

**Comparing time off work after work-related mental health  
conditions across Australian workers' compensation systems: a  
retrospective cohort study**

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## **Authors' contributions**

SG completed the analysis for the study. SG and AC were involved in the conception, design, interpretation of results, and revision of the manuscript. Both authors read and approved the final manuscript.

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## **Ethical standards**

Shannon E Gray has declared no conflicts of interest. Alex Collie has declared no conflicts of interest.

## **Ethical approval**

This article does not contain any studies with human participants or animals performed by any of the authors.

# **Comparing time off work after work-related mental health conditions across Australian workers' compensation systems: a retrospective cohort study**

## **ABSTRACT**

Workers' compensation claims (WCC) due to mental health conditions (MHC) are the most expensive due to often-lengthy periods off work. This retrospective cohort study aims to determine the factors associated with work time loss in Australian workers with accepted WCCs for MHCs, and investigate whether jurisdiction in which a claim is made affects work time loss, using administrative claims data between July 2009 and June 2011. Cox regression analysis showed that worker age, industry, occupation and type of MHC were associated with work time loss. Workers with depressive disorders had longer time loss than those with stress-related conditions. Workers from South Australia, Comcare and Victoria had the longest durations of work time loss, while Australian Capital Territory and Tasmania had shorter durations. Future research should investigate policy variations that could explain the differences in time spent on compensation between jurisdictions.

## **KEYWORDS**

mental health; compensation; policy; work absence; work injury

## INTRODUCTION

Mental health conditions (MHCs), which can include depression, anxiety and stress, are a major burden of disability and increasing problem in many countries. Mental and substance abuse disorders directly account for around 7.4% of the global burden of disease, and have the highest proportion of years lived with disability of all groups of diseases(Whiteford et al., 2013). In Australia, MHCs are the leading cause of non-fatal disease burden. Almost half of Australians aged 16-85 years suffered a MHC at some point in their life(Australian Bureau of Statistics, 2007). It is estimated that by 2020 depression will be the second leading cause of disease burden worldwide(Robinson, Rogers, & Butterworth, 2008).

The global cost of MHCs was estimated to have been US\$2.5 trillion in 2010, and projected to increase to US\$6 trillion by 2030(Bloom et al., 2011). A third of the costs arise directly from treatment, with the remainder from indirect costs associated with lost productivity and income owing to disability or death. Mental health conditions have a substantial impact on the Australian economy. Workplace stress is estimated to cost the Australian economy \$14.81 billion a year through presenteeism and absenteeism(Medibank Private, 2008). Additionally, MHCs are, on average, the most expensive form of workers' compensation (WC) claim due to often lengthy periods of work absence(Safe Work Australia, 2013). An Australian government report found that whilst compensation claims due to mental stress accounted for only 2% of all claims, they contributed to 5% of the total economic cost, and had a unit cost per case in 2012-13 of almost \$300,000(Safe Work Australia, 2015b).

Work has been found to be important for recovery from MHCs(Wilhelm, Kovess, Rios-Seidel, & Finch, 2004). Aside from generating income, it contributes to self-identity and can make the person feel as though they are contributing to society(World Health Organisation, 2005). Prolonged sickness absence due to a MHC has been associated with exacerbation of mental health issues and increased mortality risk (Melchior et al., 2010). There has been a growing focus on work-related MHCs in recent years including the production of resources

designed to support the prevention of work-related MHCs and facilitate return-to-work (RTW) for employers, colleagues, and the employee (Institute for Safety Compensation and Recovery Research).

Common causes of work-related MHCs include work pressure, workplace harassment and/or bullying, assault, and exposure to occupational violence or traumatic events (Safe Work Australia, 2015c). Previous research examining factors associated with MHC-related sickness absence found that age (Hensing, Bertilsson, Ahlborg, Waern, & Vaez, 2013; Koopmans, Roelen, & Groothoff, 2008; Prang, Bohensky, Smith, & Collie, 2016; Roelen et al., 2012), gender (Flach, Groothoff, Krol, & Bultmann, 2012; Koopmans et al., 2008; Roelen et al., 2012), size of workplace (Arends, van der Klink, van Rhenen, de Boer, & Bultmann, 2014; Nielsen et al., 2012; Prang et al., 2016), socioeconomic status (Roelen et al., 2012), type of MHC (Flach et al., 2012; Nielsen et al., 2011), industry (Flach et al., 2012; Koopmans et al., 2008; Prang et al., 2016), and self-perceived health (Nielsen et al., 2012), were all predictors of duration away from work.

The majority of existing evidence arises from European and North American nations. A systematic review published in 2014 highlighted that there had been no Australian studies examining outcomes from mental health-related sickness absence from work (Dewa, Loong, & Bonato, 2014). Since this was published, a study on MHC workers' compensation claims in the state of Victoria was published (Prang et al., 2016). This study found that older age, female gender, higher skill level, particular industries, and small organisation size were associated with delayed RTW. Moreover, workers who consulted a psychiatrist or psychologist, or were prescribed medications, took longer to RTW than those who did not, indicating association between severity of psychological illness and duration.

There are substantial differences between systems of compensation and rehabilitation globally. Australia's WC systems make compensation available to workers where there is a demonstrable link between the presence of the MHC and the conditions of work. In contrast,

in some European jurisdictions workers are eligible for compensation and rehabilitation support regardless of whether work contributed to the development or exacerbation of their MHC.

