

This paper is forthcoming in *The Economic and Labour Relations Review*
<https://journals.sagepub.com/home/elr>

Hidden costs, hidden lives: Financial effects of fatal workplace injuries for families

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Abstract

Although workplace death is known to have profound social and psychological effects on families, the economic consequences have not been explored. This pioneering study investigated families' financial situations following fatal workplace injuries. An online survey explored the impact of post-death financial change on 142 participants from Australia, Canada, the USA, and the UK using a scale from the economic strain model. Half of the participants experienced financial loss, and the proportion struggling financially increased from 24% to 62% after the death. Workers' compensation claims were made by 74% of participants, but they reported problems with delays, levels of entitlement, and satisfaction with the scheme. Other key sources of assistance were family and friends or support groups and services. Participants who were older, next-of-kin, and partner/spouses were significantly more likely to experience financial loss as were those whose deceased relative worked 51+ hours per week, possibly because the deceased was self-employed or worked significant overtime not covered by compensation settlements. Those experiencing financial loss sought short- and long-term financial help, accessed social security, re-entered the workforce, acquired mental disorders, and experienced declines in physical health, at significantly higher rates than participants without financial loss, and their children developed mental health problems significantly more often. Findings highlight the detrimental, and potentially intergenerational, effects of financial loss on the health and wellbeing of families bereaved by traumatic workplace deaths. Policy issues flowing from the results are discussed, including how this informs wider debates on refashioning regulatory protection.

Introduction

Little is known about the financial consequences for next-of-kin and families after a fatal work injury (workplace death). The number of persons immediately affected by workplace death is significant, even in rich countries with relatively low rates of workplace fatalities. Every year, more than 5,000 immediate and extended family members and close friends of Australian workers become survivors of workplace death (Matthews et al., 2012a; Dyregrov et al., 2003). An important institutional response to workplace death is workers' compensation. Although workers' compensation regimes take some account of worker's dependents when calculating death benefits, the equity and effectiveness of these mechanisms has not been evaluated. As traumatically bereaved people tend to be at greater risk of poverty, homelessness, and reliance on income support (Kemp et al., 2004), determining the full financial consequences of workplace death is an important precursor to determining the adequacy of compensation. This paper, therefore, reports the results of a study that examined the change in financial situations for next-of-kin and families following a sudden workplace death and the adequacy of regulatory responses, including workers' compensation, to their situation.

In many developed countries, several schemes can provide financial support for families following a workplace death (ILO, 2017). Most important are statutory forms of workers' compensation introduced in most rich countries over a century ago. These schemes were introduced to provide some protection (medical expenses and income support) for employees injured at work but were never designed to ensure there was no deterioration in financial circumstances. The schemes make it compulsory for employers to insure. They provide no-fault liability and specify amounts for medical expenses and income support based on weekly earnings or some similar index. They are generally confined to employees but sometimes have limited deeming provisions for some self-employed workers. In the case of death, the schemes can include lump-sum payments plus income support for surviving partners (ILO, 2017), including payments for children until they complete education. Existing research of workers' compensation claimants indicates that non-fatal workplace injuries may lead to financial disadvantage and an increased risk of poverty (Ballantyne et al., 2015). Those primarily dependent on claim payments tend to experience high levels of financial stress (Sheehan et al., 2020). Delays in receiving payments appear to be common (Keogh et al., 2000; Morse et al., 1998; Strunin and Boden, 2004) and for those with minimal savings, delays can increase financial stress and financial dependency on others (Kilgour et al., 2015), frequently family members (Keogh et al., 2000). The authors are not aware of comparable research on the financial impacts of workplace deaths for families.

In some countries, such as Australia, families of workers who die doing their job may be able to pursue civil litigation proceedings against the employer or their insurer. These proceedings require negligence to be demonstrated, can be lengthy, and ultimately any benefit won is 'offset' against any workers' compensation payments ('double-dipping' is not allowed). Civil litigation is

often the only option for the families of self-employed workers unless the worker took out private insurance – an option that often compares unfavourably to workers' compensation (Quinlan et al., 2015).

Overall, workers' compensation is the most important institutional response to workplace death in Australia and many other countries (ILO, 2017). It is, for many affected families, the primary financial safeguard for the immediate loss of income and any subsequent financial loss for spouses, children, or other dependents. For families of workers in high-risk industries, such as farming, forestry, fishing, road transport, and construction, the financial consequences may be dire because average earnings are not particularly high (Australian Bureau of Statistics, 2022). Indeed, the impacts can be intergenerational as financial stress can affect the education, job options, and life chances of children (Brand, 2015; Sandstrom and Huerta, 2013). These effects are not necessarily one-way. For example, work-related deaths of children with lower earnings could affect the finances of the wider family, if they had contributed to household finances or provided advice and support to migrant parents with limited language skills, education, or familiarity with critical institutions (banks, government agencies, etc.).

Workplace death can have financial consequences beyond those contemplated by workers' compensation (Quinlan et al., 2015). Many families cannot, or do not, access workers' compensation because the deceased worker was self-employed. The exclusion of most self-employed workers from workers' compensation is important as they constitute between 15% and 17% of the active workforce in Australia and New Zealand (Driscoll et al., 2003; Lilley et al., 2013). Self-employment, or shifts in employment status, are common in industries with a high incidence of workplace death, such as construction and road transport (Quinlan et al., 2006). There is evidence that families of self-employed workers who are victims of fatal work injuries frequently do not claim workers' compensation if they are eligible (Driscoll et al., 2003; MacEachen et al., 2021; Quinlan, 2004).

The growth of precarious employment, and vulnerable groups such as temporary or undocumented foreign workers, is often concentrated in industries with a high incidence of workplace death, representing a serious challenge for workers' compensation coverage (Lenore et al., 2004; Guthrie and Quinlan, 2005). More flexible work arrangements, including multiple jobholding, which has been linked to a higher incidence of fatalities (Bush et al., 2013), can complicate the resolution of claims even when coverage is established. There is evidence of significant under-reporting, and failure to lodge or succeed with workers' compensation claims, even after death or serious injury at work (Sears et al., 2013). Under-reporting of workplace injury and death is recognised as a major problem, suggesting that occupational health and safety (OHS) statistics should be treated with caution (Rosenman et al., 2006). Accurate measurement of a key element of the financial costs of workplace death may therefore be difficult to achieve.

