

# Work-related Chronic Obstructive Pulmonary Disease (COPD) statistics in Great Britain, 2020

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## Summary



# Chronic Obstructive Pulmonary Disease (COPD)

- 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 4,000 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/](http://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, which means that cases tend to develop a number of years after first exposure to causative agents. In many cases, symptoms 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 pollution<sup>1</sup>.

COPD accounts for a substantial number of deaths in Great Britain. Over the last decade there were, on average, around 30,000 deaths per year with COPD recorded as the underlying cause of death (see Annex). Most of these are likely to have smoking as a causative agent.

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 of COPD in England and Wales and that, allowing for under-diagnosis, the true prevalence could be 1.5 million<sup>2</sup>. In 2010, the Health Survey for England estimated that around 6% of adults have probable airflow limitation consistent with COPD, equivalent to around 3 million cases in Great Britain currently<sup>3</sup>.

## 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, it is likely that 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.

Although estimates are uncertain and vary considerably, a wide range of epidemiological studies in various countries have 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 work<sup>4</sup>, and this is consistent with an earlier consensus view of the American Thoracic Society<sup>5</sup>. The value is also consistent with recent estimates relating to the British context<sup>6</sup>, which used available estimates of COPD risk due to occupational exposures from the research literature and estimates of numbers of exposed British workers. This equates to around 4,000 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. Cases of chronic bronchitis and emphysema 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 with 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; and wood dust<sup>1</sup>. The strength of the evidence for whether these associations indicate causal relationships between exposure and COPD is stronger for some agents than others.

A large population-based study of the UK population recently analysed the prevalence of COPD by current occupational group. This identified a number of occupations for which the prevalence of COPD was significantly higher compared with all other occupations, including: “seafarers and other boat operatives”, “coal mine operatives”, “industrial cleaners”, “roofers”, “packers/bottlers/canners/fillers”, and “horticultural trades”<sup>7</sup>.

In a follow-up analysis based on lifetime occupational histories collected for a subset of the study population, the occupations most clearly associated with a higher prevalence of COPD included: “sculptors, painters, engravers and art restorers”, “gardeners and groundsman”, “food, drink and tobacco processors”, “plastics processors and moulders”, “agriculture and fishing occupations”, and “warehouse stock handlers, and stackers”<sup>8</sup>.

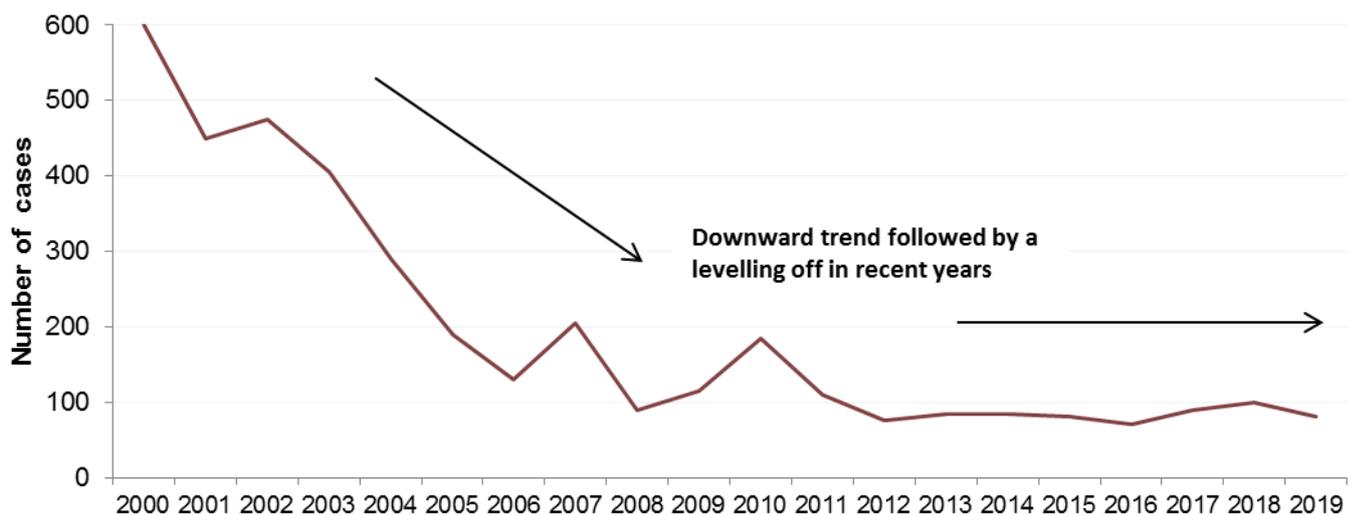
## Compensation claims and other data sources