There are also substantial differences between Australian jurisdictions with regard to eligibility for compensation for work-related MHCs, and more broadly in WC policy and practice. We have recently demonstrated that this contributes to significant differences in the duration of time off work post-injury across Australian states and territories (Collie, Lane, Hassani-Mahmooei, Thompson, & McLeod, 2016). Fully-adjusted hazard ratios for duration of time loss over the first two years post-injury demonstrated significant differences in time loss duration between states and territories. In the state of Queensland as few as 1% of injured workers continued to receive income benefits after 104 weeks' post-injury while the equivalent figure in the state of Victoria was 16%. These differences were attributed to inter-jurisdictional differences in policy and practice, given that analyses adjusted for a range of worker, employer and societal factors that impact on time loss. The magnitude of this jurisdictional policy effect for specific conditions, such as work-related MHCs, has not yet been established.

Establishing more precisely the factors that facilitate or complicate RTW among workers with MHCs will aid the development of interventions to improve RTW and recovery outcomes among those at risk of long-term sickness absence. The aims of this paper are to (1) describe a cohort of workers in Australia with compensated time away from work due to a MHC; (2) examine factors associated with duration of time loss from work and (3) determine if duration of time loss from work following MHCs varies significantly by WC jurisdiction after adjusting for other factors known to impact on time off work post-MHC.

## **METHODS**

### **Setting**

In early 2016, Australia had a labour force of 11.9 million, and the vast majority were covered by compulsory WC insurance regulated by state, territory and Commonwealth government authorities.

The compensation schemes provide coverage within the relevant jurisdiction should a work-related injury occur. Examples of work-related conditions that are eligible for compensation include acute conditions such as traumatic injury resulting from falls, diseases resulting from exposure to chemical substances, and gradual onset or chronic conditions such as low back pain. Where there is a demonstrable link between a MHC and work, jurisdictions can accept 'psychological injury' or mental health claims. Workers' compensation schemes provide benefits to the injured worker in the form of income replacement, medical expenses, or rehabilitation services for their period of time off work (Safe Work Australia, 2010). Some workers who sustained a permanent impairment or disability may be eligible to receive lump sum payments. Typically, healthcare expenses are provided on the basis that they are reasonable and necessary.

There are some important differences between Australian WC schemes, which have previously been detailed elsewhere (Collie et al., 2016). Major differences concern employer excess periods, the rate and duration of income replacement, and the insurance-regulation function relationship. There are notable differences between jurisdictions regarding both their criteria for accepting MHC claims, and for determining eligibility for some benefits (Safe Work Australia, 2010). For example, in New South Wales (NSW) the claimant must have reached the 15% whole person impairment (WPI) threshold for psychological injury to receive lump sum payments, which is assessed using the Psychiatric Impairment Rating Scale. In comparison, the WPI in the Comcare scheme is 10% and the diagnostic methodology of assessment is the American Medical Association Guide 2<sup>nd</sup> Edition.

## **Data sources**

SafeWork Australia compiles the National Dataset of Compensation-based Statistics (NDS) annually from case-level claims data that have been supplied by Australian WC authorities. Claims from the NSW, Victoria (VIC), Queensland (QLD), Western Australia (WA), South Australia (SA), Tasmania (TAS), Northern Territory (NT), and Australian Capital Territory (ACT) private compensation systems are included in the dataset. Additionally, claims from the Comcare scheme are included, which comprises Commonwealth government employees, government employees of the ACT, and more than 30 large national companies. The New Zealand Accident Compensation Corporation also provides information on work-related claims for inclusion in the NDS. The NDS does not include Australian military personnel in the defence forces. The Comcare jurisdiction also administers the Seacare scheme, which is specifically for seafarers. Police officers are not covered under the WA scheme, but are covered in the other state and territory schemes.

For the 2010 and 2011 years, 606,319 cases of compensated work injury were extracted from the NDS. Seacare cases were removed given the low volume of claims, as were cases from New Zealand to maintain an Australian focus.

Consistent with previously published case selection methods (Collie et al., 2016), cases were restricted to workers aged 15 to 80 years and if their normal weekly working hours were between one and 100 hours. Duplicate cases were removed. Finally, cases were restricted to those that resulted in greater than two weeks' time loss to ensure comparable jurisdictional-level cohorts by accounting for the ten-day employer excess period in Victoria and SA. After applying inclusion and exclusion criteria, 14,859 cases remained for analysis.

## **Outcome variables**

Duration of income compensation is the primary outcome and is calculated by dividing the number of hours compensated by the number of pre-injury work hours per week, giving the total number of compensated weeks (Collie et al., 2016). As cases were extracted from the

2010 and 2011 calendar years and the database included information to mid-2014, the dataset included a minimum 2.5 years follow up for each case. Time loss data was right censored at 104 weeks' maximum duration.

### **Independent variables**

A number of worker and workplace factors that have been associated with duration of time loss were extracted for inclusion as predictors. Age refers to worker age at the time of injury onset. Full-time workers were those who worked 35 or more hours per week. The Australian and New Zealand Standard Classification of Occupations (ANZSCO)(Australian Bureau of Statistics, 2013a) was used as a base to classify the occupations. ANZSCO is a skill-based classification system that defines high-level groups according to their attributes. Following analysis of frequencies of MHC claims in lower level (more detailed) ANZSCO categories, logical groupings of frequently represented categories were collated into higher order categories that better reflected the environments encountered within each occupation. For example, ambulance and police officers, fire and emergency workers, and prison and security guards were grouped into the single category 'protective service and emergency workers', which accounted for more than 14% of all MHC claims. Similarly, teachers, lecturers, tutors, and education aides accounted for 11% of all MHC claims and were subsequently grouped into 'teachers and education aides'. Industry was classified in accordance with the Australian and New Zealand Standard Industrial Classification(Australian Bureau of Statistics, 2013b).

