RESEARCH EXAMINING PATHWAYS TO SECONDARY PSYCHOLOGICAL INJURY

FINAL REPORT

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MEDICINE

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DATA AND ETHICS

Several data sources were used in this project and are described below:

Activity	Data	Ethics Approval Summary
Literature review	Literature	Not Required
Stakeholder engagement	Focus groups conducted for this project	Monash University Human Research Ethics Committee Project ID 47100
Injured worker perspectives	Workers' Voice Study	Monash University Human Research Ethics Committee Project ID 38157
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Healthy Working Lives

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EXECUTIVE SUMMARY

Mental health and psychological injury have become a growing priority for Australian workplaces. Workers' compensation claims for primary mental health conditions last significantly longer than claims for physical conditions and have increased to over 10% of claims in 2022-23.

Concerns have also been raised about the impact of secondary psychological injury on worker recovery and return to work, claims costs and compensation scheme sustainability. Unlike a primary psychological injury that stems from an event or accumulation of workplace stressors, secondary psychological injury may be due to the ongoing impact of primary injury, or exposure to stressors during the rehabilitation and return to work process. However, while some of the features of secondary psychological injury are now understood, there is currently no commonly accepted working definition that allows consistent understanding of secondary psychological injury. In this project, the research team conducted a targeted literature review, interviews with key industry stakeholders, a survey of injured workers, and quantitative analysis of workers' compensation claims and payments data to comprehensively understand and define secondary psychological injury.

WHAT IS "SECONDARY PSYCHOLOGICAL INJURY"?

A working definition of secondary psychological injury was developed by the research team based on project findings and incorporating feedback from the Safe Work Australia Strategic Issues Group (SIG) on Workers' Compensation.

We note that the term "secondary psychological injury" has a specific meaning in workers' compensation legislation in some Australian jurisdictions. Such legislative definitions typically indicate a diagnosed psychological condition with onset subsequent to a primary physical injury, reflecting a 'narrower' interpretation than that developed in this project. Reflecting project findings, we propose a working definition that aims to enhance the ability of workers' compensation schemes to determine prevalence, monitor trends, identify cohorts at risk, develop interventions and screening tools, and assess the impact of secondary psychological injury in a way that is consistent, relevant and transferable between jurisdictions.

Adopting a consistent working definition of secondary psychological injury ensures clarity, provides a reference point, and facilitates progress toward minimising its occurrence and impact.

In the Australian workers' compensation setting, secondary psychological injuries:

- Are characterised by either the new onset of psychological symptoms or the exacerbation of pre-existing psychological symptoms, after a workers' compensation claim begins. The beginning of the claim is defined as when the worker lodges the claim with their employer, marking the formal point of "entry" into workers' compensation processes.
- Have multiple factors contributing to onset, including worker psychological and social characteristics, claims processes and events, the injury event and its consequences, employer and healthcare actions and interactions, or a combination of these things.
- May be triggered by a specific event at any time during the claim, or by the accumulation of exposure to contributing factors over time, however prevalence is greater as claim duration extends.
- Most often presents with episodic symptoms which most commonly include symptoms of anxiety and depression, but may also encompass other aspects of psychological health.
- Can have a very substantial impact on the worker's function and ability to work and participate in normal activities.
- Do not require a diagnosis of a mental disorder and do not need to meet legislative definitions of secondary or primary psychological injury.

WHAT ARE THE MAIN DRIVERS OF SECONDARY PSYCHOLOGICAL INJURY?

Multiple compensation system, personal and workplace factors contribute to secondary psychological injury. Stakeholders and injured workers repeatedly highlighted that uncertainty regarding compensation claim processes was a key contributor. Stakeholders also reported that when a worker "languishes" or "ruminates" about their recovery, financial circumstances, social interaction or any aspect of their life, they may be at higher risk of secondary psychological injury. This, accompanied by a loss of control over their financial and healthcare decisions when engaged in compensation processes where decision making is undertaken by others (e.g., insurers), elevates the risk of secondary psychological harm. Evidence also points to financial stressors, pre-injury psychological ill health, and traumatic mechanisms of injury as potential key drivers of secondary psychological injury.

WHO ARE THE KEY STAKEHOLDERS WHEN CONSIDERING SECONDARY PSYCHOLOGICAL INJURY?

The importance of workplace colleagues, specifically an injured worker's line manager or direct supervisor, was highlighted as one of the key stakeholders with a strong influence that may contribute either to the development of, or prevention of, secondary psychological injury. The actions of the line manager at every stage of the claim, from immediately after injury through the return-to-work process, were considered important. The line manager was described as the "face" of the employer, and responsible for the worker's safety and recovery. Line managers (particularly in small businesses) were often reported as unfamiliar with workers' compensation and ill-equipped to handle the role of return-to-work coordinator.

Claims managers within insurers or claims agents are the other main stakeholder with a strong influence on the presentation of secondary psychological injury. The most frequently reported claim-related source of stress by injured workers was impersonal contacts with claims managers. Other stakeholders reported that unempathetic and inexperienced claims managers posed a significant risk to secondary psychological injury.

WHEN DOES SECONDARY PSYCHOLOGICAL INJURY OCCUR?

Secondary psychological injury does not appear to occur at specific times during a workers' compensation claim, but rather occurs due to events or the accumulation of exposures to adverse experiences throughout a claim. Stakeholders described three key components in relation to timing:

1. Identifying and addressing contributing factors sooner rather than later is very important for prevention or for reducing severity.
2. Key events, such as return to work attempts, can be challenging and stressful for workers and thus should be managed thoughtfully by insurers and employers.
3. Claim length is directly proportional to secondary psychological injury risk. That is, workers with longer claims are more likely to experience secondary psychological injury than workers early in their claim.

WHAT SCREENING TOOLS AND MONITORING METHODS ARE USED TO DETECT SECONDARY PSYCHOLOGICAL INJURY?

An array of psychosocial and psychological screening tools can and are currently used in the sector. Validated psychological screening questionnaires including the Kessler-6, Kessler-10, Depression Anxiety Stress Scale and the Orebro Musculoskeletal Pain Questionnaire were frequently cited. There were no tools specifically for secondary psychological injury, and some stakeholders noted that results of screening tools should be considered in context – a positive result from a given tool may not necessarily indicate a psychological injury or secondary psychological injury and could be indicative of poor pre-injury mental health. Stakeholders also reported that experienced claims manager or rehabilitation providers can be effective in identifying markers of secondary psychological injury, without formal screening processes. Administrative claims and services data can be used as a proxy indicator for identifying cases requiring further investigation and monitoring (e.g., when psychological medicines are being funded in a claim for shoulder pain might indicate a secondary problem) but have important limitations such as not capturing all health services and medicines used.

WHAT ARE THE MODIFIABLE ASPECTS OF THE WORKERS' COMPENSATION PROCESS THAT MAY MITIGATE SECONDARY PSYCHOLOGICAL INJURY?

Several aspects of the workers' compensation claims process could be modified to mitigate the risk of secondary psychological injury. Reducing worker uncertainty by providing information about worker entitlements, obligations and the overall function of the workers' compensation system was proposed as beneficial by several stakeholders. Upskilling claims managers and providing resources and training around communication, the workers' compensation process, and being able to offer clear explanations of processes may improve the claims experience of workers. Assisting employers to better understand their role in return to work may also improve recovery and reduce the risk of secondary psychological injury.

RECOMMENDATIONS FOR POLICY, PRACTICE AND FUTURE RESEARCH

Based on the findings of this project, several policy and practice recommendations are proposed. These recommendations are not intended to suggest a need for legislative reform. Rather they indicate actions that can be taken at a regulator and scheme level to modify, remove or introduce relevant policies and practices.

1

Adopt a national working definition of secondary psychological injury.

2

Develop more consistent approaches for risk screening (at an individual level) and monitoring (at a portfolio level).

3

Reduce uncertainty for workers.

4

Minimise repetitive or unnecessary information gathering exercises or assessments.

5

Consider offering additional support throughout the claims process to assist workers with pre-injury mental health conditions and those with long-duration claims.

The project also noted several major gaps in the evidence base, which if filled could support enhanced policy and program design.

The following research strategies are also recommended:

6

Explore the financial and economic impacts of secondary psychological injury and the impact this has on return to work.

7

Develop a better understanding of the mental health symptoms experienced by workers with secondary psychological injury.

8

Conduct a detailed investigation of current interventions being offered in the sector and the evidence for their effectiveness.

Further detail, including the rationale and anticipated benefits, of these recommendations is described in the following page.

Recommendation	Rationale	Anticipated Benefits
Recommendations for policy and practice		
1 Adopt a national working definition of secondary psychological injury	There is currently no nationally consistent definition of secondary psychological injury. Adopting a consistent working (not legislative) definition means that stakeholders can: i. Accurately determine prevalence or monitor changes in prevalence over time. ii. Identify cohorts of workers at greatest risk. iii. Develop effective interventions, services or programs focused on the key features of secondary psychological injury. iv. Identify or develop appropriate risk screening tools. v. Accurately assess the impacts of secondary psychological injury, including its effects on return to work and system sustainability. Scheme regulators and sector stakeholders could collaborate to agree on and adopt a working definition – the starting point for which has been defined through this research project.	Ability to monitor trends, identify cohorts at risk, develop interventions and screening tools, and assess the impact of secondary psychological injury in a way that is consistent, relevant and transferable between jurisdictions.
2 Develop consistent approaches for risk screening (at an individual level) and monitoring (at a portfolio level)	There are a variety of means for detecting secondary psychological injury. However, the use of these tools and methods is mainly limited to academic literature and siloed industry metrics. Many of the risk factors identified in this report are either already collected (e.g., a traumatic mechanism, younger age) or could be feasibly added to the claims triaging process (e.g., pre-claim use of mental health services or medicines). Other risk factors may be more challenging to collect (e.g., line manager attitudes and practices), but the sector could begin by adopting a set of basic risk factors for screening. Standardised monitoring at a portfolio level would provide a clearer picture of the scale of secondary psychological injury in Australia. For example, workers' compensation authorities could agree on a consistent set of health services payments data criteria (e.g., use of >2 mental health services for a physical injury claim within 6 months) that would act as a standard proxy measure of secondary psychological injury.	More effective risk screening could improve the ability to target interventions at an individual level to the specific risks identified (e.g., financial counselling for people in financial stress). Standardised portfolio-level monitoring could enable identification of key trends in secondary psychological injury or groups of workers at greater risk of developing secondary psychological injury.

Recommendation	Rationale	Anticipated Benefits
Recommendations for policy and practice		
3 Reduce uncertainty for workers	Stakeholders engaged in this research identified that uncertainty was a key driver of secondary psychological injury. Uncertainty may emerge from a variety of factors, including financial stress, worry about recovery, interacting with an unfamiliar system, and waiting for decisions that are out of the workers' control. Stakeholders could seek opportunities to reduce uncertainty for workers: i. Claims management organisations should make efforts to reduce wait times for decisions about eligibility, liability and funding for healthcare services. Where this is impractical, the reason for the wait time should be explained to the worker. ii. Claims management organisations, claims managers and workers' compensation authorities should provide a clear and simple explanation of the purpose of workers' compensation and workers' entitlements and obligations, written in non-adversarial and plain language (i.e., not "legalese"). iii. Healthcare providers treating injured workers with chronic pain should provide evidence-based education that provides clear and reasonable recovery expectations.	Greater worker certainty about claims management processes through reduced wait times (or explanations for wait times) could reduce the risk of increased stress or worry. Furthermore, an improved understanding of the workers' compensation setting and processes could reduce worker uncertainty. Consistent expectations about recovery and future capacity between healthcare providers and workers with chronic pain may reduce worker uncertainty.
4 Minimise repetitive or unnecessary information gathering exercises or assessments	Research findings suggest that workers repeating themselves or their injury being questioned through additional information gathering are sources of stress and potentially contribute to secondary psychological injury. Claims management stakeholders should ensure that questions of the worker are not unnecessarily repeated, particularly in cases of longer claims. However, claims managers should not avoid asking questions altogether – stakeholders reported "curious" claims managers, who asked how they could help or support the worker, were beneficial. Medical assessments were also noted as significant sources of stress. These should only be used where completely necessary, and if so, the purpose, steps and expected outcomes should be clearly explained to the worker in a transparent way to reduce their uncertainty.	Reducing the need for workers to repeat themselves may decrease stress, and a transparent process for necessary medical assessments may reduce both worker uncertainty and stress.

Recommendation	Rationale	Anticipated Benefits
Recommendations for policy and practice		
5 Consider offering additional support throughout the claims process to assist workers with pre-injury mental health conditions and those with long-duration claims	Findings suggest that workers with pre-injury mental health conditions and with long-duration claims are at high risk of developing secondary psychological injury. Stakeholders (e.g., claims management organisations, authorities) could consider offering universal opt-in access to additional supports (e.g., psychological support) upon entry to the system (i.e., those with pre-injury mental health conditions) and later in the claim process (i.e., those with long-duration claims). These services would be offered to all claimants at these times, so that they can be accessed without disclosing (or the pressure to disclose) mental health conditions or concerns that may not be related to the claim condition / injury.	Offering psychological and psychosocial support services to injured workers upon entry to the scheme will allow those with pre-injury mental health conditions (or those who need support) to access early support, reducing the risk of mental health condition exacerbation. Offering universal support reduces the stigma of requiring psychological support or being assessed to grant access to psychological support.
Recommendations for research		
6 Explore the financial and economic impacts of secondary psychological injury and the impact this has on return-to-work outcomes	Research findings suggest that secondary psychological injury has financial and economic impacts. However, there are limited precise estimates of the scale of this impact. Future research exploring these impacts, and the impact this has on claim outcomes, would be beneficial.	Precise measurements of the economic scale of secondary psychological injury may promote increased investment in solutions.
7 Develop a better understanding of the specific types of psychological injury experienced by workers	Research findings indicate that an array of possible psychological symptoms and conditions that injured workers may experience. Future research should seek to precisely identify and understand these symptoms, including their nature, severity and duration.	Clear identification of the nature, severity and duration of psychological symptoms experienced by injured workers could improve the precision of treatment and management.
8 A detailed investigation of current interventions being offered in the sector and the evidence for their effectiveness	Numerous interventions are currently being trialled in the Australian workers' compensation sector. Future research should aim to map conducted and planned interventions to understand their effectiveness, and what evidence these are based on. This would likely require close collaboration with claims management and rehabilitation organisations.	Understanding current and previous research efforts would reduce unnecessary or repetitive research and subsequent costs. Identifying and describing effective (and ineffective) interventions may improve costs for multiple stakeholders.

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BACKGROUND

Mental health and psychological injury has become a growing priority for Australian workplaces [1, 2]. Over 10% of workers' compensation claims in 2022-23 were for primary psychological injury, up from 6.4% in 2012-13 [3]. However, research also indicates that the prevalence of psychological symptoms in workers with existing psychological or physical workers' compensation claims may also be high: 2 in 5 Australian workers' compensation claimants report moderate or severe psychological distress [4].

Unlike a primary psychological injury that stems from an event (e.g., witnessing a traumatic event) or from an accumulation of psychological stressors in the workplace, secondary psychological injury develops after an initial physical injury or disease, and may be due to the primary injury's ongoing impact and / or exposure to stressors during the rehabilitation and return to work process. While some features of secondary psychological injury are understood, there is no commonly accepted working definition. Without an agreed working definition, it is very challenging to precisely identify symptom prevalence, the suitability of screening tools, identify key modifiable and non-modifiable drivers, and design effective interventions, programs or services.

Safe Work Australia (SWA) have highlighted "understanding worker psychological responses to injury to identify ways to assist them in their recovery and return to work" as a national priority for action [5]. In this project, the research team used a mixed-methods approach to address 7 primary research objectives established by SWA:

1

Define "secondary psychological injury" based on available evidence.

2

Provide a deeper understanding of the main drivers to an injured worker developing a secondary psychological injury during a workers' compensation claim.

3

Provide an understanding of the role of stakeholders in an injured worker developing (or preventing) secondary psychological injuries.

4

Provide evidence of what stages in the workers' compensation process secondary psychological injuries occur more frequently and the types of psychological injuries that most commonly occur.

5

Provide a greater understanding into the role and effectiveness of established or adapted screening tools in identifying or assessing the likelihood of an injured worker developing a secondary psychological injury.

6

Provide insights into the modifiable aspects of the workers' compensation process that can assist in preventing or minimising the risk of secondary psychological injuries.

7

Develop evidence-based recommendations on the practical application of this research (including critical knowledge gaps) to better support all stakeholders involved in workers' compensation claims management.

Four research activities were conducted to address these questions: (1) a targeted literature review, (2) interviews with key industry stakeholders, (3) re-analysis of recently collected lived experience survey and interview data from the Workers' Voice Study, and (4) quantitative analysis of workers' compensation claims and payments data from the Transitions Study.

These activities are described in this report, with further information available in the appendix. Each research activity was designed to address a different set of the research questions, and collectively to provide a comprehensive answer to those 7 questions (see Table 1).

TABLE 1. SUMMARY OF ACTIVITIES

Activity	Research Objectives						
	1. Define secondary psychological injury	2. Understand main drivers	3. Understand role of stakeholders	4. Evidence of stages of claim	5. Understanding of screening tools	6. Insights to modifiable aspects	7. Evidence-based recommendations
Activity 1. Literature review	●	●		●	●	●	●
A targeted review of academic and grey literature from Australia and nations with comparable workers' compensation systems (e.g., Canada) to define secondary psychological injury, identify modifiable and non-modifiable contributing factors, and evidence of the effectiveness of screening tools.							
Activity 2. Stakeholder engagement	●	●	●	●	●	●	●
Semi-structured interviews with key stakeholders in the workers' compensation sector and process to gain a deeper understanding of the factors influencing secondary psychological injury, key moments in the claims management process, the role of stakeholders, and the real-world use of screening tools.							
Activity 3. Lived experience		●	●			●	●
Analysis of a recently collected series of survey and interview data from a large national cohort of injured workers (the Workers' Voice Study) to understand secondary psychological injury from the worker's perspective.							
Activity 4. Claims data analysis		●		●			●
Quantitative analysis of a large sample of workers' compensation claims and payments linked with Medicare Benefits Scheme and Pharmaceutical Benefits Scheme data to identify the prevalence and timing of secondary psychological injury using both psychological services and medicines data.							

ACTIVITY 1: LITERATURE REVIEW

Peer reviewed research studies examining secondary psychological injury have predominantly been conducted in regions with cause-based workers' compensation systems (i.e., Australia, Canada). This activity involved targeted searches of academic and grey literature to address research objectives 1, 2, 4, 5, 6 and 7 (see Table 2).

TABLE 2. OBJECTIVES FOR ACTIVITY 1

Activity	Research Objectives						
	1. Define secondary psychological injury	2. Understand main drivers	3. Understand role of stakeholders	4. Evidence of stages of claim	5. Understanding of screening tools	6. Insights to modifiable aspects	7. Evidence-based recommendations
Activity 1. Literature review	●	●		●	●	●	●
A targeted review of academic and grey literature from Australia and nations with comparable workers' compensation systems (e.g., Canada) to define secondary psychological injury, identify modifiable and non-modifiable contributing factors, and evidence of the effectiveness of screening tools.							
Activity 2. Stakeholder engagement	●	●	●	●	●	●	●
Activity 3. Lived experience		●	●			●	●
Activity 4. Claims data analysis		●		●			●

1.1. APPROACH

1.1.1. SEARCHING, SCREENING AND SORTING

Much of the literature on secondary psychological injury in cause-based workers' compensation systems has been published by members of the research team or other Australian and international researchers in the research team's networks. A purposive snowball searching approach was therefore used to identify eligible literature. This process involved 4 steps:

1

Collating a list of existing relevant publications via national and international research networks.

2

Searching for additional relevant studies using the reference lists and citations of eligible studies.

3

Conducting focussed searches of academic literature databases.

4

Searching workers' compensation sector stakeholder websites (i.e., regulators and claims agents) to identify existing definitions of secondary psychological injury.

Literature was included that reported on workers with a workers' compensation claim for primary physical or psychological injury who experienced secondary psychological injury. Specifically, literature that included descriptions or definitions of, data on the prevalence of, or information on screening tools for secondary psychological injury, were included. All types of studies except abstracts and conference proceedings were included (see Table 3).

TABLE 3. LITERATURE REVIEW ELIGIBILITY CRITERIA

	Included	Excluded
Population	• Working age adults with workers' compensation claims	• Injured workers not in receipt of workers compensation, or where the majority of participants are not in receipt compensation from another type of system (e.g., motor vehicle accident)
Information	• Description or definitions of secondary psychological injury • Prevalence and factors affecting secondary psychological injury • Screening tools to identify secondary psychological injury	–
Study design	• Controlled trials • Cross-sectional studies • Cohort studies • Qualitative studies • Literature or systematic reviews • Opinion pieces or commentary	• Abstracts or conference proceedings

1.1.2. DATA EXTRACTION AND SYNTHESIS

Data from included studies was extracted to a Microsoft Excel spreadsheet with the assistance of the Elicit AI tool [6]. Extracted data were checked for accuracy and summarised manually. Standardised data extraction fields included:

- Study details: authors, title and DOI future reference
- Setting and sample: country of origin, study setting, sample size, sample details (e.g., condition)
- Definition of secondary psychological injury: How was secondary psychological injury defined? What criteria were used to classify secondary psychological injury?
- Secondary psychological screening tools: If a screening tool was used, which one? Was it effective?
- Key findings: Critical and relevant findings including prevalence of and factors associated with secondary psychological injury

A narrative synthesis approach was used to bring together findings from included studies.

