ISCRR
Institute for Safety, Compensation and Recovery Research

Compensation Policy and Return to Work Effectiveness (ComPARE) Project: Introductory Report

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Executive Summary

In Australia, state, territory and commonwealth governments have established an array of workers' compensation systems that collectively seek to achieve the greatest Return to Work (RTW) outcomes at the lowest cost to society. While sharing this important public health objective, these systems differ substantially in approach. There is much variance between the schemes with respect to RTW policy and practice and very little quality published evidence regarding the relative impact of policy settings on RTW outcomes.

The ComPARE project was established to develop an evidence base that can support development and implementation of effective RTW policy in Australia. This report presents an overview of the ComPARE project, describes the dataset used and the results of an initial analyses.

The project adopts a comparative effectiveness methodology, comparing outcomes between jurisdictions and using sophisticated statistical techniques to identify policy settings that have positive, negative or neutral effect on RTW. The study is led by the Institute for Safety Compensation and Recovery Research (ISCRR) at Monash University, with a national policy and data advisory group providing expert assistance, advice and guidance to the study investigators. The study is one part of a larger international study encompassing Canadian and New Zealand workers' compensation jurisdictions.

In its initial stages, the ComPARE project will utilise the National Dataset of Compensation Based Statistics (NDS), compiled by Safe Work Australia and to which each Australian workers' compensation jurisdiction provides data annually. A number of modifications, exclusions and additions to the NDS have been made to establish a comparable dataset fit for purpose for the planned analyses.

This report's findings establish that:

- There are highly significant differences in RTW outcomes between Australian workers' compensation jurisdictions; and
- These jurisdiction level differences remain after taking into account the impact of other factors known to influence RTW including age, gender, nature of injury, occupation, industry, remoteness, service accessibility and socio-economic status.
- The magnitude of the effect is as or more substantial as that associated with factors commonly considered to result in longer duration compensation claims (e.g., mental health claims).

The findings suggest that workers' compensation scheme design and scheme management ('policy and practice') have a major effect on claim duration and RTW outcomes, for injured Australian workers receiving compensation benefits. Unlike some factors affecting claim duration such as socio-economic status or injury type, policy and practice are highly modifiable. Changes to scheme design and management have the potential to substantially improve RTW outcomes for injured workers in some Australian states and territories.

Future planned analyses in the ComPARE Project will (a) examine jurisdiction-level differences among specific cohorts of injured workers, and (b) develop a set of legislative and policy indicators that can be used in analyses to begin to examine impact of specific scheme design settings on RTW outcomes.

Key messages

This report presents evidence that the state or territory in which a work-related compensation claim is made has a substantial and independent impact on the duration of

compensated time away from work. This effect persists even after taking into account demographic, socio-economic, employment and injury-related factors known to affect duration of compensated time loss. Furthermore, the magnitude of jurisdictions' impact on the duration of compensated time loss payments was comparable to or greater than that of other known factors such as aging and the presence of particular conditions.

The findings suggest that workers' compensation scheme design and scheme management ("policy and practice") have a major effect on outcomes for injured Australian workers receiving compensation benefits. Unlike some factors affecting claim duration such as socio-economic status or injury type, policy and practice are highly modifiable. Prior research has demonstrated that modifications to compensation scheme management practices such as claims handling can have a positive impact on outcomes in Australian injury compensation settings (Schaafsma, De Wolf, Kayaian, & Cameron, 2012). The present findings suggest that changes to scheme design and management have the potential to substantially improve outcomes for injured workers in some Australian states and territories.

The report also demonstrates that it is feasible to conduct comparative policy studies in Australian workers' compensation systems using existing administrative datasets.

Purpose

The Introductory Report is the first in a series of planned reports arising from the ComPARE Project. This report:

- Describes the rationale for the project;
- Describes the high-level objectives of the project;
- Describes the governance and collaborations established to support the project;
- Provides an overview of data sources used in initial analyses;
- Presents the findings of an initial analyses examining the impact of jurisdictions and other factors affecting return to work outcomes in Australia; and
- Outlines next steps for the project including anticipated future analyses and reports.

Overview of the ComPARE Project

Rationale

The individual, industrial and societal burden of work-related injury and illness are substantial. There were over half a million work-related injuries and illnesses in Australia in 2013-14 (Australian Bureau of Statistics, 2014). In addition to the direct health impacts on the injured person, these conditions have direct and indirect impact on employers, family and government (Newnam, Collie, Vogel, & Keleher, 2014). The cost to society has been estimated at over $60 billion per annum (Safe Work Australia, 2012).

State, territory and commonwealth governments in Australia have established a federation of workers' compensation systems to provide financial support for rehabilitation, return to work and lifetime care for workers with work-related injury and illness. These systems are funded by risk-based insurance premiums collected from employers by government and are the primary means by which Australian governments seek to address the public health problem of work-related injury and illness.

Each of these systems has adopted policy settings and practices that attempt to maximise Return to Work (RTW) outcomes for those injured while maintaining the financial viability of the compensation systems. Ensuring safe and effective RTW is a major objective of all of these systems, and compensation authorities play an important and highly influential role in RTW across the nation. Much of this influence occurs via the policies and practices of the compensation authority.

The influence and impact of workers' compensation policies and practices on RTW outcomes has been documented (Anema, Schellart, Loisel, Veerman, & van der Beek, 2009; Butler, 1994; Butler, Gardner, & Kleinman, 2013; Cassidy et al., 2000; Clay, Berecki-Gisolf, & Collie, 2013; Krause, Frank, Dasinger, Sullivan, & Sinclair, 2001; Loeser, Henderlite, & Conrad, 1995; Meyer, Viscusi, & Durbin, 1995; Seabury et al., 2011). For example, a review by Krause et al. (2001) examined the determinants of disability duration and RTW following work-related injury and illness across several domains, and identified several factors ranging from individual-level worker characteristics to societal-level legislation and compensation policy factors. Varying effects on disability duration were observed across policy variables, with some policies shortening, prolonging, interacting with, or having no effect on time taken to RTW.

Some individual policy settings have also been the subject of study. For example, level of compensation benefits has been positively associated with claim incidence rates and time-loss duration in a number of studies conducted over the past few decades (Butler, 1994, 1996; Cassidy et al., 2000; Hirsch, 1997; Loeser et al., 1995; Meyer et al., 1995; Worrall & Appel, 1982). Some studies have also examined the impact of waiting periods on workers' compensation outcomes, with waiting periods having a negative association with receipt of compensation, time away from work, and the frequency of certain injury types (Butler, 1994; Ruser, 1998).

Amongst the Australian workers' compensation systems, there remains a diversity of policy approaches. The schemes differ on multiple aspects including their coverage (e.g., industries and workers covered); entitlements (e.g., included injuries and illnesses); benefits (e.g., minimum and maximum levels and duration); rehabilitation (e.g., early RTW, access to support); health care (e.g., access to and coverage); administration (e.g., appeal procedures, oversight mechanisms); financing (e.g., who pays, experience rating); and job protection (e.g., duration of protection, employer obligation to accommodate injured worker) (Safe Work Australia, 2013b). These are all factors that have been identified as important to fairness of coverage and outcomes for injured workers (Lippel, 2012).

Internationally, some studies examined the impact of workers' compensation policies on RTW outcomes using a comparative, cross-jurisdictional paradigm. A 2009 study by Anema et al. (2009), for example, examined the influence of compensation policy variables on sustainable RTW, using a prospective cohort of workers with low-back pain across six countries.

In Australia and elsewhere, comparative research on work-related injury and illness has largely been conducted using aggregate-level analysis and for the purposes of establishing benchmarks to compare workers' compensation system performance across jurisdictions (Hunt, 2005). Regular Australian benchmarking reports include the Comparative Performance Monitoring report (Safe Work Australia, 2013a) and the Return to Work Monitor (The Social Research Centre, 2013), each released annually by Safe Work Australia. These reports are largely descriptive in nature without direct statistical comparison between jurisdictions, nor do they attempt to isolate and identify the impact of specific policy or practices on RTW or other outcomes. Safe Work Australia also publishes a series of reports that describe workers' compensation and occupational health and safety arrangements in Australia and New Zealand (most recent: Safe Work Australia, 2015), with the aim of guiding understanding of cross-jurisdictional differences and providing information to stakeholders to support policy and program development.

There is often little scope within a given compensation system to vary and evaluate policy settings to determine if policy or program changes result in better or worse RTW outcomes, and as such there is little evidence of the relative effectiveness of different policy settings. Comparisons across systems can provide policymakers with evidence on what works in promoting RTW and under what circumstances. To date there have been no studies in Australia that have sought to identify the impact of specific workers' compensation policies

on RTW outcomes using a comparative paradigm. This is the objective of the ComPARE study.

Objectives

The ComPARE Project is the first detailed investigation of the comparative effectiveness of workers' compensation policy and practice in Australia, and unique internationally. The project formally began in April 2015 and has secured funding for an initial 3 year period of activity.

