

Allowing Non-Disclosure in Surveys with Suicide Content: Characteristics of Non-  
Disclosure in a National Survey of Emergency Services Personnel

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PERSONNEL

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### **Abstract**

Suicide is a leading cause of morbidity, yet one significant challenge to receiving adequate support is an unwillingness to disclose mental health issues. The current study explores reasons for non-disclosure among emergency personnel, a population at risk of developing mental health problems. Twenty-nine police, ambulance, and fire and rescue agencies from around Australia participated in a mental health and wellbeing survey ( $N = 14,536$ , male = 60.5%, 52.0% over 45 years of age, heterosexual = 92.5%). Rates of mental health issues and perceptions of stigma were compared between participants who answered suicide-related questions and those who preferred not to say. Participants who preferred not to answer suicide-related questions ( $n = 1,098$ ) reported higher rates of psychological distress (symptoms of depression and anxiety), and lower wellbeing and social support, than those who reported suicidal thoughts ( $n = 1,966$ ) or no suicidal thoughts ( $n = 11,472$ ). Perceptions of mental health stigma within the workplace, and regarding one's own mental health, also tended to be higher among non-responders. Imputing their responses based on this survey information resulted in notably higher rates of estimated suicidal thoughts, plans, and attempts. Allowing for non-disclosure in self-report measures of suicide may provide more accurate prevalence estimates and facilitate identification of individuals most at risk of suicide. Addressing stigma in the workplace and also regarding one's own mental health issues may act to improve disclosure of suicidal thoughts and adaptive help-seeking behaviours.

*Keywords:* firefighters, ambulance, police, stigma, suicide.

### **Public Significance Statement**

Identifying the characteristics of non-disclosure of suicide thoughts and behaviours may assist in promoting positive help-seeking behaviours for those most at-risk. Emergency services personnel are a population at heightened risk of suicide, yet perceptions of stigma

and barriers to help-seeking may promote an unwillingness to disclose suicidal thoughts and behaviours.

Allowing Non-Disclosure in Surveys with Suicide Content: Characteristics of Non-Disclosure in a National Survey of Emergency Services Personnel

Suicide is a leading cause of death worldwide and in recent decades has received an increasing amount of empirical attention (World Health Organization, 2019). Within the Australian context there has been a growing focus on research and interventions; however, rates of suicide have increased (Australian Bureau of Statistics, 2018). An important frontier for suicide research is furthering understanding of who is at risk of *not* reporting suicidal thoughts, which may assist in facilitating the provision of services to those in need.

Investigations into nondisclosure of suicidal thoughts paint a telling picture. Around half of people who experience suicidal thoughts and behaviours do not tell others (Drum et al., 2009; Encrenaz et al., 2012; Merelle et al., 2018) and roughly 70% do not receive mental health services (Hom, Stanley, & Joiner, 2015). Among those with suicidal thoughts, choosing not to disclose suicidal thoughts to others has been associated with higher rates of psychological distress and lower wellbeing (Frey, Hans, & Cerel, 2016; Garrison, Kahn, Sauer, & Florczak, 2012; Mérelle et al., 2018; Uysal & Lu, 2011). This indicates a two-fold problem of concerning patterns of mental ill-health and a reluctance to seek help. Given the evidence of effectiveness of some treatments for suicide it is essential that personnel are motivated to engage with mental health services (Brown & Jager-Hyman, 2014; Hom, Stanley, & Joiner, 2015).

Not all inaccurate reporting of suicide risk is due to intentional withholding. Rather, uncertainty or ambivalence about suicidal thoughts (Harris, McLean, Sheffield, & Jobes, 2010), instability of suicidal thoughts over time (Kleiman et al., 2017), and poor introspective awareness (Podlogar, Gutierrez, & Joiner, 2019) have all been suggested to contribute to genuine but inaccurate self-reporting of suicide risk. However, suicide remains a heavily stigmatized topic, and hesitation to disclose suicidal thoughts or behaviours may inhibit

engagement with professional services (Han, Batterham, Calear, & Randall, 2018). Such active concealment of suicidal thoughts may occur for many reasons, including shame, fear of being seen as weak, and avoidance of unwanted or negative reactions from others (Podlogar & Joiner, 2017; 2019).

Issues with non-disclosure may become heightened and more problematic within certain settings. For instance, emergency services personnel (i.e., police, ambulance, firefighters) work within high-paced and high-risk environments, whereby poor judgement may put lives of personnel and the public at risk (Andersen, Papazoglou, Nyman, Koskelainen, & Gustafsberg, 2015). Emergency services cultures emphasize the need for personnel to be resilient amidst stressful circumstances, and issues with mental health may be seen as a personal weakness and a risk to others (Violanti, 2010). A recent study surveyed 483 firefighters with suicidal thoughts and behaviours, with 41% reported issues with reputation as a barrier to seeking professional care, while 30% indicated embarrassment as a concern (Hom, Stanley, Fallon, Ringer, & Joiner, 2016). Barriers to seeking help that exist within emergency services populations may increase non-disclosure of mental health issues, although to our knowledge such an issue has not been explored among emergency personnel. Emergency personnel have consistently been defined as a population at risk of suicidal thoughts and behaviours, and a reluctance to seek help and disclose mental health issues may hinder their ability to recover from intensive operational demands and other risks (Carleton et al. 2018; Lawrence et al., 2018; Kyron et al., 2020; Stanley, Hom, Hagan, & Joiner, 2015).

Unfortunately, concealment of suicidal thoughts may be inadvertently promoted through the use of brief screening measures of suicidal thoughts and behaviours which often rely on forced responding (i.e., yes/no). According to Podlogar and Joiner (2019), this problem can be reduced through providing an option for respondents to “prefer not to say” whether they have experienced suicidal thoughts or behaviours. To our knowledge, this

design has been implemented in two national surveys, with 2% of Dutch adults choosing not to answer suicide-related questions, and 5.6% of Australian adolescents (Merelle et al., 2018; Zubrick et al., 2016), indicating that a notable proportion of individuals may be reluctant to disclose their history with suicide. Although to our knowledge this design has not been implemented in suicide research among emergency personnel to date, damages to career and reputation that may result from stigmatizing work environments may lead to higher rates of concealment (i.e., loss of operational duties; Karaffa & Koch, 2016). Although choosing a “prefer not to say” option resembles an act of concealment, it directly reflects an individual’s reluctance to engage with suicide-related content. On the other hand, “yes/no” forced responding may promote denial of suicidal thoughts. As a result, rates of suicidal thoughts and behaviours, and associated risk factors, may be inaccurate, and thus the ability to identify and link those most in need to mental health services may be hindered.