Injury type was generated using coding based on Type of Occurrence Classification System (TOOCS) version 3(Australian Safety and Compensation Council, 2008). MHC codes were collapsed into four higher level categories:

(1) Post-traumatic stress. This includes the codes "post-traumatic stress disorder" and "short term shock from exposure to disturbing events";

(2) Stress/Anxiety. This includes the codes “anxiety/stress disorder” and “reaction to stressors”;

(3) Depressive disorders. This includes the codes “depression” and “anxiety/depression”; and

(4) Other and unspecified. This includes the codes “other mental diseases, not elsewhere classified” and “mental diseases unspecified”. This fourth category includes a range of conditions including eating disorders, schizophrenia, and conduct, neurotic and psychotic disorders.

The final predictor in the analyses is the jurisdiction (or compensation system) from which the accepted claim originated and are outlined above.

## **Analysis**

Initially, the number, rate (per 1000 workers) and median duration of time loss for MHC claims and all other injury claims were calculated by jurisdiction, age and gender. Predictors that were statistically significant predictors of time loss in Univariate Cox regression models were included in a multivariate stepwise Cox regression model. All predictor variables excluding jurisdiction (age, gender, working hours, industry, occupation group, injury type) were included in the first model. In order to determine whether jurisdiction added any explanatory power to the model and how it affected associations with other predictors, it was added to the second model. Results are expressed as adjusted Hazard Ratios (HR) with 99% Confidence Intervals (CI).

To illustrate the proportion of workers with MHCs receiving compensation over time, the difference between jurisdictions on duration of time loss was plotted on a survival curve. This was derived from the Cox regression and controls for covariates. Data were analysed by SPSS Version 22.0. P-values of  $\leq 0.01$  were considered significant.

The Monash University Human Research Ethics Committee approved this study on 8 October 2014 (project number CF14/2995-2014001663).

## **RESULTS**

### **Participant characteristics**

There were 19,833 MHC claims recorded in the NDS in the 2010 and 2011 calendar years, of which 14,849 resulted in greater than two weeks' time loss (Table 1). The median age of workers was 44 years (IQR 36-52) and females were overrepresented. The majority of workers were employed full time. Clerical and administrative workers had the most MHC claims, followed by protective service and emergency workers, and teachers and education aides. In contrast, for all other injury claims, labourers and machine operators were most commonly represented, followed by technicians, tradespersons and farmers. The most commonly represented industry groups for MHC claims were public administration and safety, health care and social assistance, and education and training. Conversely, manufacturing, health care and social assistance, and construction had the highest proportion of claims for all other injury. Stress/anxiety was the most common MHC.

### **Jurisdictional characteristics**

Female workers recorded the majority of MHC claims (Table 2). The mean age of workers across jurisdictions ranged from 40.1 to 46.0 years. The proportion of all claims that were due to MHCs varied from as low as 3.5% in WA, to 16.8% in Comcare. WA also had the lowest rate of MHC claims, whereas Tasmania had the highest. The median duration of time loss ranged from 10.8 weeks in Tasmania to 31.8 weeks in Comcare. More than 95% of workers were off benefits in ACT and Queensland at 104 weeks after injury. Comcare had the greatest proportion of workers not yet returned to work at 104 weeks (27.3%), followed by SA (22.3%).

**Table 1: Characteristics of workers with mental health conditions**

	ALL mental health claims (n=19,833)		Mental health claims >2 weeks' time loss (n=14,849)	
	n	%	n	%
<b>Median Age in years (25th-75th percentile)</b>	44 (36-52)		44 (36-52)	
<b>Gender</b>				
Male	8124	41.0	5964	40.2
Female	11709	59.0	8885	59.8
<b>Working hours</b>				
Part time	4687	23.6	3244	21.8
Full time	15146	76.4	11605	78.2
<b>Occupation groups*</b>				
Clerical and Administrative Workers	2952	14.9	2327	15.7
Protective Service and Emergency Workers	2594	13.1	2125	14.3
Teachers and Education Aides	2459	12.4	1614	10.9
Labourers and Machine Operators	1859	9.4	1332	9.0
Community and Personal Service Workers	1553	7.8	1175	7.9
Social and Welfare Workers	1255	6.3	1015	6.8
Managers	1178	5.9	997	6.7
Arts, Science, and Business Professionals	1087	5.5	899	6.1
Sales Workers	1052	5.3	815	5.5
Technicians, Tradespeople and Farmers	1038	5.2	763	5.1
Road and Rail Drivers	1008	5.1	492	3.3
Nurses and Nursing Support Workers	953	4.8	643	4.3
Hospitality, Retail and Tourism Workers	595	3.0	466	3.1
Other Healthcare Professionals	196	1.0	146	1.0
<b>Industry**</b>				
Public Administration and Safety	4507	22.7	3616	24.4
Health Care and Social Assistance	4095	20.6	3094	20.8
Education and Training	3132	15.8	2125	14.3
Retail Trade	1016	5.1	790	5.3
Transport, Postal and Warehousing	852	4.3	431	2.9
Manufacturing	808	4.1	624	4.2
Accommodation and Food Services	673	3.4	502	3.4
Wholesale Trade	612	3.1	460	3.1
Professional, Scientific and Technical Services	579	2.9	481	3.2
Financial and Insurance Services	578	2.9	466	3.1
Administrative and Support Services	538	2.7	424	2.9
Other Services	491	2.5	402	2.7
Construction	464	2.3	346	2.3
Rental, Hiring and Real Estate Services	304	1.5	247	1.7
Arts and Recreation Services	204	1.0	170	1.1
Information Media and Telecommunications	148	.7	114	.8
Mining	135	.7	90	.6
Electricity, Gas, Water and Waste Services	109	.5	79	.5
Agriculture, Forestry and Fishing	87	.4	73	.5
<b>Type of mental health condition</b>				
Stress/anxiety	13764	69.4	10277	69.2
Depressive disorders	2849	14.4	2285	15.4
Post-traumatic stress	2373	12.0	1639	11.0
Other and unspecified	847	4.3	648	4.4
<b>Jurisdiction</b>				
New South Wales	7799	39.3	5560	37.4
Victoria	4214	21.2	3761	25.3

