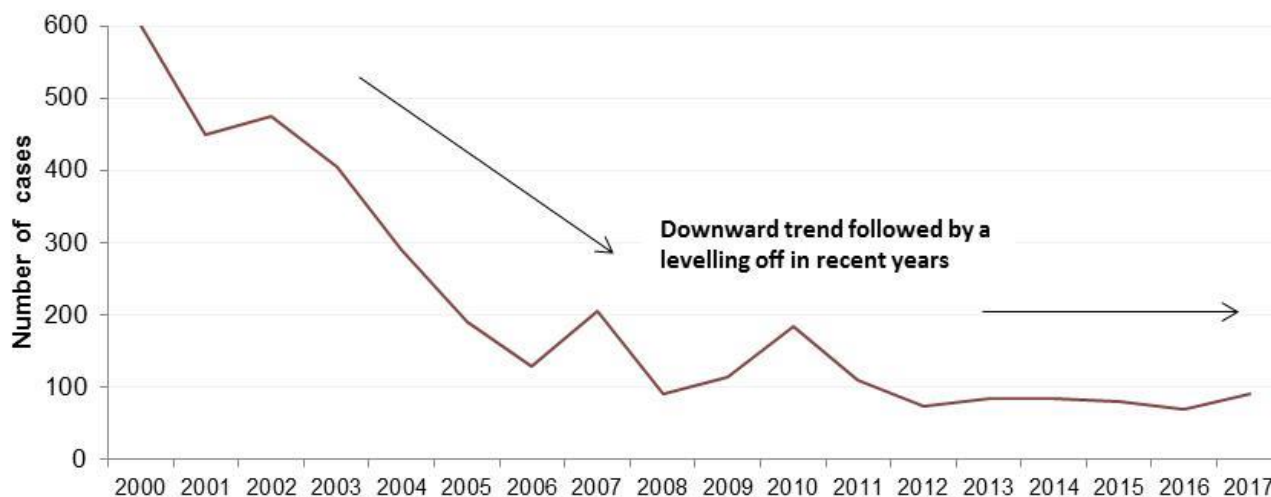
Compensation claims and other data sources

Assessments for Industrial Injuries Disablement Benefit (IIDB) and reports by doctors participating in the SWORD scheme within The Health and Occupation Reporting (THOR) network substantially understate the annual number of new cases of work-related COPD.

Several thousand cases of chronic bronchitis and emphysema among coal miners were assessed in the initial period following its specification as a prescribed disease in 1993 within the IIDB scheme, and changes to the prescription criteria as well as heightened publicity associated with successful civil litigation against the former British Coal Board subsequently led to a large increase in annual assessed cases the late 1990s.

Over the period 2008-2017 the annual number of cases has been much lower, as shown in Figure 1. There were 90 cases in 2017 compared with 70 in 2016 and an annual average of around 100 over the period 2008-2017. There have been approximately 5 new cases of emphysema due to cadmium poisoning in the period 2008-2017 within the IIDB scheme (Table IIDB01 www.hse.gov.uk/statistics/tables/iidb01.xlsx). All of these IIDB cases were male.

Figure 1: Annual new cases of COPD among former coal miners assessed for IIDB in Great Britain, 2000-2017