1.2. FINDINGS

1.2.1. CHARACTERISTICS OF INCLUDED STUDIES

Searches identified 22 pieces of literature (21 academic papers, 1 report) representing 19 studies, published between 2000 and 2024 (see Table 4). Nearly half of included studies (n=11) were a prospective cohort design, 7 were a retrospective cohort, with 2 cross-sectional, 1 case control study and 1 literature review. 8 papers were from Australia or from regions with similar workers' compensation / personal injury arrangements: 6 from Canada, 4 from the USA, 2 from Taiwan, 1 from Korea and a single literature review. Over half of studies used administrative data as a data source – 3 in combination with survey data. 5 used survey data alone, and 4 used either interviews or clinical assessment data. Sample sizes were typically between 200 and 30,000, with a single study including over 700,000 participants. A higher proportion of participants were male than female in most studies, and most participants were middle-aged.

Participants of included studies had various primary physical injuries and conditions including back pain, upper limb musculoskeletal disorders, general physical injuries and musculoskeletal disorders, and trauma (e.g., fractures, burns) (see Table 5). Two Australian studies included participants with workers' compensation claims for primary mental health conditions [4, 7].

1.2.2. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY

Psychological symptoms and conditions were most commonly identified by depressive symptoms, but also by anxiety, psychological distress, mood disorders, anxiety, mental health service and medicine use, PTSD, serious mental illness, suicidal ideation and suicide (see Table 5).

Only 4 studies specifically mentioned or defined secondary psychological injury. These were all studies with samples of Australian participants, or Australian authors in the case of Kilgour et al. (2015). Most studies referred to the condition for which the person was diagnosed or self-reported (e.g., depression, anxiety, PTSD) or to the injury that were screened (e.g., psychological distress).

Not all workers' compensation authorities or stakeholder organisations defined secondary psychological symptoms or secondary psychological injury in publicly available documentation (see Table 6). Definitions were mostly similar, noting that a secondary injury must "arise out of the compensable condition". The definition from the NSW scheme specifically noted that the primary injury is physical, whereas other definitions either did not define the nature of the primary injury and simply needed to be compensable or stated that it was likely physical.

1.2.3. PREVALENCE

Prevalence of secondary psychological injury varied substantially based on outcome definitions (e.g., degree of psychological distress) and participant inclusion criteria (e.g., types of primary injury) (see Table 5). For example, Carnide et al. (2016) identified a cumulative incidence of 50.3% of workers with high depressive levels on the CES-D in a sample of 332 workers with claims for back pain and upper extremity pain. Comparatively, Jones et al. (2021) reported only 1.3% of men had anxiety in the year following spine or upper extremity disorders. However, Jones et al. used relatively strict service proxy criteria: (1) hospitalisation with relevant diagnosis, or (2) psychoactive drug with relevant diagnosis, or (3) physician index visit with a relevant diagnosis and psychoactive medication.

1.2.4. TIMING AND STAGES OF SECONDARY PSYCHOLOGICAL INJURY

The timing of secondary psychological injury was not consistently reported and is mostly interpreted from follow-up periods or when a psychological measure was captured. For prospective cohort studies, measures were typically taken between 1 and 24 months after injury or after entering a workers' compensation system. One study noted that psychological symptoms tended to peak shortly after injury. Retrospective cohort studies using administrative data usually used a 24-month follow-up period. Psychological services and medicines tended to be used later in workers' compensation claims for physical conditions: amitriptyline (an antidepressant) was dispensed at a median of 22.4 weeks into a claim in one study, and psychologist services were accessed at 26.6 weeks in another.

1.2.5. CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY

Included studies reported a range of modifiable and non-modifiable contributing factors to secondary psychological injury (Table 7).

Person-related factors

Features of the person and their injury that contributed to secondary psychological injury were often non-modifiable. Pain (and particularly chronic pain) were identified as contributing factors in several studies, often a result of back pain. A traumatic mechanism of accident or injury (e.g., fracture, dislocation) was linked to a greater likelihood of post-traumatic stress. Financial stress, lower socioeconomic status and lower education level were associated with secondary psychological injury. Workers with pre-existing mental health conditions and poorer general health were at significantly greater risk of psychological symptoms, and workers with pre-injury substance abuse were at greater risk of future substance use disorders. Workers also

reported low self-esteem due to shame from making a workers' compensation claim. Lastly, younger workers and female workers were also associated with a greater likelihood of various psychological ill health outcomes.

Employer factors

Employer and employment-related factors were identified as significant contributors in numerous studies. Occupational injury, compared to non-occupational injury, posed an increased risk of psychological ill health and suicide. Generally higher job stressfulness and working in specific industries (e.g., public safety) as well as stressful job interactions and longer hours were linked to psychological distress and injury. Not returning to work or a failed return to work was linked to worse depressive symptoms, with workers reporting fear of sustaining a new injury due to early or inappropriate return to work.

Compensation system factors

Numerous studies identified system-related factors that significantly contributed to secondary psychological injury. Workers reported psychological distress, fear and exacerbation of anxiety and depression due to the complexities of navigating compensation systems, as well as anger and worry over delays in claims processes and approvals. A lack of support and a power imbalance between the worker and the system were also noted. Perceived injustice in the claims process, as well as low perceptions of information and interpersonal justice were also contributors. Longer duration claims were associated with a greater likelihood of accessing mental health services and higher number of mental health services.

Healthcare factors

Over-medicalising (in cases of chronic pain) and stressful interactions with healthcare providers were associated with increased risk of psychological distress ill health. Accessing psychology services and use of other pain medicines (e.g., opioids, gabapentinoids) was significantly associated with use of antidepressants in workers with low back pain.

TABLE 4. CHARACTERISTICS OF INCLUDED STUDIES

Author (Year)	Country	Study Design	Data Source(s)	Sample				
				Characteristic	Period	Size	Age	Sex
Brijnath (2014) [7]	Australia	Prospective cohort	Interview data	Injured workers, GPs, compensation agents and employers	2012	Total: 93 - GPs: 25 - Compensation agents: 26 - Injured persons: 17 - Employers: 25	Mean (SD): 48 (13.7) in injured workers	71% male, 29% female in injured workers
Bultmann (2007) [8]	Canada	Prospective cohort	Administrative data, Interview data	Injured workers with time loss claim	2005-2007	Total: 632	Mean (SD): 42.2 years (10.8)	55% male, 45% female
Carnide (2016) [9]	Canada	Prospective cohort	Administrative data, Interview data	Injured workers with time loss claim	2005-2007	Total: 332	Mean (SD): 44.3 (10.3)	54.5% male, 45.5% female
Chu (2019) [10]	Taiwan	Prospective cohort	Survey data	Injured workers	2009	Total: 572	Mean (SD): 47.8 (11.1)	67.5% male, 32.5% female
Collie (2020) [4]	Australia	Cross-sectional	Survey data	Injured workers with accepted workers' compensation claim	2016-2018	Total: 3755	18-35 years: 20% (751) 36-50 years: 34% (1281) 51-80 years: 46% (1723)	59.3% (2227) male, 40.7% (1528) female
Dersh (2006) [11]	USA	Prospective cohort	Clinical interview/ assessment data	Workers with chronic disabling occupational spinal disorders (CDOSD); most state workers' comp., few federal	2005	Total: 1,323 - Group 1 (cervical and/or thoracic injury): 199 - Group 2 (lumbar injury): 806 - Group 3 (cervical/thoracic and lumbar injury): 318	Mean (SD): 41.9 (9.6)	61.7% male, 38.3% female
Dersh (2007) [12]	USA	Prospective cohort	Clinical interview/ assessment data	Workers with chronic disabling occupational secondary psychological injury disorders (CDOSD); most state workers' comp., few federal	2005	Total: 1323	Mean (SD): 41.9 (9.6) years	61.7% male, 38.3% female

TABLE 4. CHARACTERISTICS OF INCLUDED STUDIES CONT.

Author (Year)	Country	Study Design	Data Source(s)	Sample				
				Characteristic	Period	Size	Age	Sex
Di Donato (2022) [13]	Australia	Retrospective cohort	Administrative data	Injured workers with long-term workers' compensation claims (>2 years)	<2012	Total: 15,689 - Section 39: 2761 - Injured control: 2814 - Community control: 10114	Section 39 cohort: Age 18-34 years: 1.6% (45) Age 35-44 years: 7.9% (218) Age 45-54 years: 27.2% (750) Age 55-64 years: 54.6% (1508) Age 65+ years: 8.7% (240) Injured control cohort: Age 18-34 years: 6.6% (185) Age 35-44 years: 15.4% (433) Age 45-54 years: 30.5% (859) Age 55-64 years: 31.0% (872) Age 65+ years: 16.5% (465)	Section 39 cohort: Female: 46.0% (1269) Male: 54.0% (1492) Injured control cohort: Female: 37.5% (1056) Male: 62.5% (1758)

TABLE 4. CHARACTERISTICS OF INCLUDED STUDIES CONT.

Author (Year)	Country	Study Design	Data Source(s)	Sample				
				Characteristic	Period	Size	Age	Sex
Ferreira (2024) [14]	Australia	Retrospective cohort	Administrative data	Injured workers with time loss claims	2010-2018	Total: 17689	Age 18-24 years: 8.6% (1514) Age 25-34 years: 21.7% (3846) Age 35-44 years: 25.4% (4492) Age 45-54 years: 26.7% (4724) Age 55-64 years: 16.3% (2878) Age 65+ years: 1.3% (235)	Female: 35.6% (6301) Male: 64.4% (11388)
Gray (2023) [15]	Australia	Retrospective cohort	Administrative data	Injured workers with time loss claim	2011-2015	Total: 28870	Age 15-25 years: 12.2% (3514) Age 26-35 years: 23.3% (6709) Age 36-45 years: 26.1% (7512) Age 46-55 years: 25.2% (7250) Age 56+ years: 13.2% (3794)	36.0% female (10350), 64.0% (18430) male
Gray (2024) [16]	Australia	Retrospective cohort	Administrative data	Injured workers with time loss claim	2011-2015	Total: 2800	Age 15-25 years: 9.1% (256) Age 26-35 years: 25.7% (720) Age 36-45 years: 30.1% (842) Age 46-55 years: 26.0% (727) Age 56+ years: 9.1% (255)	64.9% (1818) male, 35.1% (982) female

TABLE 4. CHARACTERISTICS OF INCLUDED STUDIES CONT.

Author (Year)	Country	Study Design	Data Source(s)	Sample				
				Characteristic	Period	Size	Age	Sex
Gross (2022) [17]	Canada	Case-control	Administrative data	Injured workers with workers' compensation claim	2017-2019	Total: 1948 - Case (MSI and PTSI): 215 - Control (MSI only): 1733	MSI and PTSI Mean (SD): 42.6 (12.2) MSI control Mean (SD): 44.3 (12.4)	MSI and PTSI: 61.4% male MSI control: 58.0% male
Jones (2021) [18]	Canada	Retrospective cohort	Administrative data	Accepted time loss workers' compensation claims	2009-2013	Total: 84925	Age 19-24 years: 8.9% (7575) Age 25-29 years: 10.3% (8740) Age 30-39 years: 21.9% (18607) Age 40-49 years: 28.6% (24328) Age 50-59 years: 25.2% (21381) Age 60-64 years: 5.1% (4294)	57.6% (48951) male, 42.4% (35974) female
Keogh (2000) [19]	USA	Prospective cohort	Survey data	Workers' compensation claims	1994-1996	Total: 537	Mean (SD): 42.2 years (9.5)	69.5% (162) male, 30.2% (373) female
Kilgour (2015) [20]	International	Systematic Review	Literature (18 studies)	-	-	-	-	-

TABLE 4. CHARACTERISTICS OF INCLUDED STUDIES CONT.

Author (Year)	Country	Study Design	Data Source(s)	Sample				
				Characteristic	Period	Size	Age	Sex
Kim (2013) [21]	USA	Retrospective cohort	Survey data	Workers with occupational injury	2000-2006	Total: 35155 No injury: 32544 Non-occupational injury: 1707 Occupational injury: 904	No injury mean (SD): 38.9 (12.0) Non-occupational injury mean (SD): 38.5 (12.1) Occupational injury mean (SD): 39.5 (11.5)	No injury: 51.5% male, 48.5% female Non-occupational injury: 51.6% male, 48.4% female Occupational injury: 66.2% male, 33.8% female
Lee (2020) [22]	Republic of Korea	Retrospective cohort	Administrative data	Compensated workers	2003-2014	Total: 775537	15-19 years	79.8% (618718) male, 20.2% (156819) female
Lin (2013) [23]	Taiwan	Prospective cohort	Survey data	Workers hospitalised for occupational accident	2009	Total: 1233	Mean (SD): 42.6 (11.8) years	71.5% (881) male, 28.5% (352) female
Lippel (2007) [24]	Canada	Prospective cohort	Interview data	Injured workers with workers' compensation claims	2003-2004	Total: 187	Mean (SD): 42 (11)	60% (113) male, 40% (74) female
Orchard (2020) [25]	Australia	Prospective cohort	Administrative data, Survey data	Workers with workers compensation claims	2014-2015	Total: 615 6-month follow-up: 454 12-month follow-up: 411 Final analysis: 151	Mean (SD): 43.6 (12.3) years	59.6% (90) male,
Orchard (2020) [26]	Australia	Prospective cohort	Administrative data, Survey data	Workers with time loss claims	2014-2015	Total: 585 6-month interview: 432 12-monht interview: 392	Mean (SD): 43.8 (12.3) years	55.6% male, 44.4% female
Orchard (2021) [27]	Canada	Cross-sectional	Administrative data, Survey data	Workers' compensation claimants with loss time claims	2019-2020	Total: 996	Mean (SD): 47.4 (12.8) years	56.5% (563) males, 43.5% (433) females

TABLE 5. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY

Author (Year)	Primary Injury / Condition		Secondary Psychological Injury / Symptoms				
	Category	Summary	Defined	Definition	Measure	Measurement Tool(s)	Measure Timing
Brijnath (2014)	Musculoskeletal disorders and mental health conditions	71% musculoskeletal, 18% mental health condition, 12% a combination of both	Yes	"Mental illness developed as a secondary issue in the recovery process"	Identified psychological injury	Self-report	Variable
Bultmann (2007)	Musculoskeletal disorders	66% (418) back pain, 34% (214) upper extremity pain	No	Depressive symptoms	Identified psychological injury	CES-D, SF-12 Mental Health	1-month post-injury and 6-months post-injury
Carnide (2016)	Musculoskeletal disorders	64.8% (215) back pain, 35.2% (117) upper extremity pain	No	Depressive symptoms	Identified psychological injury	CES-D, Self-report	1-month, 6-months and 12-months
Chu (2019)	Occupational injury	Varying injury severity, with 37.9% (217) requiring >=8 days secondary psychological injury hospitalisation	No	Severe psychological symptoms	Identified psychological injury	BSRS-5	12 months after recruitment (6 years after injury)
Collie (2020)	Musculoskeletal disorders and mental health conditions	84% (3160) with claims for musculoskeletal disorder, 16% (595) with claims for mental health condition	No	Psychological distress	Identified psychological injury; Psychological health services	Kessler 6 questionnaire; survey question re: health services use	Up to 24 months post-claim submission
Dersh (2006)	Musculoskeletal disorders	15.0% (199) for cervical and/or thoracic injury 60.9% (806) for lumbar injury 24.0% (318) for cervical/thoracic and lumbar injury)	No	Major depression, Dysthmia, Panic disorder, Alcohol abuse / dependence, Drug abuse / dependence, Personality disorders	Identified psychological injury	SCID-NP and SCID-II	Past month

TABLE 5. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Primary Injury / Condition		Secondary Psychological Injury / Symptoms				
	Category	Summary	Defined	Definition	Measure	Measurement Tool(s)	Measure Timing
Dersh (2007)	Musculoskeletal disorders	Chronic disabling occupational spinal disorders in various areas; severely disabled persons with an average disability duration of 19 months	No	Mood disorders, anxiety disorders, panic disorder, posttraumatic stress disorder, pain disorder, somatoform disorder, substance use disorders	Identified psychological injury	SCID-1 NP	Past month
Di Donato (2021)	Occupational injury	Section 39 Cohort: Physical injury: 91.7% (2531) Psychological injury: 6.8% (187) Other: 1.6% (43) Injured control cohort Physical injury: 88.6% (2492) Psychological injury: 10.6% (299) Other: 0.8% (23)	No	Service use in follow-up period may be secondary psychological injury-related	Psychological health services	Prevalence of psychological services	1-year pre- and 1-year post-workers' comp. cessation
Ferreira (2024)	Musculoskeletal disorders	Low back pain	No	Service use in follow-up period may be secondary psychological injury-related	Psychological medicines	Prevalence of psychological medicines	2-years from claim acceptance
Gray (2023)	Musculoskeletal disorders	Low back pain	Yes	Service use in follow-up period may be secondary psychological condition-related	Psychological health services	Prevalence of psychological, psychiatric and counselling services	2-years from claim lodgement

TABLE 5. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Primary Injury / Condition		Secondary Psychological Injury / Symptoms				
	Category	Summary	Defined	Definition	Measure	Measurement Tool(s)	Measure Timing
Gray (2024)	Musculoskeletal disorders	Low back pain	Yes	Service use in follow-up period may be secondary psychological condition-related	Psychological health services	Time to first service	2-years from claim lodgement
Gross (2022)	Musculoskeletal injury	Various injuries. In group with PTSI: Sprain/Strain: 32.1% (69) Joint disorder: 9.3% (20) Fracture: 14.4% (31) Laceration: 19.7% (22) Contusion: 11.2% (24) Other: 22.3% (48)	No	Post-traumatic stress injury	Identified psychological injury	Diagnosed PTSI	CS
Jones (2021)	Musculoskeletal disorders	Spine: 30.7% (26044) Upper limb: 69.3% (58881)	No	Anxiety, Depression or Anxiety and Depression	Psychological health services	Classified as anxiety / depression if one or more of: A secondary psychological injury hospitalisation event with relevant diagnosis, (ii) psychoactive drug with relevant diagnosis, or (iii) a physician index visit for relevant diagnosis with psychoactive medication	365 days before to 365 days after injury

TABLE 5. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Primary Injury / Condition		Secondary Psychological Injury / Symptoms				
	Category	Summary	Defined	Definition	Measure	Measurement Tool(s)	Measure Timing
Keogh (2000)	Musculoskeletal disorders	Carpal tunnel syndrome: 77.9% (417) Tendonitis in arm or wrist: 36.7% (195) Shoulder tendinitis: 31.0% (166) deQuervain's syndrome: 18.5% (99) Epicondylitis: 17.5% (93) Pinched nerve in the neck: 8.4% (45)	No	Depression symptoms	Identified psychological injury	CES-D (>16) Family problems Social problems	Between 1 and 4 years post-claim
Kilgour (2015)	Compensable injury	Majority of participants in included studies had work-related injuries or diseases	Yes	"Psychological consequences that occur secondarily to the physical injury"	Various	-	-
Kim (2013)	Musculoskeletal disorders and other injuries / trauma	Superficial wound, contusion: 7.2% (65) Musculoskeletal (arthropathy, back, sprain / strain): 41.0% (371) Fracture / dislocation: 6.5% (59) Crushing, amputation, poisoning: 6.3% (125) Open wound / internal organ injury: 13.8% (125) Traumatic complication, NEC: 16.0% (145) Note: occupational injury only	No	Depression	Identified psychological injury; Psychological health services	Self-report and reports of healthcare utilisation (e.g., antidepressants)	Rounds 3-5 of survey (i.e., 12-24 months)

TABLE 5. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Primary Injury / Condition		Secondary Psychological Injury / Symptoms				
	Category	Summary	Defined	Definition	Measure	Measurement Tool(s)	Measure Timing
Lee (2020)	Occupational injury	Injuries, excluding musculoskeletal disorders, exposure to noise and exposure to vibration	No	Death due to intentional self-harm	Identified psychological injury	Death index	N/A
Lin (2013)	Occupational injury	Fracture: 56.6% (698) Intracranial injury: 12.1% (149) Open wound of upper limbs: 6.8% (84) Crushing injury: 5.4% (64) Burns: 2.2% (27) Others: 16.9% (208)	No	Post-traumatic stress disorder; major depression	Identified psychological injury	BSRS-50 PTSC MINI	12 months post-injury
Lippel (2007)	Occupational injury	- Physical injuries including back injuries, upper extremity disorders, musculoskeletal disorders, burns - 82% injuries from accidents, 18% occupational diseases	No	Psychological injury (i.e., anxiety, depression)	Identified psychological injury	Self-report	Various
Orchard (2020)	Musculoskeletal injury	Musculoskeletal injuries (various)	Yes	Serious mental illness: threshold score of 13 on K6 at any of 3 interviews	Identified psychological injury; Psychological health services	Kessler 6 questionnaire; mental health service use (psychological, psychiatry, medication)	0, 6 and 12 months post-injury for survey; 18-month follow-up for services

TABLE 5. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Primary Injury / Condition		Secondary Psychological Injury / Symptoms				
	Category	Summary	Defined	Definition	Measure	Measurement Tool(s)	Measure Timing
Orchard (2020)	Musculoskeletal disorders	Soft tissue injury of back or upper extremity	No	Serious mental illness: threshold score of 13 on K6 at any of 3 interviews	Identified psychological injury	Kessler 6 questionnaire	0, 6 and 12 months post-injury
Orchard (2021)	Occupational injury	Physical injury or occupational disease	No	Serious mental illness: threshold score of 13 on K6 at any of 3 interviews	Identified psychological injury	Kessler 6 questionnaire	

TABLE 6. AUSTRALIAN INDUSTRY STAKEHOLDER DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY

Jurisdiction	Definition	Source
Comcare	Secondary injury A secondary injury is where an injury has 'arisen out of' the compensable condition. It is not necessary to link the secondary injury back to the employment, as the compensable condition has already satisfied that link. It is still necessary, however, to determine if the compensable condition has arisen out of employment, being the accepted compensable injury. When assessing if the secondary injury has 'arisen out of' the compensable condition, you need to be satisfied that there is a causal relationship between the secondary injury and the compensable condition.	Legislation
NSW	Secondary psychological injury means a psychological injury to the extent that it arises as a consequence of, or secondary to, a physical injury.	Legislation
Queensland	The insurer must take all reasonable steps to minimise the risk of the worker sustaining a psychiatric or psychological injury arising from the physical injury, including by providing reasonable services to the worker. (Implicitly defines a secondary psychological injury as a 'psychiatric or psychological injury arising from [a] physical injury').	Legislation
	A secondary psychological injury is a psychological injury that arises in consequence of a physical injury. This injury can arise from difficulty coping with a physical injury or where the physical injury was caused by a traumatic event like an assault. Insurers must take all reasonable steps to minimise the risk of a worker with a physical injury developing a secondary psychological injury. Reasonable steps also include (but are not limited to) providing reasonable services such as medical treatment and other support services.	Queensland WorkSafe website
Safe Work Australia	A new psychological injury associated with a previous compensable injury. Secondary psychological injuries are the result of a number of factors, including poor responses to the initial injury by the employer and the insurer or agent. (cited Brijnath et al (2014) 'Mental health claims management and return to work: Qualitative insights from Melbourne, Australia', pp. 772)	Taking Action Framework
WorkSafe Victoria	Where a secondary mental injury sustained on or after 31 March 2024 meets the new mental injury definition (see below), it must still meet the longstanding causation test– namely, that it is has resulted from or been materially contributed to by a compensable primary injury (usually an accepted physical injury). These criteria also apply to any aggravation of pre-existing mental injuries that are secondary to a primary injury.	Claims manual

TABLE 6. AUSTRALIAN INDUSTRY STAKEHOLDER DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY CONT.