Queensland	2615	13.2	2041	13.7
South Australia	1956	9.9	1332	9.0
Western Australia	1021	5.1	627	4.2
Tasmania	790	4.0	518	3.5
Northern Territory	249	1.3	136	.9
Australian Capital Territory (Private)	207	1.0	91	.6
Commonwealth Comcare	982	5.0	783	5.3
*54/40 missing cases				
**501/315 missing cases				

**Table 2: Characteristics of workers with mental health conditions by jurisdiction**

Jurisdiction	Covered workers* (thousands)	Number of MHC claims	% of all claims	rate per 1000 workers	Mean (SD) age in years	% (N) female	Median (IQR) weeks' time loss	IQR	N (%) off work at 104 weeks
New South Wales	3050	5560	9.2	0.9	42.8 (10.8)	57.4% (3191)	20.0	(6.8-65.1)	777 (14.0)
Victoria	2534	3761	11	0.7	44.6 (10.7)	60.1% (2260)	21.4	(8.4-65.1)	657 (17.5)
Queensland	1870	2041	4.9	0.5	43.0 (11.2)	61.6% (1257)	20.0	(7.5-51.6)	99 (4.9)
South Australia	710	1332	11.4	0.9	45.2 (11.4)	64.1% (854)	27.4	(9.6-91.3)	297 (22.3)
Western Australia	1084	627	3.5	0.3	44.8 (11.2)	64.1% (402)	18.0	(6.3-53.2)	41 (6.5)
Tasmania	208	518	12.2	1.2	44.8 (10.2)	62.2% (322)	10.8	(5.6-19.4)	35 (6.8)
Northern Territory	114	136	6.7	0.6	44.7 (11.4)	65.4% (89)	13.0	(5.5-41.7)	10 (7.4)
Australian Capital Territory (Private)	115	91	4.2	0.4	40.1 (12.2)	54.4% (50)	13.0	(4.9-26.2)	4 (4.4)
Comcare	392	783	16.8	1	46.0 (9.5)	58.7% (460)	31.8	(9.3-125.3)	214 (27.3)
Australia	10078	14849	8.3	0.7	43.8 (10.9)	59.8% (8885)	20.4	(7.4-62.8)	2134 (14.4)

\* Data for covered workers provided by Safe Work Australia (Safe Work Australia, 2015a); SD: standard deviation; n: number; rate is per 1000 workers

## **Cox regression analysis**

No multicollinearity was detected among the independent variables. The following variables were included in the final Cox regression models: age, gender, working hours, industry, occupation group, nature of injury, and jurisdiction (Collie et al., 2016).

Results from Cox regression are included in Table 3. In both models, female and male workers had similar durations of compensated time loss. Younger workers had a shorter duration of time loss than the 45-54-year reference age group. Compared with those in the public administration and safety industry, workers had significantly shorter time loss in transport, postal and warehousing, and health care and social assistance industries. This was also evident among those in the education and training industry, however this was not significant when jurisdiction was added to the model. Those in the wholesale trade industry had a significantly longer duration of time loss than the public administration and safety industry.

Nurses and nursing support workers, and road and rail drivers had less compensated time loss than clerical and administrative workers, as did community and personal service workers prior to factoring in jurisdiction. Protective service and emergency workers had a significantly longer duration.

Those with post-traumatic stress had marginally longer duration than the stress/anxiety comparator. Depressive disorders had the longest duration of time loss of all MHCs. Compared to NSW, workers from VIC, SA and Comcare had longer duration, whereas workers from TAS and ACT had a shorter duration of time loss.

The survival function identifies that SA and Comcare had the longest duration of time loss, followed by VIC (Figure 2). The ACT, TAS, and NT had the shortest. Queensland and WA were not statistically different from the comparator NSW.

