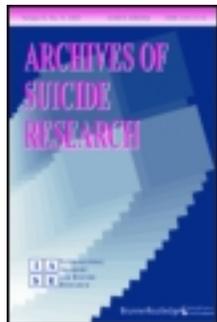


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# Correlates of Suicide in Building Industry Workers

Travis S. Heller, Jacinta L. Hawgood, and Diego De Leo

*Suicide within the construction industry in Queensland, Australia was reportedly high in a recent Royal Commission report. The current study examined the incidence and causes of suicide in this industry using psychological autopsy and focus group investigations. A total of 64 male suicides occurred over the seven-year period, representing a crude suicide rate of 40.3 per 100,000, significantly greater than the working age Australian male rate. Young employees were at excessive risk with separation/divorce, relationship problems, and untreated psychiatric conditions the major contributors. Focus groups emphasized the importance of work/home interface factors and industry-specific factors preceding suicide.*

**Keywords** construction workers, mortality, occupation, suicide, young people

Construction work is cyclical, seasonal, and sporadic (Peterson & Zwerling, 1998). Workers must take work when it is available, and are often required to undertake long working hours and heavy physical workloads. Construction workers are frequently forced to travel to find work, and spend considerable time away from the family unit. The lack of job security, heavy workload, reliance on the economy and weather, and time away from home can all take a considerable toll on workers within this male-dominated industry.

In Queensland, Australia, a recent Royal Commission into the Building and Construction Industry reported that in a four month period, nearly half (17 of 41: 41%) of all death claims made on behalf of commercial building workers were for suicide deaths (Cole, 2003). Suicide rates within and between specific occupation groups have not been comprehensively investigated in Australia. Research so far has focused on 'classes' of occupation, for example blue-collar vs. white-collar jobs.

Unskilled and semi-skilled blue-collar manual occupations tended to have high suicide rates (Hassan, 1996).

A study conducted in Victoria investigated suicides related to work factors between the years 1989 and 2000 (Bottomley, Dalziel, & Naith, 2002). Findings indicated that 19% of all suicides were employed in trade or technician occupations, with an additional 16% working in unskilled positions (including builder's laborers). Another study investigated the socio-economic differentials (including marital and occupational status), and found that suicide rates were higher among male tradesmen and laborers, when compared to the state suicide rate (Burnley, 1995). However, the relatively low incidence of suicide in this study resulted in tradesmen and laborers being combined with other occupational groups including miners, production workers, and craftsmen. Therefore, it was impossible to extrapolate the true magnitude of suicide among construction workers per se.

Also at the international level there is limited research on suicide among manual workers generally, or construction workers specifically. While some studies have been conducted in Hong Kong (Yan, 2000), Ireland (Daéid, 1997), Finland (Notkola, Martikainen, & Leino, 1993), and Sweden (Jarvholm & Stenberg, 2002a), the majority of the available research has been conducted in the USA, where suicide rates in many construction occupations appeared as elevated in comparison to the general male population and some industry comparison groups (Boxer, Burnett, & Swanson, 1995; Kposowa, 1999; Lampert, Bourque, & Kraus, 1984; Liu & Waterbor, 1994; Stack, 1995; 1999; Stern & Haring-Sweeney, 1997). For instance, laborer suicide rates were up to five times the USA national average (Stack, 1995), with rates especially high for skilled (carpenters, plumbers, electricians, and machinists) and semi-skilled (laborers and welders) manual workers (Stack, 1999). However, when socio-demographic variables such as gender, marital status, and age were controlled for, construction workers appeared no longer at increased risk of suicide (Stack, 1995; 2001). However, in the Kposowa study (1999), construction workers remained at higher risk of suicide even after controlling for age, gender, marital status, race, education, geographic location, and income.

It has been suggested that working in the construction industry may be indirectly associated with increased rates of suicide, through escalating marital strain among employees (Stack, 2001). However, more research is required to clarify the causal link between work/ home stressors and mental health problems/suicide (Stack, 2000; Wilhelm, Kovess, Rios-Seidel, et al., 2004).