Another element of the cost of workplace death not examined in detail is ‘cost-shifting’ from workers’ compensation schemes to taxpayer-supported benefits, which can occur when families do not access workers’ compensation or when workers’ compensation does not adequately cover costs (House of Representatives Standing Committee on Employment and Workplace Relations, 2003; Markey et al., 2013; Michaels, 2015). Financial compensation can be inadequate even when workers have a self-investment or insurance scheme (Matthews et al., 2012a). In cases of inadequate compensation, families may be able to pursue a claim at common law but must establish that the employer was negligent or in breach of their duty of care. These proceedings commonly take many years to resolve.

Considering the complexity of the measurement of financial costs of workplace deaths, this exploratory study aims to identify changes in families’ financial situations, reveal which families are likely to experience the greatest changes, and identify important relationships between financial pressures and health and role outcomes. A further objective is to identify sources of financial support provided to families following a workplace death and examine their satisfaction with it. Accordingly, the five research questions underpinning this research are:

1. What financial changes are experienced by families following a workplace fatality?
2. Are some families more susceptible than others to financial changes following the death?
3. Does post-death financial loss influence health and role outcomes?
4. What sources of financial support do families access following the death?
5. How satisfied are families with the financial support they receive following the death?

Findings from the existing literature on the economic and social consequences of non-fatal work injuries (e.g., Keogh et al., 2000; Lippel, 2007; Kilgour et al., 2015; Strunin and Boden, 2004) suggest that some participants in this study, and particularly those not able to access workers’ compensation, will report a financial loss following the death. This literature also suggests that participants who report financial loss will be more vulnerable than those who do not to changes in health and role outcomes following the death, and to be less satisfied with the financial assistance available to them.

Method

This study used a cross-sectional online survey that was part of a larger multi-method research program exploring the health and social consequences for surviving families of workplace death and subsequent regulatory responses to the death (Matthews et al., 2017). This paper focuses on the financial consequences for next-of-kin and families. The protocol for this study was approved by the University of Sydney’s Human Research Ethics Committee (Project number 2012/2319).

Recruitment

Databases providing next-of-kin details were not accessible, so an outreach methodology was used to recruit next-of-kin and families to complete an online survey. This outreach included using social media, organisational networking, radio interviews, and newspaper articles.

Interested persons could access an information sheet and the survey via a link on the study's home page. To be included in the study, participants had to be over 18 years of age, be able to read English, and have had a family member die as the result of a sudden workplace injury. Deaths from workplace diseases, such as mesothelioma, or medical conditions, such as a heart attack or stroke, were excluded.

Next-of-kin and families who have experienced workplace death are a hidden population, so the survey was open for 2 years (November 2013 – 2015). Keeping the survey open for this period allowed the recruitment strategies to reach as many families as possible. A total of 207 people accessed the survey during that time, but seven people did not provide any data. Of the remaining 200 participants, seven (3.5%) did not meet the inclusion criteria, 22 (11.0%) provided only demographic data, and 29 (14.5%) provided minimal or no financial data and were excluded from analyses. The final dataset comprised data from 142 participants (71.0%). The 22 participants who provided only demographic data were significantly younger ($M = 41.59$, $SD = 12.57$) than those participants included in the analyses ($M = 48.14$, $SD = 12.49$, $t = -2.31$, $df = 190$, $p = .022$). The 29 participants who did not provide financial data did not differ significantly on demographic variables from the final sample.

Participants

Table 1 shows that participants were mostly female (90.1%), reflecting the gender distribution of workplace deaths, and partners/spouses (37.3%), or parents (33.1%). Over half (62.7%) were next-of-kin to the deceased worker. They were from Australia (60.6%), Canada (16.9%), the USA (16.2%), and the UK (6.3%) and had a mean age of 48.7 years ($SD = 12.2$). Deceased workers had a mean age of 36.7 years ($SD = 13.4$), 72.5% had been in permanent work, and 71.3% had worked up to 50 hours per week. Most deaths (87%) occurred in industries that regularly account for a significant proportion of all industrial deaths in western countries: construction; manufacturing; mining; transport; and agriculture forestry and fishing. The average time since the death was 7.1 years ($SD = 6.4$).

Although the sample includes participants from four countries, the population was deemed a single population. According to Lippel (2007) the workers' compensation systems in Canada, Australia and the USA share many similarities (the UK has a similar system but was not included in comparative analyses because the sample was too small). All the countries are wealthy countries with developed workers' compensation regimes, which is the primary welfare agency for injured workers, and largely exclude self-employed workers. All countries have OHS laws and a common law system that provides an avenue for the families of self-employed persons.

Table 1. Participant and worker demographics and financial situation following the death

Variable	Total cohort (N = 142)	Reduced Finance (n = 71)	Same Finance (n = 59)	Improved Finance (n = 12)	Test Significance ^a (df, 2)
Participant					
Sex, n (%)					
Female	128 (90.1)	66 (51.6)	50 (39.0)	12 (9.4)	$p = .228$
Male	14 (9.9)	5 (35.7)	9 (64.3)	0	
Age in years, M (SD)	48.7 (12.2)	51.3 (11.1)	46.0 (13.0)	46.6 (13.0)	$p = .040^b$
Next of kin, n (%)					
Yes	89 (62.7)	55 (61.8)	29 (32.6)	5 (5.6)	$p = .001$
No	53 (37.3)	16 (30.2)	30 (56.6)	7 (13.2)	
Relationship to worker, n (%)					
Partner/spouse	53 (37.3)	38 (71.7)	11 (20.8)	4 (7.5)	$p < .001$
Parent	47 (33.1)	22 (46.8)	22 (46.8)	3 (6.4)	
Sibling	24 (16.9)	5 (20.8)	14 (58.4)	5 (20.8)	
Child	15 (10.6)	6 (40.0)	9 (60.0)	0	
Other ^c	3 (2.1)	0	3 (100.0)	0	
Country, n (%)					
Australia	86 (60.6)	48 (55.8)	31 (36.1)	7 (8.1)	$p = .070$
Canada	24 (16.9)	6 (25.0)	14 (58.3)	4 (16.7)	
USA	23 (16.2)	12 (52.2)	10 (43.5)	1 (4.3)	
UK ^c	9 (6.3)	5 (55.6)	4 (44.4)	0	
Deceased worker					
Sex, n (%)					
Female	7 (4.9)	5 (71.4)	1 (14.3)	1 (14.3)	$p = .255$
Male	135 (95.1)	66 (48.9)	58 (43.0)	11 (8.1)	
Age in years, M (SD)	36.7 (13.4)	38.3 (14.0)	35.3 (13.1)	33.6 (9.9)	$p = .317^d$
Years since death, M (SD)	7.1 (6.4)	7.49 (7.0)	6.37 (5.06)	7.57 (8.31)	$p = .549^e$
Industry, n (%)					
Construction	54 (38.3)	21 (38.9)	28 (51.9)	5 (9.2)	$p = .398$
Manufacturing	23 (16.3)	13 (56.5)	8 (34.8)	2 (8.7)	
Transport	19 (13.5)	14 (73.7)	4 (21.0)	1 (5.3)	
Agriculture, forestry, & fishing	17 (12.1)	10 (58.8)	6 (35.3)	1 (5.9)	
Mining	15 (10.6)	6 (40.0)	8 (53.3)	1 (6.7)	
Other ^c	13 (9.2)	6 (46.1)	5 (38.5)	2 (15.4)	
Employment status, n (%) ^f					
Permanent	103 (72.5)	49 (47.6)	47 (45.6)	7 (6.8)	$p = .403$
Temporary or casual	25 (17.6)	13 (52.0)	8 (32.0)	4 (16.0)	
Self employed	11 (7.9)	7 (63.6)	4 (36.4)	0	
Hours worked, n (%) ^f					
≤ 50 hours per week	97 (71.3)	43 (44.3)	47 (48.5)	7 (7.2)	$p = .016$
≥ 51 hours per week	39 (28.7)	26 (66.7)	9 (23.1)	4 (10.3)	