Assessments for Industrial Injuries Disablement Benefit (IIDB) and reports by doctors participating in the SWORD<sup>1</sup> 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. 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 in the late 1990s.

Over the period 2010-2019, the annual number of cases has been much lower, as shown in Figure 1. There were 80 cases in 2019 compared with 100 in 2018, and an average of around 100 per year over the period 2010-2019. There have been approximately 5 new cases of emphysema due to cadmium poisoning in the period 2010-2019 within the IIDB scheme (Table IIDB01 [www.hse.gov.uk/statistics/tables/iidb01.xlsx](http://www.hse.gov.uk/statistics/tables/iidb01.xlsx)). All of these IIDB cases were male.

**Figure 1: Annual new cases of Chronic Bronchitis or Emphysema among former coal miners assessed for IIDB in Great Britain, 2000-2019**



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 2019 there were 24 reports by chest physicians in the SWORD scheme compared with 12 in 2018 and a ten-year average of 23. Less than 10% of cases over this period were female (Table THORR01 [www.hse.gov.uk/statistics/tables/thorr01.xlsx](http://www.hse.gov.uk/statistics/tables/thorr01.xlsx)). This suggests that, even for more serious cases of chronic bronchitis and emphysema few are being attributed to occupational causes.

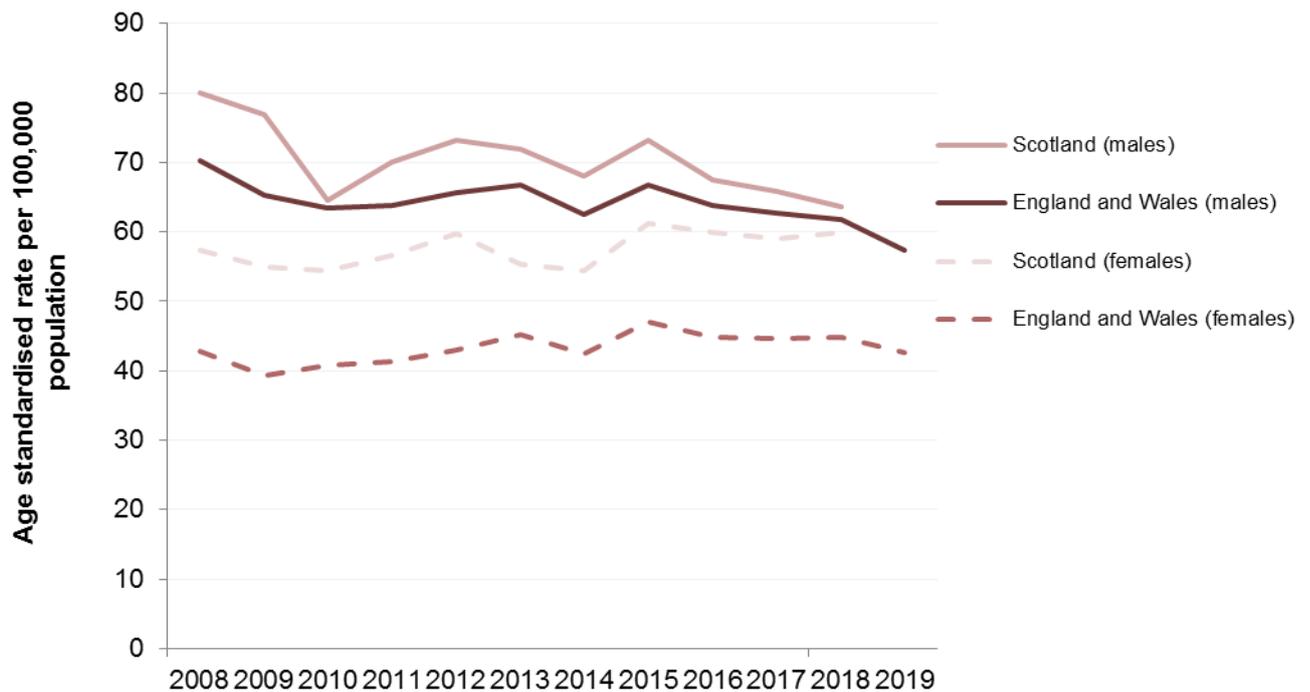
<sup>1</sup> Surveillance of Work-related and Occupational Respiratory Disease