The Project seeks to:

1) Develop a greater understanding of the impact of Australian workers' compensation system policy on RTW outcomes;
2) Identify and quantify the impact of specific workers' compensation policies on RTW outcomes;
3) Develop an evidence base that can be used by Australian workers' compensation authorities to establish policies that support improvements in RTW outcomes; and
4) Communicate and translate research findings into actionable messages that can be applied by compensation authorities within Australia and internationally.

The aim of this report is to address Objective 1 by analysing datasets to determine whether there are differences in RTW outcomes between workers' compensation jurisdictions that is independent of other factors such as worker age and gender, occupation and industry, and injury factors. Such a finding would support the hypothesis that policy and practice drives differences in RTW outcomes between jurisdictions.

International collaboration

The ComPARE project is nested within a larger international collaboration investigating the impact of compensation system policy on RTW in Canada, Australia and New Zealand. The international project will compare RTW outcomes in specific cohorts of workers between Australian, Canadian and New Zealand workers' compensation jurisdictions, and investigate the impact of specific policy settings on RTW outcomes.

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The project receives financial and in-kind support from WorkSafe Victoria and SafeWork Australia. Numerous other organisations are providing in-kind support including the Institute for Safety Compensation and Recovery Research (ISCRR) at Monash University, Workcover NSW, Office of Fair and Safe Work of Queensland Government, Workcover Tasmania, Return to Work SA, the ACT government, NT WorkSafe, Workcover WA, and Comcare.

Project Governance

The Project has been established at ISCRR by the Primary Investigator, Professor Alex Collie. The research team is located at ISCRR and consists of the Primary Investigator and a full time data analyst, Dr Tyler Lane. A post-doctoral researcher will also be employed in the 2nd year of the project.

An expert group of international researchers have agreed to be Co-Investigators on the project. These include Assistant Professor Christopher McLeod who is leading the Canadian arm of the international collaboration from the University of British Columbia and the following other experts:

- Associate Professor Peter Smith, Monash University, Australia & Institute of Work and Health, Canada.
- Professor Mieke Koehoorn, University of British Columbia, Canada.

- Professor Ben Amick, Florida International University, USA & Institute for Work and Health, Canada
- Professor Sheilah Hogg-Johnson, Institute of Work and Health, Canada

These researchers will provide advice and input on technical and theoretical aspects of the project and assist with interpreting analyses. Some investigators may also undertake specific analyses in their areas of interest as the project progresses.

A policy and data Advisory Group comprised of experts from the participating Australian workers' compensation authorities and Safe Work Australia has also been established. The Advisory Group is an important part of project governance, assisting with expert advice to understand jurisdictional policy settings and their implementation in practice, input regarding research priorities, assistance with interpretation of research findings and dissemination and communication of results.

This governance structure is mirrored in the Canadian arm of the international collaboration, with the two research groups meeting regularly via telephone and in person to coordinate research activity.

Methods

Data Sources

The Introductory Report utilises the National Dataset for Compensation-based Statistics (NDS). The dataset is an amalgamation of jurisdictional workers' compensation data, collected by Safe Work Australia (SWA). SWA is a national Statutory Agency whose primary responsibility is to lead the development of national policy to improve work health and safety and workers' compensation arrangements across Australia. Among its core functions, as set out in the Safe Work Australia Act 2008, is to collect, analyse, and publish data or other information relating to Occupational Health and Safety (OHS) and workers' compensation to inform policy development and evaluation. Each year, all public workers' compensation schemes across Australia and New Zealand supply data to SWA to allow the analysis and publication of this information. This includes data for each compensation claim lodged, as well as aggregate scheme-level data such as costs, premiums, remuneration, assets, and liabilities. These data are contained in the NDS and defined in the NDS Data Dictionary (National Occupational Health and Safety Commission, 2004).

SWA has provided the project team access to the claim level information contained in the NDS on behalf of the participating jurisdictions, governed by an Information Sharing Agreement between Monash University and SWA. This includes claim level details as well as claimant age, gender, and occupation, employer industry, and type of injury for which the claim was made. NDS data span a 10-year period covering 2003-04 to 2012-13, plus annual updates as they become available. Data have been supplied for all Australian state and territory jurisdictions, Seacare, and New Zealand. Future analyses will include claims under the Comcare scheme.

The data include postcodes from which the claim originated, which were used to link claims to regional information such as Socio-Economic Status (SES) and remoteness and service accessibility (Australian Bureau of Statistics, 2011). SES is indicated by the Index of Relative Socio-economic Advantage and Disadvantage (ISRAD) in the Socio-Economic Indexes for Areas (SEIFA) Australia (Australian Bureau of Statistics, 2013c), and remoteness and service accessibility by ranking claims based on their postcodes' 'lack of accessibility to services regarded as normal in metropolitan areas', according to the Accessibility/Remoteness Index of Australia (ARIA) (Department of Health and Aged Care, 2001, p. 3). As both rely on claimant postcodes, they are proxies rather than indicators of the SES and remoteness of individual claimants. SES can vary substantially within a postcode,

while ARIAs have been approximated to postcodes *post hoc* from operationally-defined statistical areas (geographic units of homogenously scored remoteness). Most postcodes (80%) contained one ARIA ranking; where they contained more than one (e.g., 75% Major city, 25% Inner region), the postcode was given the code of the most common ranking.

Measuring Return to Work

There are multiple validated methods for measuring RTW in the published research literature. These have broadly been categorised into measures based on administrative data, self-report surveys, and work function measures (Pransky, 2013).

There are few data sources that enable population level analyses of RTW outcomes. Among injured workers in Australia, the only viable population-level data of sufficient detail and coverage for the current project are administrative data collected by workers' compensation agencies within each Australian jurisdiction. All Australian agencies collect information on income replacement benefit payments made to injured workers during the course of their compensation claim. Using administrative data, there are several methods available for measuring RTW. These include calendar-based time-to-event outcomes such as time to first RTW, measures of partial or failed RTW attempts and measures that estimate the cumulative time away from work over a given period (Krause, Dasinger, Deegan, Brand, & Rudolph, 1999). The choice of method is dependent on the type and quality of data available and the definition of RTW being used. The most commonly used approach in the published research literature is to calculate the total duration of time away from work during a given period post-injury. Sometimes called 'work disability duration', this method seeks to estimate the number of hours, days or weeks a worker has been away from work following a work-related injury based on the amount of time they have been compensated (Krause et al., 1999). The method makes the assumption that each period (hour, day, week) of income replacement payment is equivalent to the same period of time away from work, and that benefit cessation indicates RTW.

The NDS includes a measure of the hours normally worked per week and the total number of compensated work hours ('Time lost') during the follow-up period. These data were used to develop a proxy for RTW. Specifically, we calculated the cumulative weeks away from work by dividing the cumulative compensated hours away from work post-claim by the number of pre-claim hours normally worked per week.

Such cumulative duration measures have been cited as one of the better proxies for RTW and are considered the best estimate when the source of outcome data is an administrative dataset (Krause et al., 1999). An advantage of cumulative working time lost is that it accounts for partial and failed RTW attempts, which other alternatives such as time to first RTW and other calendar time-to-event outcomes greatly underestimate since they often do not consider partial and failed RTW episodes (Krause et al., 1999).

However, cumulative time loss measures are limited in several ways. First, they only record time for which the worker's employer claimed reimbursement for compensated wages. When injured workers move to another scheme (e.g., private insurance, age pension, disability pension) or stop receiving income benefits, they are no longer recorded in the dataset, nor does the dataset indicate the claimants' outcome. Depending on scheme design, cumulative time loss measures derived from administrative datasets have been shown to underestimate the amount of total working time lost by a factor of between one and seven at one year-post claim (Dasinger, Krause, Deegan, Brand, & Rudolph, 1999). Further, since compensation is paid by the employer and reimbursed by the insurer or compensation authority, the data only record when an employer is reimbursed for paying an injured workers compensated wage, introducing an opportunity for lost data (e.g., when an employer fails to claim reimbursements). Thus, the RTW outcomes reported using the NDS are likely to underestimate the true amount of work time loss.

Second, the cumulative working time lost simplifies the complex nature of RTW. Return to work can be disjointed and fragmented, with failed attempts, partial RTW, and change of duties, which the cumulative time loss measure sums into a single amount of time lost. The NDS does not allow investigation of this complexity.

Another limit of administrative data is that it relies on multiple data input and interpretations across sites to collate data. In the NDS dataset for instance, back pain was coded differently between jurisdictions, despite all jurisdictions using the standard Type of Occurrence and Classification System (TOOCS) (Australian Safety and Compensation Council, 2008). To account for these differences and to transform the dataset to meet the conceptual and analytical needs of the ComPARE Project, such issues have been identified and addressed in the quality assurance phase (see Table 1 in the next section).

Despite these limitations, calculating the cumulative time loss measure from the NDS enables comparisons to be made between jurisdictions at a population level. Thus, it was considered sufficient for use in the initial stages of the ComPARE project.

Data preparation

A number of data cleaning, quality assurance and data modification steps were undertaken to prepare the NDS dataset for analyses. These can be categorised into three major stages:

1) Data cleaning and quality assurance conducted on the raw NDS dataset.
2) Excluding cases and creating new variables to make comparisons across jurisdictions.
3) Further limiting cases for the purposes of the initial analyses presented in this report.

