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Mental health status of the Northern Ireland population in employment: occupations and industries

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Key points

- The proportion of the population in employment in receipt of prescription drugs related to anxiety and depression in each year 2010 to 2012 (8.6%) is nearly three times the proportion self-reporting an emotional, psychological or mental health condition according to the 2011 Census (3.1%).
- The highest proportion self-reporting an emotional, psychological or mental health condition (4.3%) were found in elementary, sales and customer services occupations; the lowest proportion (2.0%) in professional occupations.
- Personal service occupations had the highest proportion prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012 (12.9%); the lowest proportion (5.5%) in skilled trades occupations.
- Significant differences in the prevalence of poor mental health between different occupations and/or industries persist after accounting for socio-economic factors.
- Sales and customer services occupations had the highest odds ratios for both self-reporting an emotional, psychological or mental health condition (+55%) and being prescribed antidepressants, hypnotics or anxiolytics (+29%), compared to professional occupations (reference category).

Contents

Introduction

Employment provides not only financial benefits, but also helps workers to achieve social contact, time structure, status and collective purpose (*latent benefits*[1]). These are basic psychological needs that contribute to a person's well-being. Different jobs vary in the extent to which non-financial benefits can be achieved; absence of these benefits can become a cause for work-related stress, leading to anxiety or depression. Such causes include[2]:

- poor management – lack of supportive supervision;
- difficult relationships with colleagues;
- bullying at work;
- lack of interpersonal contact;
- having too much or too little to do – opportunity for skill use;
- being unclear about the job role and what is required;
- a lack of control in the working environment;
- being in the wrong job given the skills, abilities and expectations of the employee;
- lack of variety;
- lack of physical security;
- an excessive workload or unrealistic deadlines;
- long working hours; and
- being under pressure to meet deadlines.

Some of these causes may be more common in certain occupations or industries than others. In Great Britain, the prevalence of work-related stress, anxiety and depression, based on self-reports, was 1,380 per 100,000 employed in the last 12 months, calculated over the 3-year period 2016/17 to 2018/19[3]. The highest rates have been found in professional occupations (2,150), and associate professional / technical occupations (1,650 per 100,000 employed in the last 12 months). The lowest rates were found in process, plant and machine operatives (630), skilled trades (670) and elementary occupations (710 per 100,000 employed in the last 12 months)[4].

The Health and Safety Executive in Northern Ireland[5] provided an estimate of 15,000 workers suffering from work-related stress in 2015/16, based on a population pro-rata of the HSE GB estimate and rounded to the nearest 1,000. Given the LFS estimate of 797 thousand people in employment in 2015 in Northern Ireland, this translates to 1.9% of the working population.

[1] Jahoda, M. (1982). Employment and unemployment: a social-psychological analysis. University Press, Cambridge.

[2] BUPA article on work-related stress, and, P. Warr (1999). Well-being and the workplace. Well-being: The foundations of hedonic psychology. Russell Sage Foundation, New York.

[3] These estimates were obtained from the Labour Force Survey (2016/17 – 2018/19). Equivalent figures are not available for Northern Ireland due to the much smaller sample size of the NI LFS.

[4] Health and Safety Executive, Work-related stress, anxiety or depression statistics in Great Britain, downloaded in September 2020.

[5] Methodology note on Northern Ireland's estimated work related health statistics

The Health Survey Northern Ireland 2015/16[6] found that 12% of people in employment in Northern Ireland found their job very stressful and a further 2% reported their job to be extremely stressful. The survey did not record whether or to which extent a stressful job led to absence or loss of productivity due to stress, anxiety or depression, nor did it collect information on occupation, industry or hours worked.

In addition to the stress that can arise from the work environment or a particular job, there are many circumstances in people's lives outside of work that can lead to stress, anxiety or depression, including[7]:

- social disadvantage, poverty or debt;
- being a long-term carer for someone;
- homelessness or poor housing;
- unemployment or losing your job;
- social isolation or loneliness;
- bereavement;
- drug and alcohol misuse;
- severe or long-term stress;
- domestic violence, bullying or other abuse as an adult;
- experiencing discrimination and stigma;
- childhood abuse, trauma, or neglect;
- significant trauma as an adult, such as being the victim of a violent crime;
- having a long-term physical health condition; and
- physical causes, such as a head injury or a neurological condition.

The prevalence of mental health problems in the workplace was estimated to be 14.1% of those aged 16 to 64 in full-time employment in England[8] . This was based on the revised Clinical Interview Schedule (CIS-R), with a score of 12 or more (symptoms warranting clinical recognition). In the adult population as a whole, roughly half of those with mental health problems scored 18 or more (severe), which means they required intervention, such as psychological therapy or psychotropic medication.

An earlier study[9] from 2001 found a prevalence of common mental disorders (12+ CIS-R score) in 13% of people in the UK aged 16 to 64 years who were currently working, or had been working in the last year. It also provided rates by occupational groups, with the highest rates in those working in sales (17%) and the lowest rates in plant and machine operatives (9%).

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[6] Department of Health: Stress at Work 2015/16

[7] The mental health charity Mind published a list of factors that could result in a period of poor mental health.

[8] Age standardised rate of Common Mental Disorders, in Mental Health and Wellbeing in England (2014), Adult Psychiatric Morbidity Survey (page 55).

[9] S.A. Stansfeld, F.R. Rasul, J. Head and N. Singleton (2011). Occupation and mental health in a national UK survey. Social Psychiatry and Psychiatric Epidemiology (46) pages 101–110.

The Office for National Statistics published age-standardized suicide rates by occupation[10], and found the highest rates in elementary and skilled occupations (males only), and the lowest rates for managers, directors and senior officials (males and females). Although it could not prove causality, it postulated that features such as low pay and job security, as well as socio-economic characteristics of individuals employed in a particular occupation, could explain some of the differences between suicide rates. Note that although most people who have died by suicide have suffered from mental disorders, most people with mental disorders do not die through suicide[11].

Whilst work-related stress appears to be a small subset of mental health problems in the workplace, it is difficult to know the extent to which work-related stress interacts with other circumstances in people's lives and the impact of work on mental health.

Deloitte[12] estimated that the costs of poor mental health amounted to £33-42 billion each year for UK employers. The Stevenson/Farmer review[13] estimated poor mental health to cost the UK economy £75-99 billion per year when also including (a) lost output from those out of work due to mental health and (b) NHS treatment costs for mental health conditions in the working age population. Neither study quotes figures for Northern Ireland, but given the size of its economy relative to the UK[14] and based on Stevenson/Farmer calculations, this roughly translates to £2 billion per year for the Northern Ireland economy as a whole.

Aims and Methodology

Data

The Northern Ireland Longitudinal Study (NILS) links data from the Northern Ireland Health Card Registration system to Census returns and administrative data from other sources[15]. These include vital events, such as births and deaths, registered with the General Register Office for Northern Ireland, and Health and Social Care data from administrative sources. The NILS sample is made up of roughly 28% of the Northern Ireland population (approximately 500,000 people) selected using 104 dates of birth. For this study, the initial dataset consisted of all NILS members aged 16 and over, who were enumerated in the 2011 Census (n=385,997). This sample was reduced further by selecting only those in employment aged 16 to 74 who could be linked to prescription data (201,797 records). Prescription data was provided by the BSO Enhanced Prescribing Database (EPD), consisting of the annual number of prescriptions processed in the British National Formulary (BNF) categories antidepressants, hypnotics and anxiolytics[16]. The final dataset was anonymised prior to handover to the research team, and did not contain identifiable individual level data. Access was only provided from within a controlled 'secure environment' and governed by strict protocols and procedures to ensure data confidentiality.

