Public Health Scotland

Scottish Burden of Disease

Future prevalence and burden of chronic liver disease

A Management information release for Scotland

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phs.otherformats@phs.scot

0131 314 5300

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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)

Cirrhosis and other chronic liver diseases are long-term conditions. The consequences from chronic liver disease can vary from person to person and can include an increased risk of early death. The prevalence of chronic liver disease is therefore influenced through two main pathways: the incidence of chronic liver disease, and the survival rate of prevalent cases. If improvements in mortality are not met by equivalent improvements in disease prevention, the number of prevalent cases will grow. Preventing and reducing exposure to risk factors such as alcohol use, obesity and hepatitis C and B is key. For those who do develop chronic liver disease, early diagnosis could allow for appropriate treatment and/or lifestyle modification which may improve outcomes.

In this report, we project the prevalence of chronic liver disease over the next two decades by incorporating information on historic trends of the prevalence of chronic liver disease, alongside projected changes in the Scottish population. The SBoD 2019 study found chronic liver disease was the 17th leading cause of disease burden in Scotland, with an estimated 34,346 disability-adjusted life years (DALYs). Chronic liver disease exhibits sizeable absolute and relative inequalities, with 63% of DALYs estimated to be attributable to inequalities in multiple deprivation.[3]

Methodology

Data

Estimates of the number of people living with chronic liver disease in Scotland were calculated for each year from 2000 to 2019. Cases were identified data from the following Scottish Morbidity Records (SMR) datasets: 00 Outpatient attendances (SMR00); 01 Inpatient and Daycase dataset (SMR01); 04 Mental Health Inpatients dataset (SMR04); and Geriatric Long-Stay (SMR01E) dataset, using a standard lookback period of 20 years.[4] SMR01/01E records allow the recording of up to six diagnosis codes. In records from 1997, ICD-10 coding was applied in Scotland, and prior to 1997 ICD-9 was applied.[5,6] Cases were identified if an appropriate code was recorded in any of the six positions and the records linked with the National Records of Scotland (NRS) Vital Events (Deaths) Register using the Community Health Index Number.[7,8]

Prevalence was estimated annually, between 2000 and 2019, and included individuals with a recorded diagnosis of chronic liver disease in the previous 20 years who were still alive at the end of the year of interest. In addition, exclusion adjustments were made to account for the small proportion of prevalent individuals who we estimated would no longer be living in Scotland in the year of interest.

A full list of ICD codes used to define chronic liver disease can be found in **Appendix 1**. Estimates of historic prevalence for chronic liver disease 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.

Analyses

Future estimates of liver disease prevalence were calculated using age-period-cohort (APC) models. APC models allow the independent effects of age, time-period and birth cohorts to be included in the model alongside a linear period component to

adjust for the collinearity between age, period and cohort. trend 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 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.[9]

For both male and female models, a full age-period-cohort model was identified as the best fitting model. For males, the linear trends for the full time period were applied; for women, the linear 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.[10]

As a comparator, future estimates of prevalence incorporating demographic changes only were calculated. Here, the sex-specific chronic liver disease prevalence for 2019 was calculated by five-year age group. These age and sex-specific estimates were then applied to NRS Population Projections to generate future estimates. These estimates assume that 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. Analysis was carried out in RStudio using the Nordpred R package for modelling. [11, 12]

Finally, these estimates of future prevalence were then used to calculate estimates of the future burden of chronic liver disease due to morbidity. 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. mild, moderate, severe) and on disability weights to take account of the consequences of both the condition and the severity of the condition.[13] Prevalence forecasts were distributed to each severity level according to the fixed proportions developed for use in the GBD 2016 study.[14] The burden due to morbidity was calculated by applying the disability weight to the number of prevalent cases in each severity level and adjusting for comorbidity. Severity distributions and disability weights for chronic liver disease can be found in **Appendix 1.**

Main points

- From 2019 to 2044, the number of people with chronic liver disease in Scotland is estimated to increase by 54%, from 43,200 prevalent cases to 66,300. This equates to an additional 23,100 people living with chronic liver disease in 2044, compared to 2019.