Jurisdiction	Definition	Source
Western Australia	185. Secondary conditions disregarded in certain cases (1) In this section — secondary condition means a condition, whether psychological, psychiatric or sexual, that, although it may result from an injury, arises as a secondary, or less direct, consequence of the injury. (2) In assessing a worker's degree of permanent impairment, any secondary condition must be disregarded if the assessment is for the purposes of — (a) section 79; or (b) Part 7 Division 2. (3) This section does not prevent a secondary condition from contributing in the assessment of damages by a court.	Legislation

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY

Author (Year)	Prevalence	Contributing Factors
Brijnath (2014)	67% (8/12 participants) with claims for musculoskeletal conditions)	• Nature of the original injury (significant functional impairment and chronic pain) • Psychological resilience of the injured person • Systemic factors (over-medicalization, medical mismanagement, injured person's mindset) • Chronic pain • Financial instability due to delays and red-tape in the compensation system • Decline of mental health treatments
Bultmann (2007)	N/A – CES-D score measured	• Recurrence and not returning to work • Sustained first return to work had fewer symptoms
Carnide (2016)	• Cumulative incidence of high depressive symptom levels over 12 months 50.3% (95% CI 44-9-55.7) • Prevalence of high levels of depressive symptoms at 12 months = 24.7% (95% CI 20.0-29.3) • Total sample: 8.1% (95% CI 5.2-11.1%) reported receiving a depression diagnosis since their injury. • Total sample: 13.9% (95% CI 10.1-17.6%) reported current mental health treatment at 6 and/or 12 months post-injury. • Persistent high symptoms: 18.8% (95% CI 7.7-29.8%) self-reported receiving a depression diagnosis by 12 months; 29.2% (95% CI 16.3-42.0%) were receiving treatment at 12 months.	• Problematic return-to-work (RTW) outcomes are associated with a poor depressive symptom course • Severity of depressive symptoms is a significant factor in accessing healthcare services for depression • Gender: Women have a higher cumulative incidence of high depressive symptom levels compared to men • Prevalence of depression diagnosis and treatment is higher among those with higher depressive symptom levels and a poorer symptom course
Chu (2019)	• Percentage of participants with severe psychological symptoms: 28.1% • Number of participants with a history of psychiatric disorders: 15 • Percentage of participants with a history of psychiatric disorders: 2.6%	• Age (older age associated with poorer return-to-work rate) • Education level (lower education level associated with poor return-to-work rate) • Injury severity (duration of hospitalization and injury-induced changes in appearance) • Inferiority (significant independent effect on return to work)

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Prevalence	Contributing Factors
Collie (2020)	• K6 Low PD: 58.0% • K6 Moderate PD: 27.5% • K6 Severe PD: 14.0% • MSD and Moderate PD 20.5% used services • MSD and Severe PD 42.3% used services	Association with greater severity on K6: • Low work ability and MHC: 7.04 (95% CI 3.67-13.51) • MHCs and poor general health: 6.72 (95% CI 4.23-10.67) • Diagnosis of both depression and anxiety in MSD: 3.94 (95% CI 3.07-5.05) • Low work ability in MSD: 3.12 (95% CI 2.56-3.79) • Financial stress: 2.63 (95%CI 2.23-3.11) • Poor general health in MSD: 2.41 (95%CI 1.92-3.02) • High level of concern about their workplace response to the claim: 2.31 (95%CI 1.88-2.83) • Stressful interactions with healthcare providers: 2.16 (95%CI 1.74-2.69) • Others (OR <2): Younger age, not currently working, pain in the last week, higher job stressfulness, requiring support to navigate claims system, and stressful job interactions Association with mental health service use (MSD only): • Working in education and training industry: 2.12 (95%CI 1.12-4.01) • Having severe psychological distress: 2.06 (95%CI 1.53-2.78) • Being off work: 2.00 (95%CI 1.48-2.69) • Others (OR <2): Working in public administration and safety, poorer general health, requiring support to navigate the claims process, being in conflict with the claims organisation, stressful interactions with healthcare providers
Dersh (2006)	• Overall prevalence of psychiatric disorders: 65% (excluding Pain Disorder) • Major Depressive Disorder: 56% • Substance Use Disorders: 14% • Anxiety Disorders: 11% • Axis II Personality Disorders: 70%	• Unrecognized and untreated psychopathology can interfere with rehabilitation and increase disability and pain perception. • Presence of CDOSDs is associated with higher rates of psychiatric disorders. • Number of injury sites: Group 3 had higher rates of psychopathology due to more injury sites. • Demographic factors: Study population was younger, more likely to be male, less likely to be black, and more likely to be Hispanic compared to general population samples. • High prevalence of specific psychiatric disorders: MDD (56.2%), Substance Use Disorders (14.1%), Anxiety Disorders (10.6%). • High prevalence of personality disorders: Paranoid PD (30.8%), Borderline PD (27.9%).

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Prevalence	Contributing Factors
Dersh (2007)	• Pre-existing psychiatric disorders: 38.7% • Post-injury psychiatric disorders: 98.9% Specific post-injury disorders: • Pain Disorder: 95.7% • Major Depressive Disorder: 49.7% • Opioid Dependence: 15%	• Stress associated with CDOSDs is a crucial factor in understanding high rates of Axis I psychiatric disorders. • Pre-existing diatheses (e.g., negative psychologic schemas) may play important roles. • Sustaining a work-related spinal injury is a risk factor for developing psychiatric disorders like major depressive disorder and opioid dependence. • Pre-injury alcohol and drug dependence are significantly associated with post-injury opioid dependence (OR: 1.8 for alcohol dependence, OR: 2.1 for drug dependence).
Di Donato (2021)	Section 39 cohort: • 1-year pre-claim cessation: 21.3% • 1-year post-claim cessation: 19.2% Injured control cohort: • 1-year pre-claim cessation: 21.6% • 1-year post-claim cessation: 13.0%	No statistical analysis to test association of factors with use of health services. Authors hypothesise the ongoing need for healthcare in the Section 39 (i.e., more disabled) group
Ferreira (2024)	14.0% (2476)	• Female: OR 1.25 (95%CI 1.09-1.43) • Younger age: OR 0.69 (95%CI 0.54-0.88) • Dispensed weak opioid: OR 3.49 (95%CI 2.99-4.08) • Dispensed strong opioid: OR 6.81 (95%CI .599-7.74) • Dispensed gabapentinoid: OR 1.46 (95%CI 1.28-1.67) • Dispensed diazepam: OR 1.57 (95%CI 1.35-1.83) • Accessed psychologist services: OR 8.50 (95%CI 7.59-9.52) • Most socioeconomic disadvantage: OR 1.29 (95%CI 1.12-1.47) • Least socioeconomic disadvantage: OR 0.86 (95%CI 0.73-0.99)

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Prevalence	Contributing Factors
Gray (2023)	9.7% (n=2800)	• Duration of time loss: Longer durations are associated with higher odds of accessing mental health services (OR: 151.66 for 76+ weeks). • Sex: Females have 17% higher odds of accessing mental health services compared to males (OR: 1.17). • Age: Older workers have 46% lower odds of accessing mental health services (OR: 0.54 for 56+ years). • Jurisdiction: Queensland has the highest odds of accessing mental health services (OR: Ref). • Remoteness: Increasing remoteness is associated with decreasing odds of accessing mental health services (OR: 0.55 for outer regional/remote/very remote). • Year of claim lodgement: More recent years are associated with increased prevalence of accessing mental health services (OR: 1.16 for 2015).
Gray (2024)	100%	• Time loss duration: Longer durations are associated with more mental health services but longer times to first service. • Jurisdiction: Victoria has the most services but accesses them later; Queensland and Western Australia access services earlier. • Financial year of lodgement: More services used in more recent years (IRR 1.28 [95% CI 1.16, 1.41] and IRR 1.23 [95%CI 1.11, 1.36] for 2014 and 2015). • Sex: Females have a significantly higher number of services than males (IRR 1.12 [95% CI 1.04, 1.21]). • Remoteness: Those in inner regional areas have fewer services than those in major cities.
Gross (2022)	11.0% (215/1948)	Worker characteristics: • Being public safety personnel: Adjusted OR = 3.11; 95% CI = 1.22-7.91 • Type of accident: Adjusted OR = 25.84; 95% CI = 17.38-38.42 • Experiencing fracture or dislocation: Adjusted OR = 3.70; 95% CI = 2.33-5.89 • Lower level of education (high school or less): Adjusted OR = 1.94; 95% CI = 1.33-2.82 Worker reported measures (risks for concurrent PTSI and MSI): • Better bodily pain score (SF36): OR 1.08 (95%CI 1.05-1.11) • Better general health (SF36): OR 0.95 (95%CI 0.92-0.98) • Better social functioning (SF36): OR 0.96 (95%CI 0.93-0.99)

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Prevalence	Contributing Factors
Jones (2021)	Note: in those that did not have anxiety / depression in year prior) Men: • Anxiety only: 1.3% • Depression only: 0.7% • Anxiety and Depression: 1.3% Women: • Anxiety only: 2.0% • Depression only: 0.8% • Anxiety and Depression: 2.0%	Note: impact of anxiety and depression reported
Keogh (2000)	31.0% with CES-D scores >= 16	• Lower education is associated with higher CES-D scores (41% of those with less than high school education scored over 16). • Severity of injury and functional impairment are predictors of experiencing symptoms of depression.
Kilgour (2015)	No direct prevalence, but psychosocial consequences were common in included studies: • Fear and insecurity: 9/13 studies • Frustration and anger: 8/13 studies • Stress: 8/13 studies • Low self-esteem: 7/13 studies • Anxiety: 5/13 studies • Depression: 5/13 studies • Suicidal ideation: 4/13 studies • Shame or humiliation: 4/13 studies • Self-abnegation: 3/13 studies • Violence and threats: 2/13 studies	Fear and insecurity attributable to interacting with the insurer: denial of compensation and poverty, surveillance and monitoring techniques, sustaining a new injury as a result of premature or inappropriate return to work; familial difficulties arising from the claims process, medical evaluations and assessments, concerns regarding the absence of or incorrect or insufficient information, not being able to convey individual concerns to IMEs, case workers and appeal commissioners. Anger and frustration / stress and mental anguish: Unable to contact insurers to discuss their financial concerns (e.g., delays in claims approvals, or payments that changed without notification) Low self-esteem: Ashamed of having made a workers' compensation claim, receiving benefits, or having failed a return to work. Anxiety / depression: Exacerbated by the difficulties negotiating the system, lack of support from claims managers

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Prevalence	Contributing Factors
Kim (2013)	Total number of workers who experienced depression: 1,264 Prevalence of depression: • Occupational injury: 5.5% • Non-occupational injury: 4.7% • No injury: 3.1%	• Type of injury: Occupational injury has a stronger association with depression (OR = 1.72; 95% CI: 1.27-2.32) compared to non-occupational injury (OR = 1.36; 95% CI: 1.07-1.65). • Workers' Compensation: WC is associated with 33% higher odds of developing depression (95% CI: 1.01-1.74). • Work-related factors: Part-time work, shorter job tenure, and long working hours are independently associated with post-injury depression risk. • Sociodemographic factors: Female sex, white race, lower income, non-married status are linked to higher odds of post-injury depression. • Health-related factors: Self-perceived poor physical and mental health status, functional activity limitation, cognitive function impairment are prominent risk factors. • Time since injury: The effect of occupational injury on depression increases over time.
Lee (2020)	65.1 per 100k for men; 17.1 per 100k for women SMR 2.21 (95%CI 2.13-2.30) (compared to reference population)	Workers with occupational injury have higher rates compared with the reference population.
Lin (2013)	Est. rate of diagnosed PTSD/PPTSD or major depression = 5.1 (3.9, 6.3) Prevalence of high score on BSRS-50 or PTSC = 13.5%	BSRS: • Lower education level: OR 1.9 (95%CI 1.0-3.4) • Loss of consciousness after injury: OR 2.1 (95%CI 1.3-3.4) • Injury affecting physical appearance: OR 3.8 (95%CI 2.3-6.7) • Life event in the 1-year follow-up period after injury: OR 4.5 (95%CI 2.9-6.7) PTSC severe or higher / any 2 items of PTSC reported at moderate or higher: • Female: OR 1.5 (95%CI 1.1-2.3) • Loss of consciousness after injury: OR 2.2 (95%CI 1.3-3.4) • Injury affecting physical appearance: OR 3.6 (95%CI 2.2-6.3) • Previous occupational injury experience before this event: OR 1.9 (95%CI 1.1-3.1) • Life event within one month before this injury: OR 2.5 (95%CI 1.0-5.7) • Life event in the 1-year follow-up period after injury: OR 3.1 (2.0-4.7)

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Prevalence	Contributing Factors
Lippel (2007)	• Number of participants with initial mental health claims: 4 • Percentage of participants reporting depression: Women: 40%, Men: 26% • Percentage of participants reporting thoughts of suicide: Women: 10%, Men: 30% • Utilization of healthcare services for psychological conditions: Some participants were treated by healthcare professionals	• Stigma: Over half of workers felt stigmatized and stereotyped as fraud artists. • Power imbalance: Workers felt overwhelmed by the system and lacked resources compared to employers and the CSST. • Lack of social support: Support from trusted individuals reduced negative effects on mental health. • Depression: 40% of women and 26% of men reported depression associated with the process. • Thoughts of suicide: 10% of women and 30% of men reported thoughts of suicide.
Orchard (2020)	• Number of participants with SMI: 181 • Percentage of participants with SMI: 29.4% • Number of participants who accessed mental health services: 75 • Percentage of participants with SMI who accessed mental health services: 41.4% Specific services used: • Met with a psychologist: 44 (24.3%) • Met with a psychiatrist: 53 (29.3%) • Prescribed antidepressants or anxiolytics: 39 (21.0%) • Participants who accessed mental health services without SMI: 31	• Increasing age: OR=0.96, 95% CI 0.93 to 0.99, p=0.01 • Sustained return to work: OR=0.27, 95% CI 0.11 to 0.69, p=0.006 • Being born in Australia: OR=2.23, 95% CI 0.97 to 5.10, p=0.06 (approaching statistical significance)

TABLE 7. PREVALENCE AND CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY CONT.

Author (Year)	Prevalence	Contributing Factors
Orchard (2020)	• Prevalence of psychological injury (depression): 30-50% • Serious Mental Illness: 22% at baseline, 21% at 6 months, 18% at 12 months	• Perceived injustice in interactions with claim agents (both informational and interpersonal) is significantly associated with poorer mental health outcomes. • Each 1-unit increase in perceptions of informational and interpersonal justice is associated with an absolute increase of 0.16 and 0.18 in K6 mental health scores at baseline. • Perceived injustice indirectly impacts mental health by increasing the likelihood of disagreements with claim agents. • A 1-unit increase in informational and interpersonal justice is associated with a 27.5% and 19.5% increased odds of reaching the threshold for a serious mental illness. • Disagreements with claim agents are associated with increased K6 mental health scores at 6 months and indirectly affect mental health at 12 months.
Orchard (2021)	• Prevalence of serious mental illness at 18 months: 16.6% • Utilization of healthcare services for mental health: 55% of those with serious mental illness • Pre-injury/illness mental health diagnosis: 21.3%	• Low perceptions of informational justice: associated with a 2.58 times higher risk of serious mental illness (95% CI 1.30-5.10) • Moderate perceptions of interpersonal justice: associated with a 2.01 times higher risk of serious mental illness (95% CI 1.18-3.44) • Low perceptions of interpersonal justice: associated with a 3.57 times higher risk of serious mental illness (95% CI 1.81-7.06) • Pre-injury mental health diagnosis: potential effect modifier • Pain and active disagreement with the WSIB: attenuated the association between case manager interactions and serious mental illness

1.2.6. SCREENING TOOLS AND MONITORING OF SECONDARY PSYCHOLOGICAL INJURY

Screening for and monitoring secondary psychological injury was achieved in a variety of ways (see Table 8). The most common validated tool reported in included studies was the Kessler-6, followed by the Centre for Epidemiologic Studies Depression Scale (CES-D). Three papers used self-report of psychological condition, and two self-report of psychological health service use. Six papers used proxies of secondary psychological injury via psychological health services and medicines. Measurements were taken at various points, but 12 months following an injury was the most common time point.

TABLE 8. TOOLS FOR DETECTING PSYCHOLOGICAL INJURY

Tool	Author (year)	Measurement time
Kessler Psychological Distress Scale (Kessler-6)	Collie (2020) Orchard (2020) Orchard (2020) Orchard (2021)	Within 24 months of claim submission 0, 6 and 12 months post-injury 0, 6 and 12 months post-injury 18 months post-injury
Centre for Epidemiologic Studies Depression Scale (CES-D)	Bultmann (2007) Carnide (2016) Keogh (2000)	1 month, 6 months post-injury 1 month, 6 months, 12 months post-injury Between 1 and 4 years post-claim
Self-report psychological condition or symptoms	Brijnath (2014) Carnide (2016) Kim (2013)	During qualitative interview 6 months, 12 months post-injury 12 months, 24 months post-injury
Structured Clinical Interview for DSM-Non-Patient Version (SCID-NP)	Dersh (2006) Dersh (2007)	Past month Past month
Self-report health service / medicine proxy	Collie (2020) Kim (2013)	Within 24 months 12 months, 24 months post-injury
Brief Symptom Rating Scale 50 (BSRS-50)	Lin (2013)	12 months post-injury
Brief Symptom Rating Scale 5 (BSRS-5)	Chu (2019)	6 years post-injury
Short Form 12	Bultmann (2007)	1 month, 6 months post-injury
Post-Traumatic Symptom Checklist (PTSC)	Lin (2013)	12 months post-injury
Mini-international Neuropsychiatric Interview (MINI)	Lin (2013)	12 months post-injury
Administrative data health service / medicine proxy	Di Donato (2021) Ferreira (2024) Gray (2023) Gray (2024) Jones (2021) Orchard (2020)	12 months pre- and 12 months post-claim cessation Within 24 months of claim acceptance Within 24 months of claim lodgement Within 24 months of claim lodgement 12 months pre- and 12 months post-injury Within 18 months of baseline interview (approx. injury)

1.3. INTERPRETATION

"Secondary psychological symptoms" and "Secondary psychological injury" were not often used as specific terms. A substantial portion of included literature referred to psychological distress and depressive symptoms, which are more clinically relevant terms. Secondary psychological symptoms, secondary psychological injury or secondary mental injury specifically, were terms used predominantly in Australian studies.

Identifying a precise prevalence of secondary psychological injury is challenging. Varying definitions and methods of screening and measuring secondary psychological injury mean that measures of prevalence are not precise. Psychological service and medicine proxies provide population coverage, but may be an underestimate, identifying only those with more serious symptoms.

Secondary psychological injury was detected via a mix of psychological screening tools and administrative data proxies. Measuring secondary psychological injury via administrative data proxies (i.e., mental health service use) is more scalable, particularly to existing systems. However, in some cases medicines and services may have multiple uses that make these measures imprecise. For example, antidepressants are more frequently being used for low back pain.

Many factors contributing to secondary psychological injury are not modifiable. Age, gender and other sociodemographic factors were linked to secondary psychological injury in multiple studies. While these may not be modifiable, stakeholders could consider methods to mitigate the impact of these factors. For example, support could be offered to younger workers early in the claims process.

Modifiable contributing factors are usually employer and compensation system related. Workers report significant stress attributable to navigating a workers' compensation system, worry about delays, and a level of perceived injustice. These factors could be modified through improved claims management practices and information for the worker. Stressful job interactions and failed return to work could be managed by better employer practices.

