![ScotPHO - Public Health Information for Scotland]

The Scottish Burden of Disease Study, 2016

Anxiety disorders technical overview

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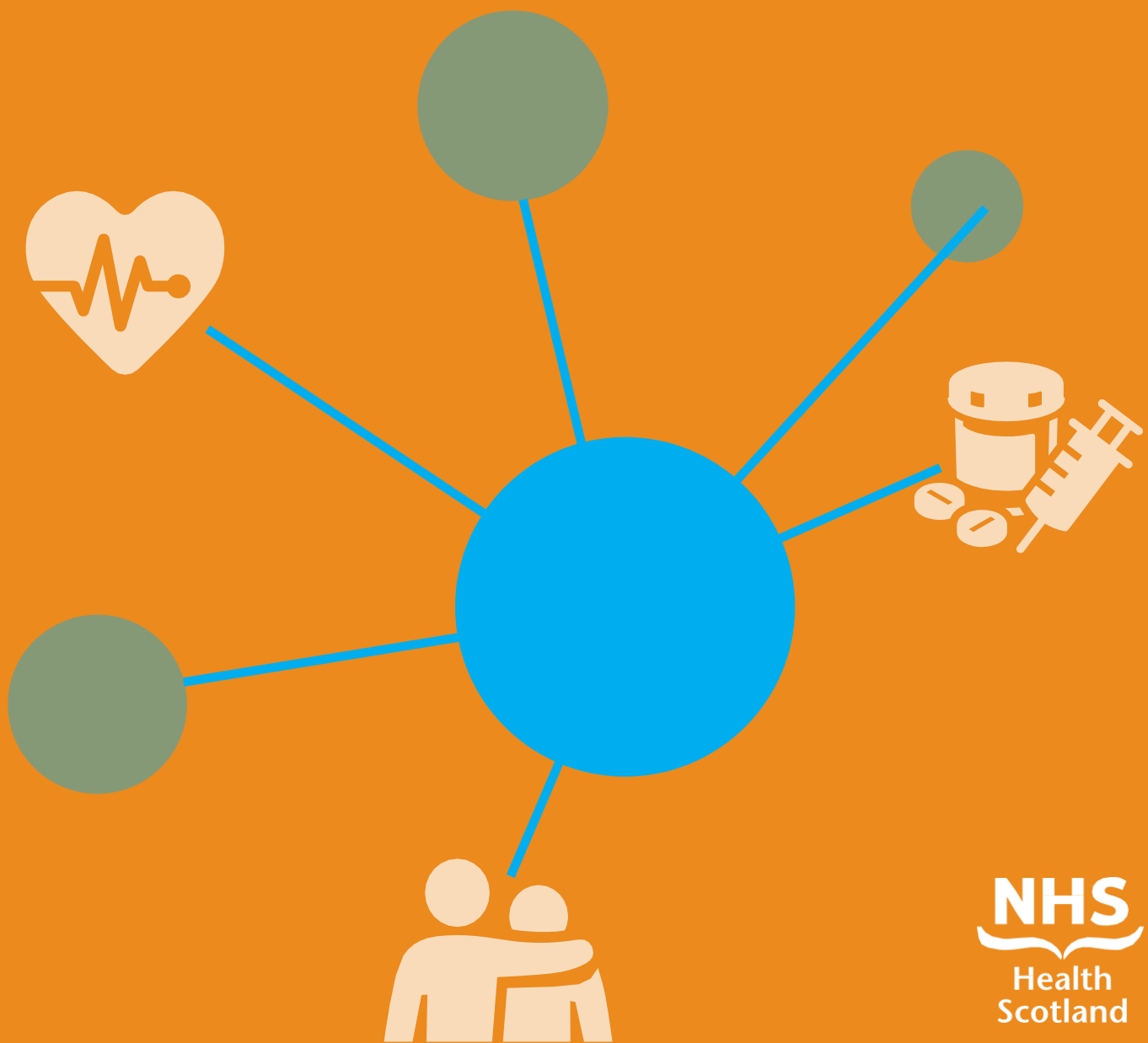
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Background

The Scottish Burden of Disease (SBoD) study team have published comprehensive estimates of the burden of disease and injury in Scotland for 2016 [1]. The purpose of this technical overview is to provide background information on the data and methodology used, noting any caveats associated with estimating the burden of anxiety disorders in SBoD.

Burden of disease studies aim to estimate the difference between ideal and actual health in a country or region at a specific point in time. Individuals can suffer non-fatal health loss due to suffering disability attributable to a disease or injury, or suffer fatal health loss which is early death due to a disease or injury. To quantify the total burden, non-fatal and fatal health loss are combined to produce a single metric called the Disability-Adjusted Life Year (DALY).