Long work hours and heavy workload were strongly associated with work-related suicides in a range of Japanese industries, including construction (Amagasa, Nakayama, & Takahashi, 2005). Furthermore, work overload, harassment (Kposowa, 1999),

non-permanent positions impacting job security (Jarvholm & Stenberg, 2002b), and lack of social integration among employees (Berkman, Melchior, Chastang, et al., 2004) have also been suggested as contributing factors for suicide.

Amongst occupations in general, pre-existing psychiatric morbidity, internal occupational stress, and access to lethal means have been associated with suicide (Stack, 2000).

As well as determining the incidence of suicide in Queensland's Commercial Building Construction Industry (CBCI) in relation to the working-age male population, this investigation aims to reveal some of the individual, work, home, and work-home interface factors that may be associated with suicide in this cohort. To do this, both quantitative (through psychological autopsy) and qualitative investigations (focus groups with industry representatives) were conducted.

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## METHOD

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### Data Sources

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In order to calculate the incidence of suicide, a variety of data sources were reviewed, including those from industry databases (i.e., insurance companies that specialize in workers from the CBCI), the Australian Bureau of Statistics (ABS), and the Queensland Suicide Register (QSR). Industry databases include both compulsory superannuation and voluntary redundancy schemes. Information within these schemes included personal information (name, date of birth, gender, etc.), cause of death, and date of death. The QSR is a databank that stores information on all completed suicides in Queensland, from 1990. The QSR holds data from post-mortem and toxicology reports, and psychological autopsy interviews conducted by police officers with the next-of-kin

of suicide victims. Psychological autopsy investigations try to recreate the circumstances leading up to the suicide (De Leo & Pouliot, in press), and for the current study included questioning relating to socio-demography, psychopathology, history of suicidality, and recent stressful life events.

#### Data Collection

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Data was collected for the period 1995 to 2001. A list of all active CBCI members (i.e., those who had paid fees in the six months preceding death) who had died during the study period was obtained from the industry databases. This list was cross-referenced by surname against the QSR to isolate definite suicides. The QSR includes three levels of classification: *Beyond Reasonable Doubt* (BRD); *Probable*; and *Possible*. Defining criteria for this classification are cited elsewhere (De Leo & Heller, 2004). The QSR inclusion criteria for suicide features cases that are identified as BRD and Probable suicides, to ensure that the information is as reliable as possible. The QSR criteria are based on research criteria, whereas official statistics rely on sufficient legal evidence to label a death as suicide beyond reasonable doubt. Even with these two levels of inclusion, the identified suicide rates are conservative and researchers acknowledge this underestimation of true suicide rates (Sampson & Rutt, 1999).

The population of the CBCI was determined by the number of active members of respective industry funds. With information obtained from two superannuation funds and one redundancy fund, it was possible for persons to be members of more than one fund, especially given that superannuation schemes are mandatory for employees, whereas redundancy schemes are voluntary. Therefore, obtaining the active membership populations from each of three funds would reveal an overestimation of the CBCI population.

To counter this, the total active membership populations from the two superannuation funds were taken, as well as a proportion (20%) from the lone redundancy firm and a conservative estimate was made after consultation with fund management. From 1995–2001, there were 167,103 active members in the Commercial Building Construction Industry, increasing from 21,158 members in 1995 to a peak of 26,577 in 2000.

#### Focus Groups

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Focus groups were conducted to examine possible work-related stressors that may contribute to suicide in the CBCI. A total of 14 industry personnel (all male) participated in two focus group sessions of different sub-populations (general construction workers and onsite union delegates). These two samples were chosen to provide a representative cross-section of opinions from within the industry. Between 6 and 8 persons participated in each focus group session that investigated the possible causal factors for suicide within the industry, reasons for living, and suicide prevention initiatives. Volunteers were sought via advertisements at one large building site centrally located in Brisbane, Queensland, and participants were randomly selected from a larger pool of volunteers. Focus group sessions took place at union headquarters during August 2004, were facilitated by two researchers (JH, TH), and lasted approximately 90 minutes. Both sessions were audiotaped with the consent of participants, and data transcribed verbatim. Union delegates were significantly older than workers (47.7 vs. 33.8 years;  $t(12) = 2.73$ ,  $p = 0.018$ ) and had more experience in the industry (29.3 vs. 14.8 years;  $t(12) = 2.70$ ,  $p = 0.019$ ). Despite these differences, both sessions were grouped together to provide qualitative responses which reflected a diverse range of responses.