To address concerns of prior research, the current study looks to explore non-disclosure in a national survey of emergency services personnel. The survey is the first of its kind within an Australian setting, and the largest to date worldwide. Non-disclosure encapsulates participants who indicated they would prefer not to answer suicide-related survey content when prompted. When compared with survey participants who answered suicide-related content, we hypothesize that non-disclosure will be associated with: (1) poorer mental health; (2) higher levels of stigma perceived within the workplace; and (3) greater barriers to seeking help. In addition, we expect that the post hoc statistical treatment of non-disclosure (i.e., assuming no suicidality vs. excluding vs. imputing) will significantly impact prevalence statistics identified by the survey.

## **Methods**

### **Participants and Procedure**

Out of the 36 emergency services agencies within Australia at the time of the survey, 33 participated. Each agency provided information on the demographic composition of their workforce, from which stratified random samples of their current employees were selected (or full censuses in smaller agencies) and contacted via email to participate in the online survey. Hard copy surveys were also made available upon request. On average, the survey took roughly 20-25 minutes to complete. All ethical procedures were approved by relevant university and emergency services committees.

In total, there was a 22% response rate in the current study. The profile of survey participants was compared to several sources, such as the 2016 Census of Population and Housing and the Productivity Commission's Report on Government Services to examine sample representativeness, and to inform weighting strategies. The sample was found to have slightly higher proportions of females or older employees. Although response bias is difficult to determine, the characteristics of the sample were compared to the known demographic characteristics of employees in the sector. Overall, response bias was found to be low, and more information regarding calculations has been presented in the supplementary information and prior research (Lawrence et al., 2018; Kyron et al., 2020). In short, those with mental health issues were not more likely to participate early in the study, and there was no significant association between response rates and rates of mental health conditions in individual agencies. When compared to known demographic characteristics of personnel in the sector, survey respondents were slightly more likely to be female, older, and in non-operational roles. No differences were found in terms of country of birth, educational status, marital status or number of children.

Participation in the survey was voluntary, with 14,868 employees across a range of roles, ranks, and locations participating. Of this number, 332 participants were in the state emergency service, spanning across four workplaces. Due to the low number of paid



employees within this sector, and the low base rates of suicidal thoughts and behaviours, employees from this sector have not been included in the current study. Analyses will rather be performed based on response from participants in the 29 workplaces in other sectors (ambulance = 3,473, fire and rescue = 2,975, police = 8,088) in order to perform sector specific analyses and ensure generalizability of results. Examination of potential response bias and approach to data weighting has been presented in the supplementary material. The methodology of the survey has also been described elsewhere extensively (see Lawrence et al., 2018; Kyron et al., 2019; 2020)

### **Measures**

**Suicidal Thoughts and Behaviours.** Participants were first asked a single question to assess whether they had ever seriously thought about taking their own life. Follow up questions assessed whether they had thought about taking their own life in the 12 months prior to the survey. If participants indicated a history with suicidal thoughts, they were also asked if they had ever planned to take their own life. Likewise, if an individual reported planning suicide at some stage in their life, they were subsequently able to indicate whether they had ever attempted to take their own life. Within each question participants could respond in a yes/no format, or indicate that they would prefer not to answer and could skip the remainder of questions pertaining to suicide. Brief measures of suicidal thoughts and behaviours have shown satisfactory performance when compared with more comprehensive measures (Desseilles et al., 2012) and are often incorporated into national surveys of this magnitude (for example, see Nielsen, Nielsen, Notelaers, & Einarsen, 2015; Taliaferro & Muehlenkamp, 2014; Zubrick et al., 2016). These questions were derived from the 2007 National Survey of Mental Health and Wellbeing (NSMHWB; Australian Bureau of Statistics, 2007). The flow of suicide-related questions in the current survey has been displayed in Figure 1.

**Psychological distress.** The Kessler-10 (K10; Kessler et al., 2002) psychological distress scale was used to assess symptoms of depression and anxiety. The scale consists of ten items using a 5-point Likert scale (1 = None of the time, 5=All of the time), with higher scores indicating a greater likelihood of experiencing a mental health condition. The scale has been shown to perform well in screening for mood and anxiety disorders (Furukawa, Kessler, Slade, & Andrew, 2003) and had high internal consistency in the current study ( $\alpha = 0.92$ ).

**Wellbeing.** The Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS; Stewart-Brown et al., 2009) was used to measure positive aspects of mental health, including emotional, cognitive-evaluation and psychological functioning, through the use of seven items on a 5-point Likert scale (1 = None of the time, 5 = All of the time). The scale has adequate psychometric properties in its use in English national surveys (Ng Fat, Scholes, Boniface, Mindell, & Stewart-Brown, 2017). Higher scores on the scale indicate higher wellbeing.

**PTSD Symptoms.** To assess symptoms of PTSD, an adapted version of the PCL-5 PTSD screening scale was used (Blevins et al., 2015). Additional questions were included to reflect the DSM-5 diagnostic criteria for PTSD (American Psychiatric Association, 2013), such as symptoms having to last for a minimum of one month and be associated with clinically significant distress or functional impairment. The PCL-5 screening scale has shown to have strong psychometric properties (Blevins et al., 2015), and the adapted version had good internal consistency in the current survey ( $\alpha = 0.89$ ). Higher total scores on the scale represent higher symptoms of PTSD.

**Perceived Stigma.** Three items from the Depression Stigma Scale (Griffiths et al., 2004) were used to assess an employee's perceptions that others within their organisation hold stigma regarding mental health issues (e.g., "Employees in my organisation would be hesitant to disclose that they were suffering from a mental health-related issue or problem").

These items were adapted to assess perceptions of stigma within an employee's workplace. Items were measured on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly Agree). Higher scores on the scales represent higher stigma regarding mental health. The items exhibited acceptable internal consistency in the current sample ( $\alpha = 0.73$ ).