First, initial modifications were applied to improve the quality and consistency of the dataset. These included removing duplicate records, removing cases lacking pre-claim working hours or with unlikely working hour estimates (< 1 hour per week and > 100 hours per week), and unlikely age ranges (< 15 years and > 80 years).

Following this initial data cleaning stage, a comparable dataset was created by further excluding unaccepted claims and claims with two weeks or less of cumulative compensated time loss duration. The latter exclusion was intended to establish an equivalent dataset between jurisdictions by removing short duration claims that are compensable in some jurisdictions but not in others. In Victoria and South Australia time loss work injury claims only become compensable when ten days of time loss has been reached. Thus claims of less than ten days duration were excluded from the datasets of other jurisdictions.

At this second stage a number of new variables were created, postcode data were linked to ABS socio-economic and remoteness data, and injury data were converted to an alternate approach previously used by the research team (Collie, Ruseckaite, Brijnath, Kosny, & Mazza, 2013) to account for coding differences across jurisdictions, and to enable meaningful interpretation of injury data.

The final modifications were conducted to make the dataset analysable for this Introductory Report. Claims were limited to those made in 2010, which provided two main benefits. First, major changes to legislation and policy occur relatively infrequently in any single jurisdiction, but across multiple jurisdictions they are more common. Limiting data to the 2010 calendar year also reduced the potential for policy or legislative change to affect the primary outcome. The second benefit was that it enabled examination of study outcomes over a consistent follow-up period post injury. The NDS receives data from jurisdictions annually and reports duration (time loss) as a total per case. For the data received, claims made between 2003 and 2007 had a 6 year follow up period, while claims made in 2013 had a follow-up period of 6 to 18 months, depending on date of claim. For this report, we chose to limit the dataset to claims accepted in the 2010 calendar year, as this provides a follow-up period of 2.5 to 3.5 years with an average of 3 years, assuming an even dispersion of claims across the 2010

calendar year. The length of the follow-up period is sufficient to enable examination of the major changes to compensation occurring in the first 12 to 24 months post-injury (e.g., income benefit step-downs; changes in employer obligation to accommodate worker) while also providing a dataset of sufficient size to provide adequate statistical power.

Claims from Seacare were excluded as there were too few in number to analyse with confidence in findings. Claims from the Accident Compensation Corporation of New Zealand were also excluded in order to limit initial analyses to the Australian jurisdictions actively involved in the project.

Table 1. Data preparation of the NDS/ComPARE dataset by stages

Modification stage	Dataset (records)	Process	Cases/variables	Reason
-	**Raw NDS dataset, 2003/04 to 2012/13** (3,539,283)	-	-	-
1	**Cleaned NDS dataset** (2,986,666)	Exclusions	Duplicate records	Duplicate records are included in error, resulting in single claims being double counted
			Unaccepted claims	Unaccepted claims do not provide compensation data and are thus not relevant to this project
			Claims with less than one or more than 100 working hours per week	Extreme working hours on either end were assumed to be unreliable
			Claims where the claimant was less than 15 or over 80 years of age at claim	Claimant ages at such extremes were rare, likely to be miscodes, and would not add much value to the analyses
2	**ComPARE Project dataset** (1,036,659)	Exclusions	Compensation claims of two weeks or less	Standardised compensation records across jurisdictions to make them comparable; Victoria and South Australia require employers to cover the first two weeks of compensation in most cases; also excludes medical and/or treatment claims only, which are not relevant to this research
		New variables and data linkages	Weeks of work lost (continuous), converted into dichotomous variables indicating whether total lost work exceeded 4, 13, 26, 52, and 104 weeks	Proxy for RTW; dichotomous variables enable regression analysis and also indicate RTW status at commonly used milestones in research and practice
			Claimant age at accident categorised into 10 year-blocks	Categorical data (converted into dichotomous variables) more interpretable in regression analyses
			Creation of back pain/strain variable to match Collie et al. (2013)	The research team felt that the coding from the cited paper was more conceptually relevant to the analytical needs of the ComPARE
			SEIFA data on socio-economic status (SES) advantage/dis-advantage linked to postcodes, converted from deciles into quintiles	Proxy for claimant SES, particularly when claim originates in the most advantaged and dis-advantaged quintiles
			ARIA data on remoteness and accessibility linked to claimant postcode	Proxy for claimant's access to services
3	**Introductory Report dataset** (92,432)	Inclusions	Records for claims made in 2010	2010 is most recent year for which there are three years of compensation data, which was the amount of time necessary for longer-term RTW analysis
		Exclusions	Seacare claims	Seacare claims were too few to analyse with any confidence
			New Zealand claims	This report only includes claims from jurisdictions actively involved in the ComPARE Project, who at this point are exclusively Australian; future research will include New Zealand

Analysis strategy

All analyses in this report refer to cumulative time loss payments as a proxy for RTW. This entails all the advantages and disadvantages noted above (see Measuring Return to Work). For clarity, this outcome is described more precisely throughout the report as 'time loss' or 'compensated time loss'.

Descriptive statistics

Descriptive analyses were undertaken to provide general information on national and jurisdictional-level claimant demographics and work characteristics. Outputs reported below include number and proportion (%), mean and standard deviation, and in the case of variables with three or more categories (e.g., employer industry), the most common category with number and proportion.

The data for this analyses were compared to the larger NDS dataset for the 2010 calendar year (only excluding duplicate records and those not receiving income replacement) in order to examine the impact of data treatment on the dataset. For example, we anticipated that excluding claims with two weeks or less compensation would have removed a greater proportion of 'minor' injuries from the dataset, such as sprains and strains.

Recovery curves

The proportion of injured workers receiving time loss payments over time by jurisdiction was graphically illustrated with recovery curves, also known as survival curves. The curves were calculated by determining the proportion of workers whose cumulative compensation payments met each duration (denoted in week-long periods) along an *x*-axis, from two weeks (where all injured workers included in the dataset are receiving time loss payments) to 2.5 years/130 weeks post-claim. The proportion of workers receiving compensation that meet or exceed each milestone is also presented in table format to enable comparison of exact figures.

Logistic regression

The final stage of analyses was to determine whether the state or territory in which a claim was made had an independent impact on duration of compensated time loss. The analyses were conducted using the binary logistic regression technique, controlling for other factors known or hypothesised to affect RTW. The outcome measure (duration of cumulative compensated time loss) was converted into dichotomous variables indicating whether each claim exceeded the 4, 13, 26, 52, and 104 week milestones (henceforth referred to as 4 weeks, 3 months, 6 months, 1 year, and 2 years). The data were dichotomised to represent standard RTW milestones commonly denoted in the sector and because the continuous 'time loss' variable was not normally distributed (skewness: 3.6; kurtosis: 22.2), which can produce misleading results in tests that compare continuous data (e.g., linear regressions).

Regression models introduced control factors in a stepwise manner to assess changes to the significance, magnitude, and direction of jurisdictions' impact on time loss payment durations. The stepwise regression helps to identify jurisdictional factors unrelated to policy and practice that affect the outcome variable, such as differences in industry type or workforce demographics. Independent variables included in the regression are listed by step of inclusion, factor, variable, and source in Table 2. Note that each factor tested in logistic regression requires a comparison factor (e.g., female workers compared to male workers to assess the impact of gender). In all cases, the comparison was the largest category by volume and/or was selected for methodological reasons. For instance, jurisdictions were compared to New South Wales, the jurisdiction with the largest number of claims; NSW also had relatively average time loss payment duration outcomes, which permitted a better illustration of the impact of jurisdiction (for example, see Figure 2).

Regressions exclude cases where data are missing in a tested variable. Of the 92,432 cases in the Introductory Report dataset, 11,788 (13%) were missing data and were thus omitted.

Northern Territory and ACT jurisdictions were excluded from regression analyses due to the small number of cases within each.

Unless otherwise stated, reported outcomes are statistically significant at a conservative $p \leq 0.01$. At this level of significance we are accepting results that have at least 99% certainty of showing real difference.

Note on interpreting logistic regression outputs

Binary logistic regression outputs are reported as Odds Ratios (OR), or the odds of an outcome occurring compared to one; ORs greater than one mean the outcome is more likely to occur than the comparison variable, ORs less than one mean the outcome is less likely, ORs equal to one mean the outcome is as likely. ORs also include Confidence Intervals (CI), which provide the range in which the real value is likely to be. The range depends on variance, statistical significance, and number of cases. If the CI overlaps with 1, the result is not considered to be significant (e.g., 0.90-1.30).

Because ORs can be difficult to interpret and compare across variables, they have been standardised throughout this report to reflect percent change to odds of outcome. For instance, if two variables have the opposite impact on RTW outcomes and their ORs are 2.00 and 0.50, their relative magnitudes are not apparent. In this example, an OR of 2.00 and 0.50 both indicate a 100% change in odds; one doubles while the other halves and though the impact is in opposite directions, their relative magnitude is the same. ORs were standardised using the following algorithm: if OR > 1, 1 was subtracted from it to produce a percentage change to odds (e.g., OR: 2.00 = 2 – 1 = 100%); if OR < 1, the inverse was produced by dividing 1 by the OR, from which 1 was subtracted (e.g., OR: 0.50 = (1 / 0.5) – 1 = 2 – 1 = 100%). The same formula applies to standardised CIs. Unstandardised ORs and CIs are reported in the Appendix.