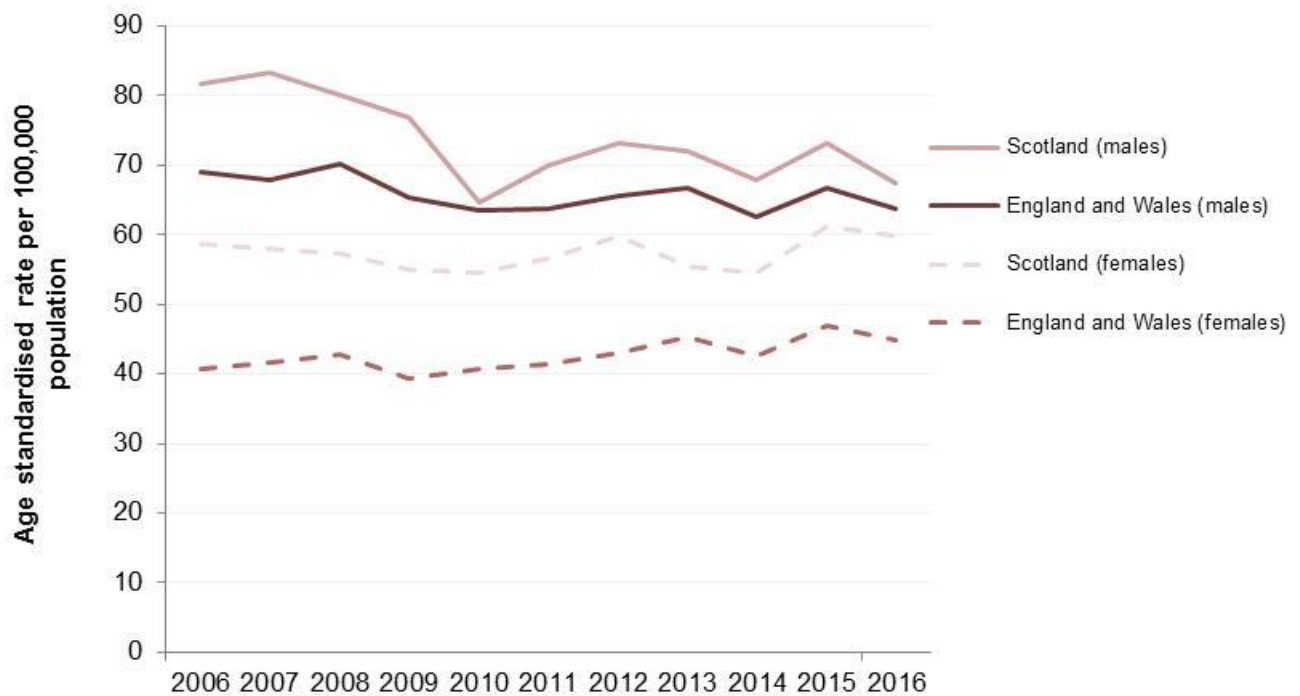
Cases of chronic bronchitis and emphysema in relation to any occupational exposure may also be recorded by chest physicians participating in the SWORD scheme within The Health and Occupation Reporting (THOR) network. The numbers of new cases reported each year have typically been substantially lower than the numbers of IIDB claims. In 2017 there were 17 reports by chest physicians in the SWORD scheme compared with 28 in 2016 and a ten-year average of 28, of which 10% were female (Table THORR01 www.hse.gov.uk/statistics/tables/thorr01.xlsx). This suggests that, even for more serious cases of chronic bronchitis and emphysema – that is, those more likely to be seen by specialist chest physicians – few are being attributed to occupational causes.

