Public Health Scotland

Scottish Burden of Disease

Future prevalence and burden of chronic obstructive pulmonary disease

A Management information release for Scotland

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Contents

Context

Scotland is expected to see a rapidly ageing population, within the context of a slight overall decrease in population, over the next two decades.[1] Public Health Scotland's Scottish Burden of Disease (SBoD) study has recently been adapted to consider how these demographic and population health trends may affect the health of the population in the future. Initial work focused on the impact of the changing demographic situation only and found that, despite a projected 1.2% decrease in the Scottish population, the combined annual disease burden from all causes of disease and injury is forecast to increase 21% in the next 20 years.[2] Absolute increases in combined morbidity and mortality disease burdens are forecast to be largest for cardiovascular diseases, cancers, and neurological diseases – together accounting for approximately two-thirds of the total increase in forecasted disease burden.

These findings are set alongside the context of a projected reduction in working-age population over that same time period with an old-age dependency ratio projected to increase from 57% in 2022 to 64% in 2042.[1] These changes will have important implications for public health and the health and social care system. To address these challenges, alongside financial constraints and sustainability, decision makers need to consider both more effective approaches to prevention and different models of care. In doing so, alongside demographic change, consideration of epidemiological changes is needed as these have the potential to either ease or add to the pressure within an already stretched system.

Background

Disease prevalence is a measure of the overall occurrence of a disease at a point in time. It can help us to better understand the scale of population health demands that are likely to arise from living with a disease. This in turn can inform discussions over how best to meet these health needs through health and social care service provision, and over how these needs could be reduced through public health interventions.

Disease prevalence is largely influenced by three epidemiological factors:

- The rate of new cases (incidence)
- The rate of remission (cure)
- The survival rate of prevalent cases (death)

Chronic Obstructive Pulmonary Disease (COPD) is a long-term lung condition. Once an individual is diagnosed with COPD, there is no treatment which can fully reverse lung damage that has already occurred. Treatment of COPD is important to slow down the rate of progression, as well as to prevent additional lung damage and extend survival. The prevalence of COPD is, therefore, influenced through two main pathways: the incidence of COPD, and the survival rate of prevalent cases. If, for example, improvements in mortality are not matched by equivalent improvements in disease prevention (i.e. reductions in incidence), the number of prevalent cases will grow, adding to disease burden. Increases in the number of older people in the population also contribute to overall burden, since COPD develops with advancing age.

In this report, we project the prevalence of COPD over the next two decades by incorporating information on historic trends of the prevalence of COPD, alongside projected changes in the Scottish population. The SBoD 2019 study found COPD was the 5th leading cause of disease burden in Scotland, with an estimated 77,000 disability-adjusted life years (DALYs). COPD disease exhibits sizeable absolute and relative inequalities, with 67% of DALYs estimated to be attributable to inequalities in multiple deprivation.[3]

Methodology

Estimates of prevalence underpin burden of disease methodology and are used to calculate the burden due to morbidity for a specific disease. The SBoD study follows the Global Burden of Disease (GBD) methodology which relies on severity distributions to quantify the proportion of the prevalent population in a particular health state (e.g. asymptomatic/mild/moderate/severe) and on disability weights to take account of the consequences of both the condition and the severity of the condition.[4] The GBD methodology adopted by the SBoD study considers COPD and COPD with heart failure separately and assigns different severity distributions and disability weights to each condition. For this reason, the prevalence of COPD and COPD with heart failure were estimated individually.

Data

COPD

Estimates of the number of people living with COPD in Scotland were calculated for each year from 2005 to 2019. To estimate prevalent cases of COPD, data from the Quality & Outcomes Framework (QOF) was used.[5] QOF was introduced in Scotland in 2004 and was decommissioned in 2016, with the final QOF publication for 2015-16 released in October 2016 by the Information Services Division (ISD), a legacy organisation of Public Health Scotland. However, although not mandatory to submit, data continued to be collected for practices up to 2019. Data is available for 896 NHS GP practices for 2016/17, 913 practices for 2017/18 and 911 practices for 2018/19, equating to 93%, 95% and 96% of practices respectively.[6]

QOF national prevalence rates for each year were applied to the corresponding estimated population from the National Records of Scotland (NRS) Mid-2021 Population Estimates Scotland to generate the total number of prevalent cases in Scotland for 2005 to 2019.[7] As QOF is an aggregate figure, cases were distributed to 5-year age and sex groups based on the distribution of prevalence of COPD, when

estimated annually based on those hospitalised with COPD. Hospital admissions were sourced from the SMR01 General Inpatient/Daycase dataset (SMR01).[8]