1.4. CONSIDERATIONS

While unlikely, a purposive search may not have detected all literature. Given the requirements for included literature, a purposive search was suitable and identified relevant literature in similar jurisdictions to Australia. However, a future systematic review with meta-analysis may be valuable in the future to identify literature from other regions and statistically test the association of specific contributing factors.

The review was restricted to work-related injury. The focus of this review meant literature examining injuries in other personal injury / compensation systems, such as motor-vehicle accident schemes, were excluded. While not necessarily work-related, many features of these schemes may be similar. This literature could be included in a future review.

ACTIVITY 2: STAKEHOLDER ENGAGEMENT

Regulators, insurers, claims managers, employers and healthcare providers are all critical stakeholders in the workers' compensation process. Each plays a vital role in the support and recovery of the injured worker and may be important contributors to secondary psychological injury. In this activity, the views, understanding and experiences of workers' compensation stakeholders were collected and synthesised to address research objectives 1-7 (see Table 9).

TABLE 9. OBJECTIVES FOR ACTIVITY 2

Activity	Research Objectives						
	1. Define secondary psychological injury	2. Understand main drivers	3. Understand role of stakeholders	4. Evidence of stages of claim	5. Understanding of screening tools	6. Insights to modifiable aspects	7. Evidence-based recommendations
Activity 1. Literature review	●	●		●	●	●	●
Activity 2. Stakeholder engagement	●	●	●	●	●	●	●
Semi-structured interviews with key stakeholders in the workers' compensation sector and process to gain a deeper understanding of the factors influencing secondary psychological injury, key moments in the claims management process, the role of stakeholders, and the real-world use of screening tools.							
Activity 3. Lived experience		●	●			●	●
Activity 4. Claims data analysis		●		●			●

2.1. APPROACH

2.1.1. PARTICIPANTS AND RECRUITMENT

This activity involved a series of focus groups conducted between May and August 2025 with workers' compensation stakeholders. Eligible participants were those employed by insurers and claims management organisations, regulators, employers and employer associations, healthcare practitioners or worker representative groups (e.g., unions) that engage in the Australian workers' compensation sector. Injured workers were not included in this activity however the views and experiences of this important stakeholder group was the focus of Activity 3.

Participants were recruited through 2 primary methods:

1. Safe Work Australia advertised the study directly to members of the Strategic Issues Group on Workers' Compensation (SIG-WC).
2. Monash University advertised the study via social media (LinkedIn).

Potential participants were directed to contact the lead researcher (MDD) directly via email. Participants were given an explanatory statement and consent form, and a date and time for a focus group was organised.

2.1.2. DATA COLLECTION

Data were collected via focus groups conducted by the lead researcher (MDD). Focus groups typically included up to 3 participants but ranged from individual interviews to groups of 6. These were conducted via video teleconference (i.e., Zoom) and lasted approximately 45-60 minutes. Focus groups were organised broadly by the role of the participant (e.g., claims managers) and encouraged open conversation, structured around the following questions:

1. How would you define a secondary psychological injury? And, how does your organisation define a secondary psychological injury?
2. Do you manage or treat injured workers? If so, how many do you think develop a secondary psychological injury?
3. What factors do you think influence the development of a secondary psychological injury? Are there factors that you think prevent secondary psychological injury?
4. At what point during a workers' compensation claim is the most critical to avoid developing a secondary psychological injury?
5. At what point during a workers' compensation claim do you think secondary psychological injury most often develops?
6. Do you or your organisation use screening tools to monitor for secondary psychological injury? If so, which tools do you use? Do you believe these tools are effective?

2.1.3. ANALYSIS

Focus groups were recorded and transcribed. Results were narratively synthesised against the main questions (as above), by identifying key phrases, themes and contributing factors to secondary psychological injury.

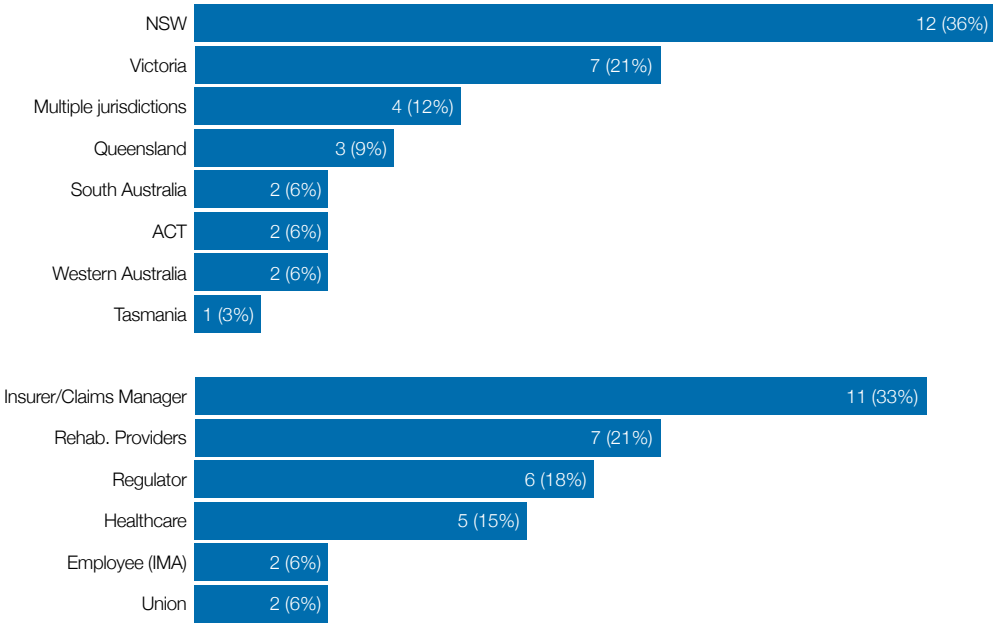
Ethical approval was obtained from the Monash University Human Research Ethics Committee (MUHREC) Project ID 47100.

2.2. FINDINGS OF FOCUS GROUPS

2.2.1. PARTICIPANT CHARACTERISTICS

A total of 33 stakeholders were interviewed in 14 focus groups. The largest group of stakeholders were from NSW, with insurers / claims managers the most common role (see Figure 1).

FIGURE 1. NUMBER AND PERCENTAGE OF STAKEHOLDERS BY JURISDICTION AND ROLE



2.2.2. DEFINITIONS OF SECONDARY PSYCHOLOGICAL INJURY

Stakeholders offered broadly similar definitions of secondary psychological injury, but posed differing opinions about specific components of the definition:

- **Psychologists refuted the concepts of "secondary" and "injury"** noting that the concept of primary vs. secondary is artificial and a byproduct of liability management, and that both are still psychological conditions. Regulator and insurer stakeholders offered similar perspectives to psychologists and prescriptive definitions, noting that from a claims management perspective, secondary psychological injury may be a legislative concept.

- **Opinions were divided about whether a secondary psychological injury needed to be a clinically diagnosed mental disorder**. Some stakeholders suggested that increased stress levels and psychological symptoms (e.g., sleep disturbances) could be expected when dealing with an unfamiliar system and that these could be considered secondary psychological injury. Rehabilitation providers suggested that a clinical diagnosis would be beneficial, as it would enhance the ability of the worker to access treatment.
- **Stakeholders accepted that secondary psychological injury could occur after a primary psychological injury** but considered that this would be uncommon. One example included a psychological "symptom change" from an acute case of post-traumatic stress disorder to chronic depression.

2.2.3. PREVALENCE OF SECONDARY PSYCHOLOGICAL INJURY

Stakeholders provided varying estimates of the prevalence of secondary psychological injury, but consistently noted that (a) many of them may not be good measures of prevalence given the scope of injured workers with whom they interact (i.e., long-duration and more serious claims); and (b) the longer the claim duration the higher the likelihood of a secondary psychological injury.

Some stakeholders estimated that, in general, approximately 10% of workers' compensation claimants (i.e., claims of any length) develop secondary psychological injury. However, others noted that this number may be higher if criteria were less stringent, and included other symptoms of psychological ill health such as sleep disturbances, negative thoughts about work and self, and isolation.

Stakeholders consistently reported that at least 80% (and in some cases 100%) of workers with long-term claims (i.e., >2 years) would develop secondary psychological injury. One rehabilitation provider noted that, whether a secondary psychological condition developed or not, "every single person is high risk". Several stakeholders also noted that they believe the prevalence of secondary psychological injury has increased in the last 5 to 10 years.

Regulators reported challenges in detecting secondary psychological injury at scale. This is because secondary psychological injury was rarely defined in administrative data. Stakeholders reported that health service and medicine data were typically used as "proxies". However, this was considered likely to underestimate prevalence.

2.2.4. CONTRIBUTING FACTORS TO SECONDARY PSYCHOLOGICAL INJURY

A broad range of factors across domains were reported to contribute to secondary psychological injury (see Table 10). Importantly, stakeholders noted that the risk of secondary psychological injury was often highly individualised.

TABLE 10. CONSISTENTLY REPORTED CONTRIBUTING FACTORS IDENTIFIED IN STAKEHOLDER INTERVIEWS

Domain	Contributing Factor
Personal	• Uncertainty (i.e., languishing, ruminating) about future (e.g., income sources, recovery) • Loss / lack of control over decision making (e.g., choice of healthcare provider) • Financial stress due to decreased income either from step-downs, multiple-to-single source of income, or loss of overtime and other benefits
Injury-related	• Traumatic mechanism (e.g., workplace violence) resulting in non-PTSD-related anxiety • Impact of injury on ability, rather than severity (e.g., low back pain) • Chronic pain (i.e., limited recovery extending claim duration)
Employment	• Lack of support (or perceived lack of support) of the line manager / direct supervisor • Loss of social environment and connection to co-workers • Limited capacity and modified duties (e.g., passive aggressiveness from co-workers) • Inexperienced line manager
System	• Unfamiliar system with a loss of control and additional obligations • Inexperienced and unempathetic claims managers • Involvement of lawyers in attempting to obtain further long-term / permanent benefits
Healthcare	• Conservative healthcare providers who "co-ruminate" • Healthcare providers who do not understand the workers' compensation system

Personal factors

Stakeholders (particularly psychologists) consistently reported that the uncertainty associated with an array of individual factors contributed to secondary psychological injury. For example, concerns about financial security, pain management, and uncertainty regarding recovery trajectory. Stakeholders reported workers "ruminating" or "languishing" about aspects of their claim significantly contributed to the risk of secondary psychological injury.

This was in part contributed to by a lack of control over decision-making where a person was previously independent. One stakeholder posed a hypothetical example:

> [An] injured worker goes to work on a Tuesday and they're fully in control of their life. They get up, they make decisions, they get the kids ready to go to school, maybe they got a mortgage approved that day, maybe they bought a car that day, maybe their fridge carked it that day… lunch time they end up being injured at work through no fault of their own, and nobody has said sorry, and nobody has checked to see if anyone is going to pick up the kids from school, and they are freaking out because they're now thinking, how the hell am I going to meet my mortgage repayments? Who's going to pick up the kids from school? Then they're told when they can go to work, how they can go to work, who they should talk to when they go to work, how much they're going to get paid, when they might get paid, and guess what, if you don't heal in this 2-year time period… you're gonna lose your job"

Several stakeholders noted that a loss of control could contribute to a loss of identity. This loss of identity could also be contributed to by not being able to work, with many workers' identities tied to their profession and employment. Some stakeholders noted that workers could be "emasculated" by losing their role as the "breadwinner" or requiring family care and support, and that this could contribute to secondary psychological injury.

Personal financial circumstances may pose a significant risk for secondary psychological injury, particularly when the worker has multiple jobs or relied on other sources of income. For example, workers who relied on cash-in-hand jobs or overtime from their primary job were noted to be at particular risk. Stakeholders reported that financial stress had become an increasing concern in recent years, with a higher proportion of workers claiming for small costs like travel to and from healthcare appointments than in previous years.

Pre-injury psychological health and history of psychological illness was highlighted as a significant contributing factor. Workers with pre-existing or comorbid psychological ill health were noted as often experiencing an exacerbation of psychological symptoms post-injury.

Injury-related factors

Most stakeholders reported that the nature and / or mechanism of injury is likely to contribute to secondary psychological injury. A traumatic mechanism of injury (e.g., workplace violence) was noted to be a likely contributing factor to secondary psychological injury early in a claim, particularly contributing to stress through thoughts of re-injury (even outside the workplace at a similar environment, e.g., shopping centre), and / or fear of colleagues being injured during, or even before, the return-to-work process.

However, several stakeholders noted that while the mechanism is an important contributing factor, the severity of the injury was not necessarily always a strong contributing factor to secondary psychological injury – rather, the impact of the injury or condition on the persons' capacity and ability was more important. For example, a broken non-dominant arm may pose less risk of secondary psychological injury than chronic low back pain. Pain, particularly chronic pain, was often noted as a major contributing factor, especially when coupled with a degree of uncertainty – e.g., "When will I ever recover?".

Employment and workplace factors

Stakeholders consistently reported that the injured workers' direct line manager / supervisor was the most important employment-related factor associated with secondary psychological injury. The reaction of the line manager immediately after an injury was noted as critical – a lack of support (or perceived lack of support, e.g., an "eye roll") within "the first 5 minutes" could be a major contributing factor to future secondary psychological injury. Stakeholders reported that this could be expressed as stigma about the injury (e.g., low back pain), and could also arise from co-workers.

Stakeholders noted that the workplace is often an important social environment for workers, and that prolonged absence can lead to isolation and loss of interaction with co-workers, which could contribute to secondary psychological injury. Regular communication with the injured worker was reported as beneficial, but mostly if communication was scheduled, so as to not "pressure" an injured worker.

Several aspects of the return-to-work process were reported as challenging and could contribute to secondary psychological injury, including:

- **The employer has not remedied or actioned the equipment or process that caused the workers' injury in the first place**. The manager is often perceived as the person "who is meant to keep the worker safe" – an injured worker may experience stress or anxiety due

- to objects or processes related to their initial injury, with concern either for themselves or colleagues.
- **A worker in modified duties can experience passive aggressiveness and / or micro-aggressions from co-workers**. Even if co-workers are supportive, a worker may not feel like a "complete contributor", or that their modified duties are "below them".
- **The line manager is inexperienced and unfamiliar with their obligations**. Managers, particularly in small to medium enterprises, were reported as unfamiliar with best practice in return-to-work as it is not their normal job, and they are usually appointed to this role to meet regulatory requirements.

System features and claims management

The workers' compensation system is foreign and requires several unfamiliar obligations of the worker. This loss of control and requirement to achieve certain goals and gather specific information can contribute to secondary psychological injury. Stakeholders reported that a lack of emotional intelligence and experience in claims managers could also exacerbate the stress of some of these processes, and even directly contribute to secondary psychological injury.

High turnover rates in the personal injury sector were linked to a worker meeting multiple claims managers during their claim and subsequently having to explain their injury (and the legitimacy of the injury) repeatedly – a factor that was thought to contribute to secondary psychological injury. Stakeholders reported that claims managers who were "curious" (i.e., asking what they could do to support / help the worker) were beneficial to avoiding secondary psychological injury and recovery in general.

Stakeholders also noted that the involvement of lawyers in the workers' compensation process could be a contributing factor, as lawyers often informed the worker that they were entitled to more benefits if they were sufficiently disabled. This was thought to contribute to a sickness behaviour and subsequent secondary psychological injury.

Healthcare

Stakeholders consistently reported that the GP plays a significant role in the care of the injured worker, and that their unfamiliarity with systems and best return-to-work practices may be a contributing factor to secondary psychological injury. Some stakeholders suggested that highly conservative GPs can trigger or start a victim mindset by "co-ruminating" with the injured worker.

A mismatch of expectations and goals between healthcare providers and workers was also noted as a contributing factor. For example, surgeons may see a successful surgery as a reduction in pain levels, whereas the worker may be expecting a return to full functional capacity.

2.2.5. TIMING OF SECONDARY PSYCHOLOGICAL INJURY

Stakeholders were not able to define a key time point (e.g., 6 weeks) at which secondary psychological injury developed or could be prevented. However, stakeholders did agree on several key timing concepts:

- **Addressing contributing factors earlier rather than later is beneficial**. Stakeholders noted that addressing worker uncertainty early was beneficial in reducing the risk of secondary psychological injury.
- **Key events in the claim are likely to be challenging**. Return to work attempts, particularly cases of a traumatic mechanism or where the worker cannot perform their usual tasks, may trigger stress and anxiety. Stakeholders noted that awareness of this risk may be helpful. Furthermore, independent medical examinations in which the worker has to prove their injury or illness may also contribute. Importantly, these events may contribute to secondary psychological injury before (i.e., anticipation), during and / or after they have occurred.
- **The longer the claim duration, the greater the risk of secondary psychological injury**. Longer duration leaves more time to be exposed to a number of contributing factors, particularly allowing the worker to ruminate and languish.

2.2.6. SCREENING TOOLS FOR SECONDARY PSYCHOLOGICAL INJURY

Stakeholders were not aware of screening tools specifically for secondary psychological injury but noted typical psychological and psychosocial stress tools (e.g., Kessler-10, Orebro, DASS, etc.). Rehabilitation providers and claims managers consistently noted that while tools are useful for new rehabilitation and claims management staff, experienced staff could quickly identify a worker at risk for or who had secondary psychological injury simply from, "the vibe". Specifically, it was reported that experienced staff could tell from a short phone call based on language, tone and specific wording (e.g., "injustice", "worry about not sleeping well"), whether the worker was at risk.

Rehabilitation providers also noted that given the fluctuating nature of symptoms, or in some cases the objectives of the worker (e.g., wanting to express a higher need), that screening tools

could be imprecise. The effectiveness of these tools was also reported to be dependent on the person delivering the tool due to claims manager skill, and perceived power imbalances. For example, one rehabilitation provider noted that a young female claims manager asking an older male construction worker about their feelings in the past week is unlikely to be received well by the injured worker.

2.2.7. PROPOSED SOLUTIONS AND IMPROVEMENTS

Stakeholders offered a range of potential options that they believed would reduce the likelihood of a secondary psychological injury. Consistent suggestions included:

- **Providing a clear and simple explanation of workers' compensation system processes could reduce the uncertainty that workers face**. One psychologist noted that a simple handout may be sufficient to convey information about processes, entitlements and obligations. However, another stakeholder also noted that education as a blanket intervention may be insufficient, and that information at the right time from the right person (i.e., employer) would be more important.
- **Train claims managers with skills and emotional intelligence necessary to empathetically handle injured workers**. Stakeholders reported sector challenges in turnover of claims managers, and that junior or inexperienced claims managers may not have sufficient skills to support worker recovery.

2.3. INTERPRETATION

"Secondary psychological injury" may not need to be clinically diagnosed. Although stakeholders were not consistent in their opinion about diagnosis or presentation of injury, they did agree that a diagnosis would be helpful to asserting liability and granting access to funding for treatment via the insurer. Provisional liability to provide funding for mental health services may be beneficial to prevent the escalation of secondary psychological injury.

Uncertainty and a lack of control are key contributors to secondary psychological injury. Stakeholders consistently point to uncertainty about any aspect of life, but particularly future finances, work and health as key contributors. A lack of control over decisions in these domains (e.g., healthcare) can also contribute to secondary psychological injury. Explaining processes, entitlements and obligations and involving the worker in healthcare decisions may allay uncertainty and return control to the worker.

The worker's direct line manager is very important. All stakeholders have a role to play in the workers' compensation process and in preventing a secondary psychological injury. However, a worker's supervisor was highlighted as essential by stakeholders, from the moment of injury through to their return to work. Getting the right information to the line manager at the right time (i.e., early in the claim) to ensure that they provide the best possible support to the worker may reduce the risk of secondary psychological injury.

Identifying and tracking the prevalence of secondary psychological injury is challenging. There was not good quality data from stakeholders on the prevalence of secondary psychological injury because (1) it depends on how the concept is defined and there is no commonly accepted definition; and (2) even if there was a common definition, data systems are not of sufficient quality to accurately measure it.

2.4. CONSIDERATIONS

Participants had extensive experience in managing injured workers with secondary psychological injury. This was beneficial, as it provided clear and in-depth insights. However, the sample lacked stakeholders with limited experience (e.g., less experienced claims managers or clinicians) who were noted as potential contributors to the development of secondary psychological injury. Future research should aim to collect data from less experienced staff in these worker-facing positions, to understand their training and development needs, and why they often remain in these roles for short durations.

Employers were underrepresented in focus groups. A large proportion of the participants of the focus groups were from claims management organisations. Future research could benefit from also including more employers.

A sizeable portion of the sample was from a single organisation. This group offered beneficial insights, but was recruited from one organisation and may thus constitute a biased perspective. This should be considered when interpreting findings.

The sample only offered perspectives on the national level. Future research could benefit from international perspectives from regions that operate similar systems to Australia (e.g., Canada).

ACTIVITY 3: INJURED WORKER PERSPECTIVES

The Workers' Voice study is a 3-year research initiative funded by the Australian Research Council that aims to develop a vision for workers' compensation policy and practice based on the lived experiences of injured workers. Conducted by Monash University in collaboration with the University of Melbourne and the University of Waterloo in Canada, the study seeks to understand the challenges faced by individuals who have made compensation claims due to workplace injury or illness and identify solutions to those challenges. Through surveys, interviews and participatory workshops, the research gathers insights from injured workers, their families, and support networks to identify systemic issues that contribute to stress, delayed recovery and poor return-to-work outcomes, and identify potential solutions to these issues.

At the time of beginning this project, the Workers' Voice study had been running for 24 months, and a number of substantial data collection activities were completed in late 2024. Among these were a cross-sectional survey of injured workers and a set of qualitative interviews with people with accepted workers' compensation claims and their key informants. In this activity, quantitative and qualitative data were re-analysed to address research objectives 2, 3, 6 and 7 (see Table 11).