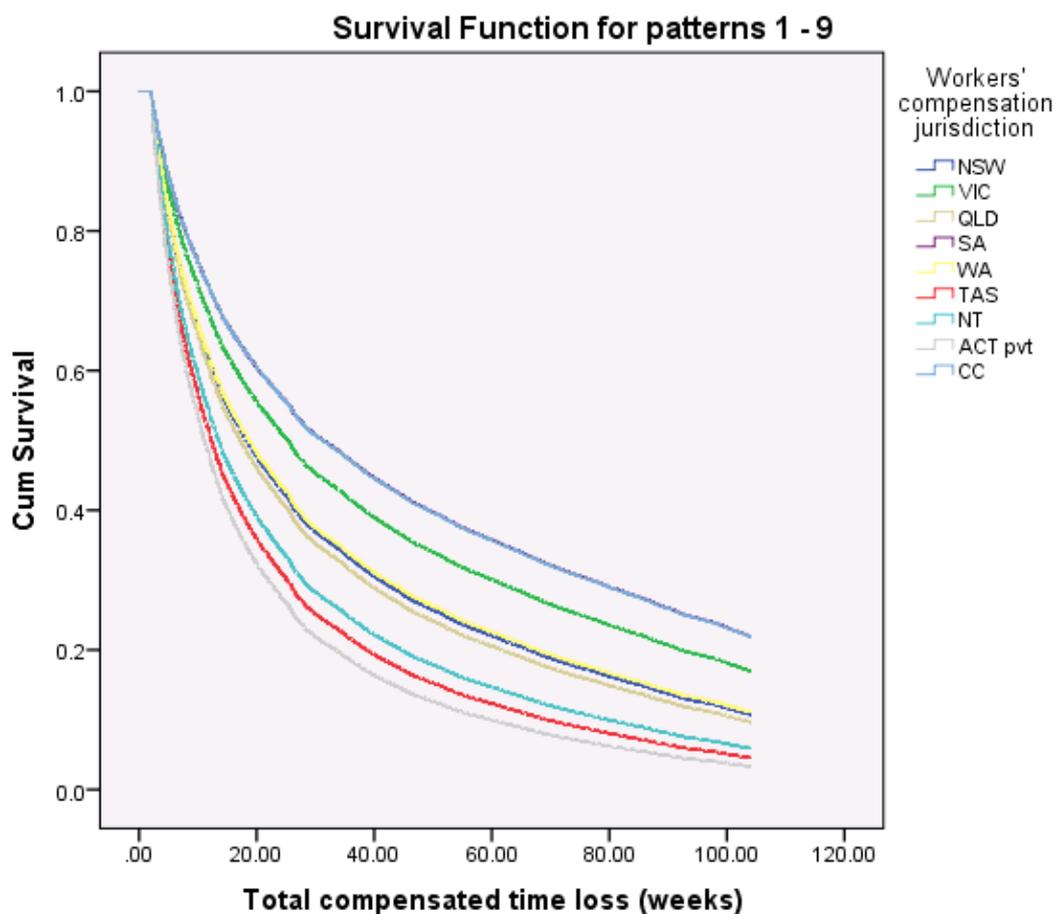
**Table 3: Factors associated with duration of time loss due to mental health condition**

	Model 1			Model 2		
	Hazard ratio	(99% CI)	p-Value	Hazard ratio	(99% CI)	p-Value
<b>Gender</b>						
Female	Ref			Ref		
Male	0.99	(0.93-1.04)	0.47	0.98	(0.93-1.04)	0.45
<b>Age group</b>						
15-24 years	1.51	(1.35-1.68)	0.00	1.50	(1.34-1.67)	0.00
25-34 years	1.23	(1.14-1.32)	0.00	1.22	(1.14-1.31)	0.00
35-44 years	1.06	(1.00-1.13)	0.01	1.05	(0.99-1.11)	0.04
45-54 years	Ref			Ref		
55+ years	1.02	(0.96-1.08)	0.49	1.03	(0.96-1.10)	0.29
<b>Work status</b>						
Part time	1.02	(0.96-1.08)	0.50	1.02	(0.96-1.08)	0.47
Full time	Ref			Ref		
<b>Industry group</b>						
Agriculture, forestry and fishing	0.75	(0.53-1.07)	0.04	0.75	(0.53-1.07)	0.04
Mining	0.98	(0.73-1.33)	0.88	0.91	(0.67-1.23)	0.43
Manufacturing	1.00	(0.87-1.14)	0.93	0.99	(0.86-1.13)	0.84
Electricity, gas, water, and waste services	1.04	(0.75-1.45)	0.73	0.96	(0.70-1.34)	0.77
Construction	0.90	(0.76-1.07)	0.12	0.88	(0.74-1.04)	0.05
Wholesale trade	0.78	(0.67-0.91)	0.00	0.81	(0.69-0.95)	0.00
Retail trade	1.02	(0.89-1.16)	0.75	0.97	(0.84-1.11)	0.53
Accommodation and food services	1.16	(1.00-1.33)	0.01	1.04	(0.90-1.20)	0.49
Transport, postal and warehousing	1.45	(1.25-1.68)	0.00	1.42	(1.22-1.65)	0.00
Information media and telecommunications	0.81	(0.61-1.07)	0.05	0.84	(0.63-1.11)	0.10
Financial and insurance services	0.89	(0.77-1.03)	0.05	0.88	(0.76-1.03)	0.03
Rental, hiring, and real estate services	1.07	(0.88-1.29)	0.38	1.10	(0.91-1.34)	0.18
Professional, scientific, and tech services	1.07	(0.93-1.23)	0.23	1.03	(0.89-1.19)	0.62
Administrative and support services	1.04	(0.89-1.21)	0.51	1.00	(0.86-1.17)	0.96
Public administration and safety	Ref			Ref		
Education and training	1.14	(1.01-1.29)	0.00	1.09	(0.96-1.24)	0.07
Health care and social assistance	1.13	(1.04-1.23)	0.00	1.11	(1.02-1.21)	0.00
Arts and recreation services	0.95	(0.75-1.19)	0.53	0.98	(0.77-1.23)	0.78
Other services	0.91	(0.78-1.07)	0.14	0.87	(0.74-1.02)	0.02
<b>Occupation group</b>						
Managers	0.95	(0.85-1.06)	0.21	0.93	(0.84-1.04)	0.10
Hospitality, Retail and Tourism Workers	1.00	(0.87-1.16)	0.95	1.01	(0.87-1.17)	0.87
Arts, Science, and Business Professionals	0.97	(0.87-1.09)	0.53	0.94	(0.83-1.05)	0.13
Teachers and Education Aides	1.09	(0.96-1.25)	0.08	1.05	(0.92-1.20)	0.33
Nurses and Nursing Support Workers	1.28	(1.12-1.46)	0.00	1.21	(1.06-1.38)	0.00
Other Healthcare Professionals	1.13	(0.89-1.43)	0.18	1.07	(0.85-1.36)	0.46
Social and Welfare Workers	1.10	(0.99-1.23)	0.02	1.03	(0.92-1.15)	0.47
Technicians, Tradespeople and Farmers	1.12	(0.99-1.26)	0.02	1.13	(1.00-1.28)	0.01
Protective Service and Emergency Workers	0.68	(0.61-0.75)	0.00	0.60	(0.54-0.67)	0.00
Community and Personal Service Workers	1.15	(1.04-1.29)	0.00	1.10	(0.99-1.23)	0.02
Clerical and Administrative Workers	Ref			Ref		
Sales Workers	0.96	(0.84-1.09)	0.41	0.94	(0.83-1.08)	0.25
Road and Rail Drivers	1.35	(1.16-1.56)	0.00	1.30	(1.12-1.51)	0.00
Labourers and Machine Operators	1.10	(0.99-1.22)	0.02	1.07	(0.97-1.19)	0.08
<b>Injury type</b>						
Stress/anxiety	Ref			Ref		
Depressive disorders	0.85	(0.79-0.91)	0.00	0.86	(0.80-0.92)	0.00
Post-traumatic stress	0.92	(0.85-0.99)	0.00	0.91	(0.84-0.98)	0.00
Other and unspecified	1.00	(0.89-1.12)	1.12	0.97	(0.86-1.08)	0.43
<b>Jurisdiction</b>						
New South Wales				Ref		
Victoria				0.79	(0.75-0.85)	0.00
Queensland				1.05	(0.97-1.12)	0.10
South Australia				0.68	(0.62-0.75)	0.00