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[10] See ONS publication 'Suicide by occupation, England: 2011 to 2015'

[11] See Brådvik, L. (2015). e. International Journal of Environmental Research and Public Health 15(9): p. 2028.

[12] This figure was broken down into absence costs (£8bn), turnover costs (£9bn) and costs of lower productivity due to attending work with poor mental health (presenteeism, £17-26bn). Deloitte (October 2017). Mental health and employers: The case for investment

[13] See Annex C of the Stevenson / Farmer review

[14] The Northern Ireland economy is 2.2% and 2.3% in terms of the UK Gross Value Added (GVA) and Gross Domestic Product (GDP) respectively, according to the Office for National Statistics.

[15] See the Northern Ireland Longitudinal Study – An Introduction

[16] British National Formulary – reference book for prescribing and pharmacology. Chapter 4 contains prescriptions for the nervous system, including hypnotics and anxiolytics (4.1) and anti-depressants (4.3).

The feasibility of this resource has been demonstrated by a number of data linkage projects that have been completed in the past, for example, on job stress and mental health, using linked prescriptions data[17].

Measures and definitions

Two measures of mental health were used. First, the 2011 Census[18] asked respondents if they have 'an emotional, psychological or mental health condition (such as depression or schizophrenia)'. In the remainder of this bulletin, this is referred to as a '*self-reported mental health condition*'.

Secondly, the linkage to prescription data was used to identify individuals for whom at least one prescription drug associated with anxiety and/or depression was processed[19] by the Business Services Organisation (HSC-BSO) in each of the years 2010, 2011 and 2012. This definition was used to capture those being long-term or persistently affected by these mental health conditions, and as such more closely aligned to the definition in the 2011 Census ('*conditions which have lasted, or are expected to last, at least 12 months*').

The population in employment was identified from the 2011 Census, where respondents were asked if they carried out any paid work, including casual or temporary work, in the previous week. Subsequent questions also asked for their job title/description and the name, address and activity of the employer. This information is combined into the Standard Occupational Classification (SOC2000) and the Standard Industrial Classification of economic activities (SIC2007). Only the first digit of both occupation and industry codes have been considered in this analysis to ensure sufficiently large categories to identify significant differences in the prevalence of poor mental health. A description of all variables used in this analysis is provided in Annex A.

Aims of study

This study originally set out to measure the extent of work-related stress, anxiety and depression in Northern Ireland using prescriptions data linked to census data via the Northern Ireland Longitudinal Study (NILS).

The original aims of this study were as follows:

- To help clarify the relationship between economic activity status or occupation and stress/depression/anxiety in Northern Ireland.
- To compare the prevalence of work-related stress/depression/anxiety in different occupations, industries and socio-economic groupings.
- To examine the effects of changes in personal circumstances over time.
- To conduct a similar analysis of GB data (at a later stage) to enable the refinement of NI derived estimates for the prevalence of work-related stress/depression/anxiety.

[17] NILS Project 078: Job stress and mental health status

[18] This information originates from question 23 of the 2011 Census individual questionnaire.

[19] Further detail on this data source is available from BSO's prescribing statistics.

It was apparent early in the study design that it was not possible to isolate work-related stress/depression/anxiety from mental health problems that could be attributable to other causes or circumstances. The close relationship between occupations and socio-economic groupings, for example, made it impossible to discern between the effects on mental health arising from the nature of the work and the effects arising from personal circumstances. Some interesting results did, however, emerge from the analysis of mental health within different occupational and industrial groups.

Methodology

There were three stages of the analysis. The first stage aimed to quantify the prevalence of poor mental health in the Northern Ireland population in employment, and to compare with other such measures in the literature. In the second stage, a disaggregation of this prevalence by occupation and industry was presented.

The last stage aimed to identify differences between occupations and industries, by accounting for differences in the socio-economic characteristics using logistic regression – a statistical model to describe the presence or absence (not magnitude) of an outcome, in this case poor mental health.

A similar analysis[20] has previously been carried out on the Psychiatric Morbidity Survey of Great Britain, presenting odds ratios of psychological disorder by occupation after adjusting for socio-demographic, financial and ill health factors. Most recently, researchers from Ulster University published a study[21] on mental ill-health among full-time health and social care professionals in Northern Ireland, as identified in the 2011 Census, and using the number of prescriptions for psychotropic medication received in the twelve months following the census.

Results

Prevalence in population in employment

Table 1 shows some high level results from this study. It shows both measures used in the NILS study: the proportion of the population in employment (1) with self-reported mental health condition and (2) processed prescriptions of antidepressants, hypnotics or anxiolytics in each year 2010, 2011 and 2012. Table 1 also shows other published figures, although care should be taken when making comparisons, as definitions, geography and time periods may be different.

[20] See the research report Occupation and mental health: Secondary analyses of the ONS Psychiatric Morbidity Survey of Great Britain, prepared by the Queen Mary School of Medicine & Dentistry and the Office of National Statistics for the Health and Safety Executive 2003

[21] Curren et al (2021). Mental ill-health among health and social care professionals: an analysis using administrative data. International Journal of Population Data Science 6, p. 1-9.

Table 1: Summary of mental health indicators of population in employment

Sources and indicators	Proportion (%)
Self-reported mental health condition, in employment, Northern Ireland	
- Census 2011, Table CT0248NI[22], aged 16-64	3.1
- NILS study, based on same 2011 Census question, aged 16 and over	3.1
Prescribed antidepressants, hypnotics or anxiolytics, NILS Study	
- At least once in 2011 only, aged 16+, in employment	16.7
- At least once in each year 2010 to 2012, aged 16+, in employment	8.6
Health Survey Northern Ireland 2015/16[23]: proportion (rounded to nearest %) of people in employment who found their job	
- very stressful	14
- extremely stressful	2
LFS Self-reported work-related stress (GB, 2009/10-2011/12):	
- 1,220 per 100,000 employed in last 12 months, as a percentage	1.2
Age-standardized rate of Common Mental Disorder, England, 2014[24]	
- in full-time employment, aged 16-64	14.1
- in part-time employment, aged 16-64	16.3

There are several interesting observations evident from Table 1 above:

1) the proportion self-reporting a mental health condition (3.1%) in the NILS sample is equivalent in the published Census table, which indicates a representative sample;

2) the proportion in receipt of prescription drugs related to anxiety and depression in each year 2010 to 2012 (8.6%) is nearly three times the proportion self-reporting a mental health condition in 2011 (3.1%) – this could indicate (a) an underreporting or change in mental health conditions, (b) the prescriptions alleviating mental health symptoms to the extent that the mental health condition is no longer felt, or (c) prescriptions being used for short-term mental health problems or non-mental health conditions;

3) Of those in employment, 16.7% were in receipt of prescription drugs related to anxiety and depression in 2011. More than half of this group (51.8%) were also prescribed such drugs in both 2010 and 2011, thus representing 8.6% of the population in employment – using a three-year period aims to highlight more persistent and/or longer-term mental health problems;

4) whilst recognising the differences between the Health Survey Northern Ireland in 2015/16, and the LFS results for Great Britain, self-reported work related stress (1.2%) is broadly similar to the proportion of people who found their job extremely stressful (2%).