Notes: ^a Fishers exact tests, unless otherwise indicated, ^b $F(2, 140) = 3.336$, ^c not included in analysis

^d $F(2, 139) = 1.158$, ^e $F(2, 139) = .601$, ^f $n \neq 142$ due to missing data

Although there are some differences in OHS law and workers' compensation between countries, there are also differences between state/provinces in Australia, Canada, and the USA. Nevertheless, preliminary analysis undertaken to identify differences between these three countries in variables central to this study – claiming workers' compensation, satisfaction with workers' compensation, sources of additional financial support, and health and lifestyle impact following the death – revealed minimal differences.

Measures

Socio-demographics

Socio-demographic items included participants' age, sex, country, next-of-kin status, and relationship to the deceased worker (partner, parent, sibling, child, other). Information about the deceased worker included age at death, the industry they worked in, the nature of their employment (permanent, temporary/casual, and self-employed), weekly hours worked (1-20, 21-35, 36-50, 51+) and time since death (in years). To allow use in analyses with a relatively small sample, hours worked were regrouped to ≤ 50 and ≥ 51 .

Financial situation

A 3-point scale from the economic strain model (Pearlin et al., 1981) was used to measure financial situation. Participants were asked to indicate how their household finances worked out at the end of the month at two points in time -- before the death (Time 1) and at the time of survey completion (Time 2) -- by selecting one response from the following options: not enough to make ends meet (scored as 1), just enough to make ends meet (scored as 2), some money left over (scored as 3).

Change in the participants' financial situation after the death was determined in three ways. The first was by comparing the median ranks at Time 1 and Time 2 using a signed ranks test to identify the cohort's overall movement in financial situation. The second way was by documenting the movement of participants' responses to the three options in the economic strain model between Time 1 and Time 2 (see Figure 1). Resulting groups were 'moved down' (reduced finances), 'stayed the same, could move down' (same finances), and 'moved up' (improved finances). An additional option – 'stayed the same, could not move down' – was available for participants who did not have enough to make ends meet before the death and were not able to move down a level if their situation got worse at Time 2.

As Figure 1 shows, this option did not apply to any participants in our study. This variable was used to identify significant differences in sociodemographic variables and therefore identify groups susceptible to financial change. The third way that financial change was categorised was by using a variable of financial loss/no loss. Financial loss comprised the reduced finances (moved down) group, and no loss comprised a combination of those who had the same or improved finances (same or moved up). This variable was used to identify the difference in post-

death health and role outcomes, support services accessed, and satisfaction with services, between participants who had experienced financial loss, and those who had not.

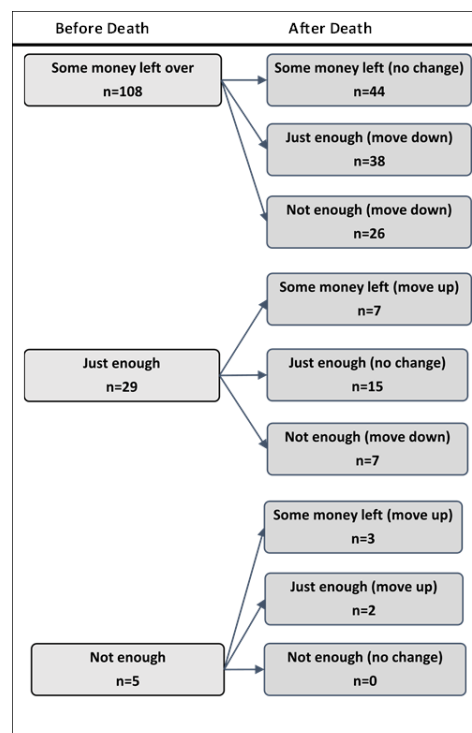


Figure 1. Change in financial situation

Financial impact on health and role outcomes

Participants were asked a series of closed (yes/no) questions about the short- and long-term impact of the death's financial consequences, for example: Did you need to re-enter the workforce to maintain the household finances? Free-text options in the survey provided opportunities for participants to provide extra, and often explanatory, data about their situation. Verbatim quotations are included in the results (participant number in brackets) where they assist with the interpretation of the findings.

Sources of financial support

Participants were asked to select or nominate all sources of both formal and informal financial or material support they had accessed following the death, including workers' compensation, family and friends, and support groups/services. Workers' compensation items included: no claim, claim underway, claim paid, claim rejected, and claim appealed. These items were regrouped to three groups for analysis: no access (no claim + claim rejected), access (claim paid), access pending (claim underway + claim appealed). If participants had not made a claim for workers' compensation, or did not intend to, they were asked to provide a reason for not making

an application. All other forms of support were coded as access (scored as 1) and no access (scored as 0).

If participants had accessed financial support from the workers' compensation system, from their social networks (e.g., family and friends), or formal support groups/services, they were asked to rate their satisfaction with financial support provided by each. Satisfaction was rated on a 5-point Likert scale (very dissatisfied to very satisfied).