**Self-Stigma.** Various aspects of self-stigma were assessed using two scales. Several questions from the Self-Stigma of Depression Scale (SSDS) measured feelings of shame and burden associated with a person's own mental health (Barney, Griffiths, Christensen, & Jorm, 2010). In addition, negative experiences employees had with others regarding their own mental health, such as being avoided or treated unfairly, were measured through several questions from the Discrimination and Stigma Scale (Brohan et al., 2013). As self-stigma related to perceptions of one's own mental health issues, these questions were only available for answering if an employee indicated having been diagnosed with a mental health condition or if they felt they had a condition that went undiagnosed. All items were shown to have good internal consistency ( $\alpha = 0.85$ ).

**Social support.** Social support was measured through the use of an adapted version of the 2-Way Social Support Scale (Shakespeare-Finch & Obst, 2011). Seven items in total assessed emotional support received, with four items retained from the original scale and an additional three items created to assess support specific to work (e.g., "My family/friends understand my job demands"). Higher scores on the scale represented receiving higher perceived support from others. The adapted scale was shown to have good levels of internal consistency in the current sample ( $\alpha = 0.87$ ).

**Barriers to Seeking Help.** Participants were provided with a list of potential barriers to seeking help, and could select the extent to which each applied to their own situation on a 5-point Likert scale (1 = Strongly disagree, 3 = Neither agree nor disagree, 5 = Strongly agree). These questions were only available to participants who perceived a need to seek

help, and had either delayed help-seeking (i.e., did not seek treatment immediately) or had not sought any help for a mental health issue of concern. Responses were converted into dichotomous variables to identify whether participants agreed with the statements or not (i.e., ambivalent or disagreed).

### **Analytical Approach**

**Missing Data.** Due of the design of the online questionnaire, which prompted participants if they missed answering any questions, there was very little item missing data. Because of the small amount of missing data (less than 0.1% for most items) and its trivial effect on the results, single imputation was performed using random hot deck imputation.

**Comparisons Between Suicide Item Responses.** Multiple Analysis of Covariance (MANCOVA) analyses were conducted to determine whether rates of mental health issues and stigma were different between responders and non-responders of suicide-related survey questions. Analyses controlled for gender, age, and total length of service. Least Significant Difference (LSD) post-hoc t-tests were performed to directly compare characteristics between non-responders and the two responder groups (i.e., “yes” and “no”). Analyses were performed using SPSS Version 25.

**Imputing Responses.** In absence of disclosure (i.e., “prefer not to say”), imputation may provide a means to predict an individual’s history with suicidal thoughts and behaviours (Rubin, 1996). The current study explores how imputation estimates may be informed by available survey content related to mental health (i.e., psychological distress and symptoms of PTSD) and perceptions of stigma (i.e., self-stigma, perceived stigma). Multiple imputation using Fully Conditional Specification (FCS) has been shown to yield unbiased estimates of missing data in prior simulation studies. It has been shown to perform well with categorical variables and allows for relaxing of assumptions of normality and linearity that may be violated in large survey studies. On the other hand, listwise deletion, or complete case

analysis, may provide biased parameter estimates and a loss of power from analyses, particularly when over 5% of missingness exists (Graham, 2009; Liu & Le, 2015).

Identification of those at risk for suicide may therefore benefit from modelling missing data using the additional information available, rather than ignoring missingness.

To determine the prevalence of suicidal thoughts and behaviours that may be undetected due to non-reporting, multiple imputation was performed based on scales measuring mental health issues and aspects of stigma. Using *proc mi* in SAS, with FCS multiple imputation, ten imputed sets were created and were subsequently pooled to estimate prevalence rates. Differences in rates of suicidal thoughts and behaviours were calculated dependent on the treatment of responders who preferred not to answer suicide questions (i.e., group non-responders with individuals indicating no suicidal thoughts or behaviours, exclude non-responders, impute missing data). The number of standard errors difference between prevalence rates were calculated based on 95% confidence levels of imputed estimate.

## **Results**

### **Sample Characteristics**

The sample characteristics have been reported in Table 1. The total sample across sectors was predominantly male, older than 35 years, serving for over 10 years, and in field/operational roles. The fire and rescue sector had notably higher proportions of male employees when compared with the ambulance and police sectors.

### **Responses to Suicide Questions by Demographic Characteristics**

Rates of response or non-disclosure to suicide-related questions have been reported in Table 2. Except for in the police sector, there were no significant differences between different genders, age groups, and lengths of service and response to suicide-related questions. Personnel that had an LGBTQ+ sexual orientation (i.e., Lesbian, Gay, Bisexual, Queer, Pansexual, Aromantic) had consistently higher rates of non-disclosure across sectors.

Older, longer-serving, and male personnel were significantly less likely to respond to suicide-related questions in the police sector only. Non-disclosure was also higher among participants who reported perceived or diagnosed mental health issues earlier in the survey. Across sectors, there were notable differences in non-disclosure, with longer serving, male, and LGBQ+ personnel in the police sector tending to have the highest rates than other sectors.

### **Comparisons of Mental Health Issues and Stigma Based on Response to Ideation**

#### **Content**

Several MANCOVAs were conducted for each occupation (Table 3). As Box's test of equality covariance matrices was violated, Pillai's trace correction has been used. Significant differences were found across response groups to the suicidal ideation questions (i.e., "no," "yes," "prefer not to say") regarding levels of psychological distress,  $F(2,14530) = 1231.25$ ,  $p < .001$ ,  $\eta^2 = 0.15$ , PTSD symptoms,  $F(2, 14530) = 1074.52$ ,  $p < .001$ ,  $\eta^2 = 0.13$ , perceived stigma,  $F(2, 14530) = 139.97$ ,  $p < .001$ ,  $\eta^2 = 0.02$ , levels of wellbeing,  $F(2, 14530) = 643.18$ ,  $p < .001$ ,  $\eta^2 = 0.08$ , and social support,  $F(2, 14530) = 530.82$ ,  $p < .001$ ,  $\eta^2 = 0.07$ , when controlling for gender, age, and total service. When limited to participants who indicated a history of diagnosed or perceived mental health issues ( $n = 6432$ ; Ambulance = 1,623, Fire and Rescue = 1,358, Police = 3,708), significant differences were found across response groups to the suicidal ideation questions regarding levels of the self-stigma aspects of shame,  $F(2,6427) = 74.96$ ,  $p < .001$ ,  $\eta^2 = 0.02$ , burdensomeness,  $F(2,6427) = 210.25$ ,  $p < .001$ ,  $\eta^2 = 0.06$ , and discrimination,  $F(2,6427) = 126.69$ ,  $p < .001$ ,  $\eta^2 = 0.04$ .

