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Suicide in the employed population: A review of epidemiology, risk factors and prevention activities

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Denna utgåva (Arbete och Hälsa 2018;52(5)) ingår i den serie av systematiska kunskapssammanställningar som ges ut av Göteborgs Universitet med finansiellt stöd av AFA Försäkring.

Dessa kunskapssammanställningar hade sin bakgrund i ett behov att ange riktlinjer för hur man fastställer samband i arbetsskadeförsäkringen. Arbetet inleddes 1981 när en grupp ortopeder, yrkesmedicinare, andra arbetsmiljöforskare och läkare från LO i Läkartidningen diskuterade en modell för bedömning av vilka arbetsställningar som utgjorde skadlig inverkan för besvär i bröst och ländrygg. Gruppen pekade också på vikten av att systematiskt ställa samman kunskap inom området (Andersson 1981). Därefter publicerades flera systematiska kunskapssammanställningar med avsikt ge riktlinjer för förekomst av skadlig inverkan vid arbetsskadebedömningar (Westerholm 1995, 2002, Hansson & Westerholm 2001).

AFA Försäkring finansierar sedan 2008 ett långsiktigt projekt med avsikt att ta fram nya kunskapssammanställningar inom arbetsmiljöområdet. Arbetet samordnas av Arbets- och miljömedicin vid Göteborgs Universitet. Dessa systematiska kunskapssammanställningar har som syfte att beskriva arbetsmiljöns betydelse för uppkomst eller försämring av sjukdom eller symptom i ett bredare perspektiv. Tillämpningen av resultaten får ske inom berörda myndigheter, arbetsplatser och försäkringsbolag.

Kunskapssammanställningarna genomförs av experter inom respektive området. Deras bedömning granskas sedan av andra experter inom området. Den nya serien av systematiska kunskapssammanställningar inleddes 2008 med en förnyad översikt om psykisk arbetsskada (Westerholm 2008), som sedan följdes av sammanställningar om fukt och mögel, helkroppsvibrationer och arbetets betydelse för uppkomst av depression (uppdatering), stroke, Parkinsons sjukdom, ALS, Alzheimers sjukdom och prostatacancer och tumbasarthros (Torén 2010, Burström 2012, Lundberg 2013, Jakobsson 2013, Gunnarsson 2014, 2015a, 2015b, Knutsson 2017, Bach Lund 2018). Under 2016 presenterades ett uppmärksammat dokument om skador efter exponering för handöverförda vibrationer (Nilsson 2016). Dessutom finns ett mycket efterfrågat dokument om hur diabetiker klarar av olika påfrestande arbetsmiljöer (Knutsson 2013). Vidare har två systematiska kunskapssammanställningar publicerats som behandlar betydelsen av exponering för värme. Den ena handlar om hur man påverkas av varma miljöer och hur man kan skydda sig (Kuklane 2017). Den andra översikten behandlar hur sjuka individer klarar att arbeta i varma miljöer (Kjellström 2017). Detta är dokument som fått hög relevans under sommaren 2018. Eftersom kunskapsläget förändras finns det ett

behov av uppdateringar av gamla kunskapssammanställningar, samtidigt som det finns ett behov av kunskapssammanställningar inom nya områden.

Den nu aktuella kunskapssammanställningen behandlar arbetsplatsens betydelse för självmord och självmordsförsök. Kunskapsöversikten har gjorts av Alison Milner och Anthony D La Montagne vid University of Melbourne respektive Deakin University, i Victoria, Australien. Externa referenter har varit Henrik Kolstad, Århus och Bo Runesson, Karolinska Institutet, Stockholm. Vi är tacksamma för författarnas gedigna arbete liksom de värdefulla och konstruktiva bidrag som referenterna har tillfört.

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Referenser

Andersson G, Bjurvall M, Bolinder E, Frykman G, Jonsson B, Kihlbom Å, Lagerlöf E, Michaëlsson G, Nyström Å, Olbe G, Roslund J, Rydell N, Sundell J, Westerholm P. Modell för bedömning av ryggskada i enlighet med arbetsskadeförsäkringen. Läkartidningen 1981;78:2765-2767.

Bach Lund C, Mikkelsen S, Frølund Thomsen J. Systematiska kunskapsöversikter; 12. Arbejdsrelaterede risikofaktorer for slidgigt i tommelens rodled. Arbete och Hälsa 2018;52(4).

Burström L, Nilsson T, Wahlström J. Exponering för helkroppsvibrationer och uppkomst av ländryggssjuklighet. I; Torén K, Albin M, Järvholm B (red). Systematiska kunskapsöversikter; 2. Exponering för helkroppsvibrationer och uppkomst av ländryggssjuklighet. Arbete och Hälsa 2012;46(2).