5) the proportion self-reporting a mental health condition (3.1%) in Northern Ireland is over two and a half times the average self-reporting work-related stress, anxiety or depression in GB in 2009/10-2011/12 (1.2%);

[22] Type of Long-Term Condition by Occupation or Former Occupation by Economic Activity, Table CT0248NI: out of 775,243 persons aged 16 to 64 in employment, 23,667 (3.1%) reported an emotional, psychological or mental health condition.

[23] Department of Health, Stress at Work 2015/16, published figures rounded to nearest percentage

[24] Age standardised rate of Common Mental Disorders, in Mental Health and Wellbeing in England (2014), Adult Psychiatric Morbidity Survey (page 55).

6) the proportion in receipt of prescription drugs related to anxiety and depression in 2011 (16.7%) is broadly similar to the proportion of people in Northern Ireland who found their job very or extremely stressful in 2015/16 (16%), and the age-standardized rate of Common Mental Disorder of those in employment in England in 2014 (14.1% for full-time and16.3% for part-time employment); and

7) Assuming that half of those with a Common Mental Disorder require intervention[25], this translated to 7-8% of those in employment in England in 2014, which is similar to the 8.6% of the working population in Northern Ireland in 2011 who are in receipt of prescription drugs related to anxiety and depression in each year 2010 to 2012.

There is a degree of overlap between self-reported mental health conditions and the proportion of people in receipt of related prescription drugs: there were 3,855 people who both had a self-reported mental health condition and were prescribed antidepressants, hypnotics or anxiolytics in each year 2010 to 2012. This represents 62.5% of those with a self-reported mental health condition (6,170), and 22.1% of all who were prescribed these drugs (17,452) in this 3-year period.

Prevalence by occupation and industry

Table 2 presents the results by occupation (a) self-reported work-related stress in GB, per 100,000 employed in the last 12 months, (b) self-reporting a mental health condition, and (c) proportion in receipt of prescription drugs related to anxiety and depression in each year 2010 to 2012. A visual representation of the Northern Ireland findings is shown in Figure 1.

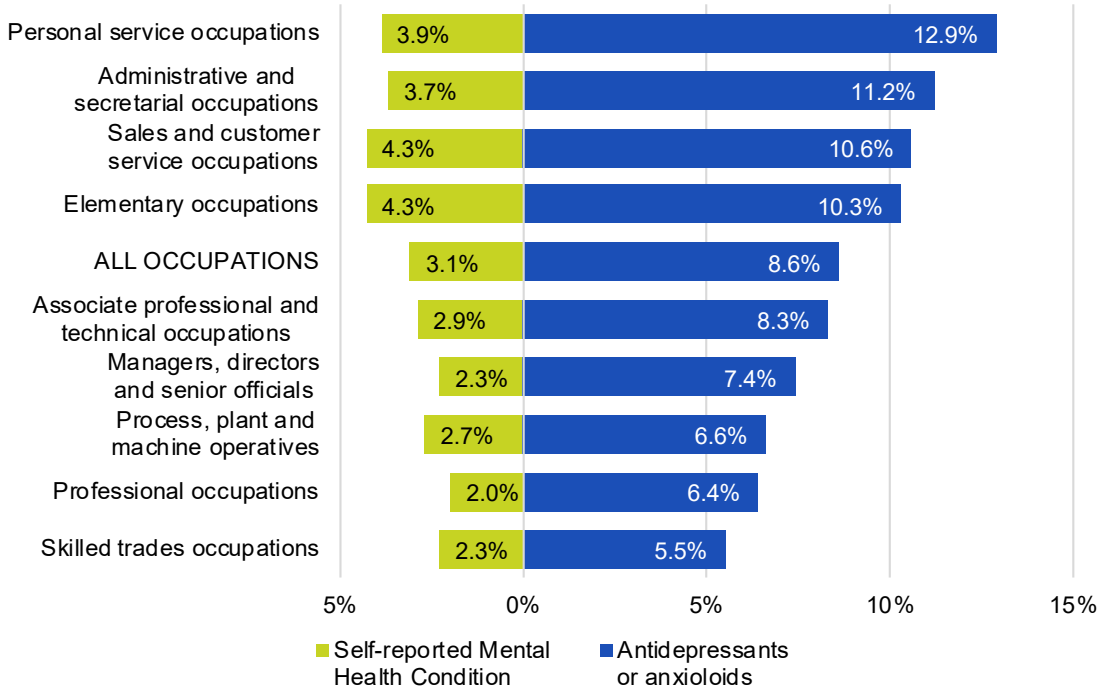
Table 2: Proportion of population in employment (1) with self-reported mental health condition in NI, (2) processed prescriptions of antidepressants, hypnotics or anxiolytics in each year 2010-2012 in NI, and (3) with work-related stress in GB, by occupation

Occupation	Group Size	Self-reported mental health condition, 2011 Census (%)	Proportion prescribed antidepressants, hypnotics or anxiolytics, 2010-2012 (%)	LFS Self-reported work-related stress (GB 2009/10-2011/12)[26], per 100,000 employed
All occupations	**201,797**	**3.1**	**8.6**	**1,220**
Managers, directors and senior officials	21,699	2.3	7.4	1,460
Professional occupations	26,395	2.0	6.4	1,840
Associate professional / technical	27,818	2.9	8.3	1,440
Administrative / secretarial	27,716	3.7	11.2	1,240
Skilled trades occupations	27,193	2.3	5.5	630
Personal service occupations	18,390	3.9	12.9	1,320
Sales and customer service occupations	14,933	4.3	10.6	930
Process, plant and machine operatives	16,615	2.7	6.6	700
Elementary occupations	21,038	4.3	10.3	640

[25] Of those who scored 12+ (clinical recognition) on CIS-R, around half scored 18 or more (required intervention), see page 12 of Mental Health and Wellbeing in England (2014).

[26] Data for 2009/10-2011/12 taken from HSE's report on self-reported work-related ill health and workplace injuries

Figure 1: Proportion of population in employment (a) with self-reported mental health condition, and (b) collecting prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012, by occupation



Key findings from Table 2 and Figure 1 are:

1) Elementary, sales and customer services occupations had the highest proportion of self-reported mental health condition (4.3%); the lowest proportion (2.0%) in professional occupations.
2) Personal service occupations, which include care workers and house keepers, had the highest proportion prescribed antidepressants, hypnotics or anxiolytics in each year 2010 2012 (12.9%); the lowest proportion (5.5%) were found in skilled trades occupations.
3) Occupational groups with below average proportions of self-reported mental health condition, also had below average proportions prescribed antidepressants, hypnotics or anxiolytics in each year 2010 to 2012 (See Figure 1).
4) In GB, professional occupations had the highest self-reported work-related stress (1,840 per 100,000 employed), whilst in Northern Ireland, this group had below average rates on both measures. Similarly, elementary occupations had one of the lowest rates of self-reported work-related stress in GB (640 per 100,000 employed), but above average rates on both measures in Northern Ireland.