Mental and physical health

The effect of the death on participants' mental and physical health was measured by comparing their current health to their health before death. Participants were asked whether a doctor had ever told them they had PTSD, depression, or an anxiety disorder. Where participants answered that they had received a diagnosis from their doctor, they were then asked whether the diagnosis was 'before', 'before and after', or 'after' the death. Positive responses to 'after' the death were scored as newly acquired mental health conditions and positive responses to 'before' and 'before and after' were scored as pre-existing conditions that continued following the death.

Physical health was measured by asking participants about the extent to which they had experienced changes in physical health symptoms since the death when compared to their health beforehand: 'experienced much less', 'no change', 'experienced much more'. Responses to 'experienced much more' were scored as declines in physical health.

Analysis

IBM SPSS version 24 was used for all statistical analyses. Fisher's exact and chi-square tests of independence were used to identify significant associations between categorical responses. The Wilcoxon signed-ranks test identified differences in reported finances before and after the death, Kruskal Wallis H and Mann Whitney U tests were used to test differences in ordinal data between groups, and one-way analysis of variance identified differences between groups and continuous data. A *p*-value of less than 0.05 was considered significant.

Results

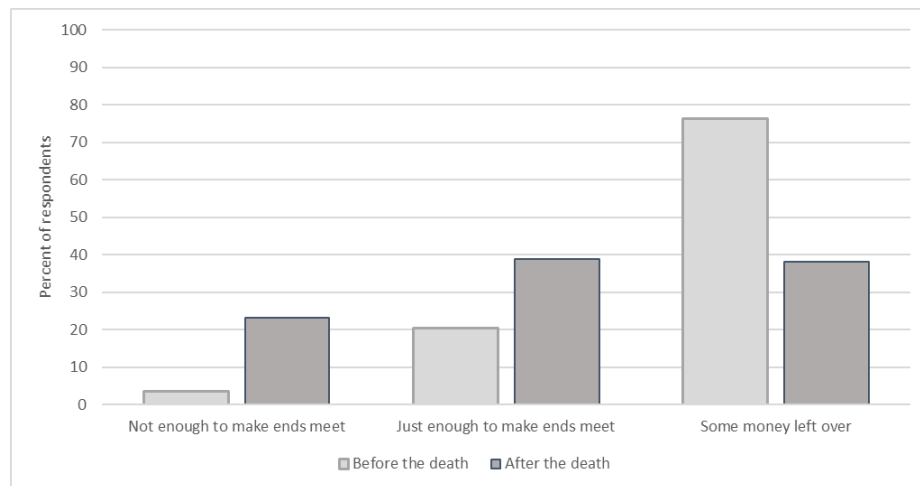
This section reports the results as they relate to the five research questions underpinning this study.

1. What financial changes are experienced by families following a workplace fatality?

Figure 2 shows the differences in the participants' reported financial situations between Time 1 and Time 2. It suggests a substantial deterioration after the death, with a particularly steep increase in the proportion of participants not having enough to make ends meet and a marked decrease in the proportion with money left over. Sixty-two percent (*n* = 88) of participants

reported struggling financially (not enough or just enough to make ends meet) following the death of their loved one. By comparison, only 24% (n = 34) were struggling before the death. A Wilcoxon Signed-Ranks test confirmed that participants' median post-death ranks were significantly lower than those before the death, $Z(142) = -6.09, p < 0.001$.

Figure 2. Differences in financial situation before and after the death



Change in finances and financial loss

Calculations to measure the change in participants' financial situations between Time 1 and Time 2 identified 71 participants (50%) who experienced a reduction in finances (moved to a lower financial level), 59 (41.5%) whose financial situation stayed the same (same level), and 12 (8.5%) who experienced an improvement in their situation (moved to a higher level) at Time 2 (see Figure 1). From these results, 71 (50%) participants experienced a financial loss (reduced finances), and 71 (50%) experienced no financial loss (same finances + improved finances) after the death.

2. Are some families more susceptible than others to financial changes following the death?

Table 1 identifies socio-demographic characteristics that were significantly associated with participants' post-death financial situation: reduced finances, the same finances, and improved finances. Being older, next-of-kin, or a partner/spouse was significantly associated with a reduction in finances. If participants' deceased relatives worked 51+ hours per week, they were also significantly more likely to experience a reduction in finances following the death.

3. Does post-death financial loss affect health and role outcomes?

Table 2 shows there was a high level of social change and acquired health problems in participants after the death, regardless of their financial situation. Approximately one-third of all participants accessed short-term financial help, increased their debt, or became primary earners. Approximately 40% changed jobs or moved to new housing.

Table 2. Financial situation and changes in health, work, education and living arrangements

Changes experienced	Total cohort (N = 142)	Financial loss (n = 71)	No financial loss (n = 71)	χ^2 Statistic
Changes for participants				
Sought short-term help	42 (30.4)	31 (73.8)	11 (26.2)	13.690**
Sought long-term help	33 (24.3)	29 (87.9)	4 (12.1)	25.993**
Increased debt	44 (33.8)	34 (77.3)	10 (22.7)	8.692***
Paid off debt	21 (16.2)	12 (57.1)	9 (42.9)	.407
Stopped life/health policy	12 (9.2)	11 (91.7)	1 (8.3)	8.847**
Developed mental disorder	81 (57.0)	50 (61.7)	31 (38.3)	10.375**
Physical health decline	84 (67.2)	53 (63.1)	31 (36.9)	12.631***
Workforce re-entry	38 (28.1)	31 (81.6)	7 (18.4)	22.618**
Changed jobs	52 (40.0)	22 (42.3)	30 (57.7)	2.483
Increased work hours	24 (18.5)	10 (41.7)	14 (58.3)	.976
Became primary earner	40 (30.8)	28 (70.0)	12 (30.0)	8.549**
Started education	25 (19.2)	12 (48.0)	13 (52.0)	.095
Moved to new housing	57 (43.8)	30 (52.6)	27 (47.4)	.141
Changed living arrangements	31 (23.8)	19 (61.3)	12 (38.7)	1.803
Changes for participants' children ^a (N = 118)				
Prolonged crying	29 (24.6)	21 (72.4)	8 (27.6)	5.592*
Angry Outbursts	58 (49.2)	38 (66.5)	20 (34.5)	6.741**
Diagnosed mental disorder	20 (16.9)	17 (85.0)	3 (15.0)	9.669**
Excessive drinking/drug use	21 (17.8)	13 (61.9)	8 (38.1)	.744
Diagnosed physical condition ^b	4 (3.4)	4 (100.0)	0 (0.0)	-
Concerns/fears of separation	53 (44.9)	31 (58.5)	22 (41.5)	.997
Regression in development	26 (22.0)	17 (65.4)	9 (34.6)	1.928
Underachieved in education	19 (16.1)	13 (68.4)	6 (31.6)	2.056
Stopped formal education	14 (11.9)	10 (71.4)	4 (28.6)	2.077
Changed living arrangements	24 (20.3)	15 (62.5)	9 (37.5)	1.005
Got a job to help finances ^b	7 (5.9)	4 (57.1)	3 (42.9)	-