TABLE 11. OBJECTIVES FOR ACTIVITY 3

Activity	Research Objectives						
	1. Define secondary psychological injury	2. Understand main drivers	3. Understand role of stakeholders	4. Evidence of stages of claim	5. Understanding of screening tools	6. Insights to modifiable aspects	7. Evidence-based recommendations
Activity 1. Literature review	●	●		●	●	●	●
Activity 2. Stakeholder engagement	●	●	●	●	●	●	●
Activity 3. Lived experience		●	●			●	●
Analysis of a recently collected series of survey and interview data from a large national cohort of injured workers (the Workers Voice study) to understand secondary psychological injury from the worker's perspective.							
Activity 4. Claims data analysis		●		●			●

3.1. APPROACH

3.1.1. WORKERS' VOICE DATA

A total of 533 participants responded to the Workers' Voice survey between September 2023 and July 2024. These were people who submitted workers' compensation claims due to work-related conditions, or their support persons (e.g., family or friends). The survey included both quantitative and qualitative (via free-text responses) survey items. Eligible participants were those with personal experience of a current or previous workers' compensation claim, were at least 18 years of age, and were proficient in conversational English.

Survey items used for this project included a subset of the full survey, and included (i) demographic and claim information, (ii) overall claims experience, (iii) impact of interactions with stakeholders in the claims process, (iv) impact of claims events and process components, and (v) health and wellbeing impacts of the compensation claims process.

Additionally, in-depth qualitative interviews were conducted with a subgroup of those who completed the survey and expressed interest in further research. The semi-structured interviews, which occurred via telephone or videoconference between February and July 2024, included items on influences that led to claim submission, key moments during the compensation claim, persons who influenced recovery, and suggested improvements to the workers' compensation system.

Demographic characteristics included age at the time of survey completion and gender identity. Information on workers' compensation claims included (i) the health condition leading to the compensation claim (i.e., injury, mental health condition, musculoskeletal disorder, or

occupational disease); (ii) claim duration (ranging from 1 month or less to 2 years or more); and (iii) claim status (i.e., accepted, denied, not yet determined).

3.1.2. SAMPLE FOR ANALYSIS

From the total of 533 survey respondents 503 (94%) reported negative mental health impacts due to their workers' compensation claim. This meant that identifying those explicitly with secondary psychological injury was challenging. Workers were therefore dichotomised based on their selection of 1 of 6 claims' experiences: (1) persistent negative experience throughout the claim (n=279) or (2) positive or mixed experience (n=224). The persistent negative experience was therefore a proxy measure of psychological injury during the claim. The 6 types of claims experiences and subsequent dichotomisation is visualised in Figure 2.

3.1.3. ANALYSIS

Descriptive statistics were first used to report the number and percentage of workers in each of the 2 claims experience groups by demographic characteristics, claimed conditions, claims contacts, and claim-related events and processes.

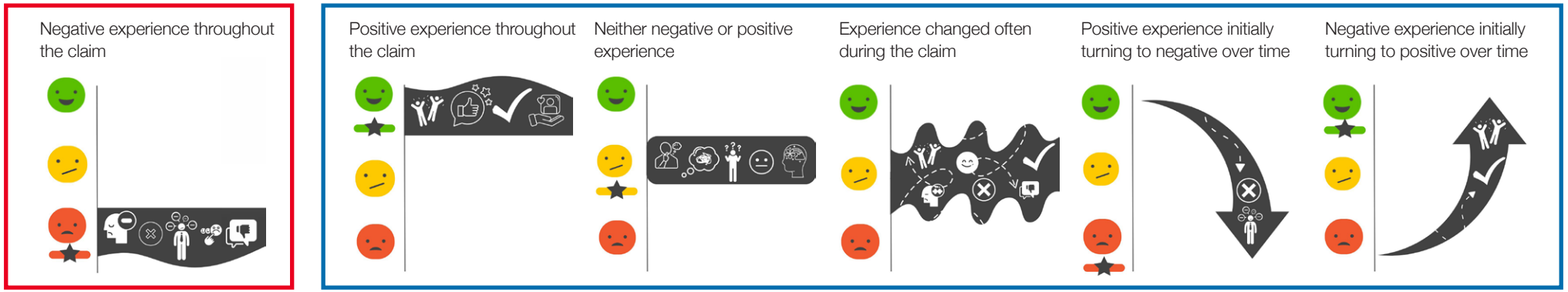
A series of binary logistic regression models were then used to test the statistical association of characteristics with having a persistent negative experience. Specific variables were chosen for each model based on the proportion of workers with missing data, described in Table 12. Model results are reported as Odds Ratios (OR) with 95% Confidence Intervals (95%CI), with statistical significance set at $p < 0.05$.

TABLE 12. VARIABLES INCLUDED IN STATISTICAL MODELLING

Model	Variables included
1: Partially adjusted	Adjusting for sociodemographic characteristics and claims history
2: Partially adjusted	Model 1 + adjusting for stakeholder groups (i.e., doctors, insurers and employers)
3: Fully adjusted	Model 2 + adjusting for claims events and processes

Open-ended survey responses and interview extracts were analysed thematically, based on the guiding question: "What affected mental health negatively during the workers' compensation claims process?".

FIGURE 2. VISUALISATION OF THE 6 OVERALL EXPERIENCE PATTERNS PRESENTED TO SURVEY RESPONDENTS. THE RED BOX SHOWS THE MAIN OUTCOME OF ANALYSIS (PERSISTENT NEGATIVE EXPERIENCE), WITH ALL PATTERNS IN BLUE GROUPED TOGETHER



3.2. FINDINGS

As above, a total of 503 participants who reported negative mental health impacts due to their workers' compensation claim were included (see Table 13, complete descriptive statistics in Appendix). Of these, 279 participants reported a persistent negative experience pattern, while 224 reported positive or mixed experience patterns.

TABLE 13. DEMOGRAPHIC CHARACTERISTICS OF INJURED WORKERS

Demographics	Negative Experience Pattern (n=279)	Positive or Mixed Experience Pattern (n=224)
	N (%)	N (%)
Age (years)		
18-24	0 (0)	2 (0.9)
25-34	14 (5.0)	14 (6.3)
35-44	51 (18.3)	28 (12.5)
45-54	81 (29.0)	75 (33.5)
55-64	110 (39.4)	86 (38.4)
65-75	23 (8.2)	19 (8.5)
Health condition		
Injury (e.g., wound, fracture)	88 (31.5)	66 (29.5)
Mental health condition	117 (41.9)	70 (31.3)
Musculoskeletal condition	66 (23.7)	78 (34.8)
Disease (e.g., infection, cancer)	8 (2.9)	10 (4.5)

The number and percentage of workers who reported positive and negative impacts of claim-related contacts, events and processes varied between the 2 groups. 87.8% (n=245) of those with a negative experience pattern reported that the insurer had a negative impact on their mental health, compared to only 60.3% (n=135) of those workers with a positive / mixed experience. A similar trend was true of the impact of the employer, with 86.4% (n=241) of those with a negative experience and 73.2% (n=164) of those with a positive / mixed experience reporting a negative impact. Lastly, 67.4% (n=151) of those with a positive / mixed experience reported a positive impact of the doctor / surgeon, compared to 53.0% (n=148) of those with a negative experience.

Regarding claims processes, high proportions of both workers with an overall negative experience (82.1%, n=229) and positive / mixed experience (74.1%, n=166) reported that income change had a negative impact. Waiting for claims approval had a negative impact for 79.9% (n=223) of workers reporting a negative experience, but only 47.3% (n=106) of those reporting a positive / mixed experience.

Statistical modelling adjusting for all available variables (Model 3, see Table 12) identified that being female was significantly associated with a lower likelihood of having a negative experience throughout the claim (OR 0.45, 95%CI 1.89, 14.42) (see Figure 3). Two insurer-related factors were significantly associated with a greater likelihood of having a negative experience throughout the claim:

- Workers who experienced negative insurer interactions (OR 5.22, 95%CI 1.89, 14.42)
- Workers who had a negative experience waiting for claims approval (OR 4.12, 95%CI 1.88, 8.99)

Full statistical models are available in Appendix 3.

FIGURE 3. STATISTICAL ASSOCIATION OF CHARACTERISTICS AND CLAIMS PROCESS, EVENTS AND STAKEHOLDERS WITH HAVING A PERSISTENT NEGATIVE CLAIMS EXPERIENCE (STATISTICALLY SIGNIFICANT FACTORS ARE HIGHLIGHTED IN ORANGE)

Category	Characteristic	Odds Ratio	Lower Limit	Upper Limit
Age	Age	1.14	0.8	1.63
Gender	Female	0.45	0.23	0.9
	Ref: Male	–	–	–
Claim Status	Other Status	0.61	0.31	1.19
	Ref: Accepted, Closed	–	–	–
Claim Duration	Claim Duration	0.85	0.63	1.14
Family	Negative Experience	0.98	0.31	3.07
	Positive Experience	2.03	0.78	5.29
	Ref: No Impact	–	–	–
Insurer	Negative Experience	5.22	1.89	14.42
	Positive Experience	0.77	0.16	3.57
	Ref: No Impact	–	–	–
Doctor / Surgeon	Negative Experience	2.5	0.72	8.56
	Positive Experience	0.53	0.17	1.64
	Ref: No Impact	–	–	–
Employer	Negative Experience	2.63	0.71	9.73
	Positive Experience	2.16	0.42	11.14
	Ref: No Impact	–	–	–

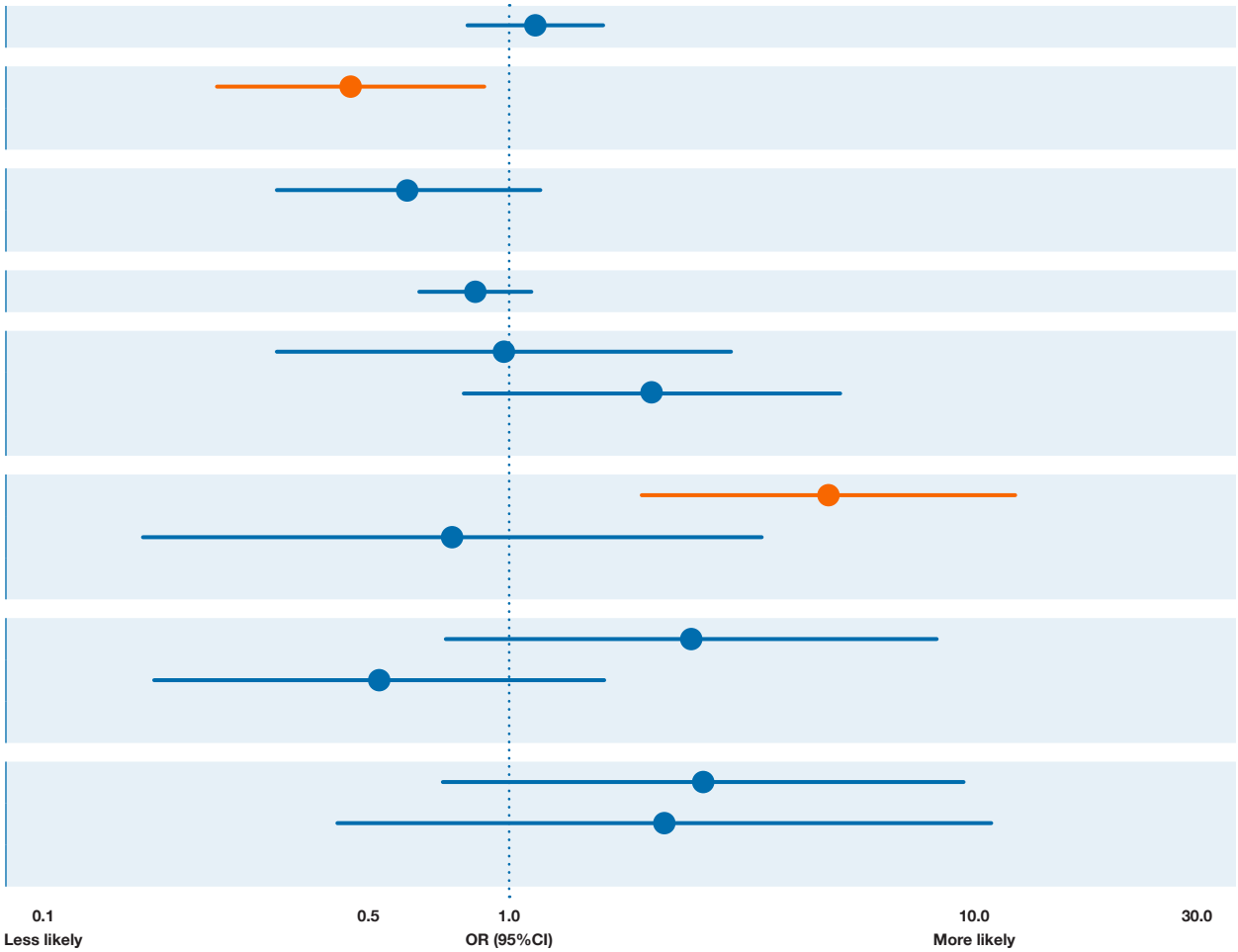
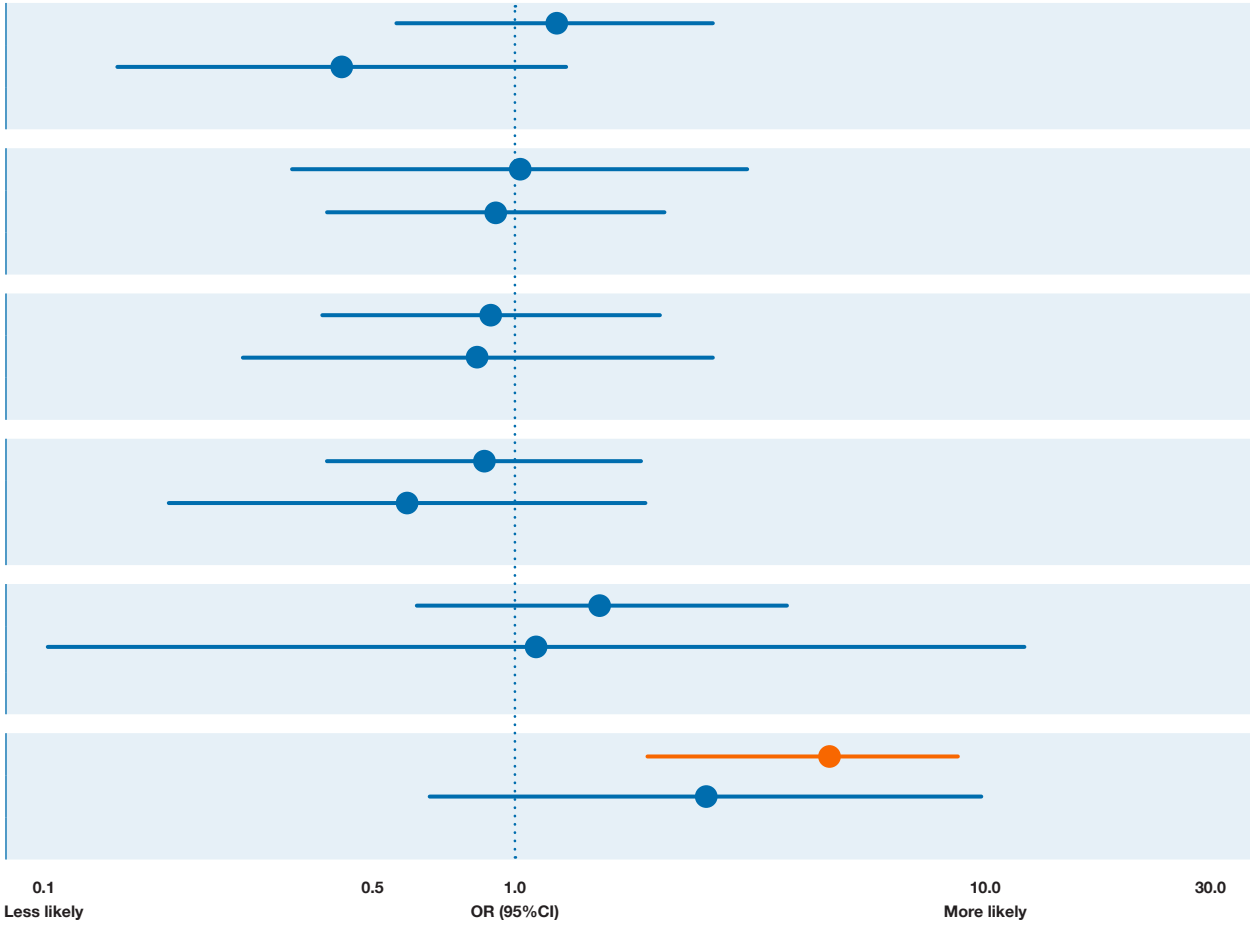


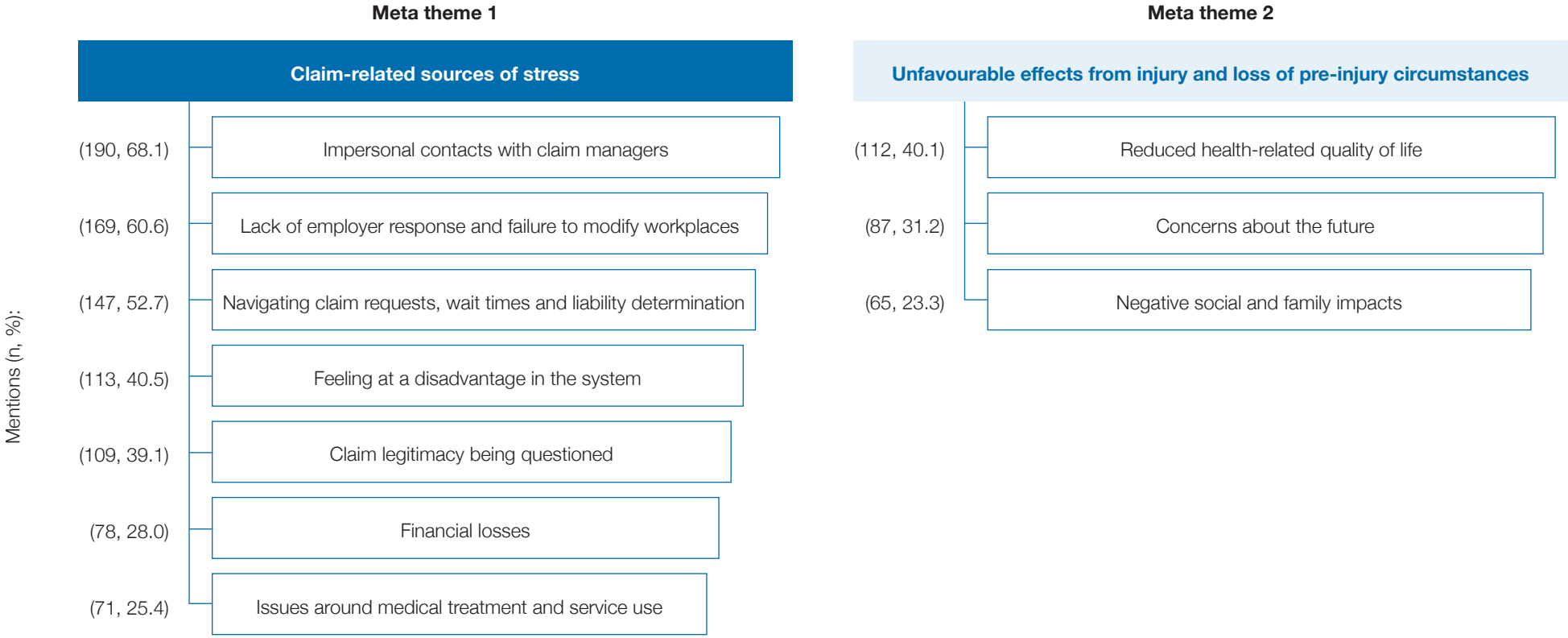
FIGURE 3. STATISTICAL ASSOCIATION OF CHARACTERISTICS AND CLAIMS PROCESS, EVENTS AND STAKEHOLDERS WITH HAVING A PERSISTENT NEGATIVE CLAIMS EXPERIENCE (STATISTICALLY SIGNIFICANT FACTORS ARE HIGHLIGHTED IN ORANGE) CONT.

Category	Characteristic	Odds Ratio	Lower Limit	Upper Limit
Disclosure	Negative Experience	1.22	0.55	2.69
	Positive Experience	0.43	0.14	1.31
	Ref: No Impact	–	–	–
Medical Certificate	Negative Experience	1.02	0.33	3.18
	Positive Experience	0.91	0.39	2.11
	Ref: No Impact	–	–	–
Evidence Gathering	Negative Experience	0.89	0.38	2.07
	Positive Experience	0.84	0.26	2.68
	Ref: No Impact	–	–	–
Paperwork	Negative Experience	0.86	0.39	1.89
	Positive Experience	0.59	0.18	1.93
	Ref: No Impact	–	–	–
Income Change	Negative Experience	1.54	0.61	3.86
	Positive Experience	0.99	0.08	12.38
	Ref: No Impact	–	–	–
Waiting for Claim Approval	Negative Experience	4.12	1.88	8.99
	Positive Experience	2.55	0.65	9.98
	Ref: No Impact	–	–	–



Qualitative analysis revealed 2 meta-themes that contributed to negative mental health during a workers' compensation: (i) claim-related sources of stress, and (ii) unfavourable effects from injury and loss of pre-injury circumstances. Ten themes were identified within these meta-themes, summarised in Figure 4.