MANCOVAs were subsequently conducted for each occupation, with pairwise comparisons between response groups. Levene's Test of Equality of Error Variances was satisfied for each sector and scale (i.e.,  $ps > .05$ ) except for the Kessler-10 scale. As the largest standard deviation was no more than four times the size of the corresponding smallest for the Kessler-10 scale, an ANCOVA was expected to still be robust (Howell, 2009). In

each occupation, psychological distress and stigma were consistently higher, and wellbeing lower, among participants who chose not to answer suicide-related questions compared with those who indicated no suicidal thoughts. Comparisons with participants who indicated suicidal thoughts were mixed. K10 psychological distress was significantly higher, and wellbeing and social support significantly lower, in police and ambulance sectors. Those who reported suicidal thoughts in the fire and rescue sector had marginally higher psychologically distress, but did not significantly differ in wellbeing and social support. PTSD symptoms were marginally higher for those who reported suicidal thoughts in the police sector, but lower in the ambulance sector. In addition, there was no significant difference in perceived stigma in each occupation when compared with participants reporting suicidal thoughts, and also no difference in shame and burden aspects of self-stigma in ambulance and fire and rescue sectors.

### **Barriers to Seeking Help Based on Ideation Responses**

Among participants who either delayed or did not seek support ( $n = 5,998$ ), those who preferred not to answer suicide-related questions reported consistently higher rates of barriers to seeking help (Table 4). Specifically, they reported the highest concerns surrounding career consequences and personal weakness from seeking help. Concerns about confidentiality,  $\chi^2(1,1763) = 4.61, p = 0.019$ , and career consequences,  $\chi^2(1,1763) = 5.91, p = 0.016$ , among participants who preferred not to answer suicide-related questions were significantly higher than participants who reported suicidal thoughts. Each barrier to seeking help was significantly higher when compared with participants who reported no suicidal thoughts.

### **Imputing Missing Responses**

Multiple imputation was performed to estimate whether “prefer not to say” responders may have experienced suicidal thoughts and behaviours or not in their lifetime, based on self-reported psychological distress, wellbeing, and perceived stigma. Prevalence rates were

notably different based on whether “prefer not to say” participants were excluded, grouped with those who did not report suicidal thoughts, or responses imputed (Table 5). Imputation was associated with higher rates of suicidal thoughts, both lifetime and in the 12 months prior to the survey, compared to when participants were deleted listwise or assumed not to have a history with suicidal thoughts. In addition, rates of lifetime suicide plans and attempts were several standard errors higher when responses were imputed, rather than grouped with individuals reporting no plans or attempts. Differences were less pronounced when imputation rates were compared with list-wise deletion rates, with rates of plans being 2.48 standard errors higher when imputation was used, and rates of attempts being 1.81 standard errors higher. In total, only 4.98% of those who preferred not to say were estimated to have attempted suicide at some stage, while 26.14% were estimated to have thought about suicide in their lifetime.

### **Discussion**

Suicide remains a heavily stigmatized topic, with disclosure of suicidal thoughts and behaviours resulting in consequences that many would rather avoid (Han et al., 2018; Podlogar & Joiner, 2017). The current study identified that in a national survey of emergency personnel a notable proportion of participants chose not to answer questions regarding suicide. These individuals tended to report comparable or higher psychological distress and symptoms of PTSD, and lower wellbeing and social support, than participants who reported suicidal thoughts. Importantly, they tended to perceive a high degree of stigma within their workplace regarding poor mental health, and the career consequences that may occur as a result. This indicates a particularly at-risk sub-population who may be reluctant to seek necessary help for their mental health problems, which is consistent with prior research into barriers to help-seeking among firefighter populations (Stanley et al., 2016). Aspects of stigma have consistently been linked to an increased risk of thinking about or engaging in



suicidal behaviours, and reduced engagement with professional services (Han et al., 2018; Carpiniello & Pinna, 2017; Hom et al., 2015; Sharaf, Ossman, & Lachine, 2012). A reluctance to disclose issues with mental health may lead to a reliance on maladaptive and fatal methods to alleviate distress, such as harmful substance use and suicide (Hom, Stanley, Spencer-Thomas, & Joiner, 2018).

Disclosure within an emergency services context may be inherently problematic as it may bring into question an individual's ability to carry out their duties (Henderson, Van Hasselt, LeDuc, & Couwels, 2016). A mistrust of individuals with mental health issues may be present within workplaces, as they may be perceived as unstable and a threat to the lives of those around them. The stigma that exists within masculine-dominated emergency services workplaces, which promote displays of strength and resilience, may act to inhibit help-seeking and potentially increase risk of suicide (Violanti, 2010). Indeed, the current study found that participants who preferred not to answer suicide-related questions were more likely to report various barriers to seeking help. In particular, concerns about confidentiality and career consequences were significant barriers to seeking help. These findings are consistent with prior research among firefighter populations indicating stigma and structural issues were significant barriers to care among firefighters (Hom, Stanley, Ringer, & Joiner, 2016; Hom et al., 2018). Further, concerns about being seen as weak and treated differently by others following disclosure were frequently reported by non-responders, and there were significant concerns surrounding burdening others due to seeking help.

A reluctance to seek help may also be driven by more personal feelings of stigma. In the current study, non-responders were more likely to hold shame around their own mental ill-health, which is consistent with research among police personnel, suggesting that individuals may begin to internalize stigma from their environment (Karaffa & Koch, 2016). Particular demographic groups within emergency services occupations may experience

higher degrees of stigma, such as LGBTQ+ personnel who were more likely to avoid answering questions pertaining to suicidal thoughts and behaviours in the current survey. LGBTQ+ people have consistently been found to be at a heightened risk of suicide within the wider community (Haas et al., 2010). Prior research suggests this is not simply due to elevated rates of mental health issues, and the unique social stigma, prejudice and discrimination they experience may affect willingness to disclose suicidal desire and seek professional mental health service (Figueiredo & Abreu, 2015).