Western Australia	0.98	(0.88-1.10)	0.71
Tasmania	1.38	(1.22-1.57)	0.00
Northern Territory	1.27	(1.00-1.60)	0.01
Australian Capital Territory (Private)	1.52	(1.15-2.02)	0.00
Commonwealth Comcare	0.68	(0.60-0.77)	0.00

Note: the reference group was selected if it had the greatest proportion of claims, a hazard ratio <1 indicates the risk of greater time until RTW compared with the reference group and vice-versa.

**Figure 1: Survival function comparing jurisdictions**



Note (for Figure 1): NSW – New South Wales; VIC – Victoria; QLD – Queensland; SA – South Australia; WA – Western Australia; TAS – Tasmania; NT – Northern Territory; ACT pvt – Australian Capital Territory private; CC – Comcare

## DISCUSSION

It has been established that MHCs represent a substantial and growing economic and health burden both globally and among Australian workers, by impacting their work and personal lives. The Australian economy is adversely affected through absenteeism and loss of work productivity. Workers' compensation claims due to MHCs are the most expensive of all claim types. The aims of this study were to describe the characteristics of those who have been compensated for work-related MHCs and examine the factors that lead to prolonged duration of time loss including jurisdiction of claim. Analyses identified several risk factors for prolonged duration of compensated time loss, and determined that jurisdiction affects both access to compensation and the duration of compensated time off work.

In 2010 and 2011, there were 14,849 accepted WC claims due to work-related MHCs resulting in time loss greater than two weeks. The proportion of those absent from work due to a MHC in this study was higher in females both overall and in every jurisdiction, consistent with other studies (Flach et al., 2012; Gjesdal & Bratberg, 2003; Prang et al., 2016). This is unique to MHCs as males dominate all other work injury claims. Some studies have found that women take longer to RTW following a MHC (Flach et al., 2012; Koopmans et al., 2008; Prang et al., 2016; Roelen et al., 2012), however this study found no significant impact of gender on duration of time loss, consistent with some other studies (Arends et al., 2014; Brouwers, Terluin, Tiemens, & Verhaak, 2009; Hensing et al., 2013; Nielsen et al., 2012; Nielsen et al., 2011). This study further strengthens the common finding that younger workers take less time off work than older workers with work-related MHCs (Blank, Peters, Pickvance, Wilford, & Macdonald, 2008; Hensing et al., 2013; Koopmans et al., 2008; Prang et al., 2016; Roelen et al., 2012). A study by Gjesdal & Bratberg (2003) found that part time workers have a significantly higher risk of longer sickness duration and transfer to disability pension (Gjesdal & Bratberg, 2003), however there was no significant difference in sickness absence between full and part time workers in this study.

Occupations were re-coded to derive logical groups that better represented working environments. Protective service and emergency workers, which was the second most commonly represented occupation group and had the longest period of time loss, includes firefighters, prison guards, ambulance officers, and police officers. Workers in these occupations are exposed to a unique set of occupational risks for MHCs, and these occupations have been associated with work-related psychological symptoms such as depression, anxiety and post-traumatic stress disorder (PTSD)(Gray & Collie, 2017; Maguen et al., 2009; Minnie, Goodman, & Wallis, 2015). Claims for MHCs were also common among clerical and administrative workers, and teachers and education aides, which is consistent with published literature that confirms higher rates of MHCs in these occupations(Kinman, Wray, & Strange, 2011; Narayanan, Menon, & Spector, 1999). This study found that certain occupation groups have significantly less time loss than clerical and administrative workers, however Nielsen et al. (2010) found no association of occupation with RTW(Nielsen et al., 2011). It is possible that occupations with significantly shorter duration of time loss (such as nurses or nursing support workers) are better equipped at returning those with MHCs to work by assisting with their recovery or providing alternative duties. Conversely, the nature of the work of protective service and emergency workers may be such that alternative duties cannot be achieved, and/or that employers require workers to be fully recovered before returning to work.