Notes^a self-reported by participant, ^b chi square not calculated due to low cell count

* p < .05, ** p < .01, *** p < .001

Over half of the participants developed a mental disorder, and close to 70% experienced a decline in physical health. One participant captured the totality of the financial, social, and emotional impact of the death on her life in the following comment:

We were self-employed at the time of the death. The company was closed following the death. Sale or disbursement of the assets has taken over 3 years. I not only lost my

spouse, I lost my source of income, my business, my employees, my place in the community, my identity. (97)

Participants reported that their children also experienced change, with one commenting that 'the effects can be generational... children in the family have reactions which can further complicate the relationships and grieving process, e.g., drug, alcohol problems' (121). Approximately 50% of children were reported to have angry outbursts and concerns or fears of separation, about 20% changed living arrangements, and regressed in their development, and 17% received a mental health diagnosis (see Table 2).

Participants experiencing financial loss were significantly more likely than those without financial loss to have experienced a decline in physical and mental health following the death, to have sought short- and long-term financial assistance, discontinued life/health insurance policies, increased their debt, and have children who had angry outbursts, prolonged crying, and a diagnosed mental health condition.

One participant, like others who experienced financial loss, said 'it was tough, and now 13 years on, still tough financially and emotionally. Now I'm dealing with a teen who doesn't understand it and is missing out' (841).

4. What sources of financial support do families access following the death?

Participants reported the need for financial support following the death. Two, for example, advised that 'there should be financial help made available, we ended up spending all our resources and now have nothing left but grief' (755), and that 'faster arrangements for financial help for the families [is needed] as they are in shock and money just goes without you noticing it' (389). Others provided suggestions regarding access to 'legal aid for those who can't afford legal costs, more support from [social security]' (584) and 'financial support for those who don't receive compensation and are expected to deal with an unexpected tragic death and financial problems' (678).

Short-term financial assistance to help meet expenses was accessed by 30% (n = 42) of participants and 24% (n = 33) needed longer-term financial assistance (see Table 2). Table 3 shows that the three most frequently reported sources were family and friends, workers' compensation, and support groups/services; superannuation funds were accessed only by participants from Australia. Sources of financial assistance listed as "other" included the participant's employer or work colleagues, victims-of-crime organisations, the local community (community fundraisers), their children's school (fee exemptions), insurance claims (including funeral insurance), and lawsuit settlements.

Table 3. Sources of post-death financial support accessed individually or in combination

Source of support ^a	Accessed N (%)	Financial loss N (%)	No financial loss N (%)	χ^2 statistic
Family and friends	122 (85.9)	60 (49.2)	62 (50.8)	.233
Workers' compensation	75 (58.6)	36 (48.0)	39 (52.0)	.942
Support groups/services	47 (33.1)	25 (53.2)	22 (46.8)	.593
Life insurance	41 (28.9)	24 (58.5)	17 (41.5)	.641
Worker's co-workers	39 (27.5)	22 (56.4)	17 (43.6)	.194
Common law payment	27 (19.0)	15 (21.1)	12 (16.9)	.712
Superannuation	26 (18.3)	16 (61.5)	10 (38.5)	.864
Social Security	25 (17.6)	21 (84.0)	4 (16.0)	11.981***
Worker's employer	23 (16.2)	13 (56.5)	10 (43.5)	.101
Trade Union	16 (11.2)	9 (56.3)	7 (43.8)	.054
Welfare ^b	3 (2.1)	2 (66.7)	1 (33.3)	-
Other sources	24 (16.9)	11 (45.8)	13 (54.2)	.735
<i>The way financial support was used</i>				
Workers' compensation only	15 (12.5)	3 (20.0)	12 (80.0)	6.524*
Alternative sources only	45 (47.5)	24 (55.6)	20 (44.4)	
Used both sources	60 (50.0)	33 (55.0)	27 (45.0)	

^a participants could select more than one source of support, ^b no analysis due to small n

* $p < .05$, ** $p < .01$, *** $p < .001$

Apart from financial support from social security - which was used significantly more frequently by participants who experienced financial loss than not - the type of financial support sources accessed by participants did not differ between those who experienced financial loss and those who did not. Similarly, the number of financial support sources accessed by participants did not differ between the financial loss (mean rank = 72.40) and no financial loss groups (mean rank 62.45, $U = 1911$, $p = .131$), suggesting that the need for some form of financial assistance is across the board. As one participant commented: 'the last thing I wanted to do was to think about how to get myself fed and pay the bills let alone go through the workers' compensation, industrial relations, and superannuation paperwork' (553).

The way participants accessed sources of financial assistance after the death, however, differed between groups (see Table 3). When claimed, workers' compensation was utilised as the sole source of financial support by a significantly higher proportion of the group that experienced no financial loss (80%) than the group that did experience loss (20%).

Workers' compensation

The major statutory social protection for the loss of an income following a workplace death is workers' compensation. Table 4 shows that of the 128 participants reporting a known claim

status, 95 participants (74%) had submitted a workers' compensation claim. Of the 83 participants whose claims had an outcome, 75 had compensation paid, 7 had their claim rejected, and 1 was appealing their claim. Thus, at the time of the survey, 75 of the 95 participants (79%) who applied for workers' compensation had received benefits.