A reluctance to seek help despite poor mental health may put such personnel at a heightened risk of suicide. However, non-disclosure to a suicide risk screening question does not necessarily indicate that the individual is at-risk, and should not be treated as such. For example, it is important to note that of the participants who responded “preferred not to say” to the suicide risk screening items, 74% were predicted by FCS multiple imputation to *not* have had any lifetime suicidal thoughts, and 95% were predicted to *not* have had a lifetime suicide attempt. Thus, the screener would likely be in error if they were to act on the opposite assumptions. Although absolute risk is statistically unlikely, the current “best standard” clinical reaction to an ambiguous situation like this is to still assume some potential for risk and, at a minimum, to provide information regarding suicide prevention resources and voluntary intervention options. However by extension, given that most suicide decedents deny risk in the screening before their death, this minimum clinical reaction may be arguably justified regardless of screening response. A principal value of collecting PNTS data is to measure the amount of stigma and/or reluctance to help-seeking for suicidal thoughts or behaviours that is prevalent for the individual as well as for the screening population. Stigma and help-seeking related issues should therefore be the primary individual or system-wide intervention targets when someone reports PNTS or when PNTS is prevalent in a screening

sample. That said, a reduction of suicide risk may be assumed to secondarily follow reductions in these primary targets.

These findings suggest that interventions to promote help-seeking should occur at the workplace and individual levels. Targeting stigma within emergency services workplaces is an essential step in promoting adaptive help-seeking behaviours. Although empirical evaluations of programs to target stigma within emergency services workplace are sparse, there are some promising developments. For instance, a Trauma Risk Management (TRiM) program was developed to address stigma associated with help-seeking following trauma exposure. The program uses elements of peer-support to increase awareness of mental health issues and reduce the structural and cultural stigma within workplaces, with preliminary evidence suggesting reductions in stigma and perceived barriers to help-seeking (Watson & Andrews, 2018). Some researchers have suggested that stigma surrounding mental health issues in emergency services populations can be addressed by increasing awareness that mental health issues can be normal reactions to exceptional circumstances and treatable (Blum, 2000; Karaffa & Koch). The use of peers or champion figures in interventions may be central to the effectiveness of interventions, as they are facilitated by a credible, relatable, and respected source (Watson & Andrews, 2018). These perspectives have been supported in research of stigma-based interventions among military personnel, a population also exhibiting elevated levels of mental health problems and stigma toward help-seeking. In preliminary trials, interventions focusing on education regarding mental health, increased contact with personnel having experienced mental health issues, and testimonies of service use have been associated with positive perceptions of treatment efficacy, likeliness to seek treatment, and positive beliefs about one's own mental health problems (Cornish, Brenner, Vogel, & Wade, 2019; Dondanville, Borah, Bottera, & Molino, 2018). Further research is needed to develop

evidence-based interventions that address stigma, improve willingness to disclose mental health issues, and promote adaptive help-seeking.

Regarding help-seeking, interventions should aim to facilitate access to professional health services, potentially by providing routine and mandatory check-ups. While this may be perceived as a financial burden to organizations, increased wellbeing of personnel may have positive impacts on productivity and stress leave that benefit performance over time (Arnetz, Nevedal, Lumley, Backman, & Lublin, 2009). An additional benefit of having routine and universal suicide prevention practices may be that it can reduce stigma against reporting such issues during screening, because ambiguous or at-risk responders would no longer have to be visibly singled out from others. Rather, everyone would receive services, and screening would merely inform the services of the individual's reported risk level—or reported reluctance to help seeking via non-disclosure—to personalize interventions. The combination of non-disclosure and poor mental health on a range of measures may signal individuals at a high risk of poor outcomes. Dedicated and confidential peer support within organizations may assist in improving disclosure and seeking support, with prior research suggesting social connectedness may be important in improving disclosure of suicidal thoughts and behaviours (Dowling, Genet, & Moynihan, 2005; Mérelle et al., 2018; Violanti, Mnatsakanova, Hartley, Andrew, & Burchfiel, 2012).

A secondary aim of the current study was to estimate how prevalence rates of suicidal thoughts and behaviours may differ based on “prefer not to say” responses. Based on information garnered from other self-report measures (i.e., psychological distress, social support, wellbeing, stigma), roughly a quarter of participants who chose not to answer suicide-related questions were estimated to have experienced suicidal thoughts throughout their lives. As a result, prevalence rates were notably higher than would occur if these individuals were assumed not to have a history with suicide or excluded from analyses, and

thus these estimates overcome a limitation noted in prior survey assessments of emergency personnel (Berg et al., 2003; Boffa et al., 2017; Carleton et al., 2018; Stanley et al., 2015; Sterud et al., 2008). While the changes are only modest, this translates to a large number of emergency services personnel who may be at-risk of negative outcomes. At the time of the survey there was 116,564 personnel employed within the fire and rescue, ambulance, and police sectors in Australia. A 1.9% difference in lifetime suicidal ideation rates identified in the current study through imputation translates to over 2200 individuals. Likewise, a seemingly small lifetime suicide attempt rate difference of 0.44% equates to over 500 individuals. This approach may therefore assist in providing more accurate prevalence statistics than forced response survey designs, and be of use to wide-scale screening of personnel at risk of suicide (Podlogar & Joiner, 2019). The number of participants who chose not to answer suicide related content in the current study may in part be due to distrust regarding the intentions of the survey and unsolicited use of the data, perpetuated by the aforementioned consequences associated with disclosure (e.g., loss of operational duties).

A limitation of the current study was the use of brief and adapted measures of mental health issues. Brief measures are often necessary to collect a large amount of information without overburdening survey participants, with single-item measures of suicidal thoughts and behaviours also having been used in prior national surveys of emergency services personnel (Carleton et al., 2018; Sterud et al., 2018). The current study examined suicidal thoughts and behaviours in relation to a select number of mental health conditions. However, various other factors that may be of importance to future research, such as borderline and substance use disorders (Brezo et al., 2007; Victor & Klonsky, 2014).