COPD with heart failure

In previous SBoD studies, COPD with heart failure was estimated by examining SMR01 records and any patient with a diagnosis code of both COPD (J40-J44; J47) and heart failure (I50) within a two-year time span were considered to have COPD with heart failure. Individuals were excluded if they also had a diagnosis ischaemic heart disease, a myocardial infarction, or were dispensed nitrate treatment as it was assumed that in these patients the heart failure was caused by ischaemic heart disease. In this current study, it was not possible to repeat this methodology for the entire lookback period, due to data availability. To estimate the future prevalence of COPD with heart failure, mean age-sex specific rates of COPD with heart failure for 2014-2016 were calculated from previous SBoD studies.[9] These rates were then applied to the Office for National Statistics (ONS) 2020-based interim national population projections, recommended for use by the NRS, to generate future estimates of the prevalence of COPD with heart failure. [10]

Estimates of prevalence and burden

Estimates of future prevalence presented here are for COPD only, to avoid double-counting of cases where both COPD and COPD with heart failure are present. However, both COPD and COPD with heart failure prevalence were used to estimate the future burden due to morbidity (YLD). Prevalence forecasts were distributed to each severity level according to the fixed proportions developed for use in the GBD 2016 study.[11] The burden due to morbidity was calculated by applying a disability weight to the number of prevalent cases in each severity level and adjusting for comorbidity. Disability weights aim to take account of the consequences of the disease and its severity, relative to other conditions. As with severity levels, disability weights from the GBD 2016 study were applied. Severity distributions for disability weights for COPD and COPD with heart failure can be found in tables A3 and A4 in the appendix.

Due to burden of disease methodology, estimates of prevalence for COPD reported here are likely to differ to other published estimates of COPD prevalence in Scotland.

Analyses

Future estimates of prevalence were projected using age-period-cohort (APC) regression models. APC analysis allow us to separate, and project trends of, effects related to: age on cases (A); how cases develop over time (P); and, the difference in the case risk in successive birth cohorts (C). There are several advantages to this approach, the main one being that period and cohort effects serve as proxies for changing events such as risk factors, public health, and improvements in medical interventions, which are often difficult to measure directly.

APC models were fitted to sex-specific data and the best fitting models, based on goodness-of-fit criteria, were selected. In addition, where the linear period trend was included in the model, either the full trend (from 2000-2019) was used or the more recent trend only (from 2010-2019). The linear period trend was selected based on whether a significant change ($p < 0.05$) was estimated between the two time periods. Following selection of the best-fit model, the resulting age and sex specific prevalence estimates were combined with Office for National Statistics (ONS) 2020-based interim national population projections, recommended for use by the NRS, to generate future estimates of prevalence.[12]

For both male and female models, a full age-period-cohort model was identified as the best fitting model. In addition, the linear period trend for the two most recent time periods (2010-2019) was applied. To compensate for the likelihood that these trends are unlikely to continue without changing indefinitely, the linear trend parameter was cut by 0%, 25% and 50% in the first, second and third 5-year period, respectively, to decrease the effect of current trends.[13]

As a comparator, future estimates of prevalence incorporating demographic changes only were calculated. Here, the sex-specific COPD prevalence for 2019 was calculated by five-year age group. These age and sex-specific estimates were then applied to population projections to generate future estimates. These estimates assume that the rate of prevalence remains constant over the forecast period. That

is, all future changes would be due to the changing demographics in Scotland ignoring the time trends identified in APC models. Estimates included in this report are those which include the impacts of projected demographic changes and historic epidemiological trends, unless stated.

Estimates of prevalence for COPD reported here may differ to other published estimates of prevalence in Scotland, as these estimated follow the disease models and definitions outlined by the SBoD study. Analysis was carried out in RStudio using the Nordpred package for modelling. [14, 15]

Sensitivity analyses

As described above, the prevalence calculated using QOF data provides an aggregate figure of overall prevalence nationally for each year studied. To enable age-sex specific analysis, the aggregate prevalence was distributed to age-sex strata based on the distribution of prevalence seen when calculated using hospital admissions from SMR01 Inpatient/Daycase dataset. However, it is recognised that this distribution is likely to be skewed towards an older population, as rates of inpatient stays show a clear increasing trend from ages 20 to 24 and onwards. [16] As a sensitivity analysis, the methodology described above was repeated on a second dataset of historic COPD prevalence. This second dataset used the same total aggregate prevalence obtained from the QOF as before, however cases were distributed to age-sex strata based on the distribution of consultations for COPD seen historically in primary care. Data on primary care consultations was obtained from the Practice Team Information (PTI) dataset.[17] The PTI dataset was collected by ISD Scotland from April 2003 to September 2013. It includes information from a nationally representative 5% sample of Scottish General Practices regarding face-to-face consultations between individuals and a member of the practice team (GPs, nurses and clinical assistants) with a unique patient-identifier.

Main points

- From 2019 to 2044, the number of people with COPD in Scotland is estimated to increase by 63%, from 134,300 prevalent cases to 219,000. This equates to an additional 84,700 people living with COPD in 2044, compared to 2019.