ORs should be interpreted with caution. ORs, which describe changes in odds, are often confused with or misrepresented as Relative Risk (RR), which describes the likelihood of an outcome. While ORs and RRs indicate the same direction of association, ORs can greatly exaggerate risk.

Table 2 Predictors in regression models of duration of compensated time loss payments by step, factor, variables, and source.

Step	Factor(s)	Variables (*comparison factor in italics*)	Source and notes
1	Jurisdiction	• *New South Wales* • Victoria • Queensland • South Australia • Western Australia • Tasmania	Jurisdiction recorded in NDS database; Northern Territory and Australian Capital territory excluded from regression analyses due to small numbers of claims limiting the robustness and confidence of outputs regarding them
2	Gender	• *Male* • Female	Claimant gender recorded in NDS database
	Age at claim	• 15-24 years • *25-34 years* • 35-44 years • 45-54 years • 55-plus years	Recorded in NDS database, put into brackets based on standard in RTW literature (e.g., Berecki-Gisolf, Clay, Collie, & McClure, 2012b; Smith, Black, Keegel, & Collie, 2014)
	Socio-economic status	• Most advantaged quintile of postcodes • *Middle three quintiles of postcodes* • Most dis-advantaged quintile of postcodes	Postcode recorded in NDS database, linked to Socio-Economic Indexes for Areas (SEIFA) postal area indexes (Australian Bureau of Statistics, 2013c)
	Remoteness and service accessibility	• *Major cities* • Inner regional • Outer regional • Remote • Very remote	Postcode recorded in NDS database linked to Australian Standard Geographical Classification (ASGC) (Australian Bureau of Statistics, 2011)
3	Part-time/ fulltime employment prior to injury	• *Working under 35 hours per week* • Working 35 or more hours per week	Hours worked prior to injury recorded in NDS database, dichotomised at <35/≥35 hours per week based on the ABS Labour Force Survey (Australian Bureau of Statistics, 2013a)
	Employer industry	• Agriculture, forestry, and fishing • Mining • Manufacturing • Electricity, gas, water, and waste services • Construction • Wholesale trade • Retail trade • Accommodation and food services • Transport, postal, and warehousing • Information media and telecommunications • Financial and insurance services • Rental, hiring, and real estate services • Professional, scientific, and technical services • Administrative and support services • Public administration and safety • Education and training • *Health care and social assistance* • Arts and recreation services • Other services	Industry recorded in NDS database using Australian and New Zealand Standard Industrial Classification (ANZIC, ABS Cat. No. 1292.0) (Trewin & Pink, 2006)
	Occupation	• Managers • Professionals • Technicians and trades workers • Community and personal service workers • Clerical and administrative workers • Sales workers • Machinery operators and drivers • *Labourers*	Occupation recorded in NDS database using Australian Standard Classification of Occupations, Second Edition (ASCO2, ABS Cat. No. 1220.0) (Australian Bureau of Statistics, 2013b)
4	Claim injury/illness type	• Fractures • *Musculoskeletal* • Other trauma • Back pains and strains • Mental health disorders • Other illness	Injury type recorded in NDS database, categorised using modified version of Type of Occurrence Classification System (TOOCS) (Australian Safety and Compensation Council, 2008), reported in Collie et al. (2013)

Research Findings & Implications

Descriptive statistics

Claimant descriptive statistics are presented in Table 4. Mean claimant age was 42 years. Thirty-eight percent of claimants were female. The most common injury claim was musculoskeletal (43%). The most common industry was healthcare and social assistance (15%) and the most common profession was labourer (24%). Around one-fifth of claims originated in the most socio-economically advantaged and dis-advantaged postcode quintiles (18% each).

Jurisdictional demographics generally reflected the larger dataset, though there were some variations. Musculoskeletal injuries (MSK) accounted for a substantially larger share of injury claims in Queensland (54%) than nationally or in other jurisdictions, while back pains and strains were the most common injury in Western Australia (41%) and Tasmania (38%). Manufacturing was the most common industry in Victoria (19%), while construction was most common in the Northern Territory (12%) and the Australian Capital Territory (17%), and the most common industry in ACT was technicians and trade workers (20%).

There were a few substantial differences by jurisdiction in terms of socio-economic status (SES). Half (49%) of the claims in Tasmania and nearly one-third (30%) in South Australia originated in the most dis-advantaged quintile of postcodes, compared to 3% and 9% in the most advantaged quintile. Advantaged postcodes were also overrepresented in Western Australia, comprising one-third of claims (31%) compared to 4% from the most dis-advantaged quintiles.

The table also includes descriptive statistics for a version of the 2010 dataset that includes those whose compensation benefits were two weeks or less. These statistics were included to allow for comparison with the study dataset, to determine whether the censuring of claims resulted in any major changes in the representativeness of the study data. The main concern was that excluding claims of two weeks or less would remove many 'minor' injury claims and change the nature of the dataset.

Descriptive statistics of the study dataset, which excluded claims of less than two weeks severity, was compared to all accepted claims made in 2010. The comparison was made to identify ways in which excluding shorter time loss and treatment-only claims changed the dataset. Injury type varied slightly between the two datasets. 'Other trauma' was much less common in the study dataset (16% to 28%) while fractures (11%) and mental health disorders (8%) were more common (compared to 7% and 4%) (Table 3). The difference in injury breakdown is not unexpected given the exclusion of claims for two weeks or less of compensated work time loss. Such injuries would be more likely to be 'minor', and would fall under the 'other trauma' category, while fractures take several weeks to heal and mental health disorders have been associated with longer work absences (Smith et al., 2014).

Table 3. Claims injury breakdown, all accepted claims compared to accepted claims with over two weeks of compensated time loss.

	Musculoskeletal % (*n*)	Back pains and strains, % (*n*)	Other trauma % (*n*)	Fractures % (*n*)	Mental health disorders, % (*n*)	Other illness % (*n*)
All accepted claims	37.6% (87,798)	18.2% (42,462)	28.4% (66,302)	6.6% (15,379)	4.1% (9,456)	5.1% (11,977)
Accepted claims, > two weeks compensated time loss	43.0% (39,718)	16.5% (15,265)	15.5% (14,347)	11.3% (10,419)	7.5% (6,896)	6.3% (5,786)

All data is for claims accepted in the 2010 calendar year.

Claimant demographics were similar across the datasets (Table 4), although the average age of workers included in the Introductory Report dataset was slightly older than that in the 2010 dataset. Overall, this analysis suggests that the Introductory Report dataset is broadly

representative of workers receiving compensation in Australia for the 2010 accident year, but that the injury mix included in this analyses has a higher proportion more ‘serious’ conditions.

Table 4 Claim characteristics by jurisdiction.

	Number of claimants	Age in years (SD)	Female % (*n*)	Most common injury, % (*n*)	Most common industry, % (*n*)	Most common profession, % (*n*)	Most advantaged quintile, % (*n*)	Most dis-advantaged quintile, % (*n*)
All accepted claims	233,391	40.2 (13.1)	36.2% (84,500)	MSK 37.6% (87,798)	Manufacturing 15.4% (35,872)	Labourer 22.5% (52,318)	19.6% (39,102)	17.1% (34,054)
Accepted claims with > two weeks compensated time loss	92,431	42.1 (12.7)	37.6% (34,769)	MSK 43.0% (39,718)	HC/SA 15.4% (14,266)	Labourers 23.6% (21,807)	18.4% (14,939)	17.8% (14,388)
New South Wales	31,246	42.2 (12.7)	38.2% (11,935)	MSK 42.8% (13,362)	HC/SA 14.8% (4,613)	Labourers 20.9% (6,533)	21.1% (5,282)	20.0% (5,004)
Victoria	18,851	43.2 (12.4)	37.5% (7,069)	MSK 42.1% (7,929)	Manufacturing 18.5% (3,487)	Labourers 23.3% (4,400)	18.4% (3,047)	15.8% (2,608)
Queensland	21,719	41.3 (12.8)	37.6% (8,178)	MSK 53.9% (11,714)	HC/SA 15.7% (3,405)	Labourers 27.4% (5,911)	12.9% (2,794)	16.6% (3,611)
South Australia	6,403	42.8 (12.1)	41.6% (2,665)	MSK 48.3% (3,087)	HC/SA 21.4% (1,378)	Labourers 21.9% (1,402)	9.3% (455)	30.0% (1,466)
Western Australia	9,227	41.7 (13.0)	33.1% (3,058)	Back pain/strains 40.9% (3,770)	HC/SA 15.7% (1,450)	Labourers 24.6% (2,267)	31.3% (2,856)	3.6% (331)
Tasmania	2,489	42.0 (12.3)	38.9% (969)	Back pains/strains 37.6% (935)	HC/SA 17.9% (445)	Labourers 31.9% (793)	3.3% (81)	49.2% (1,222)
Northern Territory	1,051	40.3 (13.3)	30.6% (322)	MSK 39.3% (413)	Construction 11.7% (123)	Labourers 22.7% (239)	19.1% (179)	15.2% (143)
Australian Capital Territory*	1,445	339.8 (13.0)	39.7% (573)	MSK 48.3% (664)	Construction 17.4% (252)	Tech/trade workers 19.8% (286)	-*	-*

Unless stated, data in this table is for claims greater than 10 days cumulative time loss. All data presented is for claims made in the 2010 calendar year. SD: standard deviation; *n*: number; MSK: Musculoskeletal injury; HC/SA: Healthcare and Social Assistance; *Advantage/disadvantage excluded for ACT as this information was only provided for those on the government compensation scheme. Volumes may not sum correctly due to missing data.