Gunnarsson LG, Bodin L. Systematiska kunskapsöversikter; 6. Epidemiologiskt påvisade samband mellan Parkinsons sjukdom och faktorer i arbetsmiljön. Arbete och Hälsa 2014;48(1).

Gunnarsson LG, Bodin L. Systematiska kunskapsöversikter; 7. Epidemiologiskt påvisade samband mellan ALS och faktorer i arbetsmiljön. Arbete och Hälsa 2015a;49(1).

Gunnarsson LG, Bodin L. Epidemiologiskt undersökta samband mellan Alzheimers sjukdom och faktorer i arbetsmiljön. Arbete och Hälsa 2015b;49(3).

Hansson T, Westerholm P. Arbete och besvär i rörelseorganen. En vetenskaplig värdering av frågor om samband. Arbete och Hälsa 2001:12.

Jakobsson K, Gustavsson P. Systematiska kunskapsöversikter; 5. Arbetsmiljöexponeringar och stroke – en kritisk granskning av evidens för samband mellan exponeringar i arbetsmiljön och stroke. Arbete och Hälsa 2013;47(4).

Kjellström T, Lemke B. Systematiska kunskapsöversikter 11; Health Impacts of Workplace Heat on Persons with Existing Ill Health. Arbete och Hälsa 2017;51:8.

Knutsson A, Kempe A. Systematiska kunskapsöversikter; 4. Diabetes och arbete. Arbete och Hälsa 2013;47(3).

Knutsson A, Krstev S. Arbetsmiljö och prostatacancer. Arbete och Hälsa 2017;51(1).

Kuklane K, Gao C. Systematiska kunskapsöversikter 10; Occupational Heat Exposure. Arbete och Hälsa 2017;51:7.

Lundberg I, Allebeck P, Forsell Y, Westerholm P. Kan arbetsvillkor orsaka depressionstillstånd. En systematisk översikt över longitudinella studier i den vetenskapliga litteraturen 1998-2012. Arbete och Hälsa 2013;47(1).

Nilsson T, Wahlström J, Burström L. Systematiska kunskapsöversikter 9. Kärl och nervskador i relation till exponering för handöverförda vibrationer. Arbete och Hälsa 2016;49(4)

Torén K, Albin M, Järvholm B. Systematiska kunskapsöversikter; 1. Betydelsen av fukt och mögel i inomhusmiljön för astma hos vuxna. Arbete och Hälsa 2010;44(8).

Westerholm P. Arbetssjukdom – skadlig inverkan – samband med arbete. Ett vetenskapligt underlag för försäkringsmedicinska bedömningar (6 skadeområden). Arbete och Hälsa 1995;16.

Westerholm P. Arbetssjukdom – skadlig inverkan – samband med arbete. Ett vetenskapligt underlag för försäkringsmedicinska bedömningar (7 skadeområden). Andra, utökade och reviderade upplagan. Arbete och Hälsa 2002;15

Westerholm P. Psykisk arbetsskada. Arbete och Hälsa 2008;42:1

Abbreviations

RR	Relative Risk
CI	Confidence Intervals
ISCO	International Standard Classification of Occupations

Introduction

Suicide is the act of deliberately killing oneself (WHO 2014) and is one example of a range of suicidal and self-harming behaviours. Other acts of self-harm include intentional self-injury or self-poisoning, which do not necessarily occur in presence of suicidal intent (Hawton, Zhal et al. 2003); a suicide attempt refers to a non-fatal, self-directed, potentially injurious behaviour where a person holds the intent to die as a result of the behaviour. Suicidal ideation refers to thinking about, considering, or planning suicide (Crosby, Ortega et al. 2011). In many countries around the world, suicide is a substantial public health issue (WHO 2018). Over 800,000 persons are estimated to die from suicide each year. The prevalence of ideation and attempts varies across areas of the world (Nock, Borges et al. 2008). In Sweden, the suicide mortality rate is 14.8 per 100,000 persons, which is below the average suicide rate in the European region (15.4 per 100,000) (WHO 2018). Globally, the number of suicide attempts is known to be far greater than the number of deaths, although, in most areas of the world, reliable data on attempts is less available than mortality data so it is difficult to gauge a true estimate of the size of the problem. In Sweden, a lack of available data is not a problem due to the presence of national data repositories. The rate of suicide attempt is approximately 97.3 per 100,000 persons (National Centre for Suicide Research and Prevention of Mental lll-Health 2013). Suicide ideation is much more common than suicide attempts or death (estimated to be between 10-15% of the general population in a given year) (Nock, Borges et al. 2008). Although not all people who think about suicide go onto engage in behavioural acts (Gunnell, Harbord et al. 2004), it can represent a risk factor for suicide attempts and death by suicide.