- Absolute and relative changes differ between the age groups and sexes. The largest absolute change in prevalence is forecast to be in males and females aged 65 to 84 years. The largest relative increases are projected to be in males and females aged 85 years and over.

- Due to projected increases in the number of prevalent cases, unless mitigated by reductions in disease severity, the non-fatal burden of COPD will increase between 2019 and 2044.

- These projected increases in prevalence and burden of COPD are not inevitable - effective prevention at all levels (primary, secondary and tertiary) can contribute to reducing the number of people developing COPD and assist those who live with COPD to live at lower levels of severity.

- These estimates are intended as a baseline for future scenarios and do not take into account any future changes in the rate of interventions or other changes in the management of the condition.

Results and commentary

Results

From 2005 to 2019, the number of people with a diagnosis of COPD increased from 97,000 to 134,300; an increase of 38% (Figure 1). Through incorporating the impact of projected population changes (age-effects) from 2019 onwards and assuming the underlying age-sex-specific prevalence rate remains the same as it was in 2019, we estimate the number of people with COPD could rise from 134,300 to 166,100 from 2019 to 2044; an increase of 24% (Figure 1 and Table 1). Refining these estimates further by incorporating historical pre-pandemic age, period- and cohort-effects identified in underlying historic data, we estimate that the number of people with COPD could increase from 134,300 in 2019 to 219,000 in 2044; an increase of 63% (Figure 1 and Table 1).

Figure 1: Trend in the number of people with COPD (2000 to 2019) with projections to 2044 (mean value per five-year period)

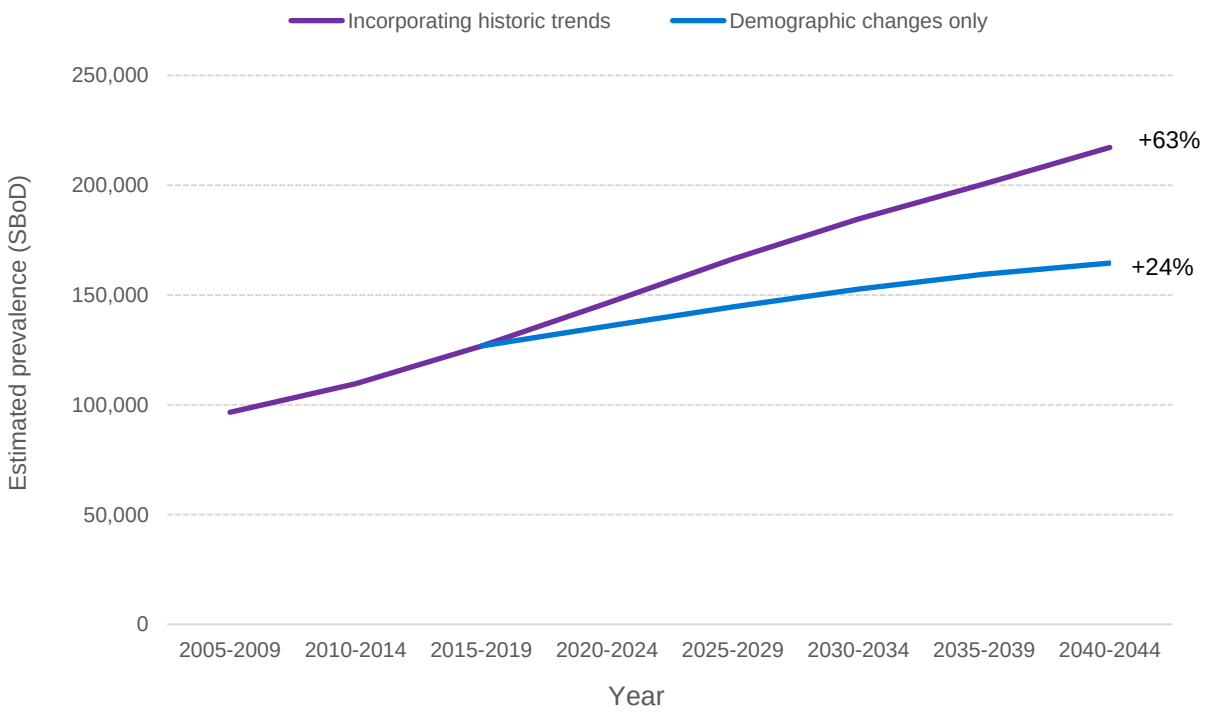


Table 1: Estimated number of people with COPD in Scotland using two different methods (selected years) with projections to 2044

Method	2019	2024	2029	2034	2039	2044	Change (n) (2019 to 2044)	Change (%) (2019 to 2044)
Demographic changes only	134,257	139,401	148,058	155,669	161,737	166,122	31,865	23.7%
Incorporating historic trends and demographic changes	134,257	150,108	170,209	187,815	202,975	218,962	84,704	63.1%

In the full APC model, incorporating historic trends and demographic changes, the largest absolute and relative increases in prevalence are expected to be seen for males. For males, an increase of 68% is projected, representing an absolute increase of 41,100 prevalent cases (Table 2). For females, there is projected to be a 59% increase in prevalence, representing an absolute increase of 43,600 prevalent cases.