# Annex

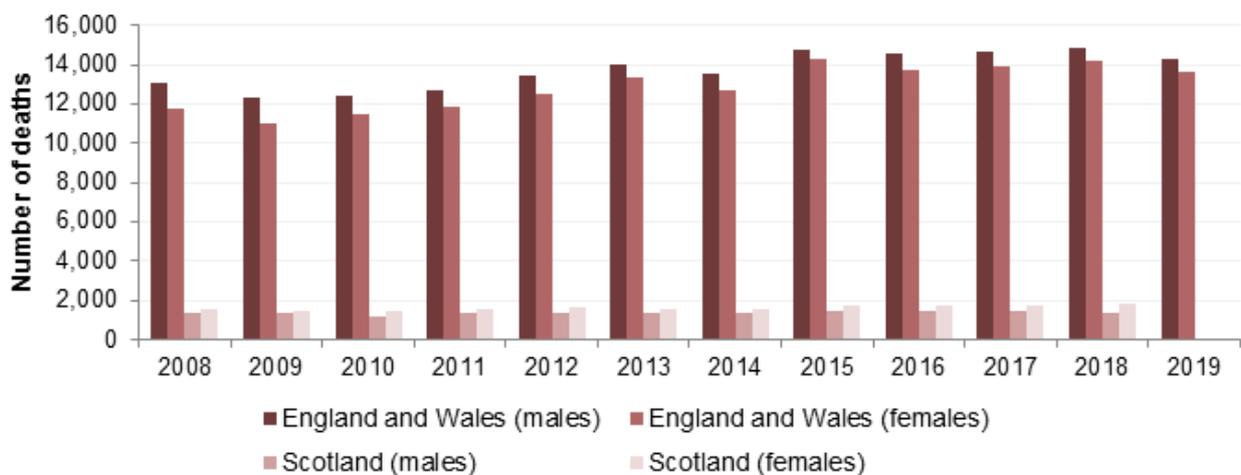
## National mortality data for Chronic Obstructive Pulmonary Disease (COPD)

Age standardised rates per 100,000 population and annual deaths for the period 2008-2019 are reproduced below based on data from the Office for National Statistics (ONS) and the National Records of Scotland (NRS to 2018). Deaths are selected based on underlying cause of death coded J40-J44 (ICD10). Age standardisation is based on the European Standard Population. This includes all COPD deaths irrespective of the causative agent, although most are likely to be related to smoking.

### Age standardised COPD mortality rates per 100,000 population, 2008-2019 (2018 Scotland)



### Total annual deaths due to COPD, 2008-2019 (2018 Scotland)



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## 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 assessment and compliance checks by the Office for Statistics Regulation (OSR). The last compliance check of these statistics was in 2013.

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. Details of OSR reviews undertaken on these statistics, quality improvements, and other information noting revisions, interpretation, user consultation and use of these statistics is available from [www.hse.gov.uk/statistics/about.htm](http://www.hse.gov.uk/statistics/about.htm)

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

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Additional data tables can be found at [www.hse.gov.uk/statistics/tables/](http://www.hse.gov.uk/statistics/tables/).

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