### Statistical Analyses

Crude and age-specific suicide rates per 100,000 persons were calculated for males working in the CBCI and were compared against equivalent rates for the working-aged populations (15–64 years) of Queensland and Australia using Standardised Mortality Ratios (SMR). Differences between CBCI and Queensland suicides were measured using standard non-parametric tests ( $\chi^2$ -test). Qualitative data from focus groups was analyzed using NVivo software Version 2.0.161.

### RESULTS

Based on the QSR classification of suicides, potential suicides among the active CBCI members were grouped as Beyond Reasonable Doubt (BRD) ( $n = 56$ ; 77.8%), Probable ( $n = 11$ ; 15.3%), and Possible ( $n = 5$ ; 6.9%). Therefore, 67 of 72 (93.1%) of the potential suicides from CBCI between 1995 and 2001 were included in further analyses, after eliminating Possible suicides.

#### CBCI Suicides

The 67 suicide deaths by members of the CBCI resulted in an average of 9.6 suicides per year. The vast majority of these suicides were males ( $n = 64$ ; 95.5%), with only three females (4.5%). The suicides broken down by age and gender are shown in Table 1. Due to the low number of female

**TABLE 1. Suicides from the CBCI by Gender and Age-Group**

Age group	Males	Females	Total
15–24 years	12	1	13
25–34 years	22	0	22
35–44 years	21	1	22
45–54 years	7	0	7
55–64 years	2	1	3
All ages	64	3	67

suicides, for all subsequent analyses only male data was calculated and presented.

Gender stratified population figures of active CBCI members were not available from industry records, however upon consultation with industry experts, an approximation of 95% males within the industry was revealed. Crude suicide rates for males from the CBCI for each year of the study are presented in Table 2. Due to low numbers, a combined rate for the three-year period 1995 to 1997 was calculated. Analyses were confined to the working-age population (15–64 years). The CBCI suicide rate peaked in 1998 (57.8 per 100,000 persons), with continued decreases in subsequent years. The overall crude suicide rate over the period 1995 to 2001 was 40.3 suicides per 100,000 persons.

#### Suicide Mortality Rates Comparisons

Australian and Queensland male suicide rates for the same period were obtained from the Australian Bureau of Statistics (ABS, 2003). Table 3 shows the comparison of CBCI suicide mortality rates with the respective comparison groups. All rates

**TABLE 2. Suicide Rates from the Commercial Building Construction Industry by Year**

Year	Suicides	Population	Rate
1995	7	20,100	-
1996	7	20,357	-
1997	6	22,018	-
1995–1997	20	62,475	32.0
1998	13	22,499	57.8
1999	12	23,727	50.6
2000	10	25,248	39.6
2001	9*	24,800	36.3
Total	64	158,7493	40.3

\*Suicide rates based on less than ten deaths should be interpreted with caution.

-Rates were not calculated because there were less than 10 deaths; hence a combined rate was computed.

TABLE 3. Comparison of CBCI Rates with Australian and Queensland Male Rates, 15–64 years, 1995–2001

Year	CBCI rate	Australia rate	Queensland		
			SMR (95% CI)	Rate	SMR (95% CI)
1995	-	27.2	-	32.3	-
1996	-	27.3	-	35.4	-
1997	-	29.9	-	32.9	-
1995–1997	32.0	28.1	1.14 (0.72–1.73)	33.5	0.96 (0.60–1.45)
1998	57.8	30.2	1.91* (1.06–3.19)	35.5	1.63 (0.91–2.71)
1999	48.00	27.1	1.87* (1.01–3.17)	29.4	1.72 (0.93–2.93)
2000	39.6	25.0	1.58 (0.80–2.82)	30.3	1.31 (0.66–2.33)
2001	36.3	26.0	1.40 (0.68–2.56)	29.2	1.24 (0.61–2.28)
Total	40.3	27.6	1.46** (1.13–1.85)	32.2	1.25 (0.97–1.59)

-Rates were not calculated because there were less than 10 deaths; hence a combined rate was computed. Consequently, SMR's were not calculated for these individual years.