Compensated time loss recovery curves

The proportion of claimants whose compensated time loss durations met each milestone is presented in Table 5. Recovery curves are illustrated in Figure 1. Differences between jurisdictions are substantial. More than half of Victorian claimants received at least three months of compensated time loss payments (52%, the highest proportion at this point) compared to less than a third in Tasmania (31%, the lowest proportion at this point). Differences in proportion receiving one and two years' worth of time loss payments were even greater; four times as many Victorian claimants received one year's worth of compensation compared to Queensland claimants (26% to 6%) and 16% of Victorian claimants received two years of compensation compared to 1% in Queensland. However, neither these figures nor the recovery curves take into account differences between claimants by jurisdiction described in Table 4 and Table 5.

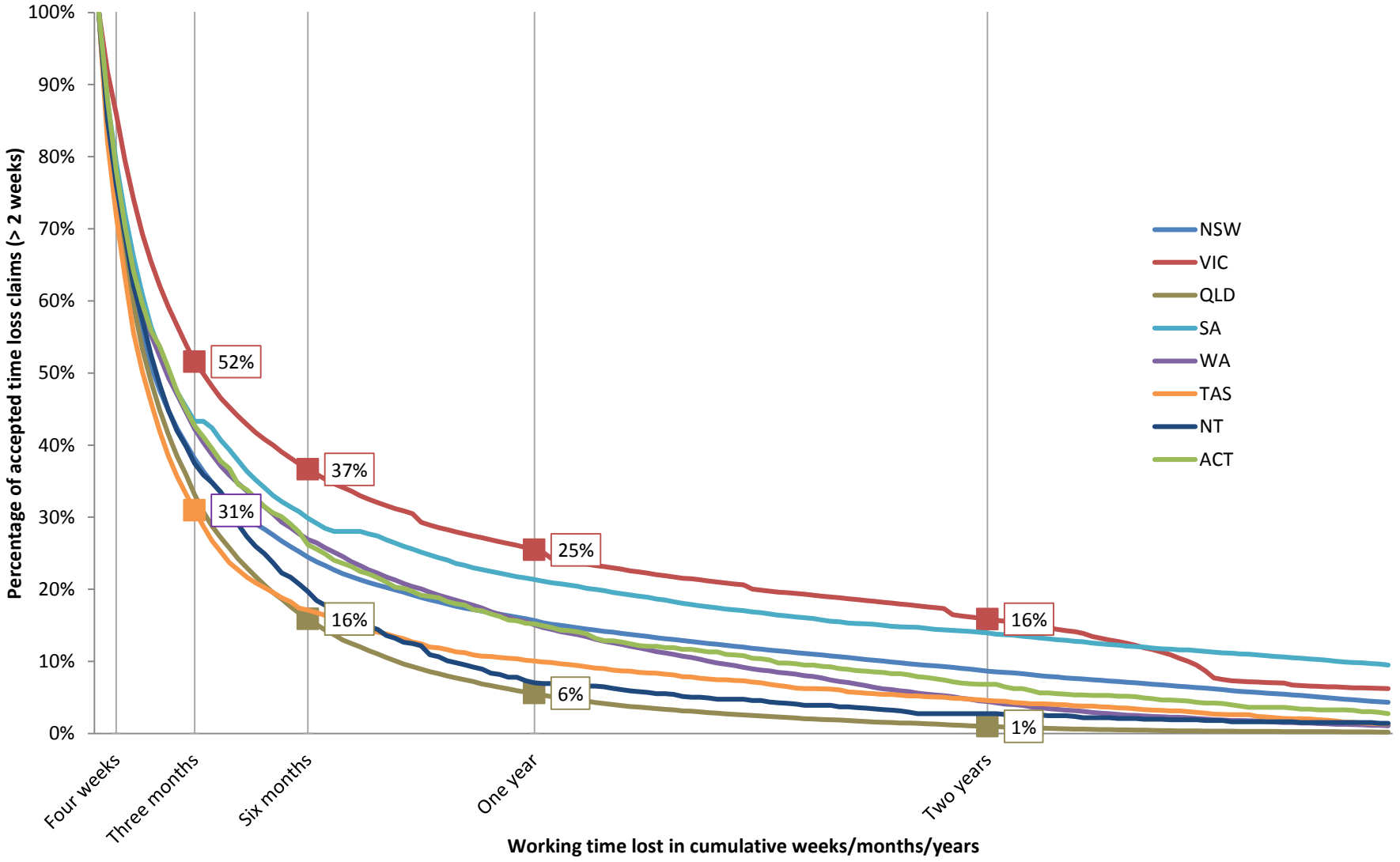
There are some interesting trends to the recovery curves that suggest the dataset and methodology are valid. For instance, workers' compensation payments in Victoria cease at 130 weeks pending a work capacity test, unless the claimant is assessed to be indefinitely incapable of RTW. Beginning around 115 weeks, the proportion of claimants still receiving time loss payments begins to diminish at an accelerated rate before coming to an abrupt halt at 130 weeks and remaining relatively stable thereafter. The trend was not observed in any other jurisdiction (for more information on policy differences between jurisdictions, see Safe Work Australia, 2014).

Table 5. Mean duration of compensated work time loss, and proportion of workers with duration of compensated time loss durations that exceed milestones.

	Mean compensated time loss in weeks (SD)	% off at four weeks (*n*)	% off at three months (*n*)	% off at six months (*n*)	% off at one year (*n*)	% off at two years (*n*)
Total	28.3 (47.3)	78.4% (72,483)	40.7% (37,665)	25.5% (23,566)	15.5% (14,290)	8.1% (7,493)
New South Wales	27.9 (45.5)	74.8% (23,368)	38.4% (12,010)	24.6% (7,688)	15.7% (4,916)	8.7% (2,706)
Victoria	43.8 (66.2)	87.3% (16,456)	52.1% (9,829)	36.8% (6,944)	25.6% (4,821)	15.9% (2,999)
Queensland	15.4 (21.7)	76.1% (16,534)	33.6% (7,300)	16.0% (3,484)	5.6% (1,220)	1.0% (218)
South Australia	38.9 (60.2)	79.2% (5,069)	43.3% (2,774)	29.8% (1,911)	21.3% (1,396)	14.0% (894)
Western Australia	24.6 (33.7)	78.3% (7,225)	43.3% (3,941)	27.1% (2,499)	15.1% (1,396)	4.5% (413)
Tasmania	19.5 (32.8)	73.2% (1,822)	31.1% (774)	17.1% (426)	10.0% (250)	4.6% (114)
Northern Territory	19.0 (28.3)	79.2% (832)	38.2% (401)	20.1% (211)	7.2% (76)	2.8% (29)
Australian Capital Territory	29.4 (43.9)	81.5% (1,177)	44.0% (636)	27.9% (403)	16.9% (244)	8.3% (120)

All data presented is for claims made in the 2010 calendar year that exceed 10 days compensated time loss.

Figure 1. Recovery curves, duration of cumulative compensated time loss by jurisdiction, claims made in 2010 with at least 2 weeks compensated time loss. Note that the ACT data includes both private and government schemes.



Compensated time loss by jurisdiction, controlling for known factors

Controlling for known covariates, state or territory of claim (jurisdiction[1]) remained strongly and significantly associated with time loss duration. Further, stepwise inclusion of control factors had no substantial effect on the significance, magnitude, or direction (i.e., whether outcomes improved or worsened) of time loss by jurisdiction. Differences by jurisdiction are illustrated in Figure 2. For a full table of regression outputs including all independent variables, please refer to the Appendix.

Similar to the findings of the recovery curve analysis, duration of compensated time loss was highest in Victoria and South Australia relative to the comparator state of New South Wales.

Injured Victorian workers had 88% greater odds of receiving income replacement at four weeks compared to injured NSW workers. This effect remained at time points from three months to two years post injury with the effect being of a smaller magnitude (32-41% greater odds) but still highly significant.