In high-income countries, it is likely that at least half of all people who lose their life to suicide are employed at the time of death (Chan, Caine et al. 2014, Milner, Morrell et al. 2014, Wada, Eguchi et al. 2016), and the prevalence of suicide ideation and attempts is similar in the employed and general populations (Gunnell, Harbord et al. 2004, Madge, Hewitt et al. 2008, Johnston, Pirkis et al. 2009, Klonsky 2011). The fact that a large proportion of the working population experience suicidal behaviours and thoughts highlights the importance of further examination of the role of employment in both suicide etiology and prevention.

The aim of this review was to provide a description of current knowledge regarding the relationship between occupation and suicide, as well as to provide evidence about the effects of workplace suicide prevention. The audience for the review includes researchers, policy-makers, and employers. We introduce the reader to this topic by first describing the epidemiology of suicide (including differences in overall risk of suicide and suicide attempt)

across different occupational groups. Following this, the review is broadly separated into two main areas. The first covers common risk and protective factors for suicide across the working population, as well as those that may be unique to specific occupational groups. The second part of the review provides a description of current workplace suicide prevention efforts across the world, many of which have been unique to specific occupational groups. Gaps in knowledge are presented, as well as promising prevention initiatives in the area. The review concludes by highlighting areas for future research and attention from policy makers.

The epidemiology of suicide in the working population

A long history of research has documented differences in the risk of suicide between different occupational groups. This includes reviews from as far back as the early 1980s (Bedeian 1982, Boxer, Burnett et al. 1995), which highlighted elevated suicide rates (e.g., death per 100,000) in those employed as chemists, farmers, law enforcement officers, and doctors. In an analysis of American data, Stack (2001) noted particularly high suicide rates in dentists, mathematicians, scientists, and artists. This paper also drew attention to particularly elevated rates in many manual trade workers, such as those employed in construction and manufacturing. Stack (2001) also called attention to methodological issues in research on the relationship between occupation and suicide, particularly the use of different referent populations across studies. For example, some studies conduct analysis in relation to another (often low risk) occupation which may inflate the reported relative risks of suicide, while other studies choose a medium risk occupation as a reference. Still others compare working populations to general population rates, which can tend to deflate reported relative risks. We believe that comparison to the general working population is the most conservative (and therefore most appropriate) referent group when assessing differences in suicide by occupational group.

The most comprehensive study conducted to date is a systematic review and meta-analysis published in 2013 (Milner, Spittal et al. 2013). The analysis contained 34 studies from a variety of countries, including the USA, Canada, Europe, the United Kingdom, Japan, Korea, New Zealand and Australia. Occupations were coded according to the International Standard Classification of Occupations (version 2008) (ISCO), which enabled comparison of suicide across nine major occupational groups:

- Category 1 (the highest skilled occupations, comprised of managers, senior officials and legislators),

- Category 2 (professionals),
- Category 3 (technicians and associate professionals),
- Category 4 (clerks),
- Category 5 (service and sales workers),
- Category 6 (skilled agricultural and fishery workers),
- Category 7 (craft and related trades workers),
- Category 8 (plant and machine operators, and assemblers), and
- Category 9 (the lowest skilled elementary occupations).

Military occupations were coded 0 because the military includes a range of different skills levels and jobs, and hence was not possible to code according to one group. The nine major groups were then collapsed into four aggregate levels of skill, from level 1 (the lowest skilled occupations) to level 4 (the highest skilled occupations).

The review compared each group above to the general working population average and found that highest risk of suicide was apparent in 'elementary' occupations such as labourers and cleaners (ISCO 9) (Relative Risk (RR) = 1.84, 95% Confidence Intervals (CI) 1.46–2.33) and plant and machine operators, and ship's deck crew (ISCO 8) (RR = 1.78, 95% CI 1.22–2.60). Those employed in service occupations (ISCO 5 such as police) had an RR of 1.52 (95% CI 1.28–1.80) and those in skilled agricultural, forestry and fishery workers (ISCO 6) had a RR of 1.64 (95% CI 1.19–2.28). The lowest risk of suicide was among the highest skill-level group of managers (ISCO category 1, RR = 0.68, 95% CI 0.50–0.93) and moderate skilled group of clerical support workers (ISCO category 4, RR = 0.77, 95% CI 0.64–0.92).

By and large, the results of this international review suggested that suicide was the highest in lower skilled jobs, while higher skilled jobs had the lowest risk of suicide. A similar result has been found in subsequent studies in specific industries such as construction, where higher skilled workers have a reduced risk of suicide compared to lower skilled workers (Milner, Niven et al. 2014, Milner, Niven et al. 2015).