Table 2: Estimated number of people with COPD incorporating historic trends with projections to 2044, by sex (selected years)

Sex	2019	2024	2029	2034	2039	2044	Change (n) (2019 to 2044)	Change (%) (2019 to 2044)
Male	60,369	67,089	75,883	84,040	91,989	101,436	41,067	68.0%
Female	73,888	83,019	94,326	103,775	110,986	117,526	43,638	59.1%

In addition to sex-specific differences, estimated future prevalence is different across age-groups (Figure 2, Table 3). Prevalence is projected to decrease in the majority of age-groups under 45. However, a relative increase in prevalence of 100% is forecast in males aged 85 and over and 104% in females aged 85+ years. Although these relative increases are considerable, they are generated from a small absolute baseline and represent absolute increases of 6,000 and 9,600 prevalent cases respectively in males and females aged 85 and above. The largest absolute increases are projected to be in the 65 to 84 years age group, with absolute increases in prevalence of 24,100 and 29,600 respectively in males and females in this age group. These large increases in the older age groups are offset by projected decreases in prevalence in younger age groups.

Projections resulting from the demographic change only model generally follow the same pattern, with some deviation (Figure 2, Table 3), with small differences in specific values.

Figure 2: Percentage change (2019-2044) in the estimated number of people with COPD by sex and age group

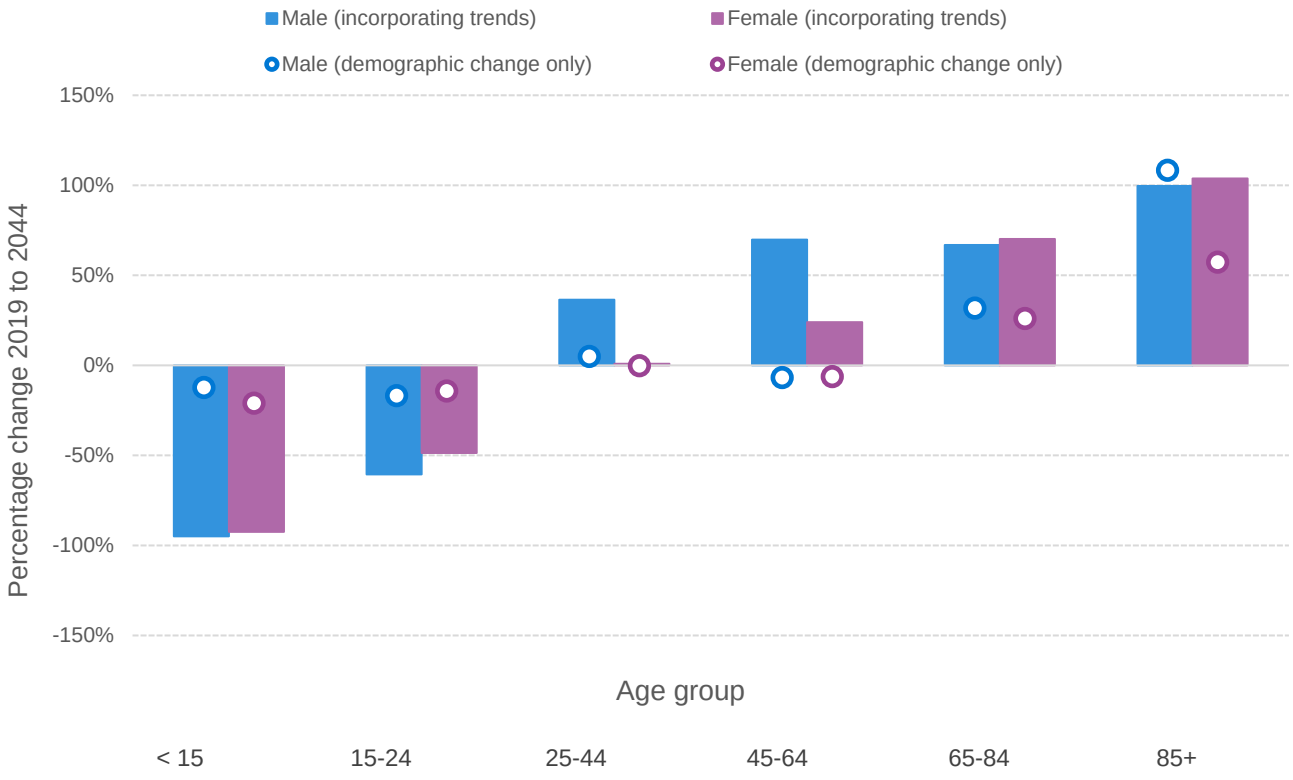


Table 3: Percentage change (2019-2044) in the estimated number of people with COPD by sex and age group