Single items may limit the identification of the specific nature of suicidal thoughts and behaviours (e.g., a near-fatal suicide attempt requiring hospital admission compared with a failed or interrupted attempt; Home, Joiner, & Bernert, 2016) that may be associated with

different risk of future completed attempts. On the other hand, they provide sensitive estimates that are able to detect a high number of individuals with concerning patterns of suicidal thoughts and behaviours, and the introduction of a “prefer not to say” option in the current study may be of benefit to future assessments by reducing socially desirable responding. Future studies into this area could implement more comprehensive measures of suicidal thoughts and behaviours to identify how estimates of prevalence rates may differ. Other scales used in the current survey, such as the Kessler 10-item measure of psychological distress (depression and anxiety), have shown strong psychometric properties despite their brevity (Furukawa et al., 2003). The current study did not explore the extent to which personnel disclosed their suicidal thoughts to those around them and was rather limited to disclosure within a survey context. This is an important question for future research into emergency services personnel, with recent studies showing a concerning proportion of survey respondents reporting suicidal thoughts choose not to disclose them to others (Mèrelle et al., 2018).

Imputation estimates of missing data were informed by several brief measures in the current study. Accurate estimates may benefit from the assessment of a wider range of information related to suicidal thoughts and behaviours, such as hopelessness (Victor & Klonsky, 2014), impulsivity (Victor & Klonsky, 2014), acquired capability (Van Orden et al., 2010), emotion regulation difficulties (Rajappa, Gallagher, & Miranda, 2012), and interpersonal adversity (Van Orden et al., 2010). Future research should assess whether the assessment of a wider variety of survey information may provide more accurate estimates of suicidal thoughts and behaviours.

### **Conclusion**

Emergency services personnel have consistently been identified to be at risk of poor mental health and suicidal thoughts and behaviours. However, aspects of stigma and career

consequences in regard to mental health problems may act to inhibit much needed help-seeking behaviours. Workplaces may benefit from interventions that act to promote openness and reduce aspects of stigma surrounding mental health. Further, providing mandatory mental health services may be an important step in normalizing help-seeking. Further research is needed to explore non-disclosure of suicidal thoughts among emergency personnel to assist in targeting mental health services to those most in need.

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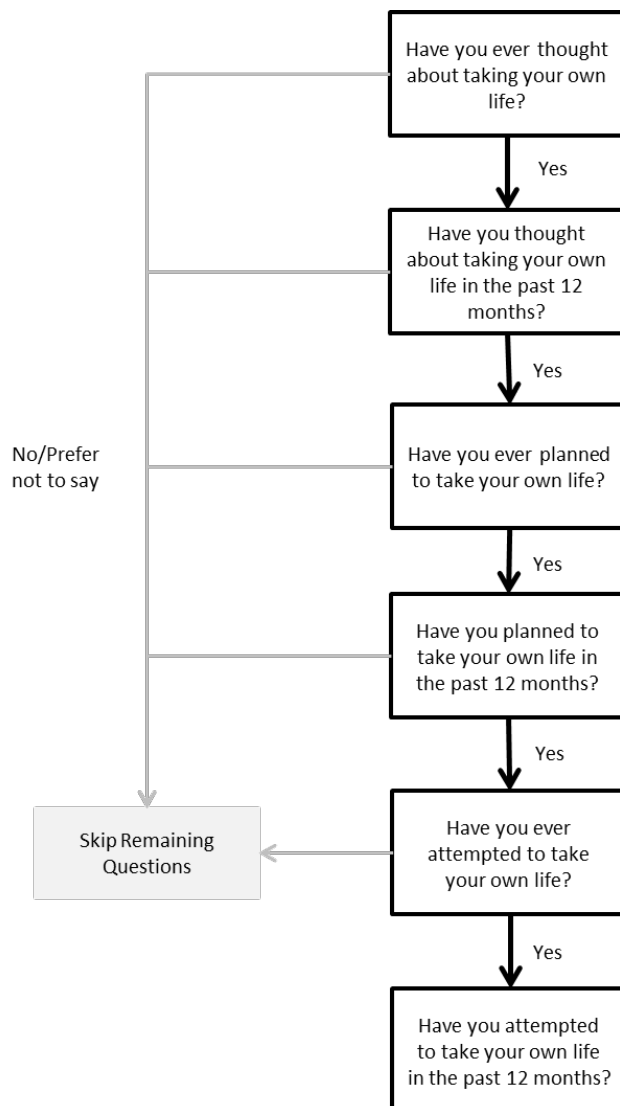


Figure 1. Sequence of suicide related survey questions.

**Table 1***Demographic characteristics of each sector.*

	Ambulance <i>n</i> = 3,473	Fire & Rescue <i>n</i> = 2,975	Police <i>n</i> = 8,088	Total <i>N</i> = 14,536
	%	%	%	%
Sex –				
Male	53.2	83.3	62.6	60.5
Female	46.8	16.7	37.4	39.5
Age group –				
Less than 35 years	33.4	20.3	27.9	20.7
35 - 44 years	25.8	24.6	31.7	27.3
45 - 54 years	25.2	32.6	28.8	34.8
55 years or over	15.7	22.6	11.6	17.2
Marital status –				
Single	14.1	8.4	11.7	10.5
Married/De facto	77.3	82.7	78.1	78.6
Widowed, separated or divorced	8.5	8.9	10.2	10.9
Total service in any organisation –				
Less than 2 years	5.3	2.5	4.0	3.5
2-5 years	19.0	14.2	15.6	14.1
6-10 years	18.8	13.1	14.4	13.6
More than 10 years	56.9	70.1	66.0	68.8
Role –				
Operational	74.2	62.3	64.9	60.5
Non-operational	14.2	23.2	13.5	22.0
Both operational and non-operational	11.6	14.5	21.6	16.5
Rank or level –				
Senior executive	1.1	0.5	1.1	0.8
Middle management	6.9	7.0	10.4	8.1
Other management	16.2	28.7	28.1	27.6
Field or administrative operative	71.0	62.0	59.5	63.9
Sexual Orientation –				
Straight	93.6	92.0	92.1	92.5
LGBQ+	6.4	8.0	7.9	7.5

*Note:* LGBQ+ = Lesbian, Gay, Bisexual, Queer, Pansexual, Aromantic.