Table 3 presents the equivalent results by industry. Figures for other demographic characteristics are presented in Annex B.

Table 3: Proportion of population in employment (1) with self-reported mental health condition in NI, (2) processed prescriptions of antidepressants, hypnotics or anxiolytics in each year 2010-2012 in NI, and (3) with work-related stress in GB, by industry

Industry	Group Size	Self-reported mental health condition, 2011 Census (%)	Proportion prescribed antidepressants, hypnotics or anxiolytics, 2010-2012 (%)	LFS Self-reported work-related stress (GB 2009/10-2011/12)[27], per 100,000 employed
All industries	**201,797**	**3.1**	**8.6**	**1,220**
Primary production	33,141	2.2	5.7	*
Manufacturing	20,130	2.3	6.2	800
Wholesale / retail trade	32,731	3.4	8.8	680
Hospitality	9,145	3.9	8.9	700
Information / communication	5,025	2.3	5.9	1,490
Financial	6,838	3.3	8.1	1,620
Real estate	2,057	2.2	9.2	1,350
Professional, scientific and technical	9,459	2.7	6.9	960
Administrative / support service	8,298	3.7	9.0	1,040
Public administration / defence	16,354	3.6	10.6	1,830
Education	19,768	2.9	9.7	1,780
Human health / social work	29,712	3.5	12.1	2,080
Arts, entertainment and recreation	3,618	3.9	8.9	690
Other service activities	5,521	3.7	10.8	1,270

* Primary production is the aggregate of multiple industries (Agriculture, forestry and fishing; Mining and quarrying; Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities; Construction) for which the LFS suppressed the results, with the exception of Construction (680 per 100,000 employed). It was not possible to derive a proportion for the combined industries.

Key findings from Table 3 are:

1) The highest proportions of self-reported mental health condition (3.9%) were found in hospitality and arts, entertainment and recreation industries; the lowest proportion (2.2%) in primary production and real estate.

2) The highest proportion of prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012 (12.1%) was found in the human health and social work sector; this sector had also the highest rates of self-reported work-related stress in GB (2.1%)

3) The lowest proportion of prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012 (5.7%) was found in primary production industries.

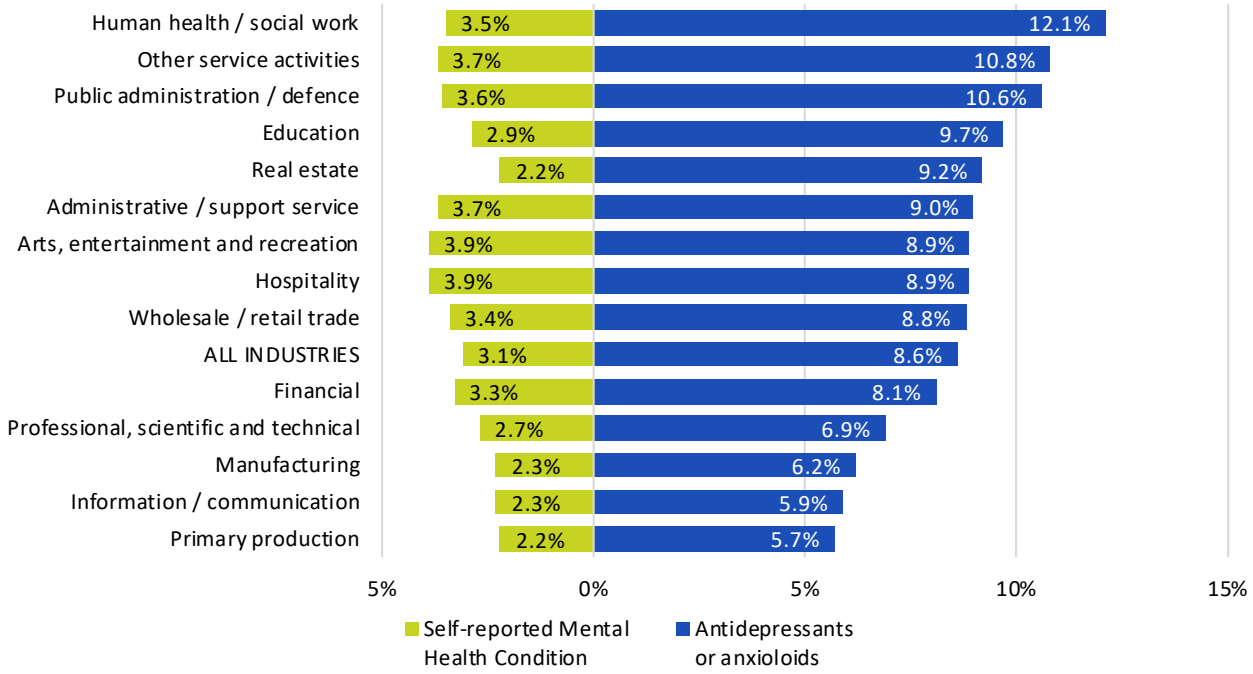
4) With the exception of education, real estate and finance, industries with below average proportions of self-reported mental health conditions, also had below average proportions of prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012 and vice versa (See Figure 2).

[27] Data for 2009/10-2011/12 taken from HSE's report on self-reported work-related ill health and workplace injuries

5) There appears to be less variation between industries compared to occupations when comparing the range of proportions of both measures for Northern Ireland (see Figure 2). This is likely due to industries containing a mix of occupations, with staff working in production, administrative and in management roles.

6) In GB, industries with the lowest self-reported work-related stress – hospitality (650), arts, entertainment and recreation (690) and wholesale and retail trade (700 per 100,000 employed) – were found to have above average rates on both measures in Northern Ireland.

Figure 2: Proportion of population in employment (a) with self-reported mental health condition, and (b) collecting prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012, by industry



The comparisons with self-reported work-related stress in GB have identified some examples of occupations and industries with opposite patterns of prevalence to the two measures of poor mental health in Northern Ireland. Figure 3 illustrates this for occupational groups.

Figure 3: Proportion of NI population in employment with self-reported mental health condition, compared to proportion of GB employed in last 12 month who reported work-related stress, by occupation

One explanation of this pattern could be that people with a mental health condition would avoid high pressure occupations and/or industries: there is an underrepresentation of people with self-reported mental health conditions in professional occupations, as well as managers, directors and senior officials, both groups having the highest rates of work-related stress according to the LFS results in Great Britain. The two occupation groups with the lowest but comparable self-reported work-related stress vary greatly in their proportion of self-reported mental health condition, from 2.0% in skilled trades, to more than double that rate (4.3%) in elementary occupations.

Controlling for socio-demographic factors

When looking at other demographic characteristics (full details in Annex B), females are more likely to self-report a mental health condition and collect prescriptions for depression or anxiety compared to males. These rates also increase by age, although self-reported mental health conditions fall for those of retirement age.

