

# Where are older workers with chronic conditions employed?

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The impact of disease and illness on the Australian labour force is substantial, with chronic health conditions suffered by almost two-thirds of the workforce.<sup>1</sup> Ill health is one of the most common reasons for retirement, second only to reaching retirement age and becoming eligible to receive superannuation or the aged pension.<sup>2</sup> The ageing population and rising prevalence of chronic disease<sup>3</sup> mean that labour force participation and productivity are likely to be increasingly affected by ill health in coming years.

Despite an abundance of literature on the relationship between disease and employment, little is known about the industries in which people suffering serious health conditions work, with few studies analysing data across industries.<sup>4</sup> A study in the United States found workers in agriculture, transportation, wholesale trade, and health-related industries, among others, to be more likely to suffer asthma than workers in other industries.<sup>4</sup>

Rather than comparisons by industry, a common approach is to compare health conditions in blue-collar and white-collar occupations or to compare a particular industry to the population as a whole.<sup>5-8</sup> Studies of this type have found people with musculoskeletal conditions<sup>9-11</sup> and heart disease<sup>12,13</sup> to be overrepresented in blue-collar occupations and an increased risk of cancer<sup>5,7,14</sup> in industries with occupational exposure to risk factors.

A focus on only one disease,<sup>15,16</sup> industry,<sup>5,17</sup> or workplace<sup>6,18</sup> makes it difficult to determine which industries are most likely to employ people with chronic health conditions. Further, most research to date has been conducted in Europe or the US, with few studies examining the prevalence of disease in the Australian labour force. Here, we use data from the 2005 National Health Survey (NHS) to identify the industries in which Australians with disabling conditions are most commonly employed.

## METHODS

Data were extracted from the 2005 NHS conducted by the Australian Bureau of Statistics (ABS) for respondents aged 45–64 years.<sup>19</sup> Self-reported health conditions were sorted by their associated probability of respondents being out of the labour force.<sup>20</sup>

## ABSTRACT

**Objective:** To determine which industries and occupational groups are associated with employment of older workers with chronic work-limiting health conditions in Australia.

**Design and participants:** Analysis of data from the 2005 National Health Survey for 4228 workers aged 45–64 years.

**Main outcome measures:** Rate of employment by industry and occupation of older workers with specific chronic conditions.

**Results:** Compared with the reference industry of property and business services, workers in the retail trade industry were found to be more likely to suffer from musculoskeletal conditions (relative risk ratio [RRR], 1.56; 95% CI, 1.04–2.36), while those in health and community services had higher rates of cardiovascular disease (RRR, 2.17; 95% CI, 1.11–4.24). Compared with the reference occupation group of professionals, managers and administrators were less likely to suffer neoplasms (RRR, 0.25; 95% CI, 0.07–0.97). Similar rates of chronic disease were seen across other occupations.

**Conclusion:** Increasing rates of chronic health conditions are unlikely to have an even impact across the workforce, as the rate of employment of older workers with these conditions varies between industries.

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Those with less than average probability were regarded as non-work-limiting and mostly included common mild conditions, such as long-sightedness. There were 20 work-limiting conditions and the top nine were selected for further analysis. Three of these conditions were then excluded, as the small number of records for each resulted in insufficient power to detect a meaningful effect.

Type of industry and occupational group were the two main covariates. The reference groups selected were “property and business services” for industry and “professionals” for occupation, as these provided both large numbers and lowest baseline risk among all the groups. Other potential confounders such as age group, sex, marital status, education level, country of birth (as a proxy for ethnicity) and Australian Standard Geographical Classification remoteness area category<sup>21</sup> were modelled. Univariate analysis was used to determine significant confounders.

Multinomial logistic regression models were used to identify multivariate factors associated with employment of older workers with chronic medical conditions. As it was possible for more than one respondent from the same household to be selected, and for responses to be correlated (particularly on work or income), standard errors were adjusted to account for clustering within households by including a cluster option in

the model. The data were weighted by the ABS to address the issue of unequal probability of selection of respondents in the survey.

Estimates of effect size are expressed as relative risk ratios (RRRs) with 95% confidence intervals. Data analysis was performed in Stata, version 9.2 (StataCorp, College Station, Tex, USA) with a 5% level of significance.