**Table 2**

*Proportion (95% confidence interval) of participants who preferred not to answer suicide-related questions.*

	Ambulance (N = 3,473)			Fire and Rescue (N = 2,975)			Police (N = 8,088)			Across Groups	
	Prefer not to say	$\chi^2$	p	Prefer not to say	$\chi^2$	p	Prefer not to say	$\chi^2$	p	$\chi^2$	p
Overall	6.39 (5.6 – 7.2)	-	-	8.0 (7.0 – 9.0)	-	-	7.9 (7.3 – 8.5)	-	-	83.32	< .001
Sex -											
Male	6.4 (5.3 – 7.5)	0.00	.952	7.8 (6.7 – 9.0)	0.30	.583	8.4 (7.6 – 9.1)	4.10	<b>.043</b>	60.33	< .001
Female	6.4 (5.2 – 7.5)			8.4 (6.6 – 10.2)			7.1 (6.2 – 8.0)			26.85	< .001
Age Group -											
Less than 35 years	6.0 (4.5 – 7.5)	0.67	.879	5.8 (3.6 – 7.9)	6.97	.073	6.8 (5.6 – 8.0)	14.6	<b>.002</b>	15.24	.004
35 – 44 years	6.4 (4.8 – 8.0)			8.6 (6.5 – 10.6)			6.7 (5.7 – 7.7)			44.98	< .001
45 – 54 years	6.9 (5.3 – 8.4)			9.3 (7.6 – 11.0)			8.9 (7.8 – 9.9)			36.08	< .001
55 years and older	6.1 (4.1 – 8.0)			6.9 (5.0 – 8.8)			9.3 (7.7 – 10.9)			9.09	.059
Total Service -											
Less than 2 years	3.7 (0.0 – 8.7)	3.83	.965	6.3 (2.5 – 10.1)	0.27	.889	6.1 (1.4 – 10.9)	11.45	<b>.010</b>	10.90	.028
2 – 5 years	3.3 (0.0 – 7.0)			6.0 (4.1 – 8.0)			7.9 (5.3 – 10.5)			5.48	.241
6 – 10 years	9.2 (3.7 – 14.6)			6.2 (4.2 – 8.1)			8.6 (5.7 – 11.4)			12.00	.017
10 years and over	5.1 (0.2 – 9.9)			6.6 (5.5 – 7.6)			8.0 (6.8 – 9.2)			72.55	< .001
Sexual Orientation -											
Straight	6.0 (5.1 – 6.8)	10.10	<b>.002</b>	7.6 (6.6 – 8.6)	11.04	< <b>.001</b>	7.5 (7.0 – 8.1)	17.48	< <b>.001</b>	59.15	< .001
LGBQ+	10.3 (7.1 – 13.5)			14.4 (9.3 – 19.4)			12.5 (9.8 – 15.3)			24.88	< .001
Mental Health Issues -											
None Reported	3.8 (2.9 – 4.6)	45.54	< <b>.001</b>	5.4 (4.3 – 6.5)	37.23	< <b>.001</b>	4.3 (3.7 – 4.9)	164.94	< <b>.001</b>	5.82	.055
Reported	9.3 (8.0 – 10.8)			11.5 (9.8 – 13.3)			12.0 (11.0 – 13.1)			8.24	.016

Note. LGBQ+ = Lesbian Gay Bisexual Queer Aromatic Pansexual. Boldfaced p-values indicate significant differences when accounting for multiple testing using Holm-Bonferroni method.

**Table 3**

*Mean differences in scores on measures based on how participants responded to the question regarding lifetime suicidal ideation.*

	Ambulance (N = 3473)							Fire and Rescue (N = 2975)						Police (N = 8088)							
	No	Yes	PNTS	PNTS vs $\eta^2$		PNTS vs $\eta^2$		No	Yes	PNTS	No vs $\eta^2$		PNTS vs $\eta^2$		No	Yes	PNTS	PNTS vs $\eta^2$		PNTS vs $\eta^2$	
				No	Yes	PNTS	Yes				No	Yes	No	vs Yes							
Psychological Distress (K10)	7.46	12.73	14.46	<b>7.00*</b>	<b>.091</b>	<b>1.74*</b>	<b>.012</b>	7.07	14.49	13.12	<b>6.05*</b>	<b>.086</b>	<b>-1.38*</b>	<b>.007</b>	7.77	13.83	15.02	<b>7.26*</b>	<b>.100</b>	<b>1.20*</b>	<b>.005</b>
% High Distress	20.35%	54.15%	62.16%					19.56%	58.73%	50.42%				23.33%	58.29%	61.11%					
Wellbeing (SWMWBS)	24.98	22.40	21.04	<b>-3.94*</b>	<b>.047</b>	<b>-1.36*</b>	<b>.019</b>	24.78	21.42	21.47	<b>-3.31*</b>	<b>.045</b>	0.05	.000	24.44	21.54	20.55	<b>-3.89*</b>	<b>.050</b>	<b>-0.99*</b>	<b>.010</b>
% Low Wellbeing	21.67%	43.19%	59.91%					21.69%	51.25%	52.94%				26.11%	50.92%	59.72%					
PTSD Score	15.45	21.79	23.01	<b>7.55***</b>	<b>.080</b>	<b>1.21*</b>	<b>.004</b>	15.13	23.54	21.83	<b>6.70***</b>	<b>.075</b>	<b>-1.71**</b>	<b>.007</b>	15.90	22.73	23.40	<b>7.50***</b>	<b>.078</b>	0.67	.001
Perceived Stigma	8.98	9.75	9.72	<b>0.74*</b>	<b>.008</b>	-0.03	.000	9.32	10.34	10.06	<b>0.74*</b>	<b>.009</b>	-0.27	.002	10.11	11.02	11.07	<b>0.96*</b>	<b>.013</b>	0.05	.000
Social Support	21.83	18.93	17.85	<b>-3.98*</b>	<b>.040</b>	-1.08	.008	21.66	17.71	17.72	<b>-3.94*</b>	<b>.049</b>	-0.02	.000	21.30	18.26	17.05	<b>-4.25*</b>	<b>.048</b>	<b>-1.21*</b>	<b>.010</b>
Self-Stigma (a)																					
Shame	8.96	9.50	10.47	<b>1.51***</b>	<b>.023</b>	<b>0.97**</b>	<b>.017</b>	8.82	9.85	10.19	<b>1.37***</b>	<b>.025</b>	0.34	.003	9.40	9.85	10.96	<b>1.56***</b>	<b>.030</b>	<b>1.11***</b>	<b>.027</b>
Burden	9.08	10.25	10.69	<b>1.61***</b>	<b>.037</b>	0.44	.002	9.10	10.69	9.70	<b>0.60***</b>	<b>.038</b>	-0.99	.003	9.28	10.44	11.07	<b>1.79***</b>	<b>.045</b>	<b>0.63*</b>	<b>.004</b>
Negative Experiences	4.43	5.27	5.38	<b>0.95***</b>	<b>.026</b>	0.11	.001	4.64	5.64	5.32	<b>0.58***</b>	<b>.015</b>	-0.32	.004	4.78	5.58	5.91	<b>1.13***</b>	<b>.032</b>	<b>0.33*</b>	<b>.004</b>