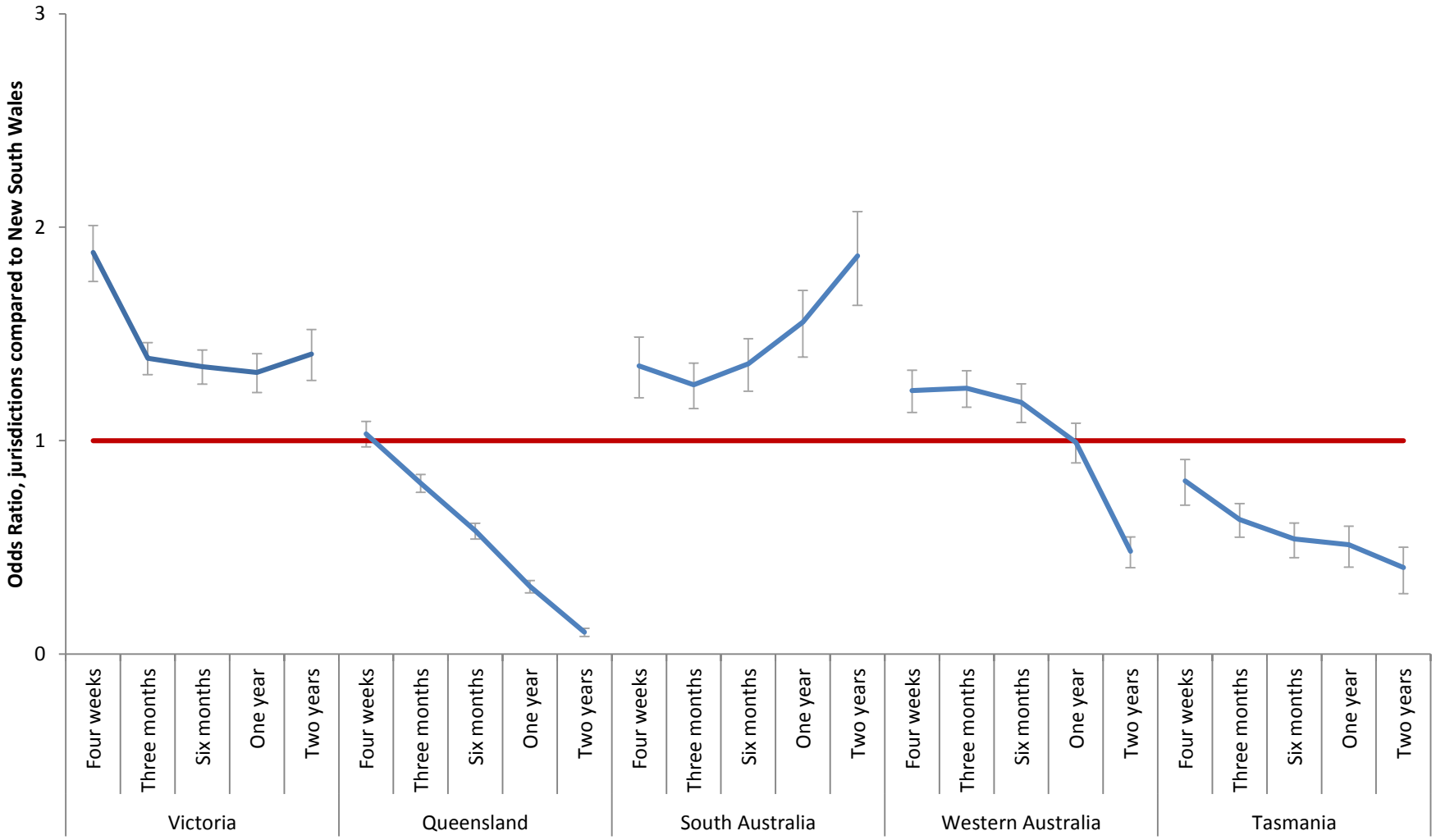
Injured South Australian workers had greater odds of receiving time loss benefits at every milestone relative to NSW workers, and this effect became stronger as time from injury increased (26% greater odds at three months rising to 87% greater odds at two years)

Tasmania and Queensland had the shortest durations of compensated time loss compared to New South Wales. The trends also suggest that injured workers in these states had significantly lower odds of receiving time loss benefits over time in comparison to New South Wales; at two years, injured Tasmanian workers had 146% lower odds of receiving time loss benefits than injured NSW workers while the equivalent figure for injured Queensland workers at two years was 871%.

Odds of receiving compensation for time loss in injured Western Australian workers were initially less than in NSW (18-25%) before “crossing over” at one year (i.e., being relatively similar to New South Wales) and having significantly greater odds than New South Wales by two years (107%).

[1] Regression analyses excluded claims originating in the Australian Capital and Northern Territories due to their small numbers, which limit the ability to conduct robust analysis with them.

Figure 2 Odds Ratios of compensated time loss reaching claim milestones at four weeks, three months, six months, one year, and two years by jurisdiction. Comparator jurisdiction for this analyses is New South Wales. Odds ratios account for demographic, regional, industry, occupation, and injury factors. Data are for claims of greater than 2 weeks duration made in 2010.



Other factors associated with work time loss

Regression analyses uncovered numerous significant relationships between worker, workplace, injury and socioeconomic factors and time lost payment durations. These relationships are noteworthy in their own right and also suggest that study data and methodology are valid. These factors also serve as “measuring sticks” by which to compare the magnitude of the impact of jurisdiction on the study outcome of compensated cumulative time loss. A full table of logistic regression outputs at each milestone is presented in the Appendix.

Worker factors had a significant impact on duration of compensated time loss. Injured female workers odds of reaching milestones were between 20-29% greater than injured male workers. Older injured workers also had greater odds; in contrast with those aged 25 to 34 years, younger workers’ (aged 15 to 24) had 29-118% lesser odds of reaching milestones, while older workers’ (aged 45 to 54) had 31-53% greater odds. The trend suggested a linear relationship with age: the older the age group, the more likely they were to meet compensated time loss milestones. The findings on gender and age are similar to those in existing research (Berecki-Gisolf, Clay, Collie, & McClure, 2012a; Berecki-Gisolf et al., 2012b; Street & Lacey, 2015).

Injured workers residing in the most dis-advantaged quintile of postcodes had greater odds of receiving time loss payments at each milestone and these odds increased with time from 7% at four weeks to 25% at two years. For injured workers residing in the most advantaged quintile the pattern was reversed with 5% lesser odds of receiving time loss payments at four weeks increasing to 25% at two years.

Workers making claims for mental health conditions had the greatest odds of reaching time loss milestones of the six injury categories. In these workers, odds of reaching compensated time loss milestones were 53-93% greater than the comparison category (musculoskeletal [MSK] injuries), similar to the findings of existing research (Smith et al., 2014). Notably, the difference was smallest at two years. This may reflect a change in the profile of the comparison group of workers with MSK conditions at these longer time periods post claims, including the potential for secondary mental health conditions to become more prevalent in longer duration MSK claims.

This is supported by evidence that workers with a physical injury are at increased risk of secondary mental health disorders such as anxiety, depression, and Post-Traumatic Stress Disorder (PTSD) (Grant, O'Donnell, Spittal, & Studdert, 2013). Qualitative evidence suggests this may be the result of chronic pain, opiate dependency, loss of work, impairment, financial problems, and stress of dealing with the compensation scheme and health systems (Brijnath et al., 2014). Unfortunately, the dataset only includes the injury for which the worker is claiming compensation and does not record co-morbidities occurring during the life of a claim, which would enable a more nuanced analyses.

Compared to musculoskeletal injuries, workers with back pain/strains had lesser odds of reaching the four week milestone (7%), but greater odds at all points between six months and two years (7-19%). Outcomes were 45% greater for fractures at four weeks but were significantly and progressively improved at every following milestone (17% at three months to 42% at two years). Odds of reaching outcomes were significantly lesser at all points for other types of trauma (52-89%) and occupational illness (18-157%) than for the MSK comparator.

Injured workers from manual labour industries generally spent more time on compensation. For instance, odds of reaching time loss milestones were 43-82% greater among injured workers in agriculture, forestry, and fishing industries, 30-46% poorer in mining, and 53-97% poorer in construction than in the comparison category (health care and social assistance). The finding is similar to that of existing research (Berecki-Gisolf et al., 2012b; Krause et al., 2001; Lilley, Davie, Ameratunga, & Derrett, 2012).

Injured workers residing in major cities appeared to have greater odds of reaching time loss milestones than workers from more rural and remote post codes. Given the numerous comparisons for remoteness (four categories plus one comparison factor and five milestones) and that the associations are not always significant, any confidence in a real and independent relationship between greater remoteness and better RTW outcomes is tenuous. Nevertheless, there was uniformity in the direction of the relationship, and more remote areas had greater magnitude of effect. Further, this relationship was found while controlling for jurisdiction and regional SES, factors for which remoteness may have been a proxy. The consistency in association highlights a potential area for further investigation.

Magnitude of impact of jurisdiction

To compare the relative importance of factors associated with duration of compensated time loss (ignoring direction of association), particularly the impact of jurisdiction compared to other factors, the ten variables with the greatest impact on compensated time loss at each milestone are presented in Table 6 below. Caution is advised with interpreting the analyses in this section as there is considerable overlap in confidence intervals. This section is not intended as a ranking system.