\*  $p < .05$ .

\*\*  $p < .01$ .

refer to males only, and are constrained to working age population of 15–64 years.

Suicide rates were higher among CBCI employees than the Australian male rate, across all years/periods of investigation, reaching statistical significance in 1998 and 1999 (Table 3). In 1998, members of the CBCI were 1.91 (95% CI 1.06–3.19) times more likely to die by suicide than the general Australian male population. Across the entire period (1995–2001), CBCI suicide rates were significantly greater (SMR = 1.46, 95% C.I. 1.34 to 1.85) than Australian male rates (38.3 per 100,000 vs. 27.6 per 100,000). CBCI rates were non-significantly higher than their Queensland counterparts from 1998 to 2001, and for the overall period (1995–2001). Trends of suicide mortality for CBCI, Australia and Queensland males are shown in Figure 1.

Based on estimations of the industry population by age groups, age-specific suicide rates were calculated where possible (see Table 4).

Among 15 to 24 year olds, the suicide rate was 61.7 suicides per 100,000 population, which was more than two-times the Australian male 15–24 year old rate

(Table 5). Rates for the 25–34 and 35–44 year age groups were higher in the CBCI than the general Australian population; however, these differences did not reach statistical significance. CBCI age-standardized rates were also compared with Queensland age-standardized rates (Table 5) with 15–24 year olds having a 103% increased risk of suicide.

#### Comparison of BCI Suicides with QSR Suicides

Male suicides from the CBCI represented 2.4% (64 of 2669) of all 15–64 year old suicides. The average age of male suicides from the CBCI was 34.6 years, with a 95% confidence interval from 32.2 to 36.9 years, which was not significantly different from non-CBCI Queensland suicides (35.9 years, 95%CI 35.4 to 36.4,  $t(2667) = 0.87, p = .382, n.s.$ ).

#### Psychological Autopsy

Comprehensive psychological autopsy information from the QSR was used to

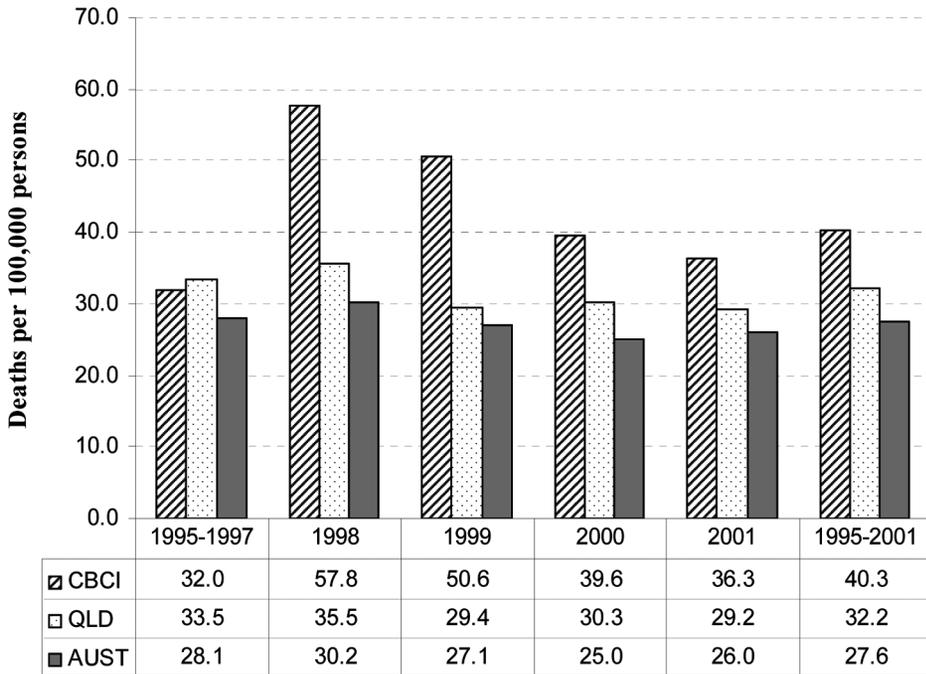


FIGURE 1. Comparison of suicide rates from CBCI, Queensland, and Australia, 1995–1997 (Males).