At the same time, it is important to highlight that there may be subgroups of workers at particularly high risk of suicide. For example, the 2013 review suggested that health care workers (coded under ISCO 2) had a comparatively lower rate of suicide when examined against unskilled workers. However, within this group, a recent study highlights the elevated rates of suicide among female doctors, and male and female nurses (Milner, Maheen et al. 2016). This study aligns with older studies on elevated risk of suicide among female doctors (Lindeman, Laara et al. 1996, Schernhammer and Colditz 2004, Agerbo, Simkin et al. 2011). This might suggest that suicide among women in medicine is a continuing problem, despite the fact that the proportion of female physicians has increased over recent decades.

There may also be differences across different country contexts. For example, a recent study in Japan (Wada, Eguchi et al. 2016) documents elevated relative risk of suicide among administrative and managerial workers. In contrast, these professions have been found to have a low risk of suicide in Australia (Milner, Niven et al. 2015). It is also likely that there are shifts in the risk of suicide by occupation over time, as demonstrated in a study by Roberts in the United Kingdom (Roberts, Jaremin et al. 2013), which found a marked decline in the suicide rate among veterinarians, pharmacists, dentists, doctors and farmers during the 1970s and 1980s, but an increase in suicide among persons employed in manual occupations. This suggests that there is a dynamic relationship between occupation and suicide over time, and this appears to vary depending on the time and location of study.

Methodology for the review

As mentioned above, the aim of this review was: 1) to provide a description of current knowledge regarding risk factors for suicide across different occupational groups and, 2) provide evidence about the effectiveness of workplace suicide prevention. We approached these two aims as an overarching systematic review, with searches conducted to update two previously published reviews in these areas.

For the first aim, we based our search on the methodology used in previous published reviews (Leach, Poyser et al. 2017, Milner, Witt et al. 2017). We searched electronic databases that indexed literature from a wide range of disciplines including medical science (EMBASE; PubMED; Web of Science), public health (Global Health), psychology (PsycINFO), and social science (ProQuest; SCOPUS).

We used a tiered search strategy to identify eligible studies. At the first stage, keywords related to working contexts were combined (e.g., “job stress*” OR "psychosocial job stress*" OR "working condition” OR “chemical exposure” OR “workplace exposure” OR “bully*” OR “mob*”). At the second stage, we searched for keywords inclusive of self-harm or suicide (e.g., "self$harm” OR suicid* OR "attempted suicid*" OR “suicid* thought*”). We then conducted a search incorporating the search terms from tiers one and two using standard Boolean operators. Keywords were adapted for the specific requirements of each electronic database. Truncation and wildcards were introduced where necessary to increase the sensitivity of the search. No restrictions were placed on publication status or language, but if we were unable to obtain adequate details for data extraction these were later excluded from meta-analyses.

Studies were included in the review provided they satisfied the following inclusion criteria: (1) included workplace exposures or risk factors, and (2) included suicide ideation, self-harm, suicide attempt, or suicide as an outcome (either as a primary or secondary outcome). Studies were also included that used the following designs: prospective cohort, case-control, retrospective mortality, cross-sectional, or intervention trial (e.g., either pre-post design, or randomised controlled trial). We reported on case reports, qualitative papers, study protocols and/or descriptions only if information from the other study designs was not available. We also excluded studies that reported on suicide rates within specific occupational groups if these did not also provide a measure of psychosocial job stressors. We focused on studies published after 2000, given there have been past studies that have provided a review of work and suicide (Stack 2001, Woo and Postolache 2008). The review searched for literature published up until May 2018.

Titles and abstracts of retrieved records were evaluated using a two-stage screening process. At the first stage, studies with relevant titles were selected for second screening by two researchers (AM and another researcher). At the second stage, only those studies satisfying inclusion criteria following a review of the full-text were retained. Disagreements were resolved by consensus between the review authors.

For the second aim, a slightly different set of databases were searched. We focused on Cochrane Trials Library and PubMed, as well as a general use search engine (Google), which was necessary in order to identify workplace suicide prevention initiatives that had not been published in academic journals. A range of suicide prevention websites were also searched to ascertain information on unpublished workplace suicide prevention activities. These included national suicide prevention websites such as:

- Australia's Living Is For Everyone (LIFE) (http://www.livingisforevery one.com.au/Home.html),
- Suicide Prevention Canada (http://www.suicideprevention.ca/),
- the Suicide Prevention Resource Center Best Practice register (http://www.sprc.org/bpr) and;
- Mental Health Compass (https://webgate.ec.europa.eu).

Information was also sought from the International Association for Suicide Prevention and the World Health Organization websites. There was no restriction placed on the time period for the review. The review searched for literature published up until May 2018.

Search terms used for the tiered search included: suicid* OR self harm* etc., (as above). Tier two search terms included: workplace* AND prevent* OR train* OR program* OR intervention. To be eligible for the review, prevention had to be provided to persons employed in workplaces, rather than to patients and service users, which meant that activities directed at clients or

other users of services, including students in school settings, hospital patients or persons in contact with the police were excluded. If not available in English, articles were excluded. The review considered information from both un-published and published literatures, including abstracts, and descriptions of programs/prevention initiatives on websites and white papers. As mentioned previously, we considered general training programs as well as prevention initiatives developed for specific occupational or industry groups. Protocols or descriptions of prevention activities that had not actually been conducted were excluded.