- Absolute and relative changes differ between the age groups and sexes. The largest absolute change in prevalence in both males and females is forecast in the 65 to 84 years age group. 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 patients progressing to decompensated liver disease, the non-fatal burden of chronic liver disease will increase between 2019 and 2044.

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

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

Results and commentary

Results

From 2000 to 2019, the number of people with a diagnosis of chronic liver disease increased from 18,400 to 43,200; an increase of 135% (Figure 1). Through incorporating the impact of projected population changes (age-effects) from 2019 onwards and assuming the underlying prevalence rate remains the same as it was in 2019, we estimate the number of people with chronic liver disease could rise from 43,200 to 43,900 from 2019 to 2044; an increase of 1.6% (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 chronic liver disease would increase from 43,200 in 2019 to 66,300 in 2044; an increase of 53.5% (Figure 1 and Table 1)

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

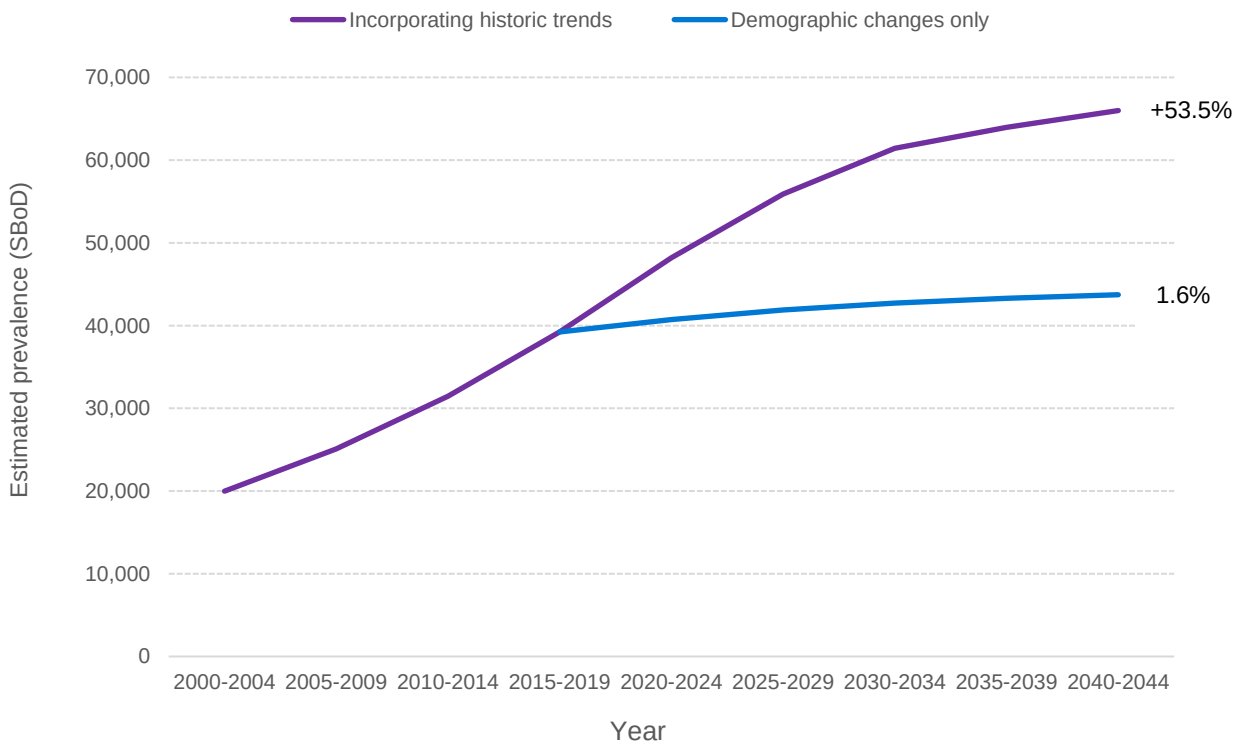

Table 1: Estimated number of people with chronic liver disease in Scotland using two different methods (selected years) with projections to 2044

Method	2019	2024	2029	2034	2039	2044	Change (n) (2019 to 2044)	Change (%) (2019 to 2044)
Demographic changes only	43,190	41,211	42,274	42,972	43,481	43,868	+678	+1.6%
Incorporating historic trends and demographic changes	43,190	48,779	56,489	61,891	64,332	66,287	+23,097	+53.5%

In the full model, incorporating historic trends and demographic changes, the largest absolute and relative increases in prevalence are expected to be seen for females. For females, an increase of 68% is projected, representing an absolute increase of 13,600 prevalent cases (Table 2). For males, there is projected to be a 41% increase in prevalence, representing an absolute increase of 9,500 prevalent cases.