FIGURE 4. THEMES FROM QUALITATIVE ANALYSES ORGANISED UNDER META-THEMES OF POOR MENTAL HEALTH INFLUENCES OF INJURED WORKERS (N=279) WITH NEGATIVE EXPERIENCES THROUGH THEIR WORKERS' COMPENSATION CLAIMS MENTIONED (MENTIONS N, %)



The most frequently mentioned source of claim-related stress was impersonal contacts with claims managers (68.1%). Participants reported that interacting with claims managers involved poor communication, and that some demonstrated a lack of empathy. 60.6% of workers also reported that a lack of employer response and failure to modify workplaces caused stress. This was typically due to poor employer responsiveness and support.

> **I was removed from the workplace by my GP. Not once did my employer reach out to me to see how I was […].”**

Over half of participants (52.7%) identified that claim rejection and wait times for claims decisions was a significant source of stress. Navigating aspects of the system in general was found to be stressful.

> **Months of not knowing if I had to pay back all the healthcare and wages impacted my mental health, leaving me anxious and depressed. Due to stress I drink too much and have gained weight.”**

Chronic pain and a loss of mobility was a significant health-related source of stress for injured workers, and 23.3% reported that losing the status as the primary earner and requiring support from family was stressful.

> **[…] I now have to take nerve blo[c]kers to survive as I have been forced to go back to work. My life revolves around pain and depression. […] I push through to support my family but I don’t have a social life as all I want to do is be by myself as the pain controls my moods which are not always but mostly directed at others.”**

3.3. INTERPRETATION

Negative mental health impacts as a result of lodging a workers’ compensation claim are common, and around half of respondents recalled the workers’ compensation process as an entirely negative experience. Regression analysis showed that males had higher odds of negative experiences throughout, as well as those who had negative interactions with insurers and a negative experience waiting for claim approval. The qualitative components then provided greater insight into these, demonstrating a number of claim-related and employer factors that contribute.

The stakeholders, events and workers’ compensation system processes that were highlighted as causing mental stress among respondents are largely modifiable. The findings from analysis of Workers’ Voice data provide further understanding of the causes of secondary psychological injury, and thus opportunities to prevent or minimise it.

Results of qualitative component of this activity speak to previous research about claim-related and modifiable factors. Several system and employer-related factors identified in this activity are similar to those identified in the literature review (activity 1) and expressed by other stakeholders (Activity 2). These consistent findings indicate that many key contributing factors are modifiable.

3.4. CONSIDERATIONS

This research activity benefited from a mixed methods approach. The qualitative component contextualising the quantitative findings, providing additional insights. Further, results were from a large national sample of injured workers and qualitative data collection reached saturation.

It is important to note that findings are from a program of research seeking to answer a related but not identical research question, meaning the available data was not fully aligned with the research questions in this project, subsequently resulting in a number of missing cases for the hierarchical logistic regression analysis. Thus, the variables entered into the regression model represent the most common claims impact factors rather than an exhaustive list. A purpose-designed study examining secondary psychological injury in future would reduce these limitations, utilising and capturing data identified in this report as contributing to secondary psychological injury.

ACTIVITY 4: CLAIMS DATA ANALYSIS

Previous Australian studies have highlighted the utilisation of mental health services and medicines by individuals with workers' compensation claims for physical conditions (e.g., low back pain) [4, 15, 16, 28]. These studies have also highlighted that services tend to be associated with longer-term claims, with services delivered later in the claims process. Some of these services may be used specifically for aspects of the physical condition. For example, antidepressants are increasingly used for low back pain [29], and techniques with a basis in psychology have recently shown promising effectiveness in treating chronic low back pain [30, 31]. However, use of mental health services and medicines may also be a viable proxy indicator of secondary psychological injury.

In this activity, a large sample of health services and medicines data for injured workers with long-duration workers' compensation claims were analysed to describe the prevalence and factors associated with accessing mental health services or being prescribed a mental health medicine, addressing research objectives 2, 4 and 7 (see Table 14).

TABLE 14. OBJECTIVES FOR ACTIVITY 4

Activity	Research Objectives						
	1. Define secondary psychological injury	2. Understand main drivers	3. Understand role of stakeholders	4. Evidence of stages of claim	5. Understanding of screening tools	6. Insights to modifiable aspects	7. Evidence-based recommendations
Activity 1. Literature review	●	●		●	●	●	●
Activity 2. Stakeholder engagement	●	●	●	●	●	●	●
Activity 3. Lived experience		●	●			●	●
Activity 4. Claims data analysis		●		●			●
Quantitative analysis of a large sample of workers' compensation claims and payments linked with Medicare Benefits Scheme and Pharmaceutical Benefits Scheme data to identify the prevalence and timing of secondary psychological injury using both psychological services and medicines data.							

4.1. APPROACH

4.1.1. DATA SOURCE

The Transitions Study was a controlled retrospective cohort study that sought to measure the impact of major changes to eligibility in the NSW workers' compensation scheme: Section 39 of the *State Workers' Compensation Legislation Amendment Act 2012* [32]. This study used a large sample of long-term workers' compensation claims and payments data linked to the Medicare and Pharmaceutical Benefits Schemes (MBS, PBS), and state government emergency department presentation and hospital admission datasets. Detailed descriptions of how this data source was cleaned and prepared is available in Appendix 4.

4.1.2. SAMPLE OF WORKERS, SERVICES AND MEDICINES

This analysis includes people in NSW who had a workers' compensation claim for physical injury or illness that occurred between 1 January 2011 and 31 December 2016. Workers with claims for mental health conditions were excluded, as it would not be possible to detect secondary psychological injury with health services and medicines as a proxy. This study period was selected to allow an adequate follow-up period for analysis. Given the Transitions Study was focussed on 2017 legislative change, a maximum injury date of 31 December 2016 allows for a consistent 2-year follow-up for all included workers.

Any mental health service funded by the MBS in the year prior to 2 years after the date of injury was included. These mental health services were identified in a list published by the Australian Institute of Health and Welfare [33], but in brief, include GP mental health care plans, psychiatrist services, focussed psychological and other allied mental health services. Any mental health service funded by the workers' compensation scheme in the 2 years after the date of injury was included. Due to the nature of workers' compensation funding, these were psychological and counselling items specific to the NSW workers' compensation scheme.

Any medicine for mental health funded in the year prior to 2 years after the date of injury was included. Medicines for mental health were defined by AIHW using Anatomic Therapeutic Chemical (ATC) codes [34], and included antidepressants (N06A), psychostimulants (N06B), antipsychotics (N05A), anxiolytics (N05B, and hypnotics and sedatives (N05C). The NSW State Insurance Regulatory Authority (SIRA) did not collect detailed information about medicines in the study period. However, given workers' compensation schemes fund the gap payment for prescriptions medicines subsidised by the PBS, it is likely this sample of medicines comprehensively captures medicines use.

4.1.3. DATA ANALYSIS

Descriptive statistics were first used to report the number and percentage of workers attending a mental health service or being prescribed a medicine for mental health at any time in the year prior to 2-years after the date of injury. The monthly proportion of workers attending services and being dispensed medicines (i.e., the incidence) was also visualised. Several health service use scenarios were defined in an attempt to identify secondary psychological injury. For example, if a person had a medicine for mental health, or a mental health service funded by either MBS or workers' compensation at any time in the 2-years post-injury, would this be considered an indicator of secondary psychological injury? Four scenarios with medicine and service requirements with varying levels of restriction were examined, summarised in Table 15.

TABLE 15. HEALTH SERVICE SCENARIOS

Scenario	Medicines (PBS)		Services (MBS)		Services (WCS)
Scenario 1: PBS | MBS | WCS	At least 1 dispense	OR	At least 1 service	OR	At least 1 service
Scenario 2: PBS & (MBS | WCS)	At least 1 dispense	AND	(At least 1 Service	OR	At least 1 Service)
Scenario 3: >2 PBS & (MBS | WCS)	More than 2 dispenses	AND	(At least 1 Service	OR	At least 1 Service)
Scenario 4: PBS & MBS & WCS	At least 1 Dispense	AND	At least 1 Service	AND	At least 1 Service

PBS: Pharmaceutical Benefits Scheme, MBS: Medicare Benefits Scheme, WCS: Workers' Compensation Scheme

Factors associated with secondary psychological injury were then measured. The third scenario described above was selected to flag claims that were considered to have had secondary psychological injury. The number and percentage of workers who had secondary psychological injury was then reported against several demographic characteristics, including:

- Mental health medicines and services use in the 1-year prior to injury
- Worker sex, age group and workplace industry (Australia and New Zealand Standard Industrial Classification [ANZSIC])
- Nature, bodily location, agency and mechanism of injury (Type of Occurrence Classification System [TOOCS])
- Socioeconomic status (derived from Data Over Multiple INdividual Occurrences [DOMINO])
- Home ownership status, relationship status, country of birth
- Receipt of either Disability Support Pension or NewStart Allowance in the 1-year pre-injury

A series of binary logistic regression models were then executed to test the statistical association of characteristics with having secondary psychological injury. Specific variables were chosen for each model based on the proportion of workers with missing data, described in Table 16. Model results are reported as Odds Ratios (OR) with 95% Confidence Intervals (95%CI), with statistical significance set at $p < 0.05$.

TABLE 16. BINARY LOGISTIC REGRESSION MODELS

Model	Variables included	N (%) missing
1: Unadjusted	Characteristics modelled separately, no adjustment	0 (0.0)
2: Partially Adjusted	Adjusting only for characteristics typically collected by workers' compensation scheme stakeholders (e.g., nature of injury)	73 (3.2)
3: Fully adjusted	Adjusted for all available covariates, including those only available via linkage to DOMINO data	597 (26.5)

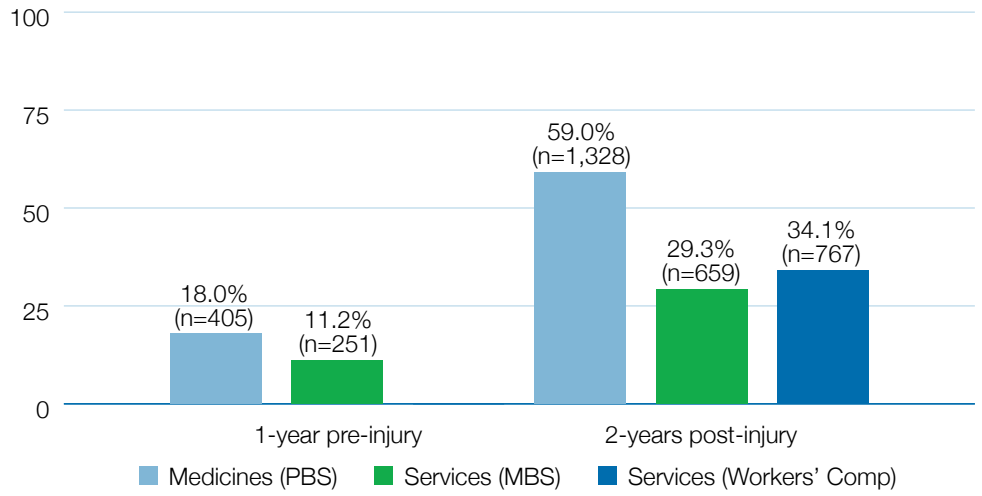
4.2. FINDINGS

The final sample of claims included 2,251 workers with time-loss claims at least 104 weeks in duration. Two thirds of workers (65.3%, n=1,471) were male, one third were aged 45-54 (34.7%, n=781), and Manufacturing and Utilities was the largest aggregate industry division (15.8%, n=356). Most claims were for injury and poisoning (81.0%, n=1,824), with a third in the upper limbs (34.3%, n=771), and over half due to body stressing (51.2%, n=1,153). Only 32.3% (n=723) were homeowners, with 31.0% partnered without dependent children (n=697). A small percentage (10.7%, n=241) had received a NewStart Allowance payment in the year prior to injury, and a smaller percentage still (2.0%, n=45) received a Disability Support Pension. Complete demographics are available in the Appendix 4.

A total of 18.0% (n=405) of workers were dispensed a medicine for mental ill health, and 11.2% (n=251) accessed a mental health service in the 1-year pre-injury (see Figure 5). In the 2-years post-injury, the proportion of workers dispensed a medicine increased to 59.0% (n=1,328) and services funded by the MBS increased to 29.3% (n=659), with 34.1% of workers accessing services funded by the workers' compensation scheme.

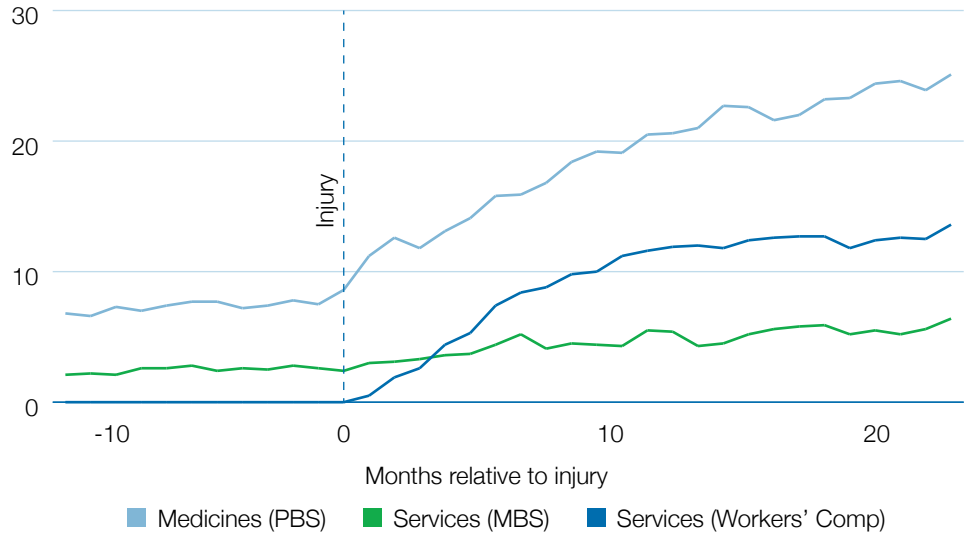
FIGURE 5. NUMBER AND PERCENTAGE OF WORKERS ACCESSING MENTAL HEALTH SERVICES OR DISPENSED A MENTAL HEALTH MEDICINE IN YEAR BEFORE AND 2 YEARS AFTER INJURY

% OF WORKERS



The monthly percentage of workers dispensed medicines and accessing service (i.e., the incidence) was consistently below 10% in the year pre-injury (see Figure 6). The incidence of medicine dispenses increased consistently month-on-month from the month of injury to 25% by 2-years post-injury. There were limited increases in mental health services funded by the MBS in the 2-years post-injury. The incidence of workers accessing services funded by the workers' compensation increased to approximately 12% before leveling out.

FIGURE 6. MONTHLY PERCENTAGE OF WORKERS ACCESSING MENTAL HEALTH SERVICES OR DISPENSED MENTAL HEALTH MEDICINE IN THE YEAR BEFORE AND 2 YEARS AFTER INJURY
% OF WORKERS



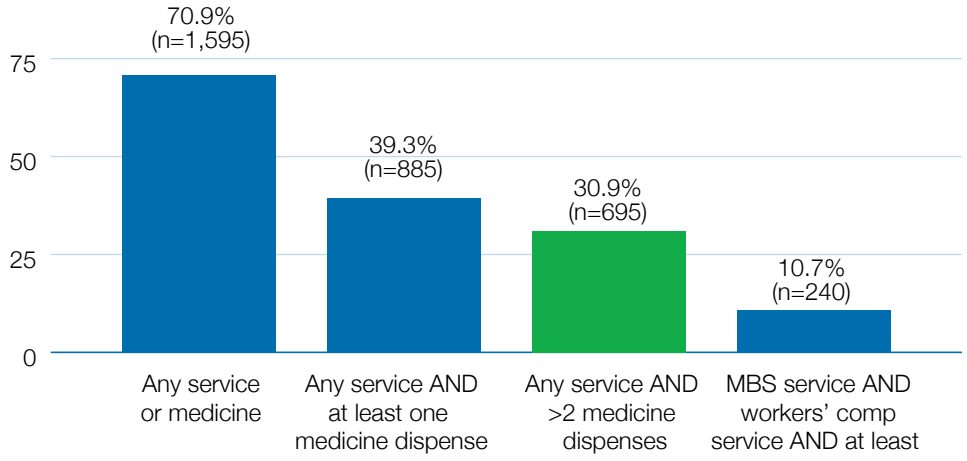
Four medicine and service use scenarios were tested:

1. Any mental health medicine or service in the 2-years post-injury
2. Any mental health service AND at least 1 mental health medicine in the 2-years post-injury
3. Any mental health service AND greater than 2 mental health medicine dispenses in the 2-years post-injury
4. A mental health service funded by the MBS AND a mental health service funded by the workers' compensation scheme AND a mental health medicine in the 2-years post-injury

As demonstrated in Figure 7, many workers (70.9%, n=1,595) had any mental health service or medicine in the 2-years post-injury. This percentage almost halved (39.3%, n=885) in the second scenario in which both a mental health medicine and a mental health service were required, and decreased again (30.9%, n=695) when the number of required medicines dispensed was raised to greater than 2. Lastly, in the most restrictive scenario, 10.7% (n=240) of workers recorded services funded by both MBS and the workers' compensation scheme and at least one medicine.

Based on previous research and discussions between the research team, the third scenario was chosen as the most likely to accurately represent the onset of secondary psychological injury. That is, workers who were dispensed medicine for mental health more than twice, and either a mental health service funded by the MBS or workers' compensation scheme, in the 2-years post-injury (as above, 30.9%, n=695).

FIGURE 7. NUMBER AND PERCENTAGE OF WORKERS IN EACH MEDICINE AND SERVICE USE SCENARIO (SELECTED SCENARIO HIGHLIGHTED IN GREEN)
% OF WORKERS



The number and percentage of workers meeting this medicine and service use scenario (i.e., having secondary psychological injury) varied by worker characteristics. The highest percentage of workers with secondary psychological injury was in those who were dispensed a mental health medicine (57.8%, n=461) and those who accessed a mental health service (57.0%, n=143) in the year pre-injury (see Figure 8). By comparison, only 25.0% (n=461) of those not dispensed a medicine in the year pre-injury later met the criteria for secondary psychological injury. This was also identified in statistical modelling, with workers dispensed a medicine (OR 3.65, 95%CI 2.84, 4.71) or accessing a service (OR 2.07, 95%CI 1.52, 2.83) in the year pre-injury consistently more likely to have secondary psychological injury in the 2-years post injury (see Figure 9).

A number of other factors were significantly associated with a greater likelihood of having secondary psychological injury (see Figure 9). Note that these are factors from the second statistical model, adjusting for characteristics typically collected by workers' compensation stakeholders:

- Younger workers (25-34 and 35-44 years)
- Those with injuries in the head or neck (OR 1.72, 95%CI 1.11, 2.66)
- Those with injuries in multiple locations (OR 1.52, 95%CI 1.07, 2.14)
- Workers who fell, tripped or slipped (OR 1.58, 95%CI 1.16, 2.16)
- Workers who hit or were hit by objects (OR 1.70, 95%CI 1.24, 2.34)
- Workers involved in vehicle incidents (OR 2.07, 95%CI 1.21, 3.56)

Only socioeconomic status was significant in the fully adjusted model that included additional information via linkage to DOMINO data (see Appendix 4). That is, workers from the most advantaged socioeconomic quintile were significantly less likely to have secondary psychological injury (OR 0.66, 95%CI 0.44, 0.99).