For both aims one and two, authors were contacted to identify additional details on results or methodology of retrieved studies if necessary. Following the search of the databases, a secondary search of reference lists was undertaken from within retrieved articles.

Possible explanations for differences in suicide across different occupational groups

The causes of why any one individual chooses to take their own life or attempt suicide have been an interest to researchers for centuries (Lester 2000, Pickering and Walford 2000). While the motivations underpinning suicide are varied at an individual level, certain patterns emerge when examined at the group level, e.g., within occupations. Further, as we discuss throughout this review, there is growing evidence that exposures within occupations have an influence on suicidal behaviours. These factors include (Figure 1):

- Characteristics of the working environment (such as psychosocial job stressors, or other workplace exposures);
- Access to means used to die by or attempt suicide;
- Exposure to death or suicide within the context of a job;
- Gendered attitudes towards help-seeking and suicide, and;
- Individual factors associated with people working in at-risk occupations.

This review provides an overview of available evidence in each of these areas, as discussed below.

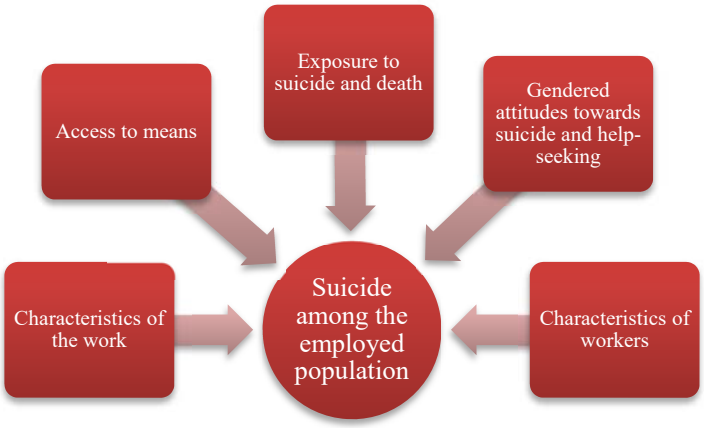


Figure 1. Summary of the factors contributing to work-related death by suicide.

Workplace psychosocial exposures

Psychosocial job stressors refer to aspects of work design, organisation or context that may cause psychological or physical harm (LaMontagne, Keegel et al. 2010). These might affect health directly or through work-related stress or distress (Figure 2).

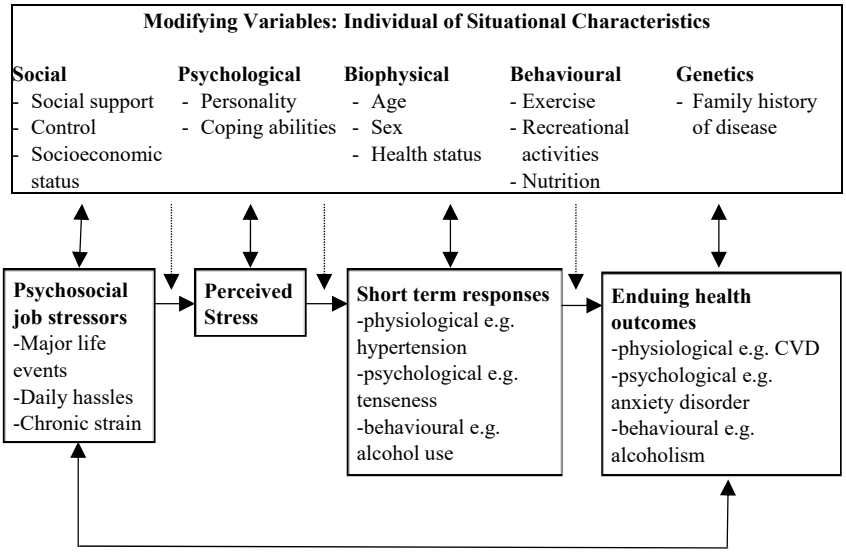


Figure 2: Job Stress Process (modified from Israel, Baker et al. 1996)

Commonly studied psychosocial job stressors include low control, which refers to reduced decision-making autonomy and the inability to decide how, when, and where work is undertaken (LaMontagne, Keegel et al. 2010). High job demands include factors such as time pressures, conflicting demands, high pace of work, proportion of work performed under pressure, amount of work, degree of concentration required, and the slowing down of work caused by the need to wait for others. The combination of both high demands and low control at work produces what is coined a situation of 'job strain' (Karasek and Theorell 1990).