Table 2: Estimated number of people with chronic liver disease 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	22,993	25,597	28,936	31,112	31,908	32,453	+9,460	+41.1%
Female	20,197	23,182	27,553	30,779	32,424	33,834	+13,637	+67.5%

Estimated future prevalence is noticeably driven by age (Figure 2, Table 3). Prevalence is projected to increase in all age groups over 25 years of age, with small changes projected in some younger age groups, though from a very low baseline. In females over the age of 25 years, there is a clear increasing trend in the relative change in prevalence through the age groups. In males, this increasing trend in relative change is seen from age 45 years.

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

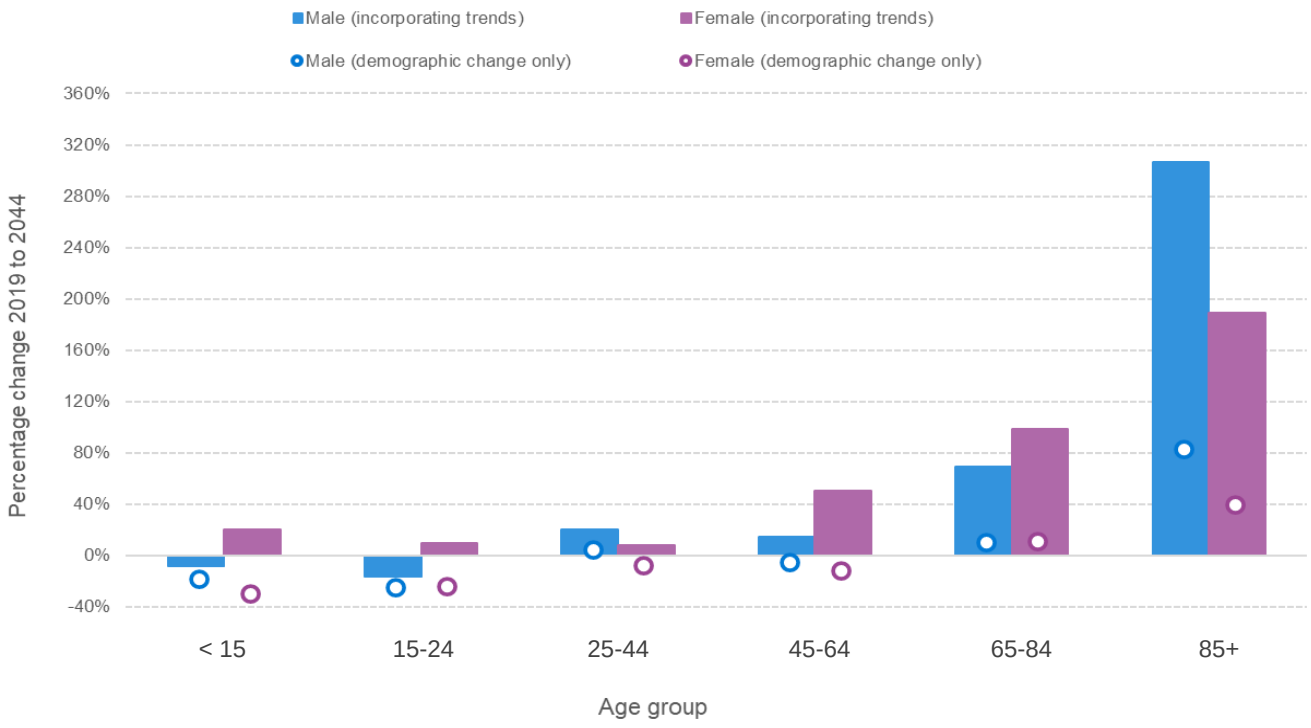

Table 3: Percentage change (2019-2044) in the estimated number of people with atrial fibrillation by sex and age group