Both rates are also higher for those who are divorced or separated, or who provide at least 20 hours of unpaid care. This may indicate that pressures in their personal lives could have had an effect on their mental health. Rates are also higher in more deprived areas, and lower in rural settings, suggesting a positive environmental effect on mental health.

Self-reported mental health conditions and being in receipt of prescriptions for depression or anxiety fall with higher educational qualifications. Both measures are higher for those working fewer hours per week. This seems counter-intuitive, as a high workload may be associated with longer hours, stress and anxiety. However, it may signify previous or existing mental health problems that have led to reduced working hours. Similarly, this could also lead to the decision to work in less stressful occupations or industries. Another explanation would be the provision of unpaid care – already

associated with higher rates of mental health conditions – that could limit the number of hours available to work.

Differences in the socio-economic make-up between occupations and industries, combined with the relationship between socio-economic factors and mental health could affect the patterns found in Tables 2 and 3. For example, with females more likely to report mental health problems, those occupations or industries with proportionally more women could appear more stressful. A model has been developed to account for socio-economic factors on the two measures for poor mental health (see Annex C). The model adjusts for age, sex, qualifications, country of birth, living arrangements, whether or not providing care, hours of work, deprivation, and urban/rural. The results for occupation and industry are presented in Table 4.

Table 4: Odds Ratios on likelihood to (1) self-report a mental health condition, and (2) receive a prescription for antidepressants, hypnotics or anxiolytics in each year 2010-2012

Occupation / Industry	Self-reported mental health condition, Odds ratio (C.I.)	Received prescription for antidepressants, hypnotics or anxiolytics, 2010-2012, Odds ratio (C.I.)
Occupation		
Professional occupations (reference)	1.00	1.00
Managers / directors / senior officials	1.11 (0.97, 1.27)	1.08 (0.99, 1.16)
Associate professional / technical	1.26 (1.12, 1.42) *	1.11 (1.04, 1.19) *
Administrative / secretarial	1.32 (1.17, 1.49) *	1.23 (1.14, 1.32) *
Skilled trades occupations	1.34 (1.17, 1.54) *	1.08 (0.99, 1.17)
Personal service occupations	1.32 (1.16, 1.50) *	1.24 (1.15, 1.34) *
Sales / customer service	1.55 (1.33, 1.79) *	1.29 (1.17, 1.41) *
Process / plant / machine operatives	1.40 (1.20, 1.63) *	1.14 (1.04, 1.25) *
Elementary occupations	1.52 (1.33, 1.73) *	1.17 (1.08, 1.27) *
Industry		
Primary production (reference)	1.00	1.00
Manufacturing	1.09 (0.96, 1.22)	1.11 (1.03, 1.19) *
Wholesale / retail trade	1.20 (1.08, 1.35) *	1.16 (1.08, 1.25) *
Hospitality	1.29 (1.13, 1.49) *	1.17 (1.06, 1.28) *
Information / communication	1.16 (0.95, 1.43)	1.12 (0.98, 1.28)
Financial	1.44 (1.22, 1.69) *	1.17 (1.05, 1.30) *
Real estate	0.89 (0.66, 1.21)	1.19 (1.01, 1.40) *
Professional, scientific and technical	1.29 (1.10, 1.51) *	1.08 (0.98, 1.20)
Administrative / support service	1.31 (1.13, 1.51) *	1.23 (1.12, 1.35) *
Public administration / defence	1.53 (1.35, 1.73) *	1.45 (1.34, 1.57) *
Education	1.14 (1.00, 1.29)	1.17 (1.08, 1.26) *
Human health / social work	1.27 (1.13, 1.42) *	1.38 (1.29, 1.49) *
Arts, entertainment and recreation	1.50 (1.24, 1.81) *	1.19 (1.05, 1.36) *
Other service activities	1.37 (1.16, 1.63) *	1.36 (1.23, 1.51) *

* significantly different from the reference category at the 5% level

In this model, professional occupations and primary production are used as reference categories. The estimated parameters reflect the relative likelihood of the two measures of mental health, and are accompanied by 95% confidence intervals. As an example, Table 4 shows an odds ratio of 1.52 (C.I. 1.33-1.73) for elementary occupations on self-reporting a mental health condition. This means that, after correcting for the socio-economic characteristics of people working in these occupations, prevalence of poor mental health on this metric is 52% higher compared to professional occupations. In a separate model that only contains occupation and industry (See Annex C), the odds ratio of 2.39 (2.12-2.69) would have suggested that the prevalence of self-reported mental health conditions in elementary occupations was more than double that in professional occupations, prior to accounting for socio-economic differences between these groups.

A graphical presentation of the findings from Table 4 can be found in Figures 4 (occupation) and Figure 5 (industry).

Figure 4: Odds Ratios on likelihood to (1) self-report a mental health condition and (2) to collect antidepressants, hypnotics or anxiolytics in each year 2010-2012, by occupation