Other job stressors include job insecurity (the subjective individual anticipation of involuntary job loss (Ferrie, Shipley et al. 2002, Sverke and Hellgren 2002)) and effort-reward imbalance (perceived imbalance between efforts expended at work and rewards in the form of pay, esteem or career opportunities (Siegrist 1996)). Other stressors that may also be pertinent to an understanding of suicide in the workplace include harassment and bullying, defined as situations where a person receives repeated negative behaviour, mistreatment and/or abuse at work from others within the organisation (Leach, Poyser et al. 2017).

There has been a growing interest in research on the relationship between psychosocial job stressors and suicidality over the past ten years. A recent systematic review of 22 separate studies summarises this research (Milner, Witt et al. 2017). The results of the systematic search process and the inclusion/ exclusion of studies can be seen in Supplementary Figure 1. In brief, a total of 4,644 records were identified following the systematic search strategy outlined above. A further two were obtained following correspondence with researchers working in the area. Following de-duplication, this was reduced to 4,334. Of these, 4,247 were excluded at the first screening stage, and a further 59 were excluded following application of the inclusion and exclusion criteria at the second screening stage. A total of 25 records were therefore included in the present review comprising 22 independent, non-overlapping studies (Supplementary Figure 1 in Appendix). Since the time the review has been published, we found one additional study published on this topic (Choi 2018).

This review demonstrated that workplace exposures such as low job control and poor supervisor or collegial support were associated with elevated odds of death by suicide. Poor supervisor and collegial support and job insecurity were particular risk factors for suicide ideation (or thoughts of suicide), as was low job control, effort-reward imbalance, high psychological demands, and role conflict. The most recent study used a longitudinal design and identified associations between suicide ideation and job strain (the combination of low control and high demands), and also a relationship between long working hours and suicide ideation (Choi 2018). Three studies from Sweden on doctors highlighted the role of degrading experiences at work/harassment as risk

factors for suicide ideation, while meetings with colleagues to discuss stressful work situations was associated with lower odds of suicide ideation (Fridner, Belkic et al. 2009, Fridner, Belkic et al. 2011, Wall, Schenck-Gustafsson et al. 2014).

There were only two studies on suicide attempts, both of which suggested elevated risk in relation to psychosocial job stressors. After adjustments, one study showed that poor social support was associated with an increased odds of suicide attempt (Ostry, Maggi et al. 2007). In another study, work harassment was associated with higher risk of suicide attempt (Frank and Dingle 1999).

As identified in the review, one of the challenges in studies on work exposures and suicide outcomes is the lack of longitudinal research designs. Hence, it is difficult to rule out reverse causation (e.g., people who are prone to being suicidal being selected into jobs with greater exposure to psychosocial job stressors). Another problem is that studies looking at suicide outcomes are likely to suffer from a lack of statistical power as suicide is a statistically rare event.

There has also been a recent systematic review on workplace bullying and suicide (Leach, Poyser et al. 2017) which included 12 studies from a number of countries, eight of which documented an elevated frequency of thoughts about suicide in response to bullying. Results of the review procedure can be seen in Supplementary Figure 2 in Appendix and is described below. Twelve studies met the criteria for inclusion in the review.

As with the review on job stressors noted above, this research is limited in that much of it was cross-sectional. A further complexity within this research is the extent to which bullying is actually an outcome of poor working environments, rather than an independent cause of suicide (Johan Hauge, Skogstad et al. 2007). A previous study we have conducted found that predictors of bullying were poor supervisor support, high job demands, and high levels of job insecurity (Milner, Page et al. 2016). Thus, it might be the case that both suicidality and bullying within a workplace is a symptom of a toxic working environment.

Biological or chemical exposures

Although our systematic review process indicated a lack of research on occupational chemical exposure and suicide, it is plausible to expect such a relationship to exist, given past research relating certain workplace chemical exposures and mental illness (London, Flisher et al. 2005). The issue of chemical exposure in farming populations is a particular problem in low-income contexts, where there is widespread and uncontrolled use of pesticides (London, Flisher et al. 2005). The main pathway for this relationship may

operate through neurotransmitter and neuroendocrine functions linked to serotonin levels (Maslinska, Lewandowska et al. 1981, Rajendra, Oloffs et al. 1986, Singh and Sharma 2000, Raines, Seidler et al. 2001, London, Flisher et al. 2005). These changes may increase the likelihood of impulsivity, which is a recognised individual risk factor for suicide (Oquendo and Mann 2000). There is also evidence from clinical and case series studies that chronic exposure to some pesticides may be associated with affective disorders, especially depression (Pilkington, Buchanan et al. 2001, Stallones and Beseler 2002, London, Flisher et al. 2005), which is a recognized risk factor for suicide. However, the strength of evidence about pesticide exposure and suicide is at this stage indirect at best. In saying this, and as reviewed below, there is good evidence that exposure to pesticides increases the likelihood of these being used as a suicide method. Considering this, controlling pesticide access and use would be a promising area of prevention.