compare information surrounding the suicide deaths of CBCI and Queensland (non-CBCI) working aged males. CBCI suicides were more likely to have consumed alcohol preceding death (59.4% vs. 42.0%,  $\chi^2(2) = 7.86, p = 0.020$ ), have had a

TABLE 4. Age-Specific Suicide Rates in CBCI, 1995–2001

Year	Suicides	Population	Rate
15 to 24 years	12	19,457	61.7
25 to 34 years	22	54,185	40.6
35 to 44 years	21	51,607	40.7
45 to 64 years	9*	33,499	26.9
45 to 54 years	7	27,613	-
55 to 64 years	2	5,886	-
Total	64	158,749	40.3

\* Suicide rates based on less than ten deaths should be interpreted with caution.

-Rates were not calculated because there were less than 10 deaths.

relationship problem in the three months prior to death (53.1% vs. 29.5%;  $\chi^2(1) = 16.60, p < 0.001$ ), and had multiple stressful life events preceding suicide (66.1% vs. 51.7%,  $\chi^2(1) = 5.04, p = 0.025$ ). Although nonsignificantly different, BCI suicides were more likely to report alcohol related problems (23.4% vs. 17.4%;  $\chi^2(3) = 5.82, p = 0.121, n.s.$ ), and less likely to have consulted a mental health professional in the three months preceding death (7.8% vs. 17.3%,  $\chi^2(2) = 4.20, p = 0.122, n.s.$ ).

#### Suicides by CBCI Youth Compared with QSR (15–24 Years)

Due to the elevated rate of suicide among young CBCI workers, a specific investigation of youth suicides (15–24 years) was conducted against an age-matched Queensland cohort (n = 562). There were only 12

TABLE 5. Comparison of CBCI Rates with Australian and Queensland Rates by Age Group

Age	CBCI rate	Australia rate	Queensland		
			SMR (95%CI)	Rate	SMR (95%CI)
15 to 24	61.7	24.5	2.52** (1.36–4.28)	30.4	2.03 (1.10–3.45)
25 to 34	40.6	35.3	1.15 (0.74–1.71)	40.7	1.00 (0.64–1.49)
35 to 44	40.7	30.1	1.35 (0.86–2.03)	34.9	1.17 (0.74–1.75)
45 to 54	-	23.7	-	28.0	-
55 to 64	-	20.6	-	22.5	-
45–64yrs	26.9	22.5	1.19 (0.58–2.19)	25.8	1.04 (0.51–1.91)
15–64yrs	40.3	27.6	1.46** (1.13–1.85)	32.2	1.25 (0.97–1.59)

-Rates not calculated because there were less than 10 deaths.

\*\*  $p < .01$ .

CBCI suicides in this age bracket, which impacted the ability to conduct multivariate analyses. Nevertheless, differences between CBCI and QSR youth were revealed in: evidence of untreated psychiatric conditions (33.3% vs. 9.8%,  $\chi^2(2) = 7.96$ ,  $p = 0.019$ ); relationship problems preceding suicide (75.0% vs. 27.2%,  $\chi^2(1) = 13.24$ ,  $p < 0.001$ ); and, being separated or divorced (25.0% vs. 5.0%,  $\chi^2(3) = 10.39$ ,  $p = 0.016$ ). Differences that didn't reach statistical significance were reported for: alcohol related problems (25.0% vs. 18.3%;  $\chi^2(3) = 6.95$ ,  $p = 0.073$ , *n.s.*); having multiple recent stressful life events (75.0% vs. 53.3%;  $\chi^2(1) = 2.22$ ,  $p = 0.136$ , *n.s.*); communicated suicide intent in lifetime (58.3% vs. 34.0%;  $\chi^2(2) = 3.17$ ,  $p = 0.205$ , *n.s.*); and current/past treatment for psychiatric disorder (8.3% vs. 22.3%;  $\chi^2(2) = 2.76$ ,  $p = 0.251$ , *n.s.*).