Sex	Agegroup	Demographic changes only % (n)*	Incorporating historic changes % (n)*
Male	under 15 years	-17.7% (-23)	-8.1% (-11)
	15 to 24 years	-24.4% (-68)	-16.3% (-45)
	25 to 44 years	5.1% (158)	20.1% (626)
	45 to 64 years	-5.2% (-566)	14.6% (1,582)
	65 to 84 years	10.5% (850)	69.6% (5,631)
	85 years and over	83.1% (454)	306.4% (1,676)
Female	under 15 years	-29.4% (-31)	20.5% (21)
	15 to 24 years	-23.4% (-64)	9.3% (26)
	25 to 44 years	-7.5% (-208)	8.4% (232)
	45 to 64 years	-11.6% (-1,015)	50.7% (4,450)
	65 to 84 years	11.7% (872)	98.9% (7,396)
	85 years and over	40.0% (319)	189.4% (1,511)

* Small differences in total values due to rounding

In the model incorporating historic changes, the largest absolute increases are projected in the 65 to 84 years age group. For males aged 65 to 84 years an absolute increase of 5,600 prevalent cases is projected from 2019 to 2044, representing a relative increase of 70%. For females aged 65 to 84 years an absolute increase of 7,400 prevalent cases is projected from 2019 to 2044, representing a relative increase of 99%.

Excluding an increase of 5% in males aged 25 to 44 years, projections resulting from the demographic change only model forecast relative decreases in prevalence in all age groups up to 65 to 84 years. Similar to the full model, the largest absolute increases are projected in the 65 to 84 years age group and the largest relative

increases in the 85 and over age groups, however these relative increases are projected to be considerably smaller than those estimated by the model incorporating historic trends.

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 chronic liver disease is also projected to increase. YLD is projected to be approximately 4,000 YLD in 2044, up from 2,100 in 2019, representing an absolute increase of 1,900 YLD and a relative increase of 91%. 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 is focussed on future projections of mortality and fatal burden, in order to develop forecasts of the overall burden of chronic liver disease in Scotland.

Summary

Both the prevalence and non-fatal burden of chronic liver disease are projected to increase over the next 20 years for males and females.

Recent trends have illustrated that the rate of hospital stays for chronic liver disease increased by 12% from 2013/14 to 2022/23.[15] In this same period, the rate of mortality from chronic liver disease decreased by 12%. [16]

Although hospital stays are not directly analogous with incidence, it is likely they reflect the general trends in incidence. Therefore, increasing prevalence estimates are likely being driven by increases in incidence and decreases in the mortality of chronic liver disease, and these are reflected in our projections over the next two decades.

Any projected increases in prevalence and burden are likely to impact the rising demand for services in the future. Early diagnosis and intervention may reduce this impact by reducing the proportion of those diagnosed who decompensate. However, these projected increases are not inevitable. We need to continue to invest in prevention at all levels. Through primary prevention we can reduce the rate of new cases of chronic liver disease 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, chronic liver disease.

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 chronic liver disease prevalence do not take into account any changes in incidence and mortality from 2020 to 2023. In addition, the use of data from 2000 to 2019 means that the effects of Minimum Unit Pricing in Scotland - positive and negative - on alcohol-related health outcomes are unlikely to be reflected in these projections.[17]

Calculation of historic prevalence, from 2000 to 2019, drew on hospital data covered by the SMR suite of datasets, as listed in the methodology. This includes SMR00 Outpatient Attendances, which reports episode level outpatient attendances. It is not mandatory for diagnoses to be recorded on the SMR00 Outpatient Attendance record and records including diagnostic data are limited. Therefore, patients who have attended outpatient settings only (i.e. with no inpatient/daycase admissions) are not likely to have been included in the historic prevalence estimates. Firstly, this may have resulted in under-estimation of the prevalence of chronic liver disease from 2000 to 2019. Secondly, limiting the prevalent cases to inpatient hospitalisations may have resulted in a cohort with an older age structure, due to the demographics of hospital activity. [18]

In these projections, as well as technical uncertainties, there may also be uncertainties in the calculation of future burden. When estimating the future non-fatal burden of chronic liver disease 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 chronic liver disease. 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 chronic liver disease 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 chronic liver disease - primary prevention - is the most effective way to reduce the rate of new cases of liver disease occurring.