The impact of jurisdiction becomes increasingly strong as both an absolute and relative factor affecting duration of compensated time loss over time post injury. For instance, at four weeks there are only two jurisdictions among the ten most important factors (Victoria and South Australia) and their standardised ORs range between 35% and 88%. By two years, there are four jurisdictions among the top ten factors (South Australia, Western Australia, Tasmania, and Queensland) with standardised ORs range between 87% and 871%. This suggests that jurisdiction level policy has a more substantial impact on total duration of compensated time loss in longer duration claims than in shorter duration claims.

Table 6 Ten factors with greatest impact on duration of compensated time loss at each milestone, standardised OR (CI); jurisdictions in bold, claims made in 2010

	Variables with largest impact as indicated by standardised Odds Ratio	Standardised Odds Ratio (99% CI)		Direction of effect
Four weeks	**Victoria**	**88%**	**(76-102)**	**Poorer**
	Mental health claim	89%	(67-113)	Poorer
	Other trauma claim	69%	(59-80)	Better
	Agriculture, forest, fishing industry	58%	(35-86)	Poorer
	Construction industry	55%	(38-74)	Poorer
	Mining industry	46%	(22-75)	Poorer
	Fracture claim	45%	(34-58)	Poorer
	Arts and recreation service industry	38%	(13-70)	Poorer
	Aged 55+	37%	(27-48)	Poorer
	South Australia	**35%**	**(22-50)**	**Poorer**
Three months	Illness claim	130%	(111-156)	Better
	Other trauma claim	89%	(78-101)	Better
	Mental health claim	89%	(74-105)	Poorer
	Tasmania	**58%**	**(40-80)**	**Better**
	Aged 15-24	53%	(42-66)	Better
	Construction industry	53%	(39-68)	Poorer
	Aged 55+	52%	(43-62)	Poorer
	Agriculture, forest, fishing industry	45%	(27-66)	Poorer
	Victoria	**39%**	**(31-46)**	**Poorer**
	Aged 45-54	38%	(30-64)	Poorer
Six months	Illness claim	151%	(124-182)	Better
	Mental health claim	93%	(77-110)	Poorer
	Tasmania	**86%**	**(59-116)**	**Better**
	Other trauma claim	79%	(67-92)	Better
	Queensland	**73%**	**(63-85)**	**Better**
	Aged 15-25	65%	(50-81)	Better
	Construction industry	63%	(46-62)	Poorer
	Aged 55+	58%	(47-70)	Poorer
	Very remote postcode	54%	(10-116)	Better
	Aged 45-54	48%	(38-58)	Poorer
One year	**Queensland**	**215%**	**(188-246)**	**Better**
	Very remote postcode	167%	(55-359)	Better
	Illness claim	157%	(121-199)	Better

	Tasmania	**95%**	**(62-135)**	**Better**
	Aged 15-25	95%	(72-122)	Better
	Mental health claim	91%	(73-111)	Poorer
	Construction industry	77%	(55-102)	Poorer
	Other trauma claim	59%	(46-74)	Better
	Wholesale trade industry	57%	(35-83)	Poorer
	Aged 55+	56%	(42-70)	Poorer
Two years	**Queensland**	**871%**	**(706-1,063)**	**Better**
	Very remote postcode	157%	(15-475)	Better
	Tasmania	**146%**	**(89-221)**	**Better**
	Illness claim	133%	(91-185)	Better
	Aged 15-25	118%	(81-162)	Better
	Western Australia	**107%**	**(79-140)**	**Better**
	Construction industry	97%	(65-135)	Poorer
	South Australia	**87%**	**(66-110)**	**Poorer**
	Agriculture, forest, fishing industry	82%	(43-133)	Poorer
	Information media and telecommunications industry	78%	(16-171)	Poorer

Implications

This report presents evidence that the state or territory in which a work-related compensation claim is made has a substantial and independent impact on the duration of compensation time loss and, by proxy, return to work. This effect persists even after controlling for demographic, socio-economic, employment and injury-related factors known to affect duration of compensated time loss. Furthermore, the magnitude of jurisdictions' impact on the duration of compensated time loss payments was often comparable to or greater than that of other factors known to impact on return to work outcomes.

The findings suggest that workers' compensation scheme design and scheme management ("policy and practice") have a major effect on RTW outcomes for injured Australian workers receiving compensation benefits. Unlike factors such as socio-economic status or injury type, policy and practice are highly modifiable. Prior research has demonstrated that modifications to compensation scheme management practices such as claims handling can have a positive impact on outcomes in Australian injury compensation settings (Schaafsma et al., 2012). The present findings suggest that changes to scheme design and management have the potential to substantially improve RTW outcomes and reduce duration of compensated time loss for injured workers in some Australian states and territories.

The report's findings should not be interpreted as a blanket statement on the performance of the included jurisdictions in RTW. As stated in the introduction, the aim of the ComPARE Project is not to create a 'league table' comparisons of state and territory performance. Rather the objective is to understand the impact of policy and practice on RTW outcomes. Workers' compensation policy is composed of myriad and complex rules, each of which can work to improve or worsen RTW outcomes. Future analyses in the ComPARE study will seek to identify effective and ineffective policy.

Strengths and limitations

As noted in the methods, the outcome used in this study is duration of compensated time loss payments for which an employer was reimbursed, a proxy for RTW. One of the limitations of using this outcome is that payments may stop for reasons other than successful RTW, such as retirement, moving to another compensation scheme, enrolling in education, or an employer may fail to claim reimbursement. However, the NDS is also currently the only national, population-based dataset that enables inter-jurisdictional comparison of the type undertaken in this study.

While regression analyses controlled for as many factors known to affect RTW as possible using the dataset available, there remains a possibility that factors other than policy and practice may explain the observed effect of jurisdiction. For example, macroeconomic circumstances such as unemployment rates may vary between jurisdictions and were not specifically accounted for in this study. It should also be noted that this study does not

identify specific legislative or policy settings affecting compensated time loss and return to work. This will be the subject of future analyses in the ComPARE project.

Jurisdictional differences may also reflect differences based on who is eligible, who applies, and who is accepted to workers' compensation schemes. For instance, high rates of claims acceptance would increase not only the proportion of claims accepted but may incentivise less seriously injured workers to apply, while coverage of mental health conditions varies between jurisdictions. As far as possible, the regression analyses included variables that account for these factors (e.g., socioeconomic status, full-time / part-time work status, claims for mental health) and their inclusion did not negate the effect of jurisdiction on outcomes.

NDS data are limited in that they only record the primary injury or illness responsible for the claim; there is no information on co-morbid or secondary health issues. Other studies underway are linking compensation data with health system data, such as hospital records, to quantify the impact of co-morbid and secondary health conditions on claim-relevant outcomes (Hassani Mahmooei, Berecki-Gisolf, Hahn, & McClure, 2014).

Next steps

Future analyses in the ComPARE project will seek to determine the impact of specific policy and practice settings on RTW outcomes. The following next steps are planned:

1) Rating each of the participating jurisdictions on a set of compensation scheme design indicators/factors that can then be used in analysis to identify the impact of specific policy settings on RTW outcomes.
2) Further subgroup analyses to determine if the jurisdiction effect demonstrated in this initial analysis occurs in specific cohorts of workers. This will include examining outcomes between jurisdictions in cohorts such as older or younger workers, occupations such as public emergency service personnel or educators, and workers with specific conditions such as fractures, back pain and/or mental health conditions.

Over the longer term, the project team seek to develop a more detailed and comparable dataset that includes payment, services, and hospital admissions data from participating jurisdictions. Most of the participating jurisdictions have such data, albeit in various formats. One advantage of these additions, particularly payment-level data, is that they can be used to identify more instances of compensated time loss and unsuccessful or partial RTW scenarios (Dasinger et al., 1999). This level of detail will also be required to conduct international comparison studies with our Canadian and New Zealand colleagues.

Summary and conclusion

The ComPARE project is investigating the comparative effectiveness of workers' compensation policy on return to work outcomes. This report analysed cumulative durations of compensated work time loss from the NDS dataset to assess whether the jurisdiction in which a claim is made has an independent effect on duration of compensated time loss, a proxy marker of return to work. Recovery curves illustrated substantial differences between jurisdictions over time while regression analyses isolated the effect of jurisdiction to provide evidence for an independent impact of policy and practice. Other important factors included claimant age and gender, SES, remoteness, employer industry, and injury type. While this report does not identify specific policies and practices that improve RTW outcomes, the findings justify further research into their impact.

Appendix

Table 7. Logistic regression outputs. The table presents Odds Ratios [99% confidence interval] of receiving time loss benefits across five time points post injury, for the factors included in the regression model. All data are for claims of greater than two weeks duration accepted in the 2010 calendar year.