This study identified that the most commonly represented industries from which MHC claims arise are public administration and safety, and healthcare and social assistance. In comparison to the public administration and safety industry, only the wholesale trade industry had a significantly longer duration of time loss. A study of mental health WC claims in the state of Victoria reported that around a quarter were from the healthcare and social assistance industry, followed by public administration and safety (20%)(Prang et al., 2016). The study compared the time taken to first sustained RTW of the healthcare and social assistance industry to others, and found the public administration and safety industry had a

longer duration. The present study replicates this finding in an Australia-wide dataset. Another study compared time to RTW of employees in the government, municipal, and private sectors, and found that the latter two had a longer time to RTW following a mental health disorder(Nielsen et al., 2012). A study by Koopmans et al (2008) found that those in the education and public sector took the longest time to RTW, followed by those in the commercial sector and health care sector(Koopmans et al., 2008) when depressed. Given the lack of consistency with respect to industry classification between the present study and these two prior studies, comparisons of results cannot be directly made.

In workers with MHCs, the type of psychological illness has been associated with duration of sickness absence(Flach et al., 2012; Gjesdal & Bratberg, 2003). In the present study MHCs have been coded by personnel within insurance agencies based on information received from the treating physician, and cannot be considered medical diagnoses. This is also a limitation of many prior studies in the field. This study found that workers with depressive disorders and post-traumatic stress had a significantly longer duration of time loss than those with stress/anxiety. These findings are somewhat consistent with a study from Denmark that found stress had a shorter time to RTW than depression(Nielsen et al., 2011), however the nature of injury was self-reported and not coded in the same manner as this study. Furthermore, a study by Flach et al (2011) found that diagnosed depression, anxiety, stress and burnout resulted in a longer time to RTW than adjustment disorder (which is included in stress/anxiety category in the present study). While there are differing rules regarding who can access compensation in Australia and the nations where these studies have been conducted, these findings suggest that work-related MHCs involving depression result in longer duration of time off work than other MHCs. This could be a function of the severity of illness, the ability of the workplace to accommodate the worker, and/or the effectiveness of treatment for the MHCs. There is limited evidence internationally regarding effective interventions for return to work in work-related MHCs(Sampson, 2015). A review by Sampson (2015) found some evidence that those suffering adjustment disorder who

engaged in problem solving therapy reduced their time off work (Sampson, 2015). Similarly, work-directed, psychological, or combined interventions had positive associations with RTW for depression.

Changes between the first and second Cox regression models demonstrate that jurisdiction has an impact on the outcome of a worker with a MHC claim. The variation in the proportion of MHC claims across jurisdictions is likely related to differences in criteria for acceptance and assessment of MHC claims. These differences in eligibility mean that the severity and nature of MHC claims that are accepted will vary substantially between jurisdictions. This may account for the variation in the number and proportion of MHC claims across jurisdictions, as well as the variations in time loss.

There is little consistency across Australian jurisdictions with respect to psychological impairment assessment. The diagnostic methods of assessment across the jurisdictions include the Psychiatric Impairment Rating Scale (Parmegiani, Lovell, Skinner, & Milton, 2001), Guide to the Evaluation of Psychiatric Impairment for Clinicians (Epstein, Mendelson, & Strauss, 2005), and different editions of the American Medical Association Guides to the Evaluation of Permanent Impairment. Additionally, threshold requirements for access to permanent impairment lump sum payments differ between Australian jurisdictions, from 0% whole person impairment (WPI) in the ACT to 30% in Victoria. Workers with MHC claims are ineligible for lump sum payments in South Australia. There are also additional limitations in that 30% WPI in Victoria must not be secondary to a physical injury and the 15% WPI threshold in NSW is applicable only as the primary injury. In the Northern Territory, a combination of physical and psychological injury must be greater than 5% WPI.

The survival curve illustrates the difference between jurisdictions with respect to time loss adjusted for other factors, with SA and Comcare having the longest duration, and the ACT and QLD having the shortest duration. Shorter durations do not necessarily reflect positive employment outcomes. The findings can be interpreted to suggest either that better

performing jurisdictions offer greater support to compensated workers and employers, or that they encourage workers to leave the scheme earlier, for instance by providing lump sum settlement payments. Anecdotally, a large proportion of MHC claims in Australia are denied and there is evidence that workers with MHC claims do not pursue workers compensation claims due to concerns about employers' response (Safe Work Australia, 2005). The wording of the legislation across jurisdictions differs, however the terms for rejection of a MHC claim are similar for all except Comcare (Pearce & Dubey, 2006). All other jurisdictions' legislation includes a clause that psychological injuries are excluded from compensation if it is deemed that the MHC arose due to reasonable management action relating to employment. In Comcare's legislation, however, exclusionary provisions do not extend to management action in general, only disciplinary action. Additionally, the degree to which employment had to have contributed to the MHC for the claim to be accepted is described using different language (Pearce & Dubey, 2006), and varies between "material", "substantial", "significant" and "major or most significant". The variations in language regarding exclusionary provisions and the definition of the degree to which employment contributed to the MHC likely affects the acceptance rates within each jurisdiction. Further, it is possible that the claim process for MHCs differs from other work-related injuries within jurisdictions and may contribute to the variation in the proportion of MHC claims. Claiming for MHCs may also be more difficult due to the lack of physical manifestations (Brijnath et al., 2016).

A report was commissioned by the Australian Government in 2006 that sought to conduct an analysis of the management of psychological injury WC claims (Pearce & Dubey, 2006).

This report noted that the language used in all jurisdictions' legislation with regard to the link between the MHCs and the injured worker's employment is vague (e.g. 'arising out of', 'reasonable'), allowing greater flexibility for decision makers when determining the claim. It is suggested that the final decision to approve or deny a psychological injury claim will depend on the impression that the claimant makes on the decision maker, and hence is not an example of a law where the language within the legislation can guarantee an outcome. A

conclusion by one of the report's authors was that while there exist some differences between jurisdictions, they generally do not significantly impact upon the outcome of an injured worker's compensation claim (Pearce & Dubey, 2006), however findings from the present study indicate that this is not the case. After controlling for age, gender, work status, industry, occupation and injury type, the jurisdiction in which a WC claim is lodged is significantly associated with the time spent on compensation and away from work.