In SBoD 2016, all data are presented as three year averages for period 2014-2016. A three year period is used to smooth out most of the effect if the mortality or morbidity of a single year happens to be unusual. Further information about the SBoD study, including a more thorough explanation of the methodology used, overview reports, detailed results and other specific disease briefings, can be found on the website of the Scottish Public Health Observatory (ScotPHO) [1].

Estimated burden due to anxiety

Anxiety was the 10th leading cause of disease burden in Scotland in 2016, resulting in a total of approximately 46,000 DALYs. The burden of anxiety was fully attributed to individuals suffering health loss due to living with anxiety.

Figure 1 Percentage of total DALYs by gender and age-group for anxiety
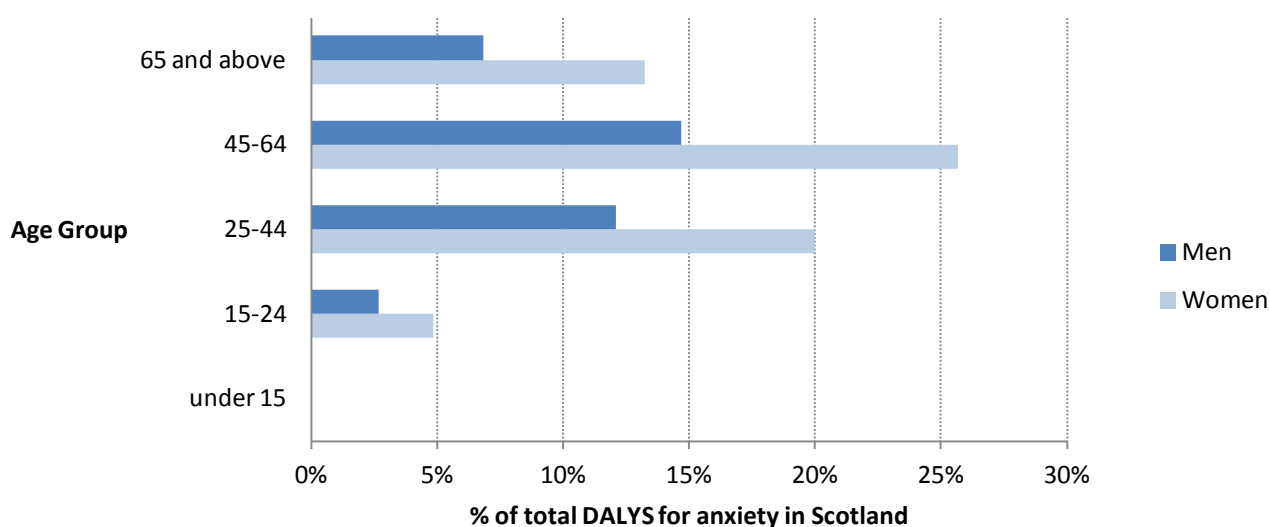
Women contributed a higher proportion of the burden (51%) than men (49%). Women aged 45-64 years accounted for 26% of the total burden for anxiety followed by women aged 25-44 years (20%). Men aged 45-64 years accounted for 15% of the total anxiety burden. Note that the burden which we are describing above is the absolute burden and has not been adjusted for the age/gender case-mix.

The age standardised DALY rates for anxiety, by deprivation[1] decile, are shown in Figure 2. The DALY burden increased with increasing levels of deprivation: individuals in the most deprived decile experienced a burden that was 2.5 times greater than individuals in the least deprived decile.