For patients who develop chronic liver disease secondary prevention - early diagnosis and intervention - can help to mitigate the risk of decompensation and therefore the severity of ill-health and the risk of early death in those who at at-risk of developing, or exacerbating, other health conditions.

We need to continue to invest in prevention at all levels. Through primary prevention we can reduce the rate of new cases of chronic liver 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, chronic liver disease.

The SBoD team are doing further work on the future projections of mortality and fatal burden, to inform forecasts of the overall burden of chronic liver disease 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 chronic liver disease 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.

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.

Contact

Fatim Lakha, Consultant in Public Health Medicine
Clinical and Protecting Health Directorate
phs.sbod-team@phs.scot

Eilidh Fletcher, Principal Information Analyst
Consultancy Services
phs.sbod-team@phs.scot

Grant Wyper, Principal Epidemiologist
Public Health Sciences
phs.sbod-team@phs.scot

For all media enquiries please email **phs.comms@phs.scot** or call 0131 275 6105.

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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
I85	Oesophageal varices
I850	Oesophageal varices with bleeding
I859	Oesophageal varices without bleeding
I982	Oesophageal varices in diseases classified elsewhere
K70	Alcoholic liver disease
K700	Alcoholic fatty liver
K701	Alcoholic hepatitis
K702	Alcoholic fibrosis and sclerosis of liver
K703	Alcoholic cirrhosis of liver
K704	Alcoholic hepatic failure
K709	Alcoholic liver disease, unspecified
K71	Toxic liver disease
K710	Toxic liver disease with cholestasis
K711	Toxic liver disease with hepatic necrosis
K713	Toxic liver disease with chronic persistent hepatitis
K714	Toxic liver disease with chronic lobular hepatitis
K715	Toxic liver disease with chronic active hepatitis
K717	Toxic liver disease with fibrosis and cirrhosis of liver
K718	Toxic liver disease with other disorders of liver
K719	Toxic liver disease, unspecified

IC10 code	Description
K72	Hepatic failure, not elsewhere classified
K720	Acute and subacute hepatic failure
K721	Chronic hepatic failure
K729	Hepatic failure, unspecified
K73	Chronic hepatitis, not elsewhere classified
K730	Chronic persistent hepatitis, not elsewhere classified
K731	Chronic lobular hepatitis, not elsewhere classified
K732	Chronic active hepatitis, not elsewhere classified
K738	Other chronic hepatitis, not elsewhere classified
K739	Chronic hepatitis, unspecified
K74	Fibrosis and cirrhosis of liver
K740	Hepatic fibrosis
K741	Hepatic sclerosis
K742	Hepatic fibrosis with hepatic sclerosis
K743	Primary biliary cirrhosis
K744	Secondary biliary cirrhosis
K745	Biliary cirrhosis, unspecified
K746	Other and unspecified cirrhosis of liver
K75	Other inflammatory liver diseases
K758	Other specified inflammatory liver diseases
K759	Inflammatory liver disease, unspecified
K76	Other diseases of liver
K760	Fatty (change of) liver
K766	Portal hypertension
K767	Hepatorenal syndrome

IC10 code	Description
K769	Liver disease, unspecified

Table A2: ICD-9 codes

IC10 code	Description
571-	Chronic liver disease and cirrhosis
572.3	Portal hypertension
572.4	Hepatorenal syndrome
572.5	Other sequelae of chronic liver disease
572.6	Other sequelae of chronic liver disease
572.8	Other sequelae of chronic liver disease
572.9	Other sequelae of chronic liver disease
573-	Chronic passive congestion of liver

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

Severity level	Description	% of prevalent cases	Disability weight (0-1)
Compensated cirrhosis of the liver	No symptoms. Liver can still function	67	0.000
Decompensated cirrhosis of the liver	Has a swollen belly and swollen legs. The person feels weakness, fatigue and loss of appetite.	33	0.178

Appendix 2 – Publication metadata

Publication title

Scottish Burden of Disease: Future prevalence and burden of chronic liver disease

Description

Release of Scottish Burden of disease prevalence estimates for chronic liver disease 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 SMR data from 1980 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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