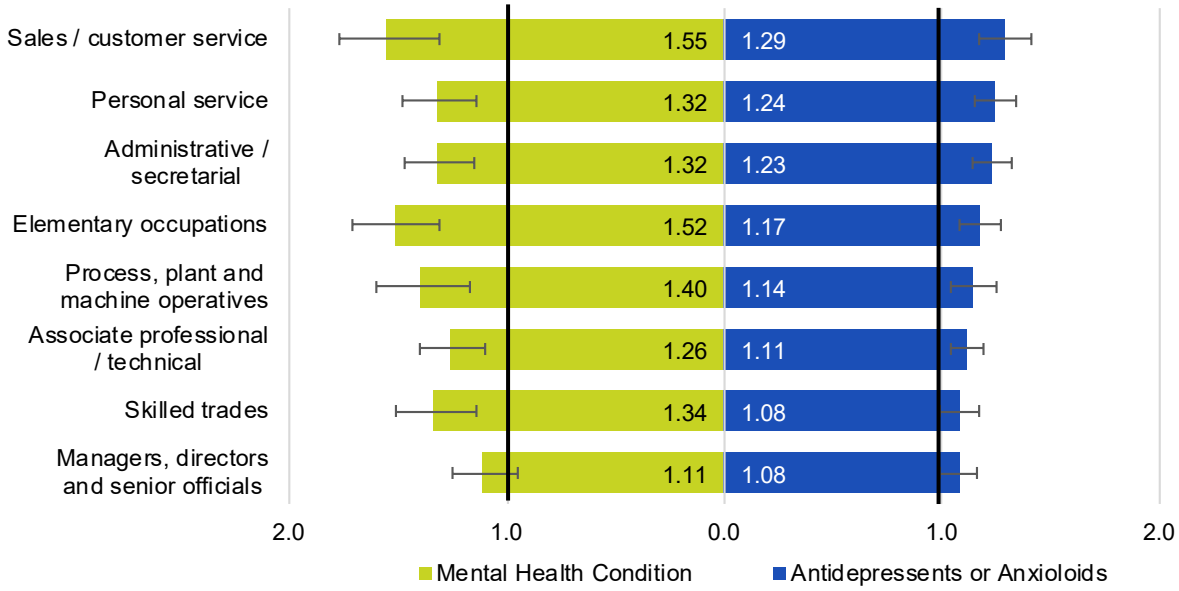
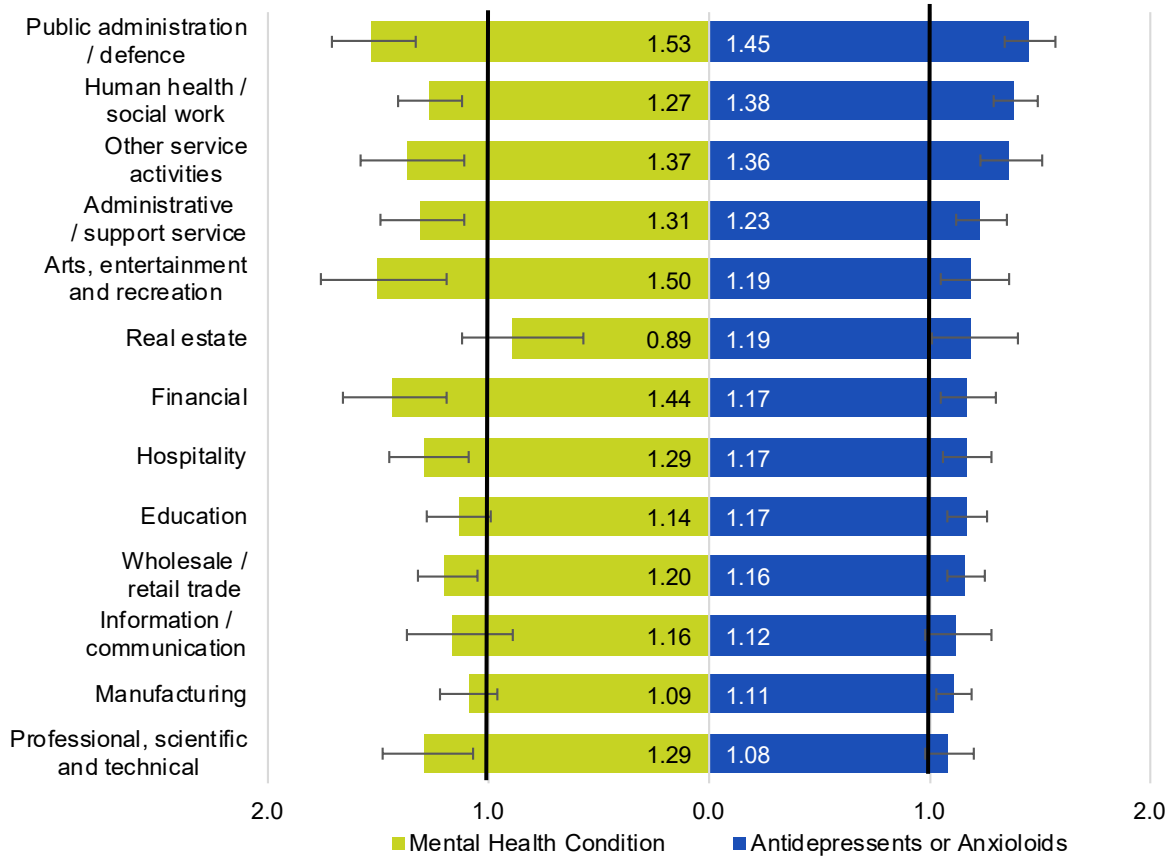


Figure 5: Odds Ratios on likelihood to (1) self-report a mental health condition and (2) to collect antidepressants, hypnotics or anxiolytics in each year 2010-2012, by industry



Key findings from this analysis are:

1) Significant differences in the prevalence of poor mental health between different occupations and/or industries persist after accounting for socio-economic factors;

2) After correcting for socio-economic factors (see Annex C), there is less variation in prevalence of poor mental health in either measure between occupations and industries; and

3) Sales and customer services occupations had the highest odds ratios for both self-reported mental health conditions (1.55) and being prescribed antidepressants, hypnotics or anxiolytics (1.29), compared to professional occupations (reference category);

4) In terms of industry, people employed in public administration and defence had the highest odds ratios for both self-reported mental health conditions (1.53) and being prescribed antidepressants, hypnotics or anxiolytics (1.45), compared to primary production (reference category); and

5) The relative differences in odds ratios between occupations and industries, as well as the size of confidence intervals, are smaller for prescriptions than for self-reported mental health conditions. This may indicate that prescription data is a better measure for prevalence of poor mental health compared to self-reporting a mental health condition.

Limitations

This study used the combined high quality data from the 2011 Census[28] and the BSO's Electronic Prescribing Database. In Northern Ireland, patients do not pay for prescriptions since April 2010, thus removing financial barriers between medical need and access to medication. Still, there may be some with poor mental health who did not seek medical help, who were prescribed medicine not captured in this study[29], or were directed towards non-pharmaceutical interventions, such as counselling or social prescribing[30]. The capture of mental health conditions in the Census may be under-reported due to stigma or the Census questionnaire being completed by a household member. These factors in both measures of poor mental health may be of varying importance for different socio-economic groups or occupations. For example, higher prevalence of poor mental health was found in females compared to males, using either measure and even after accounting for other socio-economic differences. Females are more likely to work part-time, carry out unpaid care, have higher educational qualifications, and are more represented in certain occupations or industries. There may be merit in modelling males and females separately to identify differences within occupations in prevalence of poor mental health between males and females.

The latest figures on work-related stress, anxiety or depression statistics in Great Britain, published by the Health and Safety Executive, include estimates for 2019/20. They showed a statistically significant increase compared to the previous year (2018/19), in particular in skilled trades, elementary occupations and caring, leisure and other service occupations. A separate report[31] stated that the emergence of Covid-19 may be a contributory factor, although it did not appear to be the main driver of changes in work-related ill health. The pandemic could have reduced job security and changes in working conditions, which together with added pressures in their private lives, could impact on workers' mental health.

Conclusions

This study was unable to quantify the prevalence of work-related stress or establish its relationship with different occupations, industries and socio-economic groupings. However, it did highlight differences in the prevalence of poor mental health between different occupations and industries in Northern Ireland, beyond the effects of socio-economic and demographic factors.

The relationship between mental health and work-related stress is clearly not a simple one. Different patterns of self-reported mental health and self-reported work-related stress with regards to occupation could arise from those with the poorest mental health choosing less stressful occupations. Those reporting good mental health may be more likely to suffer work-related stress in their chosen occupation, but may be more able to cope with it.

[28] Further information is available in the 2011 Census Quality Assurance Report.

[29] This study only used BNF categories for antidepressant (4.3), hypnotics and anxiolytics (4.1), whilst prescriptions for other mental health disorders such as (psychosis (4.2) and substance dependence (4.10) were excluded.

[30] See HSC-BSO news story for examples of Social Prescribing.

[31] See Potential impact of COVID-19 on HSE's main statistical data sources in 2019/20

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Annex A

Description of variables

Self-reported mental health condition originated from the 2011 Census, where a respondent ticked 'An emotional, psychological or mental health condition (such as depression or schizophrenia)' when asked Question 23 'do you have any of the following conditions which have lasted, or are expected to last, at least 12 months? (Tick all that apply)'.