FIGURE 8. NUMBER AND PERCENTAGE OF WORKERS WITH SECONDARY PSYCHOLOGICAL INJURY IN THE 2-YEARS POST-INJURY BY SELECTED CHARACTERISTICS (DOTTED LINE INDICATES OVERALL PREVALENCE OF 30.9%)

% OF WORKERS WITH SECONDARY PSYCHOLOGICAL INJURY

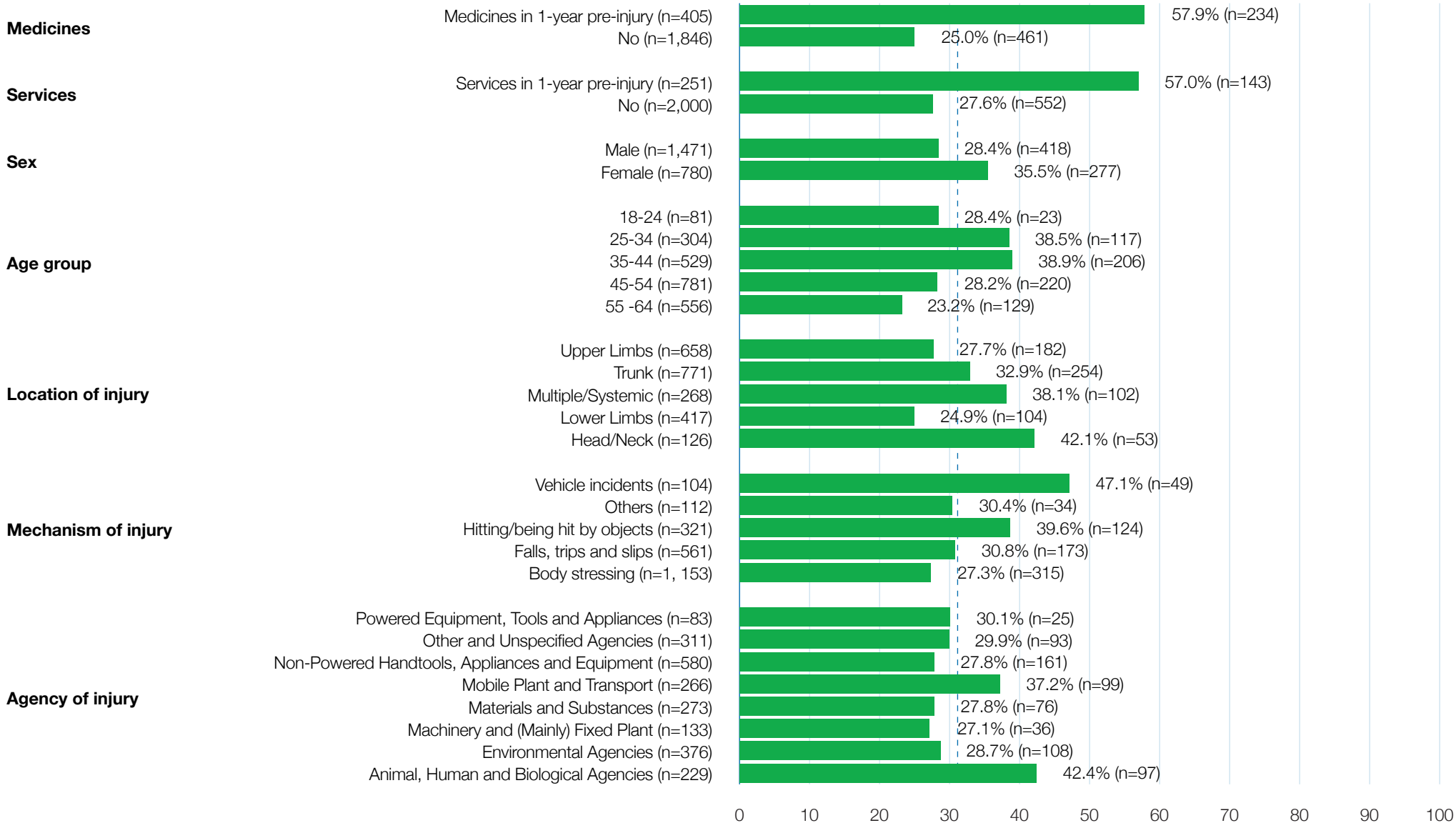


FIGURE 9. STATISTICAL ASSOCIATION OF CHARACTERISTICS WITH HAVING SECONDARY PSYCHOLOGICAL INJURY IN 2-YEARS POST-INJURY, ADJUSTING FOR CHARACTERISTICS TYPICALLY COLLECTED BY WORKERS' COMPENSATION STAKEHOLDERS (STATISTICALLY SIGNIFICANT FACTORS ARE HIGHLIGHTED IN ORANGE)

Category	Characteristic	Odds Ratio	Lower Limit	Upper Limit
Healthcare	Medicines in 1-year pre-injury	3.65	2.84	4.71
	Services in 1-year pre-injury	2.07	1.52	2.83
	Ref: No Medicines / No Services	–	–	–
Sex	Female	1.09	0.85	1.4
	Ref: Male	–	–	–
Age group	18-24	1.17	0.66	2.01
	25-34	1.87	1.37	2.55
	35-44	1.68	1.3	2.17
	Ref: 45-54	–	–	–
	55-64	0.8	0.6	1.05
Industry	Accommodation and Food Services	1.39	0.84	2.28
	Administrative and Support Services	0.87	0.48	1.55
	Agriculture, Forestry and Fishing	1.23	0.71	2.09
	Art, Recreation and Other Services	0.62	0.37	1.02
	Construction	0.9	0.61	1.31
	Education and Training	1.24	0.64	2.35
	Health Care and Social Assistance	1.27	0.84	1.91
	IT, Financial and Administrative	1.41	0.8	2.46
	Mining	1.33	0.66	2.59
	Public Administration and Safety	0.83	0.52	1.32
	Retail Trade	1.04	0.69	1.58
	Transport, Postal and Warehousing	1.14	0.75	1.71
	Wholesale Trade	0.65	0.37	1.1
	Ref: Manufacturing and Utilities	–	–	–

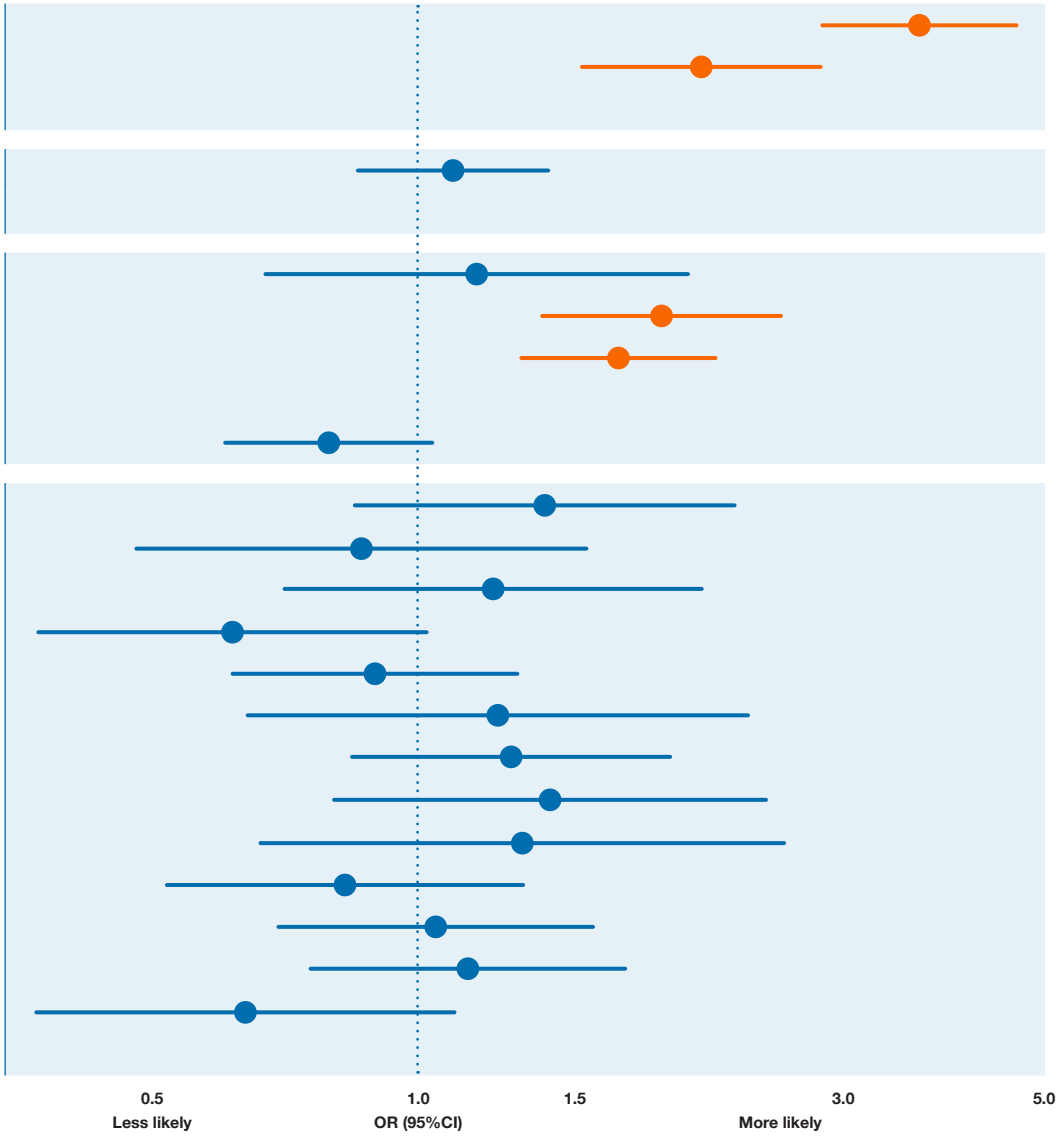
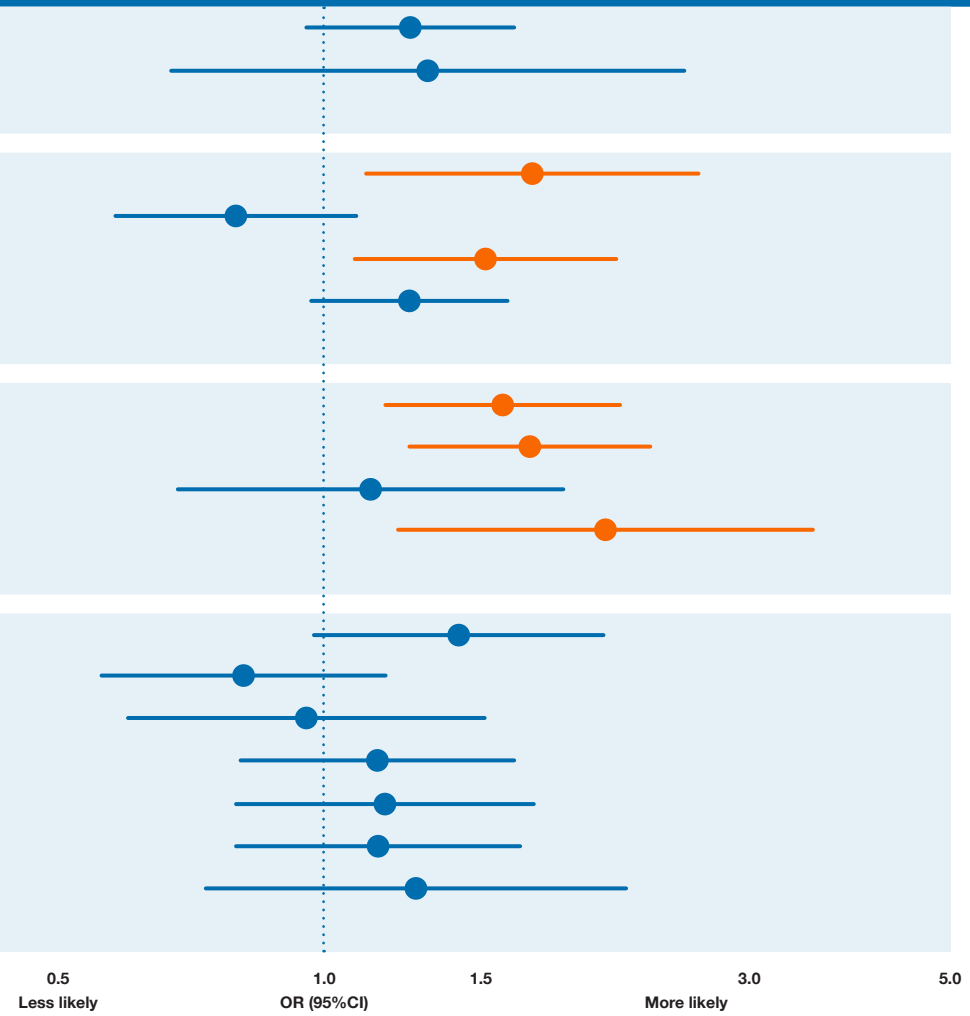


FIGURE 9. STATISTICAL ASSOCIATION OF CHARACTERISTICS WITH HAVING SECONDARY PSYCHOLOGICAL INJURY IN 2-YEARS POST-INJURY, ADJUSTING FOR CHARACTERISTICS TYPICALLY COLLECTED BY WORKERS' COMPENSATION STAKEHOLDERS (STATISTICALLY SIGNIFICANT FACTORS ARE HIGHLIGHTED IN ORANGE) CONT.

Category	Characteristic	Odds Ratio	Lower Limit	Upper Limit
Nature of Injury	Diseases of the Musculoskeletal System	1.24	0.95	1.63
	Other Diseases	1.33	0.67	2.56
	Ref: Injury and Poisoning	–	–	–
Location of Injury	Head/Neck	1.72	1.11	2.66
	Lower Limbs	0.8	0.58	1.09
	Multiple/Systemic	1.52	1.07	2.14
	Trunk	1.24	0.96	1.61
	Ref: Upper Limbs	–	–	–
Mechanism of Injury	Falls, trips and slips	1.58	1.16	2.16
	Hitting/being hit by objects	1.7	1.24	2.34
	Others	1.14	0.68	1.87
	Vehicle incidents	2.07	1.21	3.56
	Ref: Body Stressing	–	–	–
Agency of Injury	Animal, Human and Biological Agencies	1.41	0.97	2.06
	Environmental Agencies	0.81	0.56	1.18
	Machinery and (Mainly) Fixed Plant	0.96	0.6	1.52
	Materials and Substances	1.15	0.8	1.64
	Mobile Plant and Transport	1.18	0.79	1.73
	Other and Unspecified Agencies	1.15	0.79	1.67
	Powered Equipment, Tools and Appliances	1.28	0.73	2.2
	Ref: Non-Powered Handtools / Appliances	–	–	–



4.3. INTERPRETATION

Medicines and services for mental health are prevalent among injured workers with long duration physical injury claims. Over 70% of the sample had a mental health medicine or service in the first 2 years of their workers' compensation claim for a physical injury or condition. Monthly incidence figures also indicate that the demand for mental health care (and presumably poorer mental health) increased throughout the 2-year follow-up period. The proxy indicator of multiple medicine dispenses and at least one service indicates that nearly a third of workers are developing secondary psychological injury at some point in the first 2 years since their injury.

Pre-injury use of mental health medicines and services is the strongest predictor of secondary psychological injury. This indicates that those workers who had mental health concerns or conditions pre-injury are the most susceptible to an exacerbation or new psychological injury once a workers' compensation claim begins. While it is impractical for workers' compensation stakeholders to conduct routine linkage to other data sources (e.g., PBS), it may be worthwhile to screen (if not already) for pre-injury use of mental health services, medicines or concerns. However, in the context of privacy concerns (i.e., a worker disclosing pre-injury mental health status that is not related to their claim), stakeholders could offer unconditional psychological supports so that workers can have timely access to the necessary services that could reduce their risk of an exacerbation of a mental health condition.

Medicines may be a better proxy indicator of secondary psychological injury than services. Far more workers were dispensed mental health medicines than accessed mental health services. This was almost double the proportion of workers who had a mental health service funded by the workers' compensation scheme. This, combined with the monthly incidence of 20%, indicates that workers are more likely to be dispensed a medicine than access a service and that medicines may therefore be a more sensitive proxy indicator of secondary psychological injury. Workers' compensation regulators could consider routinely recording information about medicines in-detail, rather than in the current more aggregated form [35].

4.4. CONSIDERATIONS

This sample represents injured workers with more serious workers' compensation claims. Due to the design of the Transitions Study, injured workers in this sample would go on to have at least 104 weeks' disability – in many cases, far more than this. The seriousness of these workers' compensation claims means that findings may not be generalisable to the broader profile of workers' compensation claims in Australia.

Sociodemographic data was incomplete for many injured workers. Population utilisation of Centrelink and linkage between large administrative datasets means that information about workers' living arrangements and socioeconomic circumstances was missing. The potential impacts of this are evidenced in the prevalence of secondary psychological injury in workers with missing data which was generally lower. For example, workers with missing homeownership information had a much lower prevalence of secondary psychological injury compared to homeowners and non-homeowners.

The age of claims and services may not be fully representative of modern circumstances. The NSW workers' compensation scheme, like many in Australia, has undergone significant legislative reform since the period of this study thus results may not be reflective of current policy, practice or attitudes to mental health. Furthermore, mental health service utilisation in Australia has generally increased. Future data linkage studies with more recent data may reveal additional findings.

Not all medicines and services were captured in these data. Medicines and services paid for out-of-pocket or through private health insurance were not captured in these data.

Medicines prescribed off-label for secondary purposes were not included. The clinical indication for medicines use was not available in the PBS payments data, so other medicines that can be used off-label (e.g., beta blockers for anxiety) were not included.

SYNTHESIS OF FINDINGS

DEFINING "SECONDARY PSYCHOLOGICAL INJURY"

RESEARCH OBJECTIVE 1: DEFINE "SECONDARY PSYCHOLOGICAL INJURY BASED ON AVAILABLE EVIDENCE"

A working definition of secondary psychological injury was developed by the research team based on the multiple streams of evidence collected through the project. As noted earlier in the report, several stakeholders noted that the term "secondary psychological injury" had a specific meaning in workers' compensation legislation in some Australian jurisdictions, reporting that the term is typically used to reflect a diagnosed psychological condition with onset subsequent to a primary physical injury. Our literature search highlighted that four workers' compensation authorities specifically defined secondary psychological injury, however these reflect a 'narrower' interpretation than that intended for use in this project. This project sought to develop a consistent working definition of secondary psychological injury, enabling monitoring of trends, identification of cohorts at risk, development of interventions and screening tools, and assessment of its impact.

The definition of secondary psychological injury is therefore as follows: In the Australian workers' compensation setting, secondary psychological injuries:

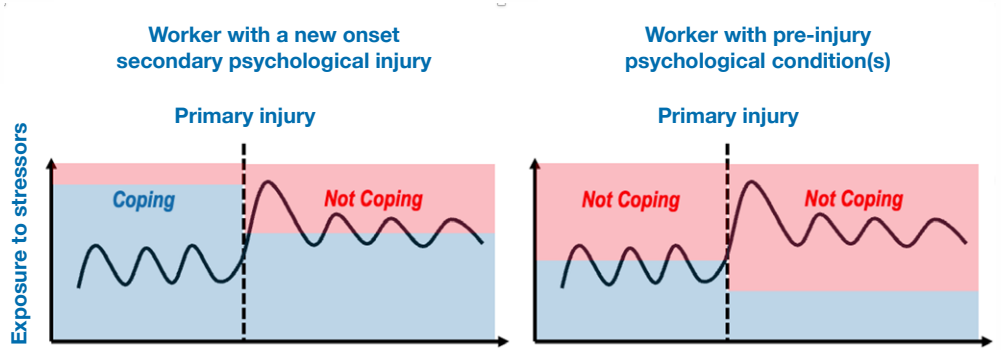
- Are characterised by either the new onset of psychological symptoms or the exacerbation of pre-existing psychological symptoms, after a workers' compensation claim begins. The beginning of the claim is defined as when the worker lodges the claim with their employer, marking the formal point of "entry" into workers' compensation processes.
- Have multiple factors contributing to onset, including worker psychological and social characteristics, claims processes and events, the injury event and its consequences, employer and healthcare actions and interactions, or a combination of these things.
- May be triggered by a specific event at any time during the claim, or by the accumulation of exposure to contributing factors over time, however prevalence is greater as claim duration extends.
- Most often presents with episodic symptoms which most commonly include symptoms of anxiety and depression, but may also encompass other aspects of psychological health.
- Can have a very substantial impact on the worker's function and ability to work and participate in normal activities.
- Do not require a diagnosis of a mental disorder and do not need to meet the legislative definition of secondary or primary psychological injury.

EXPLANATION OF THE CONCEPT

Secondary psychological injury tends to occur after a worker's ability to cope with stressors is impacted by a workplace injury or illness. This is visualised in Figure 10:

- The wavy line refers to the fluctuation of stressors in an individual's life – sometimes stressors are elevated, particularly if someone experiences a workplace injury.
- Usually, people can cope with these stressors (represented in blue) – the ability to cope with these stressors may differ between people, and be lower in those with existing psychological conditions.
- When a person is not coping with stressors (represented in red) they are likely to exhibit psychological symptoms or have a psychological condition.
- An injury in the workplace may reduce a worker's ability to cope and (particularly if the ability to cope was already lower) lead to secondary psychological injury.

FIGURE 10. CONCEPT TO EXPLAIN THE RELATIONSHIP BETWEEN COPING ABILITY AND EXPOSURE TO STRESSORS BEFORE AND AFTER A PRIMARY INJURY



- Stressors fluctuate pre- and post-injury
- A new injury at work may reduce a person's ability to cope with these stressors and introduces new stressors (e.g., future uncertainty, financial stress)

- A pre-existing psychological condition reduces the ability to cope with stressors
- An injury at work may then mean an inability to cope with new or additional stressors

MAIN DRIVERS OF SECONDARY PSYCHOLOGICAL INJURY

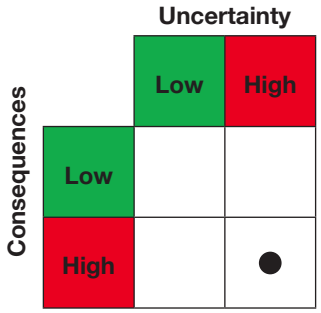
RESEARCH OBJECTIVE 2: PROVIDE A DEEPER UNDERSTANDING OF THE MAIN DRIVERS TO AN INJURED WORKER DEVELOPING A SECONDARY PSYCHOLOGICAL INJURY DURING A WORKERS' COMPENSATION CLAIM

Uncertainty and lack of control

Stakeholders consistently pointed to uncertainty as a key contributing factor to secondary psychological injury. Concerns about the future emerged as a theme from surveys directly of injured workers. When the worker is allowed to "languish" or "ruminate" about their future financial circumstances, recovery (especially pain), social interaction and any other aspect of their life, they are at a higher risk of secondary psychological injury. Uncertainty is particularly impactful when consequences are high (e.g., "Will I make my mortgage payment?") (see Figure 11).

Injured workers can also lose a substantial degree of independence when entering a workers' compensation system. Decisions with substantial ramifications for their healthcare and personal finances are made by an unfamiliar third party (i.e., the insurer) within a system that imposes obligations on them that they most likely have not experienced previously. Workers may also react negatively to perceived imbalances in experience and age between themselves and a relatively junior claims management workforce.