Table 4. Known status of workers' compensation claim

Status N = 128	Frequency N (%)
No claim	33 (25.8)
Claim underway	12 (9.4)
Compensation paid	75 (58.6)
Claim rejected	7 (5.4)
Appealed	1 (0.8)

Table 4 also shows that some participants did not make a claim for workers' compensation (n = 33) or had their claim rejected (n = 7). Most provided a reason for not making a claim (n = 28, 84.8%), including that they were not entitled to make a claim because they were not classified as a dependent (n = 9), they were not eligible to claim (n = 7), their deceased relative did not have access to workers' compensation because they were self-employed (n = 4) or a temporary/casual worker (n = 2), the death occurred before compensation entitlements were available (n = 3), and they were not aware they could make a claim (n = 3). Of the 7 claims rejected, 4 (57.1%) were from families of self-employed workers and temporary/casual workers. A chi-square test of independence showed that there was no significant association between claim status (no claim, n = 33; claim paid, n = 75; claim pending, n = 13; claim denied, n = 7) and financial loss, Fisher's exact, $p = .268$.

However, the workers' compensation payment offered was rarely adequate as a sole source of financial assistance (see Table 3). Eighty percent (n = 60) of all participants who received workers' compensation (n = 75) also sought financial assistance from alternative sources, possibly while waiting for the finalization of their claim, or because the payment was not adequate. Notably, social security assistance was sought by 18.7% (n = 14) of participants whose claim was paid, 15.4% (n = 13) of those with a claim pending, 14.3% (n = 7) of those whose claim was denied, and 21.2% (n = 7) of participants who did not make a workers' compensation claim.

One participant advised that 'compensation for work-related deaths ... are meagre at best; my family would be far better off financially if my husband were left in a vegetative state for 10 years' (620). Another said that compensation was paid to the children 'but was a fraction of the settlement... as much was taken in legal fees over [the] prolonged period of time taken to complete investigations and hold [the] inquest' (804).

Time taken for claims to be finalised

Successful claimants advised that the time taken for a claim to be finalised varied from 2 weeks to 7 years, with an average time of about 18 months, but 24% of claims took over 2.5 years to be completed. The claims of participants who experienced financial loss took significantly longer to settle (mean ranks = 36.23) than those for participants who did not experience financial loss (mean ranks = 27.11), $U = 319$, $p = .046$. The time some waited for a decision resulted in participant exhaustion and disillusionment, as identified by this participant:

My brother died in [year]. My younger brother has barely worked since then as he witnessed the death. He is now unable to ever be employed again, due to his mental state... I instigated a workers' compensation claim against his own insurance policy (he was self-employed at the time), and it has only been finalised this year after three years of intense fighting. Since the changes in the workers' compensation laws, we were required to take a very small pay out which is now invested for him. I have also had to sell property so that I can look after him financially. We have received no financial support from anyone over this time and have been unable to even receive assistance from any government department. I will be looking after my brother for the rest of our lives. I have explored all avenues available to me re assistance for him and keep hitting brick walls. (647)

No financial assistance

Not everyone received financial assistance following the death. Fifteen (11.2%) of the 134 participants who responded to the items about financial support did not seek or receive any financial assistance. For several, the journey seeking financial assistance, either through workers' compensation, or other means, extended for years following the death and in the end was not successful. This participant's comment reflects their journeys:

We had no financial or emotional support from the government/authorities. The police took two years to provide their report on my father's death... after three years our claim for compensation was rejected due to lack of evidence (Dad fell from a roof at work). We were referred to another lawyer to make a claim for public liability possibly taking another 3 years and at that stage, we came to the decision not to proceed. (678)

5. How satisfied are families with the financial support they receive following the death?

Table 5 details satisfaction levels with the three most accessed sources of financial support - family and friends, workers' compensation, and support groups/services. There were no significant differences in satisfaction between financial loss and no loss groups for the support provided by workers' compensation and support groups/services. However, significantly greater dissatisfaction was reported with financial assistance provided by family and friends by participants who experienced financial loss following the death.

Table 5. Satisfaction with financial support accessed following the death

Source of support	Total cohort n (%)	Financial loss n (%)	No financial loss n (%)	Test statistic (df)
Family and friends (n = 122)				
Very dissatisfied - dissatisfied	50 (41.0)	32 (64.0)	18 (36.0)	$\chi^2 (2) = 7.741^*$
Neither satisfied-nor-dissatisfied	18 (14.8)	6 (33.3)	12 (66.7)	
Satisfied - very satisfied	54 (44.3)	22 (40.7)	32 (59.3)	
Workers' compensation (n = 68) ^a				
Very dissatisfied - dissatisfied	40 (58.8)	20 (50.0)	20 (50.0)	$\chi^2 (2) = 3.477$
Neither satisfied-nor-dissatisfied	11 (16.2)	7 (63.6)	4 (36.4)	
Satisfied - very satisfied	17 (25.0)	5 (29.4)	12 (70.6)	
Support groups/services (n = 47)				$\chi^2 (1) = 1.953$
Very dissatisfied - dissatisfied	21 (44.7)	14 (66.7)	7 (33.3)	
Neither satisfied-nor-dissatisfied ^b	6 (12.8)	2 (33.3)	4 (66.7)	
Satisfied - very satisfied	20 (42.5)	9 (45.0)	11 (55.0)	

^a only 68 of 75 who accessed workers' compensation provided a satisfaction rating, ^b not included in chi-square analysis due to small n

* $p < .05$

Of interest is the high rate of dissatisfaction with financial support provided by workers' compensation (58.8%) when compared to the dissatisfaction with financial support from family and friends (41%) and groups and services (44.7%). Given there are some differences in workers' compensation and OHS laws between countries represented by most participants in this study, we examined the satisfaction ratings to determine if the schemes from Australia, Canada, and the USA had any influence on ratings (the UK was not included in comparative analyses because the sample was too small). Dissatisfaction rates did not differ significantly between participants accessing the scheme in Australia (61.1%), the USA (80.0%), and Canada (37.5%; Fisher's exact $p = .257$).

Discussion

In policy debates over OHS, severe injury and death are often mentioned and media interviews with the family are common. Surprisingly, however, there has been little attempt to assess the financial impact of death on families, which is relevant not only to policy/support settings but also to obtaining a clearer idea of the overall economic impact of workplace death. The impact of a fatal work injury is profound, especially as the vast majority of those dying have spouses/partners and loved ones, including dependent children in many cases. In addition to the shock, grief, emotional turmoil, and logistical challenges of arranging the funeral and household matters, research has identified significant and often long-term suffering, including prolonged grief, depressive disorders, and post-traumatic stress (Matthews et al., 2019). Amid this

disruption, families must adjust and re-orientate their finances and seek compensation through a complex and sometimes prolonged process that may alter their life circumstances permanently.