#### Focus Groups

Analysis of focus group discussions identified four major themes: Work Conditions; Interpersonal Relationships; Suicide Prevention; and Pressure. Various sub-themes were identified and are shown in Table 6, together with quotation examples for each

sub-theme. Within the context of the sub-themes, long working hours, workplace pressure, use of alcohol and drugs as a means to cope with the demands of work, and non-disclosure of personal problems to peers were consistently reported by both focus groups. Rates of separation and divorce are purportedly high within the CBCI, seemingly a consequence of heavy workload, financial pressures, and substance misuse as a coping strategy.

#### DISCUSSION

Suicide is a significant problem in Queensland's Commercial Building Construction Industry, with almost ten members each year taking their own life. Suicides in this occupation represented 2.4% of all suicides by working-age males (15–64 years) in Queensland from 1995 to 2001. The crude suicide mortality rate of males from within the CBCI ranged from 32.0 per 100,000 persons for the period 1995 to 1997, to 57.8 deaths per 100,000 persons in 1998. Since the peak in 1998, the rates have steadily declined each year. When compared to Australian male and Queensland male suicide rates across the same periods, the CBCI rates were 46% and 25%

TABLE 6. Summary of Themes and Sub-Themes from Focus Group Sessions

Themes	Sub-themes	Example quotation
Work conditions	Long work hours	"...we are working 60 hours, some blokes are working 70 hours /80 hours a week,... it's just ridiculous."
	Bullying	"I reckon (apprentices)... have the worst of it mate"
	Alcohol and drugs	"People are taking drugs to keep themselves awake"
	Recreation time	"No time for a private life... work 5 and a half days a week"
	Financial management	"...not knowing or getting the education on how to look after your money..."
	Managerial issues	"... need to know how to talk to people, because you learn how to talk to someone you will get them to do a damn sight more than if you walk up (and say) 'I want you to do this s\$#thead and I want it done now'..."
	Job security	"They just go there is your 8 hours (notice), see you later, and you think, 'gees, I thought I was a valued employee, but now I am not."
	Male dominance of industry	"(Construction workers) are also having fun... slagging (each other) off..."
Interpersonal relationships	Single fathers	"my day starts at 4am every day and I don't just get to go home, I have to pick my son up, bring him home, do the homework, do the washing, the cooking, keep the house clean,... and it gets you down after about 3 or 4 months"
	Alcohol and drugs	"(Alcohol is) just putting a big front up, hiding the problem that is there to start with, soon as that alcohol wears off, voom straight back again" "guys might stop off and have a beer on the way home from work, that is their de-stressing, then it's... 'Where the hell have you been...'"
	Male dominance of the industry	"...not around office chicks... all day, (not) learning how to deal with them (women)"
	Discussing problems with peers	"When it comes to personal issues, guys clamp up, they don't want to talk about anything"
Suicide prevention	Causative factors	"we work the hours that we work to get the money to pay the bills,... so you forfeit your family life... it's a no-win situation"
	Responsibility of suicide prevention	"Everyone-the government, the unions, master builders,... the boss and your workmates"
	Buffers to suicide	"Good mates,... children,... religion,..."
	Discussing problems with peers	"...Guys have more faith in their (union) delegates, because they know delegates keep quiet."
Pressure	Managerial issues	"The bosses keep putting pressure on"
	Relationships	"... everybody is under pressure then somebody says something nasty, now if you are not under pressure it is going to go over your shoulders, but the moment you are under pressure you think it is personal"
	Job security	"You don't know where your next job us going to be and if you are going to be out of work for 3 months"

greater, respectively. In 1998, CBCI members were 1.91 and 1.72 times more likely to die by suicide than males from Australia and Queensland, respectively. The periods of high suicide coincided with low construction activity (i.e., value of work done), and elevated numbers of working days lost due to industrial disputes in Queensland (ABS, 2004). However, further economic modeling research is necessary to clarify the importance of these industry factors in the increase of suicide within this industry.