Figure 2 DALYs (rates per 100,000[2]) of total anxiety burden by deprivation decile
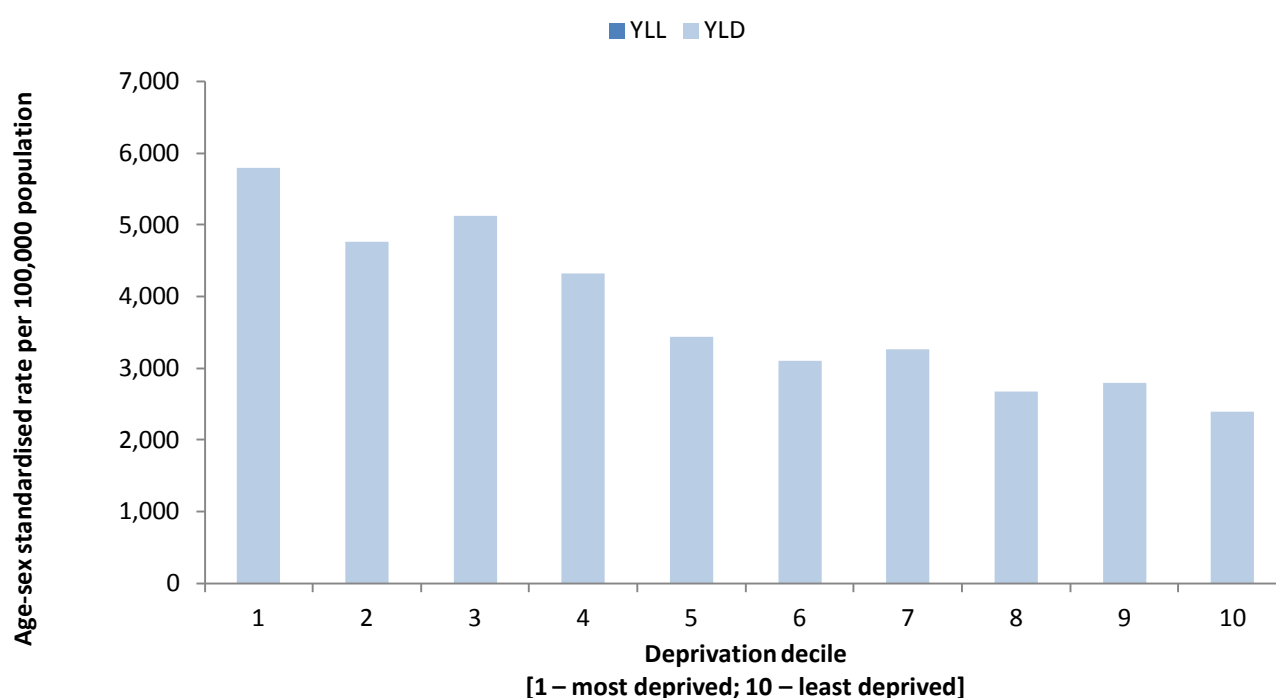
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How did we produce these estimates?

DALYs attributed to a disease, or injury, are calculated by combining estimates from two individual metrics: Years of Life Lost (YLL) due to premature mortality and Years Lived with Disability (YLD).

Years of Life Lost (YLL) due to anxiety

Each single death contributes to the total YLL through calculating the difference between the age at death and the life expectancy at that age. Although anxiety may lead to loss of life through (for example) suicide, Anxiety is not regarded, in itself, as a valid clinical cause of death in burden of disease studies. There is, therefore, no YLL component in the DALY for this condition; the entire burden estimated comes from non-fatal consequences of health loss due to anxiety [2].

Years Lived With Disability (YLD) due to anxiety

Years lived with disability (YLD) are estimated using:

- disease and injury prevalence estimates
- levels of severity
- disability weights

Our sources of information for these three components are as follows:

Estimating the number of individuals suffering disability

We used the Scottish Health Survey to estimate prevalence of anxiety in Scotland. The Scottish Health Surveys (SHeS) are a series of stratified, cluster-sampled, cross-sectional surveys designed to measure the health of a representative sample of the Scottish population living in private households. This survey series started in 1995 with latest survey carried out in 2017 [3].

In SHeS, details on symptoms of depression and anxiety are collected via a standardised instrument, the Revised Clinical Interview Schedule (CIS-R[4,5]. The CIS-R is a well-established tool for measuring the prevalence of mental disorders [6]. The complete CIS-R comprises 14 sections, each covering a type of mental health symptom and asks about presence of symptoms in the week preceding the interview. Prevalence of two of these mental illnesses - depression and anxiety – was first introduced to SHeS in 2008, as part of the nurse interview. Since 2012, the questions have been included in the biological module, with participants completing the questions themselves on the interviewer laptop (CASI).

The CISR scale for anxiety generates a score between 0 and 4; a score of 2 of more is the threshold for any of the conditions being regarded as 'clinically significant' [7].

We have used the SHeS survey prevalence by gender, of those reporting two or more symptoms on the CISR anxiety scale, taking an average from 2012-15 (four survey waves) (see table 1 below). The survey prevalence was then multiplied with the NRS population estimate (2016) for males and females separately to obtain expected number of cases of depression by gender. In order to obtain the distribution of these cases by both age (16 years and over), gender and SIMD, the average distribution of prevalence across the years (2014-16) of individuals community-dispensed antidepressant medication was used.

Table 1 CISR scale scores from Scottish Health Survey 2012-2015 combined

CISR scale scores from Scottish Health Survey 2012-2015 combined		
Anxiety symptom score	**CISR score**	**CISR score**
	Males (%)	Females (%)
0 symptoms	82.9	73.1
1 symptom	9.1	14.0
2 or more symptoms	7.9	13.0

Using this method of identifying prevalent cases of anxiety, we estimated that there were approximately 473,000 individuals, aged 16 in the Scottish population suffering disability due to anxiety disorders in 2016.