Age and sex are taken from the Northern Ireland Health Card Registration system, owned and managed by the Health and Social Care Business Services Organisation (HSC-BSO). A 28% sample of its population is used as the spine of the Northern Ireland Longitudinal Study (NILS).

The highest educational qualifications is derived from the 2011 Census, where respondents were asked Question 27: 'Which of these qualifications do you have? (Tick every box that applies if you have any of the qualifications listed)'. The information collected from responses to this question were combined in a variable 'highest educational qualification'. For the purpose of this analysis, some categories of this have been combined.

Living arrangement is a variable that combines 2011 Census information from both marital status (Question 4) and the relationship matrix (Question H6). In this analysis, living in a couple includes married, registered same-sex partnership or cohabiting. Those not living in a couple are split into divorced or separated, and other marital status.

Country of birth is collected from the 2011 Census (Question 7); the analysis combined the three GB countries and all countries outside the UK and Ireland.

Provision of unpaid care originates from Question 25 of the 2011 Census: 'Do you look after, or give any help or support to family members, friends, neighbours or others because of either (a) long-term physical or mental ill-health/disability, or (b) problems related to old age? (Do not count anything you do as part of your paid employment)'. In the analysis, this has been turned into a binary variable, whether or not to provide 20 or more hours of unpaid care per week.

Weekly hours of work is taken from the 2011 Census, Question 42: 'in your main job, how many hours a week do […] you usually work?'. In this analysis, the categories '31-48' and '49 or more' hours were combined to reflect those in full-time employment.

The Northern Ireland Multiple Deprivation Measure (NIMDM 2010) identifies seven separate domains of deprivation and an overall summary measure. The income domain was used to assign individuals to one of five equal groups (or quintiles) ranging from most deprived to least deprived, based on their usual address of residence. Although the NIMDM measure was updated in 2017, the 2010 based NIMDM measure was included in the analyses given it was based on data sources relating to a time period aligned with Census 2011.

Urban/Rural Residence: Eight Settlement Bands (A-H) based on the 2011 Census population were used to classify settlements12. Settlements with a population of greater than or equal to 5,000 people were classified as 'Urban' while settlements with a population of less than 5,000 people were classified as 'rural'.

Logistic regression

Logistic regression is a statistical technique to describe a binary outcome, in this case, the presence or absence of poor mental health, using explanatory variables. The analysis was carried out using SPSS[32]. All explanatory variables in this analysis were categorical, which means that one category had to be selected as a reference category, to compare the impact of other categories within the same variable against the outcome. Reference categories were selected based on the lowest prevalence of poor mental health within a variable, in order to make interpretation of the results easier.

The estimated coefficients are transformed into odd ratios, which can be interpreted as follows:

- An odds ratio of one for the comparison group indicates no difference between the reference category and the comparison group.
- An odds ratio greater than one indicates that the comparison group is more likely to experience poor mental health compared to the reference group. For example, an odds ratio of 1.36 for females indicates that there is a 36% greater likelihood of self-reporting a mental health condition compared to males (see Table C.1 in Annex C).
- An odds ratio less than one indicates that the comparison group is less likely to experience poor mental health compared to the reference group.

Confidence Intervals (CI's) are a range of likely values around the odds ratio. Confidence Intervals that do not cross one are statistically significant while those that do cross one are not statistically significant from the reference category. For example, the confidence interval for the odds ratio for females self-reporting a mental health condition compared to males (1.27-1.45) does not cross one and hence is statistically significant (see Table C.1 in Annex C).

[32] See SPSS documentation on Multinominal Logistic Regression

Annex B

Table B.1: Proportion of population in employment (1) with self-reported mental health condition and (2) collecting prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012, by socio-economic and area characteristics

Characteristic	Group Size	Self-reported mental health condition, 2011 Census (%)	Collecting prescribed antidepressants, hypnotics or anxiolytics, 2010-2012 (%)
Total Sample	**201,797**	**3.1**	**8.6**
Sex			
Male	97,887	2.3	5.3
Female	103,910	3.9	12.2
Age band			
16-29	43,746	2.1	3.4
30-44	75,856	3.3	8.1
45-64	75,617	3.5	11.8
65+	6,578	2.1	13.9
Educational Qualifications			
No Qualification	28,864	4.1	12.5
Level 1 + other	34,515	3.2	9.2
Level 2 + apprentice	42,073	3.3	8.6
Level 3+4	96,345	2.6	7.3
Living Arrangement			
Couple	129,027	2.5	8.3
Divorced / separated	14,209	7.5	17.8
Other	58,561	3.2	7.1
Country of Birth			
Northern Ireland	176,538	3.1	9.0
Great Britain	10,013	3.7	8.5
Republic of Ireland	4,223	2.9	8.4
Other	11,023	1.9	3.3
Provision of unpaid care			
Less than 20 hours per week	192,166	3.0	8.4
20 or more hours per week	9,631	4.9	13.2
Weekly hours of work			
15 hours or less	11,506	5.2	13.4
16-30 hours	42,823	4.3	12.7
31 hours or more	147,468	2.5	7.1
Deprivation Quintile (MDM'10)			
Most deprived	29,428	4.3	10.0
2nd Quintile	39,462	3.3	8.8
3rd Quintile	43,037	2.9	8.2
4th Quintile	46,074	2.7	8.2
Least deprived	43,796	2.5	8.4

Characteristic	Group Size	Self-reported mental health condition, 2011 Census (%)	Collecting prescribed antidepressants, hypnotics or anxiolytics, 2010-2012 (%)
Urban/rural			
Urban	113,152	3.5	9.4
Mixed urban/rural	19,195	2.7	8.4
Rural	69,450	2.4	7.4

Annex C

Table C.1: Odds Ratios on likelihood to self-report a mental health condition, unadjusted and fully adjusted models

Variables	Unadjusted model	Fully adjusted model
Occupation		
Professional occupations (reference)	1.00	1.00
Managers, directors and senior officials	1.26 (1.10, 1.44) *	1.11 (0.97, 1.27)
Associate professional / technical	1.47 (1.30, 1.65) *	1.26 (1.12, 1.42) *
Administrative / secretarial	1.86 (1.65, 2.09) *	1.32 (1.17, 1.49) *
Skilled trades occupations	1.47 (1.29, 1.68) *	1.34 (1.17, 1.54) *
Personal service occupations	1.89 (1.67, 2.13) *	1.32 (1.16, 1.50) *
Sales / customer service	2.42 (2.11, 2.78) *	1.55 (1.33, 1.79) *
Process, plant and machine operatives	1.75 (1.52, 2.02) *	1.40 (1.20, 1.63) *
Elementary occupations	2.39 (2.12, 2.69) *	1.52 (1.33, 1.73) *
Industry		
Primary production (reference)	1.00	1.00
Manufacturing	1.09 (0.97, 1.23)	1.09 (0.96, 1.22)
Wholesale / retail trade	1.35 (1.21, 1.51) *	1.20 (1.08, 1.35) *
Hospitality	1.58 (1.39, 1.81) *	1.29 (1.13, 1.49) *
Information / communication	1.20 (0.98, 1.48)	1.16 (0.95, 1.43)
Financial	1.52 (1.29, 1.79) *	1.44 (1.22, 1.69) *
Real estate	1.08 (0.80, 1.47)	0.89 (0.66, 1.21)
Professional, scientific and technical	1.45 (1.24, 1.69) *	1.29 (1.10, 1.51) *
Administrative / support service	1.46 (1.27, 1.69) *	1.31 (1.13, 1.51) *
Public administration / defence	1.65 (1.46, 1.87) *	1.53 (1.35, 1.73) *
Education	1.54 (1.36, 1.74) *	1.14 (1.00, 1.29)
Human health / social work	1.65 (1.47, 1.85) *	1.27 (1.13, 1.42) *
Arts, entertainment and recreation	1.81 (1.50, 2.18) *	1.50 (1.24, 1.81) *
Other service activities	1.68 (1.42, 1.99) *	1.37 (1.16, 1.63) *
Sex		
Male (reference)	-	1.00
Female	-	1.36 (1.27, 1.45) *
Age band		
16-29 (reference)	-	1.00
30-44	-	1.89 (1.74, 2.06) *
45-64	-	1.87 (1.70, 2.04) *
65+	-	1.05 (0.87, 1.27)
Educational Qualifications		
Level 3+4 (reference)	-	1.00
Level 2 + apprentice	-	1.14 (1.06, 1.23) *
Level 1 + other	-	1.05 (0.97, 1.14)
No Qualification	-	1.28 (1.17, 1.40) *