Variables in equation	Four weeks	Three months	Six months	One year	Two years
Jurisdiction (Reference: New South Wales)					
Victoria	1.88** (1.76-2.02)	1.39** (1.31-1.46)	1.35** (1.27-1.43)	1.32** (1.23-1.41)	1.41** (1.29-1.53)
Queensland	1.03 (0.97-1.09)	0.80** (0.76-0.84)	0.58** (0.54-0.62)	0.32** (0.29-0.35)	0.10** (0.09-0.12)
South Australia	1.35** (1.22-1.50)	1.26** (1.16-1.37)	1.36** (1.24-1.49)	1.56** (1.41-1.72)	1.87** (1.66-2.10)
Western Australia	1.24** (1.14-1.34)	1.25** (1.16-1.33)	1.18** (1.09-1.27)	0.99 (0.90-1.09)	0.48** (0.42-0.56)
Tasmania	0.81** (0.71-0.93)	0.63** (0.56-0.72)	0.54** (0.46-0.63)	0.51** (0.43-0.62)	0.41** (0.31-0.53)
Gender (Reference: male)					
Female	1.22** (1.15-1.30)	1.28** (1.22-1.35)	1.29** (1.22-1.37)	1.27** (1.19-1.37)	1.20** (1.10-1.32)
Advantage/dis-advantage					
Most dis-advantaged quintile	1.07* (1.01-1.14)	1.13** (1.07-1.19)	1.17** (1.10-1.24)	1.20** (1.12-1.29)	1.25** (1.14-1.37)
Most advantaged quintile	.95 (0.90-1.01)	0.88** (0.83-0.93)	0.85** (0.80-0.90)	0.81** (0.75-0.87)	0.83** (0.75-0.92)
Age (Reference: 26 to 35 years)					
15 to 24 years	0.77** (0.72-0.84)	0.65** (0.60-0.70)	0.61** (0.55-0.67)	0.51** (0.45-0.58)	0.46** (0.38-0.55)
35 to 44 years	1.21** (1.13-1.29)	1.27** (1.19-1.35)	1.38** (1.29-1.48)	1.43** (1.31-1.56)	1.43** (1.27-1.60)
45 to 54 years	1.31** (1.22-1.40)	1.38** (1.30-1.46)	1.48** (1.38-1.58)	1.51** (1.39-1.64)	1.53** (1.37-1.71)
55 years and over	1.37** (1.27-1.48)	1.52** (1.43-1.62)	1.58** (1.47-1.70)	1.56** (1.42-1.70)	1.54** (1.36-1.73)
Remoteness (Reference: Major city)					
Inner region	1.02 (0.96-1.09)	0.95* (0.90-1.00)	0.93* (0.88-0.99)	0.93 (0.87-1.00)	0.96 (0.88-1.06)
Outer region	1.00 (0.93-1.09)	0.93* (0.86-0.99)	0.91* (0.84-0.98)	0.84** (0.76-0.93)	0.84** (0.73-0.97)
Remote	1.04 (0.85-1.27)	0.87 (0.73-1.03)	0.84 (0.69-1.03)	0.73** (0.56-0.96)	0.62* (0.42-0.93)
Very remote	1.25 (0.91-1.72)	0.87 (0.67-1.13)	0.65** (0.46-0.91)	0.38** (0.22-0.65)	0.39* (0.17-0.87)

*: $p \leq .01$; **: $p \leq .001$

	Four weeks	Three months	Six months	One year	Two years
Part time/Full time (Reference: Part time)					
Full time	0.92** (0.86-0.97)	0.96 (0.91-1.01)	0.93* (0.88-0.99)	0.97 (0.90-1.04)	0.99 (0.90-1.09)
Industry (Reference: Health care and social assistance)					
Agriculture, forestry, and fishing	1.58** (1.35-1.86)	1.45** (1.27-1.66)	1.43** (1.23-1.66)	1.47** (1.22-1.78)	1.82** (1.43-2.33)
Mining	1.46** (1.22-1.75)	1.31** (1.13-1.52)	1.30** (1.09-1.54)	1.34** (1.09-1.67)	1.30 (0.95-1.78)
Manufacturing	1.17** (1.06-1.30)	1.15** (1.05-1.25)	1.23** (1.11-1.36)	1.32** (1.17-1.50)	1.45** (1.23-1.71)
Electricity, gas, water, and waste services	1.09 (0.86-1.39)	1.07 (0.87-1.32)	1.00 (0.78-1.29)	1.00 (0.72-1.37)	0.99 (0.64-1.54)
Construction	1.55** (1.38-1.74)	1.53** (1.39-1.68)	1.63** (1.46-1.82)	1.77** (1.55-2.02)	1.97** (1.65-2.35)
Wholesale trade	1.20** (1.05-1.37)	1.29** (1.16-1.45)	1.42** (1.26-1.61)	1.57** (1.35-1.83)	1.73** (1.42-2.11)
Retail trade	1.16* (1.02-1.31)	1.17** (1.05-1.30)	1.20** (1.06-1.35)	1.29** (1.12-1.50)	1.42** (1.17-1.73)
Accommodation and food services	1.24** (1.10-1.40)	1.22** (1.10-1.35)	1.28** (1.14-1.44)	1.36** (1.17-1.57)	1.58** (1.30-1.91)
Transport, postal, and warehousing	1.15* (1.02-1.30)	1.09 (0.98-1.21)	1.15* (1.02-1.29)	1.24** (1.08-1.43)	1.35** (1.11-1.63)
Information media and telecommunications	0.98 (0.73-1.31)	1.20 (0.93-1.55)	1.35* (1.01-1.80)	1.40 (0.99-1.97)	1.78** (1.16-2.71)
Financial and insurance services	1.24 (0.96-1.58)	1.19 (0.97-1.45)	1.03 (0.82-1.30)	1.04 (0.78-1.38)	1.11 (0.76-1.62)
Rental, hiring, and real estate services	1.24 (0.97-1.57)	1.18 (0.97-1.44)	1.14 (0.91-1.44)	1.31 (1.00-1.73)	1.45* (1.01-2.10)
Professional, scientific, and tech services	1.17 (0.99-1.39)	1.16* (1.01-1.34)	1.25** (1.06-1.47)	1.16 (0.95-1.42)	1.15 (0.87-1.52)
Administrative and support services	1.23** (1.08-1.39)	1.30** (1.17-1.45)	1.36** (1.21-1.54)	1.40** (1.20-1.62)	1.57** (1.28-1.91)
Public administration and safety	1.03 (0.91-1.16)	1.07 (0.96-1.18)	1.06 (0.94-1.18)	1.02 (0.89-1.18)	0.98 (0.80-1.20)
Education and training	0.87* (0.77-0.98)	0.91 (0.82-1.01)	0.92 (0.81-1.03)	0.96 (0.83-1.12)	1.13 (0.91-1.39)
Arts and recreation services	1.38** (1.13-1.70)	1.16 (0.98-1.37)	1.07 (0.88-1.30)	1.18 (0.93-1.49)	1.24 (0.90-1.70)
Other services	1.32** (1.13-1.53)	1.34** (1.18-1.52)	1.36** (1.18-1.57)	1.48** (1.25-1.76)	1.64** (1.31-2.05)

*: $p \leq .01$; **: $p \leq .001$

	Four weeks	Three months	Six months	One year	Two years
Occupation (Reference: labourers)					
Managers	0.99 (0.88-1.12)	0.90* (0.81-0.99)	0.87** (0.78-0.97)	0.88 (0.77-1.01)	0.89 (0.75-1.05)
Professionals	1.00 (0.91-1.11)	0.93 (0.85-1.00)	0.87** (0.80-0.96)	0.83** (0.74-0.93)	0.80** (0.69-0.94)
Technicians and trades workers	0.91** (0.85-0.98)	0.89** (0.84-0.95)	0.88** (0.82-0.95)	0.87** (0.80-0.94)	0.90 (0.80-1.00)
Community and personal service workers	0.95 (0.87-1.04)	0.88** (0.81-0.94)	0.88** (0.81-0.96)	0.88* (0.79-0.98)	0.90 (0.78-1.04)
Clerical and administrative workers	1.00 (0.89-1.13)	0.86** (0.78-0.95)	0.85** (0.76-0.95)	0.87* (0.76-0.99)	0.87 (0.73-1.04)
Sales workers	0.94 (0.84-1.07)	0.91 (0.82-1.01)	0.92 (0.82-1.04)	0.92 (0.80-1.06)	0.85 (0.70-1.02)
Machinery operators and drivers	1.01 (0.93-1.09)	1.01 (0.94-1.08)	0.99 (0.92-1.07)	0.93 (0.85-1.02)	0.93 (0.82-1.05)
Injury/illness (Reference: musculoskeletal injuries					
Fractures	1.45** (1.34-1.58)	0.85** (0.80-0.91)	0.76** (0.71-0.82)	0.75** (0.68-0.82)	0.71** (0.62-0.80)
Other trauma	0.59** (0.56-0.63)	0.53** (0.50-0.56)	0.56** (0.52-0.60)	0.63** (0.57-0.69)	0.66** (0.58-0.74)
Back pains/strains	0.93* (0.87-1.00)	1.00 (0.94-1.05)	1.07* (1.01-1.14)	1.12** (1.04-1.20)	1.19** (1.08-1.31)
Mental health disorders	1.89** (1.67-2.13)	1.89** (1.74-2.05)	1.93** (1.77-2.10)	1.91** (1.73-2.11)	1.53** (1.35-1.75)
Other diseases	0.85** (0.77-0.94)	0.43** (0.40-0.48)	0.40** (0.35-0.44)	0.39** (0.33-0.45)	0.43** (0.35-0.52)

*: $p \leq .01$; **: $p \leq .001$

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