Younger workers (15 to 24 year olds) in the CBCI were at elevated risk of suicide, whereas older workers had very similar suicide rates to the general Australian and Queensland males. The period of investigation was a time when rates for young Australian and Queensland males were the highest they have ever been, so the CBCI rates exceeding these highlights the extent and seriousness of this problem. In contrast, previous studies have shown that suicide rates in similar occupations increase with age (Lampert, Bourque, & Kraus, 1984; Stern & Haring-Sweeney, 1997); however these studies were conducted in countries where suicide rates increases with age, a trend not seen in Australia.

Work-related factors, interpersonal/family factors, and individual factors appear to interrelate with each other to explain suicide in the CBCI. Similar multifactorial findings have been reported in other occupations such as farmers (Malmberg, Simkin, & Hawton, 1999) and doctors (Hawton, Malmberg, & Simkin, 2004). Further research is necessary to ascertain possible causality in this regard, for example, if the work pressure leads to alcohol abuse and marital separation, or vice versa.

CBCI workers commonly work 6 days a week, and up to 80 hours each week to meet the demands made of them by their employers. Long working hours may impact not only upon the time spent with family at home, but the quality of this time, with a reduced prospect of participating in

recreational activities. Long working hours, which was consistently reported in focus groups, may have an indirect influence on increasing suicide risk in this cohort. Long hours can impact mental health (Spurgeon, Harrington, & Cooper, 1997; Tennant, 2001), and can contribute to marital dissatisfaction and problems at home, with the spillover effect of work-related stress on mood at home having a greater effect than home-related stress on mood at work (Leiter & Durup, 1996). Similarly, work-related suicides (including construction industry) in Japan were associated with long working hours, heavy workloads, low levels of social support at work, and low levels of decision latitude (Amagasa, Nakayama, & Takahashi, 2005).

Separation/divorce is a recognized risk factor for suicide, particularly among males (Kposowa, 2000), and has been shown to be relevant in blue-collar industries (Burnley, 1995; Stack, 1995). In line with this, standard psychological autopsy investigations revealed that young CBCI suicides were more likely to be separated/divorced and have serious relationship problems preceding their death. Focus groups revealed that the strain of long working hours impacted personal relationships, with a high rate of separation reported in the industry. The loss of a spouse through separation may exacerbate an already stressful work life, diminish social support networks, and intensify financial strain.

Alternatively, the high rates among the younger workers in the current study could be related to the pressures associated with joining a 'masculine' industry, which (as reported from focus groups) has a bullying culture, particularly directed towards apprentices and those new to the industry. Although work-related problems were not reported in psychological autopsy interviews, this may have been due to nondisclosure of bullying, with males less likely than females to seek help for workplace bullying (Ólafsson & Jóhannsdóttir, 2004),

and about one-third of people who are bullied “doing nothing” about it (Rayner, 1998). As well as verbal and physical abuse, intimidation, and isolation, workplace bullying can take the form of unrealistic deadlines, excessive work hours, and non-existent lunch breaks (Gardon, 2004). Bullying in the workplace is prevalent in blue-collar working environments (Ager-vold & Gemzøe Mikkelsen, 2004), has been shown to predict depression (Kivimäki, Virtanen, Vartia, et al., 2003), and has been linked to suicide in the UK and Norway (Rayner, Howl & Cooper, 2002).

Alcohol use, heavy drinking and past and current drug use is rife among construction industry workers (Mandell, Eaton, Anthony et al., 1992; Zhang & Snizek, 2003). This was characterized by low job security and poor work conditions (Zhang & Snizek, 2003). In the current study, alcohol and substance misuse was described in focus groups as a form of coping with the pressure of the industry, and is symptomatic of the industry culture. Additionally, alcohol use preceding suicide and alcohol related problems were revealed from psychological autopsies. Alcohol and substance abuse counselling may be recommended for future prevention initiatives, with random drug and alcohol testing possibly having an impact on reducing the incidence of this maladaptive coping behavior.