Exposure to other people who have died or attempted suicide

There are well known associations between being exposed to suicide and increased risk of suicide in others surrounding the person at risk (Joiner 1999). This phenomenon has been referred to as suicide contagion or "copy-cat" suicidal behaviours (Gould and Lake 2013). Suicide contagion refers to the posited mechanisms through which being exposed to suicide could lead to greater risk of suicide among those exposed. It is based on the idea that some element of the suicidal process may be "contagious", resulting in suicide clusters. Suicide contagion can be viewed within the larger context of behavioural contagion or social learning theory (Gould and Lake 2013), which suggests a role of shared group experiences in shaping individual behaviours. Evidence about the existence of suicide contagion has been drawn from studies on the impact of media reporting on suicide, studies of suicide "clusters", and studies of the impact on adolescents of exposure to a suicidal peer (Gould and Lake 2013). Suicide "clusters" refer to "the occurrence of two or more completed or attempted suicides that are nonrandomly "bunched" in space or time (e.g., a series of suicide attempts in the same high school or a series of completed suicides in response to the suicide of a celebrity) (Joiner 1999).

Our systematic review process identified no empirical studies assessing the possible influence of contagion on occupational suicide. However, this has been mentioned as a possible risk factor for suicide occurring in certain occupational groups, such as veterinarians (Bartram and Baldwin 2008) (while also acknowledging the other risks in this job such as access to means). There has also been some research to suggest that there may be suicide clustering among unemployed populations (Milner, Too et al. 2018). While empirical

research is lacking, anecdotal evidence about suicide contagion has motivated suicide bereavement programs in the workplace (as discussed further below). Given this, we would suggest this as an area of further research.

Access to lethal means used to suicide

The availability of potentially lethal suicide methods such as firearms and medications are also thought to be an explanation for higher rates of suicide in specific occupational groups, such as those in the defence force (Mahon, Tobin et al. 2005) and those working in medicine (Hawton, Agerbo et al. 2011). Our systematic review process identified only two studies. The first was conducted across the entire working population of New Zealand concluded that, rather than necessarily being associated with higher suicide rates, greater access to lethal means was more likely to influence the choice of method within at risk occupational groups (Skegg, Firth et al. 2010). For example, nurses, doctors and pharmacists were more likely to use poisoning than were other employed people, while farmers and hunters were more than twice as likely as all others employed to use firearms (Skegg, Firth et al. 2010). A more recent paper across the entire Australian working population (Milner, Witt et al. 2017) found that occupations with greater access to lethal means (i.e., police and protection officers, defence force, farmers and agricultural workers, medical practitioners and veterinarians, and manufacturing workers) had suicide rates above those without access. It appeared that the risk of suicide was greater among female workers with access to lethal means (a rate ratio of 3.02 compared to females without access) than males with access (a rate ratio of 1.24 compared to males without access). Further, men and women that had access to specific suicide methods in their work (e.g., nurses having access to medicines) were much more likely to use these when they chose to end their lives. These studies corroborate studies from low- and middle-income contexts, which have linked high rates of suicide among farmers to greater access to lethal pesticide chemicals (London, Flisher et al. 2005).

These findings show the importance of restricting access to suicide methods. Indeed, at a population level, reducing access to lethal means is one of few suicide prevention strategies for which there is convincing evidence (Barber and Miller 2014). Past research has shown that reducing the availability and accessibility of firearms (Reisch, Steffen et al. 2013), charcoal (Yip, Law et al. 2010), as well as installing physical barriers and/or safety nets around bridges and tall buildings (Pirkis, Spittal et al. 2013) has been associated with a reduction in suicide deaths, with little evidence of means substitution (Pirkis, Spittal et al. 2013, Law, Sveticic et al. 2014).

Gendered working environments

As detailed above, suicide rates in many studies are elevated among labourers, agricultural workers, plant and machine operators, and police officers. By and large, these occupations employ a much higher proportion of males compared to females (Preston 1999), hence could be described as male-dominated. The gendered nature of the populations working in these occupations is not insignificant, particularly when viewed alongside the fact that male suicide outnumbers female suicide at a ratio of three to one in many high-income countries.

Some researchers have argued that elevated rates of suicide in male-dominated occupations quite simply reflects the greater proportion of men employed in these jobs (Bhatia, Rathi et al. 2014). Certainly, this is a potential explanation. Aside from gender as an individual characteristic of workers, an emerging body of research suggests the role of structurally-based gendered norms on suicide (Milner, Scovelle et al. 2018, Milner and King under review). These gendered-norms can be seen to be reflected in attitudes towards treatment-seeking as well as in exposure to risk factors such as alcohol and drugs, both of which may influence an individual's risk of suicide.