Annex

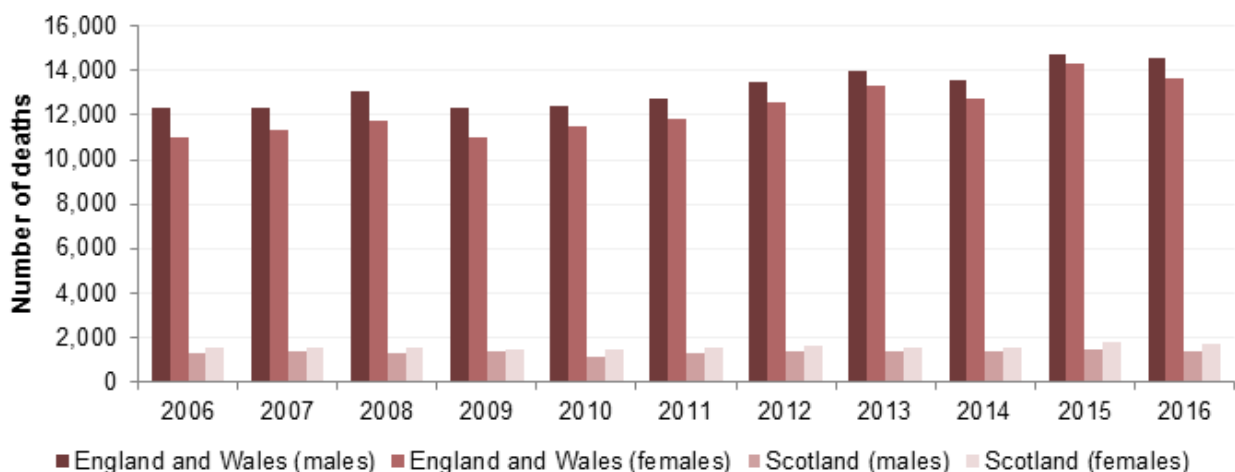
National mortality data for Chronic Obstructive Pulmonary Disease (COPD) due to all causes (and predominantly smoking)

Age standardised rates per 100,000 population and annual deaths for the period 2006-2015 are reproduced below based on data from the Office for National Statistics (ONS) and the National Records of Scotland (NRS). Deaths are selected based on underlying cause of death coded J40-J44 (ICD10). Age standardisation is based on the European Standard Population.

Age standardised COPD mortality rates per 100,000 population



Total annual deaths due to COPD, 2006-2016



References

1. MRC Institute for Environment and Health (2005). Review of literature on chronic bronchitis and emphysema and occupational exposure. Leicester, UK
2. NICE (2004). Chronic obstructive pulmonary disease. NICE clinical guidelines on management of chronic obstructive pulmonary disease in adults in primary and secondary care. *Thorax* 59(suppl 1):1-232.
3. Mindell J, Chaudhury M, Aresu M and Jarvis D (2011). Lung function in adults. Health Survey for England 2010 Vol 1, Chapter 3. Health and Social Care Information Centre.
4. Blanc P, Toren K (2007). Occupation in chronic obstructive pulmonary disease and chronic bronchitis: an update. *Int J Tuberc Lung Dis* 11(3):251-257
5. American Thoracic Society (2003). American Thoracic Society Statement: Occupational contribution to the burden of airway disease. *Am J Respir Crit Care Med* 167:787-797
6. Hutchings S, Sadhra, Kurmi et al. (2017). 410 Estimating the Burden of occupational Chronic Obstructive Disease (COPD) in the UK. *Occup Environ Med.* 70:A141 http://oem.bmj.com/content/70/Suppl_1/A141.1
7. De Matteis S, Jarvis D, Hutchings S et al. (2016). Occupations associated with COPD risk in the large population-based UK Biobank cohort study. *Occup Environ Med.* 73(6):378-84.

National Statistics

National Statistics status means that statistics meet the highest standards of trustworthiness, quality and public value. They are produced in compliance with the Code of Practice for Statistics, and awarded National Statistics status following an assessment by the Office for Statistics Regulation (OSR). The OSR considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is Health and Safety Executive's responsibility to maintain compliance with the standards expected by National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the OSR promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

An account of how the figures are used for statistical purposes can be found at www.hse.gov.uk/statistics/sources.htm.

For information regarding the quality guidelines used for statistics within HSE see www.hse.gov.uk/statistics/about/quality-guidelines.htm

A revisions policy and log can be seen at www.hse.gov.uk/statistics/about/revisions/

Additional data tables can be found at www.hse.gov.uk/statistics/tables/.

General enquiries: Statistician Andrew.Darnton@hse.gov.uk

Journalists/media enquiries only: www.hse.gov.uk/contact/contact.htm

© *Crown copyright* If you wish to reuse this information visit www.hse.gov.uk/copyright.htm for details.
First published 10/18.