## RESULTS

Among our study population of 4228 people who were in the workforce at the time of the survey, 2721 (64%) indicated that they had at least one of the top 20 work-limiting medical conditions (Box 1). Health care was the most common industry of work (13%) in the study population, followed by property and business services (12%) and retail trade (11%) (Box 2).

Among the potential confounders assessed, age group, sex and marital status were associated with employment of older workers with work-limiting conditions. The likelihood of having a work-limiting medical condition increased with age. Compared with those aged 45–49 years, the odds ratio (OR) of having a work-limiting condition was found to be 1.35, 2.06 and 2.21 for those aged 50–54 years, 55–59 years and 60–64 years, respectively; this relationship was statistically significant ( $P < 0.001$ ). Female workers were

1 Demographic details of 4228 people in the study sample		
Variable	No.	%
Workers with work-limiting medical condition(s)	2721	64.4%
Age group (years)		
45–49	1467	34.7%
50–54	1302	30.8%
55–59	988	23.4%
60–64	471	11.1%
Sex		
Male	2365	55.9%
Female	1863	44.1%
Born in Australia	2898	68.5%
Highest level of post-school education		
Higher degree, postgraduate diploma, bachelor degree	869	20.6%
Undergraduate diploma, associate diploma	602	14.2%
Basic/skilled vocational qualification	1060	25.1%
Has qualification, level not stated	80	1.9%
No post-school qualification	1617	38.3%
Social marital status		
Married in a registered marriage	3078	72.8%
Married in a de facto marriage	72	1.7%
Not married	1078	25.5%
ASGC remoteness area category		
Major cities	2858	67.6%
Inner regional	866	20.5%
Other areas	504	11.9%

ASGC = Australian Standard Geographical Classification. ◆

2 Industry and occupation of 4228 people in the study sample		
	No.	%
<b>Industry</b>		
Health and community services	551	13.0%
Property and business services	506	12.0%
Retail trade	464	11.0%
Manufacturing	445	10.5%
Education	346	8.2%
Construction	336	7.9%
Transport and storage	288	6.8%
Government administration and defence	239	5.7%
Agriculture, forestry and fishing	223	5.3%
Others*	830	19.6%
<b>Occupation</b>		
Professionals	828	19.6%
Intermediate clerical, sales and services	662	15.7%
Managers and administrators	590	14.0%
Associate professionals	547	12.9%
Tradespersons and related workers	434	10.3%
Intermediate production and transport	390	9.2%
Labourers and related workers	332	7.9%
Elementary clerical, sales and service	267	6.3%
Others†	178	4.2%

\* Incorporates industries accounting for less than 5% each: wholesale trade (4.8%); finance and insurance (3.1%); accommodation, cafes and restaurants (2.7%); personal and other services (2.6%); cultural and recreational services (2.2%); communication services (1.7%); mining (1.4%); and electricity, gas and water supply (1.3%). † Incorporates occupations accounting for less than 5% each: advanced clerical and service workers (3.6%); and occupation not determined (0.6%). ◆

more likely than males to have a work-limiting medical condition (OR, 1.21; 95% CI, 1.06–1.37), while people in a de facto marriage were less likely than those in a registered marriage to have a work-limiting condition (OR, 0.45; 95% CI, 0.28–0.72).

Multivariate analysis showed musculoskeletal conditions to be significantly more common among people working in retail trade than those in the reference industry of property and business services (RRR, 1.56; 95% CI, 1.04–2.36) (Box 3). The health and community services industry had higher rates of cardiovascular disease than the reference industry (RRR, 2.17; 95% CI, 1.11–4.24). None of the occupational groups were found to be at significantly increased risk of chronic disease compared with the reference group of professionals; however, managers and administrators were less likely to suffer neoplasms (RRR, 0.25; 95% CI, 0.07–0.97).

Due to small numbers of workers, a number of industries, including wholesale trade, finance and insurance, and accommodation, cafes and restaurants (see footnote to Box 2 for full list), were grouped together for analysis. As a group, these smaller industries were found to have higher rates of musculoskeletal (RRR, 1.50; 95% CI, 1.03–2.17), cardiovascular (RRR, 2.51; 95% CI, 1.35–4.69), and endocrine conditions (RRR, 1.61; 95% CI, 1.02–2.55) than the reference industry. Further investigation found that the rate of disease in some of these smaller industries was significant enough to be detected. For example, workers in accommodation, cafes and restaurants were particularly likely to be suffering from musculoskeletal (RRR, 2.87; 95% CI, 1.45–5.65), cardiovascular (RRR, 4.57; 95% CI, 1.62–12.87) and endocrine conditions (RRR, 3.56; 95% CI, 1.67–7.60), as well as bronchitis (RRR, 2.94; 95% CI, 1.24–6.98).