Severity distribution and disability weights

The levels of severity and disability due to anxiety in Scotland were based on the specifications of the GBD 2016 study [8]. This allowed prevalent cases to be disaggregated by levels of severity and the associated disability at each level of severity. The disability weights were developed by the GBD study through surveys of the general public and take into account the consequences of each disease, condition and injury [9]. The severity distributions and disability weights for anxiety are outlined in Table 2.

Once the severity of anxiety and associated disability were taken into account, individuals were estimated to be suffering approximately 46,000 YLD in 2016 due to living with anxiety disorders.

Table 2 Description and allocation to severity levels for anxiety with corresponding disability weight

Severity level	Description	% of individuals	Disability weight
Asymptomatic	Experiences no symptoms by virtue of, for instance being on treatment or because of the natural course of the condition.	29	Nil
Mild	Feels persistent sadness and has lost interest in usual activities. The person sometimes sleeps badly, feels tired, or has trouble concentrating but still manages to function in daily life with extra effort.	39	0.030
Moderate	Has constant sadness and has lost interest in usual activities. The person has some difficulty in daily life, sleeps badly, has trouble concentrating, and sometimes thinks about harming himself (or herself).	19	0.133
Severe	Has overwhelming, constant sadness and cannot function in daily life. The person sometimes loses touch with reality and wants to harm or kill himself (or herself).	13	0.523

Data quality

In order to provide a measure of the degree of accuracy[3] and relevance[4] of the estimated disease DALYs to users, a measure of data quality has been developed for the SBoD study. This measure assigns a RAG (Red; Amber; Green) status to each disease or injury indicative of the accuracy and relevance of the estimates. Interpretation of the RAG status can be defined as follows:

 Highly accurate and relevant

Estimates have been derived using relevant and robust data sources with only a small degree of adjustments performed to the input data.

 Moderately accurate and relevant

Estimates have been derived using reasonably relevant and robust data sources with only a moderate degree of adjustments performed to the input data.

 Uncertainties over accuracy and relevance

Estimates have been derived using less comprehensive or relevant data sources with a high degree of adjustments performed to the input data.

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[3] How precise, unbiased or certain the estimate is.
[4] Do we measure the thing we want to measure?

The data quality has been assessed using three main criteria:

- Relevance and accuracy of the data source used to measuring the population of interest
- Likelihood that the implemented disease model captured the overall burden of disease or injury
- The relative contribution of ill-defined deaths to YLL, and YLL to DALY.

These criteria are subjectively assessed and each criterion is scored on a scale of 1 to 5. Further details on these data quality measures are available on the ScotPHO website [1].

Based on these criteria, the estimates of burden of anxiety in Scotland are ⓇⒶⒼ **moderately accurate and relevant.**

Obtaining estimates of the number of individuals suffering from anxiety is difficult. The stigma associated with mental health conditions means that individuals may not admit to having depression, or opt to pursue non-traditional treatments [10].

We have chosen to use the Scottish Health Survey, a nationally representative general population survey to estimate the number of individuals suffering from anxiety in Scotland. SHeS uses CIS-R, a validated tool, to measure anxiety and we feel that that SHeS represents a more robust source to estimate prevalence than relying on health care administrative datasets

Our study estimated an anxiety prevalence of 11% in Scotland in 2016 in adults aged 16 years and over. In comparison, the Global Burden of Disease study (GBD) 2016 estimated an anxiety prevalence of approximately 5% in the Scottish population [11]. The 2015/16 Quality and Outcomes Framework (QOF) in Scotland, that estimated a prevalence of 6.8% for patients aged 16 and above [12], whilst a survey conducted in the United States found a 12-month prevalence of 6.6% [13].

What next to improve estimates for anxiety?

Future work on the SBoD study will attempt to refine the estimates of prevalence. The improvement of prevalence estimates will include reviewing the coding and recording of Anxiety in alternative national datasets and exploring local area datasets for information. The development of the Scottish Primary Care Information Resource (SPIRE) will help us to improve our estimates of the burden of disease in Scotland [14]. Further to this, work will be carried out to attempt to derive estimates of severity levels that are dependent on age and that are specific to the Scottish population.

These improvements are partly dependant on exploring other data sources and reviewing evidence from high quality research that it is relevant to Scotland. Please contact the SBoD project team (nhs.healthscotland-sbod-team@nhs.net) for enquiries and suggestions on how to improve our estimates.

References

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