#### Limitations

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Numerous factors have been suggested to complicate the investigation of suicide within specific occupations (e.g., doctors, lawyers, construction workers). First, suicide has a very low prevalence rate (between 1 and 2 for every 10,000 people), and to conduct statistically relevant analyses, large numbers of cases are required. In specific occupational groups the problem of the small sample size is clearly more challenging (Cantor, Tyman, & Slater, 1995). In addition, reliable information

about occupation at the time of suicide is often lacking or generic. For instance, death reports frequently provide aggregated categories. As such, “laborers” can include landscape gardeners, builder’s laborers, factory workers, and fruit pickers/handlers. Further, occupation at the time of death may not be reflective of the job that had been held by the individual for the majority of their employed life. Additionally, using inappropriate comparison groups (e.g., often the general population) when the occupation of interest has a gender-bias can provide meaningless results (Stack, 2000). Finally, information from within specific occupations and industries is generally hard to access, because of unclear borders between jobs, multiple employers within an industry, and ineffectual maintenance of personal records.

In this study, CBCI suicides were compared to the general male working-age population, not to a similarly skilled occupation. An attempt was made by the authors to compare suicide rates against a similar skill-level occupation (electrical workers) based on the Australian Standard Classification of Occupations (ABS, 1996). In this case, mortality data was only available from the Australian Bureau of Statistics who have “strong reservations about the quality of occupation data” on death certificates (ABS, personal communication, 2003). To perform reliable investigations, access to death data from comparable industries appears necessary to overcome these limitations.

In this research, it was not possible to segregate different occupations (e.g., carpenter, crane driver) and different skill levels (e.g., tradesperson, laborer). This was a consequence of the record-keeping procedures in place, which did not identify specific roles. Therefore, whether laborers have higher suicide rates than tradespersons, or vice versa remains unclear.

Psychological autopsy studies are complex and have many methodological

constraints (for a review see De Leo & Pouliot, in press). The psychological autopsy method reported in this study utilized existing resources (i.e., police officers investigating the death), which may have prevented some salient information from being reported, for instance, the use of illicit drugs. Additionally, the police investigation typically occurs within days from the death (3 to 10) and the proxy/ies interviewed can be emotionally upset and may not be prepared to provide the most relevant information. However, the actual Form 1 used in Queensland by police officers contains all the questions (except the SCID) that are included in the psychological autopsy interview that is performed by clinically trained interviewers, for quality control purposes (on a random sample basis), approximately six-eight months after the death. A training session from an AIS-RAP representative to police personnel has occurred so far on a yearly basis.

In general, focus group research is limited by the lack of generalisability of responses that are produced, the difficulty in determining strength and consensus of issues raised, and the subjective nature of responses. The current study could have been strengthened by having additional focus groups involving other relevant persons (e.g., employers, survivors of suicide). However, the use of qualitative data provides additional explanatory power for the justification of elevated suicide rates, and offers a basis for which additional research can build upon.

## CONCLUSIONS

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Construction workers have a tendency towards elevated suicide rates, compared to the general male working age population. This is amplified in young CBCI workers, whose suicide risk is approximately twice that of age-matched cohorts. It appears that work-related factors (e.g.,

long working hours, pressure), interpersonal factors (e.g., relationship problems), and individual factors (e.g., alcohol and substance abuse) interact to contribute to suicide risk in this male-dominated, blue-collar industry. Strong cultural themes evolve around the industry itself, such as being 'masculine,' and having a frequent association with alcohol and drug use, with more emphasis on 'toughing it out' than on communicating problems. That such themes are encountered by young males upon immediately entering the industry may contribute to perpetuating existing attitudes and behaviors, and may prove resistant to change once ingrained. Prevention programs may need to incorporate wholesale changes to the industry culture, before any specific interventions may be rendered viable. Future research should include industry-specific psychological autopsy interviews with next-of-kin, to more reliably understand the contribution of work factors in the development of fatal suicidal behaviors.

## AUTHOR NOTE

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