Differing policies between jurisdictions that can affect the recovery of an injured individual may not solely be those policies that relate specifically to psychological injury. For example, the time that employers are given to notify the insurer varies between jurisdictions. For all injuries, prompt notification of the injury to the insurer initiates management of the claim and enables earlier intervention that may benefit a worker with a psychological injury (Safe Work Australia, 2014). Further, insurers are required to make a decision on the claim within different time periods, and hence it is possible that treatment is delayed for injured workers until confirmation that their claim has been accepted. For example, in NSW employers are required to notify the insurer of an injury to a worker within 48 hours of becoming aware, whereas in Queensland they are given eight business days (Safe Work Australia, 2010). Additionally, the timeframe for a decision on a claim differs between jurisdictions, meaning that injured workers may be waiting for a decision for up to 84 days after claim lodgement (e.g. in Tasmania), and not all jurisdictions provide provisional liability which provides access to services whilst a decision on the claim is made (Safe Work Australia, 2010). These arrangements could potentially exacerbate mental health conditions by delaying access to medical treatment, or adding stress to the claim process (Kilgour, Kosny, McKenzie, & Collie, 2015).

A study looking at the health effects of compensation systems found that 53% of work-related injury claimants reported moderate to high stress levels associated with one or more of the elements of the claims process (Grant, O'Donnell, Spittal, & Studdert, 2013).

Furthermore, it found that claimants with high levels of claim-related stress were at a

heightened risk of poor-long term recovery. Subjecting workers with MHCs to difficult claims processes could lead to poor RTW outcomes, and may explain some of the differences between jurisdictions with respect to duration of time compensated. Variations in the policy and practices of WC between jurisdictions should be the subject of future research in order to identify policies and practices that lead to better or worse RTW outcomes.

Some WC jurisdictions are taking the initiative to better identify and manage psychosocial risks within the workplace to prevent or minimise psychological harm (Cotton, 2008). For example, Queensland introduced dedicated 'psychosocial inspectors' to review workplaces where risk factors such as harassment and bullying were commonly identified (Johnstone, Quinlan, & McNamara, 2008). Victoria sponsored research that showed consulting the injured worker and managing psychosocial risks can improve psychological outcomes, thus contributing to a reduction in the incidence of psychological injury claims and led to the publication of a guide to prevent work-related stress for employers (Cotton, 2008; WorkSafe Victoria, 2007).

This study has a number of strengths and limitations. The NDS is a population based dataset but it is administrative data and was therefore not compiled primarily for research purposes. It has been demonstrated that administrative datasets of compensated time loss underestimate the time lost to injury (Dasinger, Krause, Deegan, Brand, & Rudolph, 1999). Mental and physical health problems are interrelated (World Health Organisation, 2005) and comorbidities may substantially prolong the duration of absence due to MHC (Koopmans et al., 2008). Given that only the primary injury is recorded in the dataset, any contributing physical or psychological illnesses that are occurring alongside the primary injury, which are known to contribute to sickness absence, were not able to be investigated. Additionally, the database does not capture information on non-work-related factors that may affect duration of compensated time loss (Wilhelm et al., 2004) (e.g. social support). The NDS also does not include any information on illness severity.

The cessation of income benefits does not necessarily indicate RTW. It could indicate withdrawal of the claim, retirement, return to education, lump sum payment, or another outcome. As with most datasets, there is also the possibility of varying quality of data where variables may have been miscoded or inconsistently coded. This dataset is not representative of all work-related MHCs, as not all workers submit a claim or their claim may be rejected. The NDS covers the vast majority of Australian workers, however does not include self-employed workers who could potentially provide further interesting information. Also, it does not include compensation data from the Western Australian police or Australian military personnel within the defence forces, both of which include occupations that would likely have a high prevalence of work-related MHCs claims, especially depression and PTSD (McFarlane, Hodson, Hooff, & Davies, 2011; Wilhelm et al., 2004). Despite these limitations, the NDS encompasses all major compensation schemes in Australia and provides a large sample size which provides confidence in the study's validity, and allowed comparisons between Australian WC jurisdictions, something which has not been possible with jurisdiction-specific datasets.

The process to RTW is continuous and involves understanding of the past, present and future mental health status of the individual (Andersen, Nielsen, & Brinkmann, 2012). It is important to continually involve supervisors and employees in the process as this can influence the support offered to the returning employee (Andersen et al., 2012). Australian jurisdictions are beginning to accept the important role of evidence-based psychological interventions, such as early identification and early support and treatment, in order to prevent more serious consequences. Future research that looks at interventions to encourage or facilitate RTW among those with MHC could help ease the burden and improve outcomes for the worker, employer, and the compensation scheme (Sampson, 2015).

This study found evidence to suggest that increasing age, working in the wholesale trade industry, being a protective service and emergency worker, and having depression or post-

traumatic stress were associated with prolonged duration of time off work following a work-related MHC. In contrast, working in the transport, postal and warehousing, and health care and social assistance industries, and in particular occupation groups were associated with shorter duration of time loss. This study also demonstrated that duration of time loss following work-related MHC varies significantly across the WC jurisdictions in Australia.

These results may help define at risk groups and can aid in the development of interventions to prevent sick leave or reduce sickness absence due to MHCs, as well as provide feedback to compensation schemes with regard to how they compare to their Australian counterparts.

Additionally, it has provided justification for future research into jurisdictional policy and practice differences given the varying durations of time loss between compensation schemes.

#### **Declaration of interest statement**

The authors declare that they have no competing interests.

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