Sex	Agegroup	Demographic changes only % (n)	Incorporating historic changes % (n)
(Male	under 15 years	-12.3% (-37)	-95.0% (-281)
	15 to 24 years	-16.8% (-85)	-60.5% (-306)
	25 to 44 years	4.9% (100)	-36.5% (736)
	45 to 64 years	-6.8% (-1,056)	68.8% (10.798)
	65 to 84 years	31.7% (11,400)	66.9% (24,088)
	85 years and over	108.3% (6,558)	99.6% (6,032)
Female	under 15 years	-21.0% (-49)	-92.5% (-216)
	15 to 24 years	-14.3% (-47)	-48.6% (-159)
	25 to 44 years	-0.2% (-5)	0.9% (18)
	45 to 64 years	-6.3% (-1,250)	-24.0% (4,750)
	65 to 84 years	26.0% (10,976)	70.2% (29,606)
	85 years and over	57.3% (5,320)	103.8% (9,638)

In burden of disease studies, prevalence is used to calculate the non-fatal burden [years lived with disability (YLD)] of a condition, along with estimates of the severity and disability associated with the disease. Applying burden of disease methodology to the projected values of prevalence, we estimate that the non-fatal burden due to COPD is also projected to increase. YLD is projected to be approximately 13,900 YLD in 2044, up from 8,500 in 2019, representing an absolute increase of 5,400 YLD and a relative increase of 62%. Considering males and females stratification, the projected increases in YLD follow the same trends as seen in prevalence.

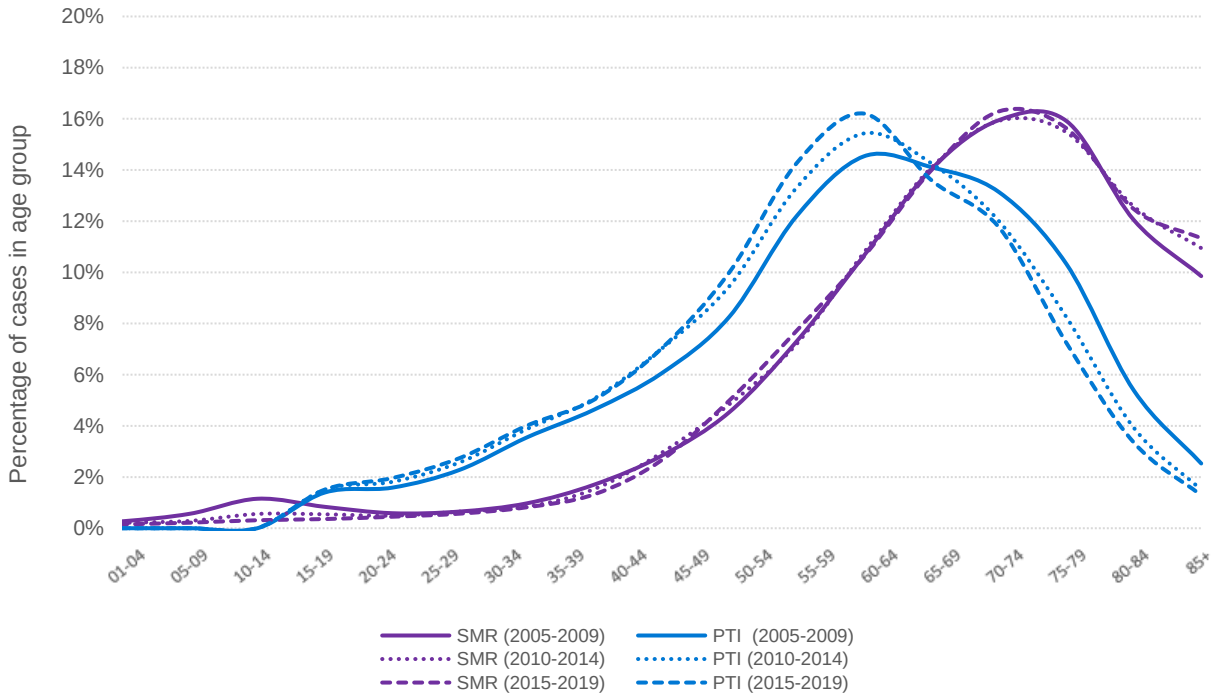
Overall burden (DALYs) is a composite measure incorporating both non-fatal and fatal burden. This projected increase in non-fatal burden will not necessarily lead to a similar change in the overall burden, as the latter will also be influenced by projected changes in mortality and fatal burden for a disease. Further work by the SBoD team will focus on future projections of mortality and fatal burden, in order to develop forecasts of the overall burden of COPD in Scotland.