This pioneering, exploratory study provides initial insights into the financial effects of workplace deaths. It examined the financial changes experienced by families following a workplace fatality, whether some families were more susceptible to financial loss than others, the nature of the financial support accessed, and families' satisfaction with the support they received. It also explored the impact that financial loss had on health and role outcomes following the death.

Regarding the financial changes experienced, half of the participants experienced a loss in finances when compared to their situation before the death, and the number struggling to make ends meet more than doubled (from 24% to 62%). Not all families were able to draw on workers' compensation, magnifying the impact of a workplace death on the most vulnerable, who in this study were the next-of-kin and partners of deceased workers. Another group of families who were particularly susceptible to negative financial changes were those of deceased workers who had worked 51+ hours per week. It appears there is a discrepancy or gap in the formal entitlements for families of employees whose earnings depended on significant amounts of overtime, but this requires detailed investigation.

Older partners/spouses were also adversely affected, most likely because they had less opportunity to transition to, or take up, additional employment to supplement their income following the death. Even for those who may have had successful workers' compensation claims, it is unlikely that these payments adequately covered income losses. Previous research on workers' compensation and non-fatal injuries suggests that claim payments replace only 16% of the total loss in earnings in the 10 years after the injury (Seabury et al., 2014). Authorities have also pointed to problems where the deceased worker has children from several relationships or there are 'blended' families of children from different relationships, often resulting in multiple and competing claimants (Quinlan et al., 2015). We were unable to explore these issues in this study. However, dissatisfaction with the system among the present participants suggests they warrant attention as factors exacerbating deficiencies in the amount of financial support.

Overall, family and friends were the most frequently accessed source of financial support. Workers' compensation was also a major source of financial support but was only accessed by 59% of participants, equally by those who did and did not experience a financial loss after the death. A significant proportion of participants did not apply for workers' compensation, including when the deceased was self-employed or a temporary/casual worker, and when families were uncertain about their entitlements (see also, Matthews et al., 2012b). A majority of families who made claims but were denied were those of self-employed and temporary/casual workers, which lends support to previous findings that families of precarious and non-unionised workers are especially vulnerable in this regard (Quinlan, 2004; Michaels, 2015). Over 11% of participants received no financial support whatsoever, including some who had pursued workers'

compensation claims unsuccessfully. Previous research with key institutional representatives - employers, insurers, workers' compensation officials, unions, and lawyers – identified groups particularly likely to have claims denied (Quinlan et al., 2015). They included the families of self-employed workers (part of a growing workforce of dependent subcontractors) and those from vulnerable communities, specifically non-English speaking immigrants and those on short-term work visas. This finding is consistent with existing research on gaps in workers' compensation coverage and administration affecting precarious workers (Guthrie and Quinlan, 2005; Quinlan and Mayhew, 1999; MacEachen et al., 2021).

Even among those receiving workers' compensation, 80% had to seek additional financial assistance, the key sources being family and friends, and support groups/services. In addition to shortfalls in entitlements, an important factor was delays in payments; a situation also experienced by workers with non-fatal injuries (Kilgour et al., 2015; Strunin and Boden, 2004). Ignoring the burden associated with the administrative complexities of the claim process, workers' compensation claims took an average of 18 months to be processed, with a quarter taking more than 2.5 years, which constitutes a significant financial burden, especially in cases where the deceased worker was the primary breadwinner. As with incidents of non-fatal work injury (Keogh et al., 2000), the need for a significant proportion of families to seek short-term forms of 'bridging' finance from family and friends indicates a serious deficiency in existing compensation arrangements.

Additional evidence of the deficiency in workers' compensation arrangements was found in the proportion of participants who also sought financial assistance from social security (18% of those whose claim was paid, 14% of those whose claim was denied). This finding provides evidence of 'cost-shifting' financial support from workers' compensation to the taxpayer. It also highlights how the combination of families' inexperience or exclusion (21% of those with no claims accessed social security), and increases in self-employment and other forms of precarious work currently not eligible for workers' compensation, can accentuate the transfer of social costs away from industry who benefits from these arrangements and onto the general community (Quinlan and Mayhew, 1999).

Participants in this study reported substantial health changes following the death, especially those who experienced financial loss. They were significantly more likely than those without financial loss to develop a mental health condition and to experience a decline in physical health following the death. These findings support existing evidence of elevated mental health conditions in people bereaved by sudden and violent deaths (Kristensen et al., 2012), that are further exacerbated by financial pressures (Corden et al., 2010), and frequently accompany declines in physical health (Stroebe et al., 2007). The extensive literature on the social determinants of health sheds further light on these findings, but they particularly resonate with existing evidence that financial stress leads to psychological difficulties (Myers, 2000), and financial hardships contribute to a decline in physical health (Ahnquist et al., 2012). Importantly, the present findings provide a new contribution to the OHS and industrial deaths literature that

points to a much-needed public health response aimed at providing greater financial support for families bereaved by traumatic workplace incidents, at least in some jurisdictions.

Another important finding involved intergenerational effects on children. Around half of children expressed anger or fear, 20% changed living arrangements, and 17% received a mental health diagnosis. Participants also reported drug and alcohol problems. These effects, and direct financial ones, could significantly affect educational attainment and future job prospects. These effects could not be explored in this study, but they deserve further detailed investigation because intergenerational effects magnify the financial costs of workplace death for families and the economic costs to the wider community. If this is a common experience it should be a focus for future policy interventions.

Participants' overall satisfaction with the provision of financial support was also assessed. While there were no significant differences between financial groups regarding satisfaction with support provided by workers' compensation and support groups/services, participants experiencing financial loss reported significantly greater dissatisfaction with the financial support provided by their family and friends. Further research is required to explore the reasons for this dissatisfaction. It is possible, for example, that the request for financial help increased existing difficulties with family and friends (Kahn and Pearlin, 2016) or that those asked may have been in a similar financial situation and unable to assist.

An interesting, related finding was the tendency toward extreme ratings of satisfaction or dissatisfaction with financial assistance provided by family and friends and support groups/services, which contrasted with the tendency toward dissatisfaction with workers' compensation. These results suggest that, while improvements have been made in workers' compensation entitlements following workplace death in several jurisdictions over the past 10-15 years, significant deficiencies remain in terms of coverage, the level of support, or administration (Quinlan et al., 2015).