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . (a) only available for participants reporting diagnosed or perceived mental health issues ( $N = 6,432$ ). Controlling for length of service, age, and gender. Significant associations are boldfaced. PNTS = prefer not to say. K10 Distress = Kessler-10 measure of psychological distress (depression and anxiety). SWMWBS = short Warwick Edinburgh mental well-being scale.

**Table 4**

*Proportion (n) of employees with a perceived need for help indicating reasons for not seeking help, by disclosure and non-disclosure to suicide survey questions.*

Reasons for not seeking help	Suicidal Thoughts			Comparisons between groups (Pearson $\chi^2$ )	
	No (n = 4,272)	Yes (n = 1,089)	PNTS (n = 637)	No vs PNTS	Yes vs PNTS
It would stop me from my operational duty	40.5% (1,572)	44.2% (481)	47.4% (302)	<b>26.45***</b>	1.70
Concerns about confidentiality	40.1% (1,715)	46.9% (511)	52.3% (333)	<b>33.55***</b>	<b>4.61*</b>
People would treat me differently	48.1% (2,055)	58.4% (636)	63.4% (404)	<b>52.03***</b>	<b>4.23*</b>
Harm my career prospects	45.0% (1,924)	54.3% (591)	60.3% (384)	<b>51.72***</b>	<b>5.91*</b>
I would be seen as weak	40.8% (1,741)	54.5% (593)	56.2% (358)	<b>54.04***</b>	0.50
It would negatively impact my colleagues	42.4% (1,812)	48.6% (527)	51.5% (328)	<b>18.57***</b>	1.54
I would be seen as a burden to my team or my family	36.2% (1,546)	51.0% (555)	51.6% (329)	<b>56.12***</b>	0.08

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . Items were only available for answering if participants indicated a mental health issue they needed help for. PNTS = Prefer not to Say.

**Table 5**

*Proportion (95% CI) of suicidal thoughts and behaviours dependent on treatment of respondents who preferred not to respond.*

	$N_{PNTS}$	PNTS Imputed Rates	Total Sample Rates After PNTS Data Strategy			Differences in Rates Between Strategies		$k$
			Assume No Suicidal Thoughts	Exclude	Impute Responses	Impute vs. Assume No Suicidal Thoughts	Impute vs. Exclude	
Lifetime Suicidal Thoughts	1098	26.14%	13.53 (12.97 – 14.08)	14.63 (14.03 – 15.23) <sup>(a)</sup>	15.49 (14.87 – 16.11)	1.96 (SE = 6.20)	0.86 (SE = 2.72)	287
Suicidal Thoughts 12 Month	1153	13.70%	5.41 (5.03 – 5.78)	5.87 (5.48 – 6.27) <sup>(b)</sup>	6.49 (6.05 – 6.63)	1.08 (SE = 7.30)	0.62 (SE = 4.19)	158
Lifetime Suicide Plan	1228	13.93%	6.29 (5.89 – 6.68)	6.89 (6.44 – 7.30) <sup>(c)</sup>	7.46 (7.01 – 7.91)	1.17 (SE = 5.10)	0.57 (SE = 2.48)	171
Lifetime Suicide Attempt	1284	4.98%	2.04 (1.81 – 2.27)	2.24 (1.99 – 2.49) <sup>(d)</sup>	2.48 (2.21 – 2.75)	0.44 (SE = 3.32)	0.24 (SE = 1.81)	64

*Note.* (a)  $n = 13,438$ , (b)  $n = 13,383$ , (c)  $n = 13,308$ , (d)  $n = 13,252$ .  $k$  = total number of extra survey participants identified to have suicidal thoughts and/or behaviours

through imputation, based on total sample size of 14,536.  $SE$  = Number of standard errors in the differences between proportions, based on standard error of imputed rates.

$N_{PNTS}$  = Number of participants that chose not to say. Imputation rates refer to proportion of individuals estimated to have suicidal thoughts and/or behaviours (i.e.,  $k$ ) out of the total number who preferred not to say (i.e.,  $N_{PNTS}$ ).

**Appendix 1***Correlations and descriptive statistics of survey scales.*

	1.	2.	3.	4.	5.	6.	7.	8.	Mean	SD	Skewness	Kurtosis
1. Psychological Distress (K10)	1	-	-	-	-	-	-	-	8.90	6.87	1.05	0.87
2. Wellbeing (SWEMWBS)	-0.72***	1	-	-	-	-	-	-	23.96	4.59	-0.27	0.23
3. PTSD Symptoms	0.78***	-0.59***	1	-	-	-	-	-	17.14	8.04	1.21	0.98
4. Perceived Stigma	0.27***	-0.28***	0.30***	1	-	-	-	-	9.87	2.39	-0.05	0.01
5. Social Support (2WSS)	-0.49***	0.59***	-0.44***	-0.25***	1	-	-	-	20.75	5.47	-0.34	-0.59
6. Self-Stigma (Shame)	0.38***	-0.36***	0.39***	0.31***	-0.30***	1	-	-	9.55	3.30	-0.11	-0.89
7. Self-Stigma (Burden)	0.48***	-0.45***	0.49***	0.31***	-0.41***	0.64***	1	-	9.71	2.90	-0.26	-0.49
8. Self-Stigma (Experience)	0.28***	-0.32***	0.33***	0.37***	-0.30***	0.32***	0.54***	1	4.98	2.17	0.44	-0.47

*Note:* \*\*\*  $p < .001$ . K10 = Kessler-10 measure of psychological distress (depression and anxiety symptoms), SWEMWBS = Short Warwick-Edinburgh Mental Wellbeing Scale, 2WSS = 2-Way Social Support.