Sensitivity analysis results

In order to quantify the impact of the choice of data used as age-sex distribution applied, a further analysis was carried out where the total COPD QOF prevalence was distributed to age-sex strata using prevalence generated from the PTI dataset. Using this data and incorporating the impact of projected population changes (demographic-effects) only, the prevalence of COPD could increase by 3%, to 138,700, by 2044. This is a considerably smaller increase than seen in the primary analysis where an increase of 24% is projected. This is likely due to the age-distribution from PTI being concentrated in age profiles where either small increases or decreases in the population are expected, compared to the SMR distribution where an older age profile is seen (Figure 3).

Refining these PTI distribution estimates further by incorporating the age, period- and cohort-effects, we estimate the prevalence COPD could increase by 106% to 276,700 prevalent cases, by 2044. In contrast to the demographic changes only model, this is considerably higher than projected in the primary analysis, where an increase of 63%, to 218,900 cases, is projected. These results highlight the dependency of forecasts on the choice of data source for age-sex distribution. This is discussed further in **Limitations**.

Figure 3: SMR and PTI age distributions applied to aggregate COPD prevalence



Summary

Both the prevalence and non-fatal burden of COPD are forecast to increase over the next 20 years. This is despite a projected slight decrease in the Scottish population size.

Long term trends have illustrated that the incidence rate for COPD is decreasing in Scotland. In the 10 years prior to the COVID-19 pandemic, incidence of COPD in males decreased by 9%, from 148 cases per 100,000 2010/11 to 135 cases per 100,000 in 2019/20, and decreased by 6% in females, from 142 cases per 100, 000 2010/11 to 134 cases per 100,000 in 2019/20. A sharper decrease was observed over the pandemic period, however incidence has increased in the most recent two years, but has remained lower than the rates observed prior to the pandemic.[18]

Similarly, long term trends illustrate that mortality from COPD in males has also been decreasing. COPD mortality in males decreased by 7%, from 64.4 cases per 100,000 in 2010 to 59 cases per 100,000 in 2019. Mortality in females remained relatively stable over the same period. [19]

As the above COPD incidence is derived from hospital admission data only, it is probable increasing prevalence estimates reported here are being driven more by increases in incidence at a lower severity, which would not be captured by hospital admission data, and these are reflected in our projections over the next two decades.

Limitations

Projections, by definition, are unstable and become less robust the longer the forecast period. External events, changes to population projections and limitations in the original models can all impact the robustness of projections. For example, the use of pre-pandemic period time trends in COPD prevalence do not take into account any changes in incidence and mortality from 2020 onwards.

In these estimates, estimates of future prevalence have been based upon historic prevalence of COPD in Scotland. It should be noted that this may not reflect the true

situation in Scotland as research from Asthma and Lung UK (2022) suggests that between half to two thirds of those with COPD are undiagnosed. [20]

In addition, added uncertainties exist due to the age-sex structure of the data. The distribution of aggregate COPD prevalence to age-sex strata has been estimated by examining the distribution of prevalence found when analysing hospital admission data. The age-sex structure of the data will have a significant impact on the results of the analysis, as shown by the sensitivity analysis above, therefore estimates should be used with caution.

Finally, as well as technical uncertainties, there may also be uncertainties in the calculation of future burden. When estimating the future non-fatal burden of COPD using YLD, these projections assume the distribution across severity levels will remain constant over time. This may not be the case, particularly when decreased mortality rates may cause people to live longer and develop further complications of COPD. Any changes to the distribution of prevalence across the severity levels throughout the projection period will affect YLD estimates.

Conclusion and next steps

This analysis forecasts an increase in prevalence of COPD in Scotland over the next two decades. Any projected increases in prevalence and burden are likely to impact the sustainability of services in the future. However, these projected increases are not inevitable and, as such, we need to continue to invest in prevention at all levels.

Improving the wider determinants of health and tackling the underlying mechanisms and modifiable risk factors which increase the risk of COPD - primary prevention - is the most effective way to reduce the rate of new cases COPD occurring. The most significant risk factor for COPD is smoking.[21] In 2013, the Scottish Government introduced a target, aiming for a smoking prevalence of 5% or lower amongst the adult population in Scotland.[22] Data from the Scottish Health Survey 2022 illustrates that whilst overall smoking prevalence has been reducing in Scotland since 2003, inequalities persist.[23] In 2022, the age-standardised prevalence of smoking in adults was 25% in those living in the most deprived areas, compared to 7% amongst adults

living in the least deprived areas. An updated *Tobacco and Vaping Framework: Roadmap to 2034*, published by the Scottish Government 2023, acknowledges that whilst progress has been made on this target, continued effort if required, particularly with respect to inequalities in smoking prevalence.[24]

For patients with COPD secondary prevention - early diagnosis and intervention - can help to reduce the severity of ill-health and the risk of early death in those who at at-risk of developing, or exacerbating, health conditions. Early interventions, such as pulmonary rehabilitation, can help them to live in better health. In 2021 the Scottish Government published the *Respiratory care - action plan: 2021 to 2026*, which includes a commitment to ensure everyone with COPD who would benefit from pulmonary rehab is able to access support.[25]

We need to continue to invest in prevention at all levels. Through primary prevention we can reduce the rate of new cases of COPD occurring and through deploying effective secondary and tertiary prevention we can reduce the health-related quality of life impacts, and risk of early death, in people already living with, or at-risk of, COPD.