Although illuminating, the present findings should be treated with caution. They are drawn from an exploratory, cross-sectional study based on a small, self-selecting sample, which may have been biased toward participants who had concerns about the support they received following the death. The survey also used several single-item measures and required proficiency in English to complete. This requirement may have potentially biased the results because the families of workers of non-English speaking backgrounds, often concentrated in vulnerable or precarious jobs in hazardous industries, such as construction, agriculture, and manufacturing, may be underrepresented (Toh and Quinlan, 2009; Ahonen and Benavides, 2006). Although viewed as one population for reasons identified in the methods, the inclusion of different countries may nevertheless have impacted our findings. We took safeguards to minimise this possibility by including generalised questions, so they were not country specific, and were meaningful to the differences in OHS laws and enforcement practices. Follow-up interviews provided participants the opportunity to provide additional input as well as identify any serious issues with our

methods. Our survey provides some probative evidence to guide future research in multiple countries. If we had confined our study to a single country the findings would have been less valuable in this regard. Although not affecting our cohort, future users of the 3-point scale from the economic strain model should note that it cannot measure declining finances in the group that could afford the decline the least. Finally, many of the health changes reported by our participants might also be experienced by families that are exposed to a sudden traumatic death that is not work-related. The changes in health, therefore, may not be connected to the work-relatedness of the injury. Further research that focuses on the nature and context of fatal incidents would provide clarity to this element of workplace deaths.

Nonetheless, to our knowledge, it is the first study to quantitatively examine the impact of workplace death on families' financial situations. It provides initial evidence of the detrimental effects of workplace deaths and a basis for future research. In broad terms, the findings are consistent with earlier institutional and documentary studies, and other research on deficiencies in workers' compensation (Keogh et al., 2000; House of Representatives Standing Committee on Employment and Workplace Relations, 2003; Kilgour et al., 2015; Lippel, 2007; Morse et al., 1998; Strunin and Boden, 2004).

Several policy issues and areas of further research flow from the present findings. First, while there were limits in what we could measure in this study, the context and challenges posed by precarious work in this regard need to be recognized. Deficiencies in coverage and entitlements and the poor success of claims reported by families of self-employed contractors and temporary workers indicate that these, and other precarious work arrangements, challenge the coverage of workers' compensation and can pose particular problems for safeguarding injured workers and the families of those killed at work (Guthrie and Quinlan, 2005; MacEachen et al., 2021). Resolving these problems require a serious rethinking of social protection regimes, including the scope of workers' compensation regimes and their relationship with social security, another important source of financial support accessed by families in this study. This issue has already drawn attention from policymakers in government inquiries, including a recent Australian Senate report on insecure/on-demand work, which pointed to evidence that the families of food delivery workers had been left destitute following work-related deaths (Select Committee on Job Security, 2021). The findings on self-employed and temporary workers in our study points to an implication of the growth of precarious work for workers' compensation that requires attention.

Second, the findings from this study suggest that even for those participants able to access workers' compensation, there are problems with delays, the level of entitlement, and overall satisfaction with the regime (see also Matthews et al., 2012a; Quinlan et al., 2015; and for non-fatal work injuries, Kilgour et al., 2015). Concerning delays, a few additional points can be made. Various initiatives aimed at accelerating the compensation determination process for injured workers and families of deceased workers have been implemented in the past 10-15 years (e.g. Safework Australia, 2021). The effectiveness of these measures in particular regimes, however, has yet to be determined. Focused research that identifies critical elements that accelerate

claims determination would prove instructive to reducing the lengthy claim assessment periods experienced by participants in this study.

One implication of the foregoing, notwithstanding its limitations, is that broadening the coverage of workers' compensation regimes to include self-employed subcontractors and other vulnerable workers, would not only address the coverage gap for families of these workers but may also speed up the process of seeking financial redress and make outcomes more certain (Quinlan et al 2015; MacEachen et al 2021). Although further work in this area is needed, as well as an assessment of existing policy shortcomings, the present findings provide some guidance on dealing with this important issue in addition to improving the effectiveness of workers' compensation regimes for all families of relatives killed at work. At a broader level, research that models the impact of reconfiguring legislation setting minimum labour standards to meet challenges posed by global changes in work arrangements, including the gig/platform economy which represents a calculated attempt to evade existing protective laws and standards (Forsyth, 2022), is warranted.

Finally, while acknowledging that workers' compensation regimes vary within federal countries like Australia, the USA, and Canada, the absence of significant inter-country differences regarding satisfaction with workers' compensation schemes suggests their limitations are general, not the outcome of deficiencies in particular regimes. This finding indicates the problem is deep-rooted or structural, not something that has been resolved, at least not in the countries we examined.

Conclusion

The financial impact of workplace death on families is under-researched but available evidence indicates it is a significant issue. While the findings of this exploratory study should be treated with caution, they indicate that the financial situation of many families changed significantly following the death, with the number struggling to make ends meet increasing substantially. Older participants, next-of-kin and partners were particularly vulnerable to experiencing financial loss especially when the deceased relative worked 51 or more hours per week. Existing financial supports, especially workers' compensation – the major statutory social protection for the loss of an income – leave many families both financially disadvantaged and dissatisfied. This study pointed to some complicating issues including the challenges of precarious work arrangements corroding workers' compensation coverage. In addition to administrative issues, such as delays in payment, the study pointed to further difficulties including the interaction between financial loss and the emotional and psychological burden associated with workplace death, as well as the effects on children and other potential intergenerational effects that require further investigation.

At the very least the study demonstrates the urgent need for more detailed research on the economic costs of workplace death to inform policy enhancement and especially inter-generational effects which are long-term. Workers' compensation regimes have received less attention than industrial relations and OHS in research and are less often the subject of public inquiries (for a recent exception see Senate Select Committee on Job Security, 2022). Our study reinforces the need to rectify this imbalance given the significant social and human impacts of deficiencies identified. More broadly, the findings are consistent with and contribute to a wider body of research pointing to regulatory gaps in existing work protection regimes. Our study points to serious limitations in protection for those families who cannot access workers' compensation. Further, profound changes to work, like the growth of platform work and the gig economy (where many workers are deemed self-employed) and large numbers of vulnerable foreign workers on short-term visas, are increasing the proportion of the workforce falling through the cracks. The problems posed by pervasive precarious work arrangements for injured workers and their families was highlighted by the report of the Senate Select Committee on Job Insecurity (2022). Together with the findings of an earlier Senate Inquiry (Senate Education and Employment References Committee, 2018) into workplace death, the present study reinforces the case for refashioning regulatory regimes to better protect workers and their families.

Funding

This research was funded by the Australian Research Council Discovery Project Grant DP120103377.

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