A similarly combined group of other occupations, comprising advanced clerical and service workers, and those whose occupation was not determined, was found to have significantly increased rates of bronchitis (RRR, 2.37; 95% CI, 1.17–4.79), endocrine conditions (RRR, 2.51; 95% CI, 1.31–4.81) and neoplasms (RRR, 3.46; 95% CI, 1.14–10.47). This was primarily due to the high prevalence of these conditions among advanced clerical and service workers, who were also more likely than professionals to have musculoskeletal conditions (RRR, 1.81; 95% CI, 0.96–3.39).

## DISCUSSION

The rising prevalence of chronic health conditions is unlikely to have an even impact across the workforce, as older workers with chronic conditions are more likely to be employed in certain industries (such as

**3 Multivariate relative risk ratios (95% CI) for workers having specified conditions, by industry and occupation**

Covariate	Mental*	Musculoskeletal†	Cardiovascular‡	Bronchitis§	Endocrine¶	Neoplasms**
<b>Industry††</b>						
Agriculture, forestry and fishing	0.82 (0.39–1.71)	0.89 (0.54–1.47)	0.74 (0.26–2.11)	1.39 (0.69–2.79)	1.14 (0.60–2.17)	0.97 (0.23–4.12)
Manufacturing	0.63 (0.32–1.22)	0.89 (0.58–1.37)	1.51 (0.73–3.10)	1.17 (0.63–2.17)	1.08 (0.63–1.83)	1.42 (0.38–5.26)
Construction	0.77 (0.37–1.63)	1.36 (0.86–2.16)	0.67 (0.25–1.80)	1.28 (0.66–2.50)	1.15 (0.61–2.14)	0.25 (0.03–2.15)
Retail trade	1.64 (0.91–2.95)	<b>1.56 (1.04–2.36)</b>	1.56 (0.71–3.41)	1.26 (0.66–2.41)	1.58 (0.95–2.63)	1.07 (0.26–4.40)
Transport and storage	0.73 (0.32–1.68)	0.98 (0.60–1.60)	1.47 (0.61–3.55)	0.71 (0.32–1.58)	1.32 (0.73–2.39)	1.51 (0.33–6.99)
Government administration and defence	0.81 (0.39–1.66)	1.08 (0.66–1.77)	2.16 (0.91–5.11)	0.91 (0.44–1.88)	1.31 (0.71–2.43)	0.30 (0.03–2.66)
Education	0.89 (0.45–1.76)	1.10 (0.70–1.72)	1.05 (0.42–2.61)	1.08 (0.56–2.07)	1.17 (0.68–2.03)	1.39 (0.36–5.33)
Health and community services	1.01 (0.55–1.84)	1.30 (0.87–1.94)	<b>2.17 (1.11–4.24)</b>	1.41 (0.79–2.51)	1.12 (0.67–1.85)	1.50 (0.45–4.97)
Others‡‡	1.47 (0.86–2.49)	<b>1.50 (1.03–2.17)</b>	<b>2.51 (1.35–4.69)</b>	1.67 (0.99–2.81)	<b>1.61 (1.02–2.55)</b>	0.79 (0.25–2.49)
<b>Occupation§§</b>						
Managers and administrators	0.82 (0.47–1.45)	0.87 (0.61–1.23)	0.90 (0.49–1.65)	1.25 (0.77–2.02)	0.77 (0.48–1.22)	<b>0.25 (0.07–0.97)</b>
Associate professionals	1.21 (0.71–2.08)	0.98 (0.69–1.38)	1.32 (0.73–2.40)	0.72 (0.43–1.21)	1.17 (0.77–1.78)	0.76 (0.26–2.23)
Tradespersons and related workers	0.87 (0.44–1.71)	1.24 (0.84–1.84)	1.24 (0.63–2.44)	0.94 (0.53–1.68)	0.93 (0.54–1.58)	0.40 (0.05–3.08)
Intermediate clerical, sales and service	1.47 (0.93–2.32)	1.09 (0.78–1.51)	1.38 (0.78–2.45)	0.88 (0.55–1.39)	1.18 (0.79–1.77)	0.53 (0.18–1.56)
Intermediate production and transport	1.28 (0.71–2.29)	0.93 (0.62–1.38)	0.83 (0.40–1.72)	0.70 (0.38–1.28)	1.10 (0.68–1.78)	0.76 (0.20–2.92)
Elementary clerical, sales and service	1.69 (0.87–3.31)	1.38 (0.86–2.20)	1.24 (0.53–2.88)	1.10 (0.54–2.24)	1.40 (0.80–2.43)	0.44 (0.09–2.09)
Labourers and related workers	0.99 (0.52–1.89)	1.29 (0.87–1.91)	0.46 (0.18–1.13)	0.93 (0.53–1.64)	0.87 (0.52–1.46)	0.74 (0.22–2.48)
Others¶¶	1.87 (0.85–4.11)	1.69 (0.96–3.00)	0.65 (0.20–2.15)	<b>2.37 (1.17–4.79)</b>	<b>2.51 (1.31–4.81)</b>	<b>3.46 (1.14–10.47)</b>