The SBoD team are doing further work on the future projections of mortality and fatal burden, to inform forecasts of the overall burden of COPD in Scotland. They are also working to build upon these projections to explore how forecasts may be influenced by various scenarios. Examples include changes to the prevalence of underlying risk factors for COPD and the introduction of any novel treatments or public health interventions. In addition, the SBoD team are working with the Whole Systems Modelling team at PHS to determine how these various projections and scenarios are likely to impact service provision in the health and social care systems over the next 20 years.

Glossary

Burden of disease (and injury)

The quantified impact of a disease or injury on a population using the disability-adjusted life years (DALY) measure.

Chronic Obstructive Pulmonary Disease (COPD)

A group of lung conditions which cause breathing difficulties. Includes emphysema and chronic bronchitis.

DALY (disability-adjusted life year)

A standardised metric that can be used to quantify the health loss due to dying prematurely or to living with the health consequences of diseases, injuries or risk factors. DALYs are a summary metric of population health. DALYs are an absolute measure of health loss; they count how many years of healthy life are lost due to death and non-fatal illness or impairment. They reflect the number of individuals who are ill or die in each age-sex group and location.

Disability

In burden of disease studies, this is synonymous for “loss of health”, or any, short or long term, departure from full health.

Disability weight

Numerical representations of the severity of health loss associated with a health state. Disability weights are numbers between 0 and 1 that are multiplied by the time spent living with a health loss to determine the years lived with disability associated with the cause of that loss. In the GBD, disability weights are derived from a worldwide, cross-cultural study to compare the relative severity of health problem.

Early death

The burden from dying prematurely. Often used synonymously with **years of life lost**.

Fatal burden

The burden from dying prematurely as measured by years of life lost. Often used synonymously with **years of life lost**.

Health loss

The total burden from early death and ill-health. Often used synonymously with **disability adjusted life year (DALY).**

Health states

The consequences of diseases and injuries or their risk factors. Health state refers to an individual's levels of functioning within a set of health domains such as mobility, cognition, pain, emotional functioning, self-care, etc. Health states do not refer to general well-being (which is a broader construct) or to aspects of participating in society, although they clearly affect these other aspects of life and may be affected by them.

Ill-health

Often used synonymously with **years lived with disability**.

Life expectancy

The average number of years of life expected to be lived by individuals who survive to a specific age.

Non-fatal burden

The burden from living with ill-health as measured by years lived with disability. Often used synonymously with **years lived with disability**.

Sequelae

Consequences of diseases and injuries for which epidemiological estimates and YLD calculations are made. It encompasses not only the traditional clinical meaning, but also a broader categorization of health outcomes such as severity levels for a particular disease, injury or impairment.

Severity distribution

Severity distributions are a means of summarising the range of health loss suffered to disease which enables estimates of disease occurrence to be paired with disability weights to estimate Years Lost to Disability in burden of disease studies.

YLD (Years of Life lived with a Disability)

In burden of disease studies this is also referred to as ‘ill-health’. YLDs are computed

as the prevalence of different disease-sequelae and injury-sequelae multiplied by the disability weight for that sequela. Disability weights are selected on the basis of surveys of the general population about the loss of health associated with the health state related to a disease sequela.

YLL (Years of Life Lost due to premature mortality)

YLLs are computed by multiplying the number of deaths at each age x by a standard life expectancy at age x. In SBoD we use an aspirational world life expectancy table developed for the Global Burden of Disease study.

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Further information

Further information and data for this publication are available from the **publication page** on our website.

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Let us know what you think about this publication via. the link at the bottom of this **publication page** on the PHS website.