Variables	Unadjusted model	Fully adjusted model
Living Arrangement		
Couple (reference)	-	1.00
Divorced / separated	-	2.50 (2.32, 2.69) *
Other	-	1.56 (1.46, 1.66) *
Country of Birth		
Other (reference)	-	1.00
Northern Ireland	-	1.68 (1.45, 1.94) *
Great Britain	-	1.97 (1.65, 2.35) *
Republic of Ireland	-	1.58 (1.26, 1.99) *
Provision of unpaid care (per week)		
Less than 20 hours (reference)	-	1.00
20 or more hours	-	1.44 (1.30, 1.58) *
Deprivation Quintile (MDM'10)		
Least deprived (reference)	-	1.00
4th Quintile	-	1.13 (1.04, 1.23) *
3rd Quintile	-	1.22 (1.12, 1.33) *
2nd Quintile	-	1.26 (1.16, 1.37) *
Most deprived	-	1.40 (1.28, 1.52) *
Urban/rural		
Rural (reference)	-	1.00
Mixed urban/rural	-	1.19 (1.07, 1.31) *
Urban	-	1.32 (1.24, 1.41) *
Weekly hours of work		
31 hours or more (reference)	-	1.00
16-30 hours	-	1.28 (1.20, 1.37) *
15 hours or less	-	1.73 (1.57, 1.91) *

* significantly different from the reference category at the 5% level

- variables not included in unadjusted model

Table C.2: Odds Ratios on likelihood to collect prescribed antidepressants, hypnotics or anxiolytics in each year 2010-2012, unadjusted and fully adjusted models

Variables	Unadjusted model	Fully adjusted model
Occupation		
Professional occupations (reference)	1.00	1.00
Managers, directors and senior officials	1.37 (1.27, 1.48) *	1.08 (0.99, 1.16)
Associate professional / technical	1.33 (1.24, 1.42) *	1.11 (1.04, 1.19) *
Administrative / secretarial	1.96 (1.83, 2.10) *	1.23 (1.14, 1.32) *
Skilled trades occupations	1.17 (1.08, 1.27) *	1.08 (0.99, 1.17)
Personal service occupations	1.85 (1.72, 1.98) *	1.24 (1.15, 1.34) *
Sales / customer service	2.07 (1.90, 2.25) *	1.29 (1.17, 1.41) *
Process, plant and machine operatives	1.42 (1.30, 1.55) *	1.14 (1.04, 1.25) *
Elementary occupations	1.93 (1.79, 2.07) *	1.17 (1.08, 1.27) *
Industry		
Primary production (reference)	1.00	1.00
Manufacturing	1.09 (1.01, 1.18) *	1.11 (1.03, 1.19) *
Wholesale / retail trade	1.32 (1.24, 1.42) *	1.16 (1.08, 1.25) *
Hospitality	1.38 (1.27, 1.51) *	1.17 (1.06, 1.28) *
Information / communication	1.07 (0.94, 1.22) *	1.12 (0.98, 1.28)
Financial	1.23 (1.11, 1.37) *	1.17 (1.05, 1.30) *
Real estate	1.54 (1.31, 1.81) *	1.19 (1.01, 1.40) *
Professional, scientific and technical	1.26 (1.14, 1.39) *	1.08 (0.98, 1.20)
Administrative / support service	1.33 (1.22, 1.46) *	1.23 (1.12, 1.35) *
Public administration / defence	1.62 (1.50, 1.75) *	1.45 (1.34, 1.57) *
Education	1.82 (1.69, 1.96) *	1.17 (1.08, 1.26) *
Human health / social work	2.05 (1.91, 2.19) *	1.38 (1.29, 1.49) *
Arts, entertainment and recreation	1.45 (1.27, 1.64) *	1.19 (1.05, 1.36) *
Other service activities	1.73 (1.56, 1.92) *	1.36 (1.23, 1.51) *
Sex		
Male (reference)	-	1.00
Female	-	2.06 (1.98, 2.15) *
Age band		
16-29 (reference)	-	1.00
30-44	-	2.70 (2.54, 2.87) *
45-64	-	3.84 (3.60, 4.09) *
65+	-	4.77 (4.34, 5.24) *
Educational Qualifications		
Level 3+4 (reference)	-	1.00
Level 2 + apprentice	-	1.14 (1.09, 1.20) *
Level 1 + other	-	1.21 (1.15, 1.27) *
No Qualification	-	1.46 (1.39, 1.55) *

Variables	Unadjusted model	Fully adjusted model
Living Arrangement		
Couple (reference)	-	1.00
Divorced / separated	-	1.76 (1.68, 1.85) *
Other	-	1.28 (1.23, 1.34) *
Country of Birth		
Other (reference)	-	1.00
Northern Ireland	-	2.58 (2.32, 2.87) *
Great Britain	-	2.31 (2.03, 2.63) *
Republic of Ireland	-	2.13 (1.82, 2.48) *
Provision of unpaid care (per week)		
Less than 20 hours (reference)	-	1.00
20 or more hours	-	1.27 (1.20, 1.36) *
Deprivation Quintile (MDM'10)		
Least deprived (reference)	-	1.00
4th Quintile	-	1.05 (1.00, 1.10)
3rd Quintile	-	1.05 (1.00, 1.11)
2nd Quintile	-	1.10 (1.04, 1.16) *
Most deprived	-	1.15 (1.09, 1.21) *
Urban/rural		
Rural (reference)	-	1.00
Mixed urban/rural	-	1.14 (1.08, 1.22) *
Urban	-	1.24 (1.19, 1.29) *
Weekly hours of work		
31 hours or more (reference)	-	1.00
16-30 hours	-	1.24 (1.20, 1.29) *
15 hours or less	-	1.33 (1.25, 1.41) *

* significantly different from the reference category at the 5% level

- variables not included in unadjusted model