FIGURE 11. CONSEQUENCE AND UNCERTAINTY MATRIX



Example of high uncertainty: Waiting for a claim to be approved and not understanding what is happening with the eligibility determination process

Example of high consequences: Having limited financial resources and needing to make mortgage repayments, and feed and clothe a family

Financial stress

Loss of full income and concerns about future sources of income was identified as a contributing factor to secondary psychological injury in the literature review, stakeholder engagement and injured worker surveys. Injured workers report significant financial stress, and concerns about financial losses. Stakeholders noted that workers often have multiple sources of income to sustain themselves and their families, but that workers' compensation will only compensate for the primary (work-related) source of income, which may be insufficient to meet their needs.

Pre-injury psychological health and the mechanism of injury

Psychological ill-health pre-injury and a traumatic mechanism of injury were identified as significant predictors of secondary psychological injury via the literature review and health service proxies in the claims analysis. This was consistent with other research activities, indicating that secondary psychological injury could be an exacerbation of pre-injury stress or ill-health. Traumatic mechanisms were noted as contributory by stakeholders. Incidents such as workplace violence that may not present with initial PTSD could trigger anxiety and elevated stress upon initial return to work attempts.

KEY STAKEHOLDERS IN PREVENTING SECONDARY PSYCHOLOGICAL INJURY

RESEARCH OBJECTIVE 3: PROVIDE AN UNDERSTANDING OF THE ROLE OF STAKEHOLDERS IN AN INJURED WORKER DEVELOPING (OR PREVENTING) SECONDARY PSYCHOLOGICAL INJURIES

The line manager, employer and workplace

While all aspects of the workplace were consistently reported as important contributors, the role of the line manager / direct supervisor emerged as the most important. These stakeholders are the direct interaction for the worker, and effectively the face of their employer. Every aspect of line manager conduct, from the initial reaction to the injury, to ongoing communication, and facilitating the return to work, are associated with secondary psychological injury.

The workplace is also an important social environment for the worker. Absence from work due to injury contributes to a degree of social isolation, and potentially subsequent psychological ill health. Workers' identities are also often tied to their occupation and employment. Secondary psychological injury may then in part stem from social isolation and a loss of identity.

Claims managers and the system

Other than the line manager, claims managers were considered the main stakeholder when discussing secondary psychological injury. Workers considered interactions with the insurer stressful, often having a negative impact on their mental health. Impersonal and unempathetic claims managers who do not offer clear explanations of decisions and processes to workers were considered especially hazardous. High levels of turnover in the sector means that workers find themselves repeating their experiences to new claims managers, reported as a stressful and frustrating experience.

TIMING OF SECONDARY PSYCHOLOGICAL INJURY

RESEARCH OBJECTIVE 4: PROVIDE EVIDENCE OF WHAT STAGES IN THE WORKERS' COMPENSATION PROCESS SECONDARY PSYCHOLOGICAL INJURIES OCCUR MORE FREQUENTLY AND THE TYPES OF PSYCHOLOGICAL INJURIES THAT MOST COMMONLY OCCUR

It was challenging to identify a specific time or moment in which a worker started down the path of secondary psychological injury. Academic literature typically incorporated follow-up periods of 12-18 months, whereas claims data analysis indicated immediate increases in the prevalence of mental health medicine use. Stakeholders pointed to 3 key components that are the best descriptors of timing:

1. The earlier the better. Addressing contributing factors as early as possible in a workers' compensation claim was considered beneficial. In particular, stakeholders reported that addressing worker uncertainty about their claim, entitlements, and obligations early, was critical.
2. Key events can be challenging. Return to work attempts, especially in cases of traumatic mechanisms or where the worker cannot perform their usual tasks, may trigger anxiety. Other events, such as independent medical examinations, may also be problematic.
3. Claim length is directly proportional to secondary psychological injury prevalence. Stakeholders, claims data analysis, and previous studies also agree that the longer the workers' compensation claim, the greater the risk of secondary psychological injury.

SCREENING TOOLS FOR SECONDARY PSYCHOLOGICAL INJURY

RESEARCH OBJECTIVE 5: PROVIDE A GREATER UNDERSTANDING INTO THE ROLE AND EFFECTIVENESS OF ESTABLISHED OR ADAPTED SCREENING TOOLS IN IDENTIFYING OR ASSESSING THE LIKELIHOOD OF AN INJURED WORKER DEVELOPING A SECONDARY PSYCHOLOGICAL INJURY

A wide array of screening tools for risk identification and monitoring were identified. Academic literature frequently pointed to the Kessler-6 and CES-D tools to screen for psychological distress and depression, respectively. Stakeholders reported using standardised tools such as the Kessler-10, DASS and Orebro, as well as bespoke and in-house tools. No tools were specifically for secondary psychological injury, rather for psychological and psychosocial distress and other psychological conditions. Stakeholders noted that the results of these tools should be taken in context (i.e., a positive result from a given tool may not necessarily indicate secondary psychological injury and could be indicative of pre-injury mental health), and that experienced claims managers and rehabilitation providers who could quickly identify psychological concerns from simple conversations may be just as valuable.

Psychological health services and medicines as a proxy detected via administrative data were used in several studies and in the claims data analysis in this project. Local regulators also suggested that this was the current method of monitoring for secondary psychological injury. While there are important limitations of this method of monitoring that were noted earlier, this still may be a suitable method for scalable monitoring.

MODIFIABLE ASPECTS OF THE WORKERS' COMPENSATION PROCESS

RESEARCH OBJECTIVE 6: PROVIDE INSIGHTS INTO THE MODIFIABLE ASPECTS OF THE WORKERS' COMPENSATION PROCESS THAT CAN ASSIST IN PREVENTING OR MINIMISING THE RISK OF SECONDARY PSYCHOLOGICAL INJURIES

Uncertainty

As noted earlier, uncertainty is a key driver of secondary psychological injury. It is also likely modifiable. Unfamiliarity with a complex system leads to uncertainty and confusion that can in turn lead to secondary psychological injury. Workers' compensation stakeholders could consider developing clear information about the workers' entitlements, obligations and the overall function of a workers' compensation system. Stakeholders believed that this could be a beneficial intervention,

but that it should avoid citing specific legislation when pointing to worker obligations. However, other stakeholders noted that educational interventions are only effective if delivered at the right time to the right people, and that education for employers and line managers may be more useful.

Claims management

Interactions with insurer claims managers was highlighted as stressful by multiple stakeholders: inexperienced and unempathetic claims managers were cited multiple times. Upskilling claims managers and providing training on emotional intelligence was pointed to by stakeholders as potentially beneficial. Specialist claims manager roles, with expertise in handling more complex claims (e.g., challenging pre-injury socioeconomic circumstances) may be useful. High levels of turnover in claims managers often means that workers have to deal with multiple claims managers – an experience many find stressful. Increasing claims management capacity may reduce this phenomenon.

Employers

Numerous aspects of the employer and the workplace are central to secondary psychological injury and could be modified. Employers have particularly important roles in the prevention, identification and management of secondary psychological injury. These roles extend beyond rehabilitation and return to work to include prevention via the identification and reduction of workplace psychosocial risks, as recognised in recent Occupational Health and Safety regulatory reforms across the country. Some rehabilitation stakeholders reported that they screened the workers' line manager for their attitudes toward work injury and return to work. This could be a beneficial step and also provide an opportunity to educate the line manager (who is likely unfamiliar with workers' compensation themselves) about their obligations, best practice and next steps. Stakeholders noted that the workplace is often an important social environment for workers, and that prolonged absence can lead to isolation and loss of interaction with co-workers. Some stakeholders pointed to the potential benefits of having the injured worker visit the workplace for social purpose, provided that a return to the workplace would not be distressing. It is important to note that workplace psychosocial hazards contributing to primary psychological injury overlap substantially with psychosocial hazards that contribute to secondary psychological injury, and include things such as job design, job demands, workplace support and recognition.

RECOMMENDATIONS FOR POLICY, PRACTICE AND FUTURE RESEARCH

Research Objective 7: Develop evidence-based recommendations on the practical application of this research (including critical knowledge gaps) to better support all stakeholders involved in workers' compensation claims management

Recommendation	Rationale	Anticipated Benefits
Recommendations for policy and practice		
1 Adopt a national working definition of secondary psychological injury	There is currently no nationally consistent definition of secondary psychological injury. Adopting a consistent working (not legislative) definition means that stakeholders can: i. Accurately determine prevalence or monitor changes in prevalence over time. ii. Identify cohorts of workers at greatest risk. iii. Develop effective interventions, services or programs focused on the key features of secondary psychological injury. iv. Identify or develop appropriate risk screening tools. v. Accurately assess the impacts of secondary psychological injury, including its effects on return to work and system sustainability. Scheme regulators and sector stakeholders could collaborate to agree on and adopt a working definition – the starting point for which has been defined through this research project.	Ability to monitor trends, identify cohorts at risk, develop interventions and screening tools, and assess the impact of secondary psychological injury in a way that is consistent, relevant and transferable between jurisdictions.
2 Develop consistent approaches for risk screening (at an individual level) and monitoring (at a portfolio level)	There are a variety of means for detecting secondary psychological injury. However, the use of these tools and methods is mainly limited to academic literature and siloed industry metrics. Many of the risk factors identified in this report are either already collected (e.g., a traumatic mechanism, younger age) or could be feasibly added to the claims triaging process (e.g., pre-claim use of mental health services or medicines). Other risk factors may be more challenging to collect (e.g., line manager attitudes and practices), but the sector could begin by adopting a set of basic risk factors for screening. Standardised monitoring at a portfolio level would provide a clearer picture of the scale of secondary psychological injury in Australia. For example, workers' compensation authorities could agree on a consistent set of health services payments data criteria (e.g., use of >2 mental health services for a physical injury claim within 6 months) that would act as a standard proxy measure of secondary psychological injury.	More effective risk screening could improve the ability to target interventions at an individual level to the specific risks identified (e.g., financial counselling for people in financial stress). Standardised portfolio-level monitoring could enable identification of key trends in secondary psychological injury or groups of workers at greater risk of developing secondary psychological injury.

RECOMMENDATIONS FOR POLICY, PRACTICE AND FUTURE RESEARCH CONT.

Research Objective 7: Develop evidence-based recommendations on the practical application of this research (including critical knowledge gaps) to better support all stakeholders involved in workers' compensation claims management

Recommendation	Rationale	Anticipated Benefits
Recommendations for policy and practice		
3 Reduce uncertainty for workers	Stakeholders engaged in this research identified that uncertainty was a key driver of secondary psychological injury. Uncertainty may emerge from a variety of factors, including financial stress, worry about recovery, interacting with an unfamiliar system, and waiting for decisions that are out of the workers' control. Stakeholders could seek opportunities to reduce uncertainty for workers: i. Claims management organisations should make efforts to reduce wait times for decisions about eligibility, liability and funding for healthcare services. Where this is impractical, the reason for the wait time should be explained to the worker. ii. Claims management organisations, claims managers and workers' compensation authorities should provide a clear and simple explanation of the purpose of workers' compensation and workers' entitlements and obligations, written in non-adversarial and plain language (i.e., not "legalese"). iii. Healthcare providers treating injured workers with chronic pain should provide evidence-based education that provides clear and reasonable recovery expectations.	Greater worker certainty about claims management processes through reduced wait times (or explanations for wait times) could reduce the risk of increased stress or worry. Furthermore, an improved understanding of the workers' compensation setting and processes could reduce worker uncertainty. Consistent expectations about recovery and future capacity between healthcare providers and workers with chronic pain may reduce worker uncertainty.
4 Minimise repetitive or unnecessary information gathering exercises or assessments	Research findings suggest that workers repeating themselves or their injury being questioned through additional information gathering are sources of stress and potentially contribute to secondary psychological injury. Claims management stakeholders should ensure that questions of the worker are not unnecessarily repeated, particularly in cases of longer claims. However, claims managers should not avoid asking questions altogether – stakeholders reported "curious" claims managers, who asked how they could help or support the worker, were beneficial. Medical assessments were also noted as significant sources of stress. These should only be used where completely necessary, and if so, the purpose, steps and expected outcomes should be clearly explained to the worker in a transparent way to reduce their uncertainty.	Reducing the need for workers to repeat themselves may decrease stress, and a transparent process for necessary medical assessments may reduce both worker uncertainty and stress.

RECOMMENDATIONS FOR POLICY, PRACTICE AND FUTURE RESEARCH CONT.

Research Objective 7: Develop evidence-based recommendations on the practical application of this research (including critical knowledge gaps) to better support all stakeholders involved in workers' compensation claims management

Recommendation	Rationale	Anticipated Benefits
Recommendations for policy and practice		
5 Consider offering additional support throughout the claims process to assist workers with pre-injury mental health conditions and those with long-duration claims	Findings suggest that workers with pre-injury mental health conditions and with long-duration claims are at high risk of developing secondary psychological injury. Stakeholders (e.g., claims management organisations, authorities) could consider offering universal opt-in access to additional supports (e.g., psychological support) upon entry to the system (i.e., those with pre-injury mental health conditions) and later in the claim process (i.e., those with long-duration claims). These services would be offered to all claimants at these times, so that they can be accessed without disclosing (or the pressure to disclose) mental health conditions or concerns that may not be related to the claim condition / injury.	Offering psychological and psychosocial support services to injured workers upon entry to the scheme will allow those with pre-injury mental health conditions (or those who need support) to access early support, reducing the risk of mental health condition exacerbation. Offering universal support reduces the stigma of requiring psychological support or being assessed to grant access to psychological support.
Recommendations for research		
6 Explore the financial and economic impacts of secondary psychological injury and the impact this has on return-to-work outcomes	Research findings suggest that secondary psychological injury has financial and economic impacts. However, there are limited precise estimates of the scale of this impact. Future research exploring these impacts, and the impact this has on claim outcomes, would be beneficial.	Precise measurements of the economic scale of secondary psychological injury may promote increased investment in solutions.
7 Develop a better understanding of the specific types of psychological injury experienced by workers	Research findings indicate that an array of possible psychological symptoms and conditions that injured workers may experience. Future research should seek to precisely identify and understand these symptoms, including their nature, severity and duration.	Clear identification of the nature, severity and duration of psychological symptoms experienced by injured workers could improve the precision of treatment and management.
8 A detailed investigation of current interventions being offered in the sector and the evidence for their effectiveness	Numerous interventions are currently being trialled in the Australian workers' compensation sector. Future research should aim to map conducted and planned interventions to understand their effectiveness, and what evidence these are based on. This would likely require close collaboration with claims management and rehabilitation organisations.	Understanding current and previous research efforts would reduce unnecessary or repetitive research and subsequent costs. Identifying and describing effective (and ineffective) interventions may improve costs for multiple stakeholders.

REFERENCES

1. Employers Mutual Limited (EML), *Inside the minds of Australia's workplaces: Evidence, insight, and collective action for better mental health outcomes*. 2025, EML: Melbourne, Australia.
2. SuperFriend, *Indicators of a Thriving Workplace Survey: 2023 Key Insights*. 2023, SuperFriend: Melbourne, Australia.
3. Safe Work Australia (SWA). *Key Work Health and Safety Statistics Australia 2024*. 2024 [cited 06 December 2024]; Available from: https://data.safeworkaustralia.gov.au/insights/key-whs-stats-2024#heading2.
4. Collie, A., et al., *Psychological Distress in Workers' Compensation Claimants: Prevalence, Predictors and Mental Health Service Use*. J Occup Rehabil, 2020. **30**(2): p. 194-202.
5. Safe Work Australia (SWA), *National Return to Work Strategy 2020-2030*. 2020, Safe Work Australia: Canberra, Australia.
6. Elicit. *Elicit: The AI Research Assistant*. 2025 [cited 20 May 2025]; Available from: https://elicit.com.
7. Brijnath, B., et al., *Mental health claims management and return to work: qualitative insights from Melbourne, Australia*. J Occup Rehabil, 2014. **24**(4): p. 766-76.
8. Bültmann, U., et al., *Health status, work limitations, and return-to-work trajectories in injured workers with musculoskeletal disorders*. Qual Life Res, 2007. **16**(7): p. 1167-78.
9. Carnide, N., et al., *Course of Depressive Symptoms Following a Workplace Injury: A 12-Month Follow-Up Update*. J Occup Rehabil, 2016. **26**(2): p. 204-15.
10. Chu, P.C., et al., *Long-Term Effects of Psychological Symptoms after Occupational Injury on Return to Work: A 6-Year Follow-Up*. Int J Environ Res Public Health, 2019. **16**(2).
11. Dersh, J., et al., *Prevalence of psychiatric disorders in patients with chronic disabling occupational spinal disorders*. Spine (Phila Pa 1976), 2006. **31**(10): p. 1156-62.
12. Dersh, J., et al., *Do psychiatric disorders first appear preinjury or postinjury in chronic disabling occupational spinal disorders?* Spine (Phila Pa 1976), 2007. **32**(9): p. 1045-51.
13. Di Donato, M., et al., *Health service use after long periods of workers' compensation: Transitions Study Report 3*. 2022, Healthy Working Lives Research Group, School of Public Health and Preventive Medicine, Monash University: Melbourne, Australia.
14. Ferreira, G.E., et al., *Patterns of antidepressant use in people with low back pain: A retrospective study using workers' compensation data*. Eur J Pain, 2025. **29**(1): p. e4773.
15. Gray, S.E., et al., *The Prevalence of Mental Health Service Use in Australian Workers with Accepted Workers' Compensation Claims for Low Back Pain: A Retrospective Cohort Study*. Journal of Occupational Rehabilitation, 2023. **33**(3): p. 602-609.
16. Gray, S.E., et al., *Patterns of Mental Health Service Use in Australian Workers with Low Back Pain: A Retrospective Cohort Study*. Journal of Occupational Rehabilitation, 2024. **34**(4): p. 913-922.
17. Gross, D.P., et al., *Risk Factors for Developing Concurrent Posttraumatic Stress Injury After Work-Related Musculoskeletal Injury: A Case-Control Study*. Journal of Occupational and Environmental Medicine, 2022. **64**(9).
18. Jones, A.M., et al., *Impact of anxiety and depression disorders on sustained return to work after work-related musculoskeletal strain or sprain: a gender stratified cohort study*. Scandinavian Journal of Work, Environment & Health, 2021(4): p. 296-305.
19. Keogh, J.P., et al., *The impact of occupational injury on injured worker and family: outcomes of upper extremity cumulative trauma disorders in Maryland workers*. Am J Ind Med, 2000. **38**(5): p. 498-506.
20. Kilgour, E., et al., *Interactions between injured workers and insurers in workers' compensation systems: a systematic review of qualitative research literature*. J Occup Rehabil, 2015. **25**(1): p. 160-81.
21. Kim, J., *Depression as a psychosocial consequence of occupational injury in the US working population: findings from the medical expenditure panel survey*. BMC Public Health, 2013. **13**(1): p. 303.
22. Lee, H.-E., et al., *Increased risk of suicide after occupational injury in Korea*. Occupational and Environmental Medicine, 2021. **78**(1): p. 43.
23. Lin, K.-H., et al., *Long-Term Psychological Outcome of Workers After Occupational Injury: Prevalence and Risk Factors*. Journal of Occupational Rehabilitation, 2014. **24**(1): p. 1-10.
24. Lippel, K., *Workers describe the effect of the workers' compensation process on their health: a Québec study*. Int J Law Psychiatry, 2007. **30**(4-5): p. 427-43.

25. Orchard, C., et al., *Prevalence of serious mental illness and mental health service use after a workplace injury: a longitudinal study of workers' compensation claimants in Victoria, Australia*. Occup Environ Med, 2020. **77**(3): p. 185-187.

26. Orchard, C., N. Carnide, and P. Smith, *How Does Perceived Fairness in the Workers' Compensation Claims Process Affect Mental Health Following a Workplace Injury?* J Occup Rehabil, 2020. **30**(1): p. 40-48.

27. Orchard, C., et al., *The Association Between Case Manager Interactions and Serious Mental Illness Following a Physical Workplace Injury or Illness: A Cross-Sectional Analysis of Workers' Compensation Claimants in Ontario*. J Occup Rehabil, 2021. **31**(4): p. 895-902.

28. Ferreira, G., et al., *Patterns of antidepressant use in people with low back pain: a retrospective cohort study using workers' compensation data*. European Journal of Pain, 2024. **ACCEPTED**.

29. Ferreira, G.E., et al., *Efficacy, safety, and tolerability of antidepressants for pain in adults: overview of systematic reviews*. BMJ, 2023. **380**: p. e072415.

30. Hancock, M., et al., *Cognitive functional therapy with or without movement sensor biofeedback versus usual care for chronic, disabling low back pain (RESTORE): 3-year follow-up of a randomised, controlled trial*. The Lancet Rheumatology.

31. Kent, P., et al., *Cognitive functional therapy with or without movement sensor biofeedback versus usual care for chronic, disabling low back pain (RESTORE): a randomised, controlled, three-arm, parallel group, phase 3, clinical trial*. The Lancet, 2023. **401**(10391): p. 1866-1877.

32. Lane, T.J., et al., *The impact of long-term workers' compensation benefit cessation on welfare and health service use: protocol for a longitudinal controlled data linkage study*. Int J Popul Data Sci, 2021. **6**(1): p. 1419.

33. Australian Institute of Health and Welfare (AIHW). *Medicare mental health services*. 2025 [cited 10 August 2025]; Available from: https://www.aihw.gov.au/mental-health/topic-areas/medicare-subsidised-services.

34. Australian institute of Health and Welfare (AIHW). *Mental health prescriptions*. 2025 [cited 10 August 2025]; Available from: https://www.aihw.gov.au/mental-health/topic-areas/mental-health-prescriptions.

35. Tefera, Y.G., et al., *Capture, Coding, and Reporting of Health Care and Medicine Information in Australian Workers' Compensation Systems*. Journal of Occupational and Environmental Medicine, 2024. **66**(5).

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