Appendices

Appendix 1 – Background information

Table A1: ICD-10 codes

IC10 code	Description
J40-	Bronchitis, not specified as acute or chronic
J41-	Simple and mucopurulent chronic bronchitis
J42-	Unspecified chronic bronchitis
J43-	Emphysema
J44-	Other chronic obstructive pulmonary disease
J47-	Bronchiectasis

Table A2: ICD-9 codes

IC10 code	Description
490-	Bronchitis, not specified as acute or chronic
491-	Chronic bronchitis
492-	Emphysema
494-	Bronchiectasis
496-	Chronic airway obstruction, not elsewhere classified

Table A3: Description and allocation to severity levels for COPD with corresponding disability weight

Severity level	Description	% of prevalent cases	Disability weight (0-1)
Asymptomatic	Has condition but experiences no symptoms by virtue of, for instance being on treatment or because of the natural course of the condition.	53	0.000
Mild	Has cough and shortness of breath after heavy physical activity, but is able to walk long distances and climb stairs.	30	0.019
Moderate	Has cough, wheezing and shortness of breath, even after light physical activity. The person feels tired and can walk only short distances or climb only a few stairs.	7	0.225
Severe	Has cough, wheezing and shortness of breath all the time. The person has great difficulty walking even short distances or climbing any stairs, feels tired when at rest, and is anxious.	9	0.408

Table A4: Description and allocation to severity levels for COPD with heart failure with corresponding disability weight

Severity level	Description	% of prevalent cases	Disability weight (0-1)
Mild	Is short of breath and easily tires with moderate physical activity, such as walking uphill or more than a quarter-mile on level ground. The person feels comfortable at rest or during activities requiring less effort.	55	0.041
Moderate	Is short of breath and easily tires with minimal physical activity, such as walking only a short distance. The person feels comfortable at rest but avoids moderate activity.	12	0.451
Severe	Is short of breath and feels tired when at rest. The person avoids any physical activity, for fear of worsening the breathing problems.	32	0.514

Appendix 2 – Publication metadata

Publication title

Scottish Burden of Disease: Future prevalence and burden of chronic obstructive pulmonary disease

Description

Release of Scottish Burden of disease prevalence estimates for COPD for 2020-2044.

Theme

Population health and forecasts

Topic

Burden of disease

Format

PDF

Data source(s)

Please see methodology section for full data sources and time periods.

Date that data are acquired

Please see methodology section for full data sources and time periods.

Release date

18/03/2025

Frequency

Ad hoc

Timeframe of data and timeliness

The basis for the publication is Quality and Outcomes Framework (QoF) data from 2005 to 2019.

Continuity of data

Please see methodology section for information on continuity of data and coding.

Revisions statement

Revisions relevant to this publication

Concepts and definitions

Please see **Glossary**

Relevance and key uses of the statistics

Population health surveillance; service planning and sustainability; quality improvement and assurance.

Accuracy

The report contains projections of the prevalence of disease in Scotland to 2044. Projections and forecasts, by definition, are unstable and become less robust the longer the forecast period. Please see **Limitations** section for full details.

Completeness

Please see methodology section for information on completeness of data.

Comparability

The prevalence described in this report is estimated following the disease models and definitions outlined by the SBoD study and therefore may not be directly comparable to other estimates of prevalence.

Accessibility

It is the policy of Public Health Scotland to make its websites and products accessible according to published guidelines. More information on accessibility can be found on the **PHS website**.

Coherence and clarity

Measures to enhance coherence and clarity within this report include: explanatory chart/table notes, minimal use of abbreviations/abbreviations explained in the text, comprehensive notes on background and methodology.

Value type and unit of measurement

Figures are shown as absolute number, percentages and relative change. Units of measurement are disability-adjusted life years (DALYs); years lived with disability (YLDs) and years of life lost (YLL) and prevalence of disease. Please see **Glossary** for further details.

Disclosure

The PHS protocol on Statistical Disclosure Protocol is followed.

Official statistics accreditation

Management information.

UK Statistics Authority assessment

Not put forward for assessment.

Last published

First publication.

Next published

To be confirmed.

Date of first publication

Not applicable.

Help email

phs.sbod-team@phs.scot

Date form completed

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Appendix 3 – Early access details

Pre-release access

Under terms of the 'Pre-release Access to Official Statistics (Scotland) Order 2008', PHS is obliged to publish information on those receiving pre-release access ('pre-release access' refers to statistics in their final form prior to publication). The standard maximum pre-release access is five working days. Shown below are details of those receiving standard pre-release access.

Standard pre-release access:

Scottish Government Department of Health and Social Care (DHSC)

NHS board chief executives

NHS board communication leads

Early access for management information

These statistics will also have been made available to those who needed access to ‘management information’, i.e. as part of the delivery of health and care:

Early access for quality assurance

These statistics will also have been made available to those who needed access to help quality assure the publication:

Appendix 4 – PHS and official statistics

About Public Health Scotland (PHS)

PHS is a knowledge-based and intelligence driven organisation with a critical reliance on data and information to enable it to be an independent voice for the public's health, leading collaboratively and effectively across the Scottish public health system, accountable at local and national levels, and providing leadership and focus for achieving better health and wellbeing outcomes for the population. Our statistics comply with the **Code of Practice for Statistics** in terms of trustworthiness, high quality and public value. This also means that we keep data secure at all stages, through collection, processing, analysis and output production, and adhere to the Office for National Statistics '**Five Safes**' of data privacy.

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