Bold relative risk ratio (RRR) values are significant at the 5% significance level.

\* Mental conditions, excluding drug and alcohol dependency. † Musculoskeletal conditions, excluding back trouble. ‡ Cardiovascular disease, including atherosclerosis, heart disease and stroke. § Bronchitis, emphysema, asthma, and other related conditions. ¶ Endocrine, metabolic and immunity disorders, excluding diabetes type 1.

\*\* Neoplasms, excluding skin cancer. †† RRRs compared with reference industry of property and business services. ‡‡ Incorporates industries accounting for less than 5% each: wholesale trade; finance and insurance; accommodation, cafes and restaurants; personal and other services; cultural and recreational services; communication services; mining; and electricity, gas and water supply. §§ RRRs compared with reference occupation of professionals. ¶¶ Incorporates occupations accounting for less than 5% each: advanced clerical and service workers; and occupation not determined.

retail trade, and health and community services).

On the other hand, employment in some industries and occupations appears to be associated with a reduced likelihood of having some chronic conditions. For example, managers and administrators are significantly less likely to have cancer than professionals. Possible reasons for this include managers being less exposed to cancer risk factors, or being able to afford to stop working when their health deteriorates due to leave entitlements and insurance related to superannuation.

It is important to note that a number of the industries with significantly higher rates of chronic illness are growth industries, such as retail trade and health and community services. These two industries accounted for a quarter of the employed workforce in 2005, up from around 20% in 1990.<sup>22</sup> If the

chronic conditions in growth industries are work-related, rates of disease may increase in the future as these industries continue to grow. However, if they are unrelated to work, it may mean that older workers with these conditions can more readily gain employment in these industries.

The cross-sectional nature of this study means that only people still in the workforce at the time of the survey were included, and those whose conditions were so severe that they had stopped working were excluded. This may result in an underestimation of the impact of ill health on workforce participation.

A further limitation of our study is that the reasons behind the differing rates of disease across industries are not known. The level of job control may be a factor, as workers with a high level of control over their work have previously been found to be

less likely to develop heart disease than those with a low level of control.<sup>23</sup> In addition, lower socioeconomic status is thought to be related to both lower-grade occupations and poorer health,<sup>23,24</sup> and thus may help explain the higher rates of illness in some occupations and industries.

It is possible that people with serious health conditions self-select themselves out of the industries where their health would be an obstacle to their work — particularly when their condition is work-related — resulting in lower rates for these industries. This would seem to be the case for occupations such as tradespersons and labourers, and industries such as agriculture and construction, in which high rates of chronic health conditions are commonly reported<sup>19–11,25</sup> but were not found in this study. Indeed, one study found that retirement from the construction industry due to disability is

around 143% more common than in the general population.<sup>9</sup>

Given Australia's ageing population, emerging workforce shortages, and with chronic disease affecting the majority of the workforce,<sup>1</sup> measures to prevent illness may be an important strategy for increasing future labour force participation.

Although our study had insufficient data for small industries to examine these in detail, the results suggest that chronic health conditions among older workers may be more common in smaller industries. Future research targeting these smaller industries is warranted to further our understanding of where older workers with chronic conditions are employed, and how we can best improve both their health and labour force participation.

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**COMPETING INTERESTS**

None identified.

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