Where there has been a lack of studies on gendered working environments and suicide, it is plausible for such a relationship to exist. Examples of gendered-norms in an occupation come from recent studies showing that being employed in a male-dominated occupation is associated much lower likelihood to seek treatment for mental health problems, even after controlling for a range of individual and work-related factors (Milner, Scovelle et al. 2018). Alongside this, there are studies documenting greater exposure to risk factors such as alcohol and drugs in certain male-dominated occupations (Battams, Roche et al. 2014). Hence, greater exposure to risk factors and a lower likelihood of seeking treatment for mental health problems may explain elevated rates in male-dominated occupations.

At the same time, research also highlights elevated rates of suicide in certain female dominated occupations, such as nursing (Milner, Maheen et al. 2016). The reasons for this are likely to be connected to access to means (discussed above) and working characteristics. However, there may be other gender-related explanations for suicide within nurses that are yet to be identified. Expressions of gender and gendered responses to distress are complex and multifaceted. For example, acceptable female responses to social stress may differ by time, context and perhaps by occupation. More research into variation in female suicidal behaviours across various work and non-work contexts would help in progressing understanding of the link between gendered working environments and suicide.

Selection of "at risk" people into "at risk" occupations

Health selection is another explanation for higher rates of suicide within specific occupation groups, in that certain individuals who might be at elevated risk of suicide choose to work in jobs that have a number of the other risk factors present in them (i.e. people "select" into certain jobs). Two influential papers on suicide among veterinarians (Bartram and Baldwin 2008, Bartram and Baldwin 2010) highlight personality and cognitive factors such as a preference to working with animals rather than people, lack of communication skills and lower emotional intelligence as being potential explanations for elevated rates of suicide among this group of workers. Personality and mental health have also been raised as important risks for suicide among Australian farmers (Kunde, Kõlves et al. 2017). However, a population level study by Agerbo, Gunnell et al. (2007) found that vulnerabilities connected with individual's mental health did not explain all the relationship between occupational risk and suicide. This suggests that health selection may explain some, but certainly not all, the connection between the work context and suicide. This area of research is likely to be connected to the idea of the "healthy worker effect" which suggests that there is differential selection of people into and out of work depending on individual characteristics, such as health status.

Summary

This review has provided an overview of recent research describing the relationship between occupation and suicide. The factors underpinning differences in the risk of suicide across different occupational groups are likely to reflect a complex set of factors, including exposures at work, such as poor quality psychosocial working environments. Other risk factors include occupationally-specific access to means, gendered attitudes and behaviours, and the characteristics of individuals self-selecting into specific occupations. At the present time, the evidence is strongest for the influence of psychosocial job stressors and access to means. We would argue that this highlights the importance of addressing these in workplace suicide prevention initiatives.

At the same time, it is clear that the evidence-base about the risk factors for suicide across different occupation group needs to be strengthened. This is because there is currently an over-reliance on cross-sectional studies where both the exposure and outcome information are self-reported. This presents problems related to reverse causation, where suicide ideation may be driving reporting of job stressors, and also may create a situation where unmeasured person error (i.e., personality) drives both reporting of job stressors and suicidality. A similar problem may exist in studies using psychological autopsy

designs, as the information on exposures may be afflicted by recall bias. A further problem may be the fact that the studies are not using representative samples, due to a low response rate to survey designs. It is also notable that several studies did not separate the experience of stress and distress from psychosocial job stressors. In addition, we would highlight the complete lack of information on protective factors for suicide across different occupational groups. Increasing understanding of both risk and protective factors is particularly important for prevention initiatives.

Workplace suicide prevention

As we explain above, a substantial proportion of suicides in the working age population occur among those employed at the time of death (Chan, Caine et al. 2014, Milner, Morrell et al. 2014, Wada, Eguchi et al. 2016). Among those employed people who die by suicide, we also know that certain occupational groups are more at risk than others, and that certain exposures that occur within an occupation (such as psychosocial job stressors) are likely risk factors for suicide. All of these reasons emphasize the importance of workplace suicide prevention to reduce suicidal behaviours in those who may be at risk in the employed population. Aside from these reasons, the workplace is a setting in which a large number of people can be accessed efficiently for training purposes (Bovopoulos, Jorm et al. 2016). For the purposes of this review, we define workplace suicide prevention as suicide prevention activities conducted in workplaces, including: job stress prevention; suicide prevention literacy (e.g., activities to reduce stigma, and increase awareness and help-seeking), and suicide bereavement interventions (i.e., postvention) (Linde, Treml et al. 2017). Workplace suicide prevention activities may include one or a combination of these activities.

Characteristics of workplace suicide prevention activities

In 2015, we published a systematic review of suicide prevention in workplace settings (Milner, Page et al. 2015), which we have updated for the purpose of this review. We found 13 examples of workplace suicide prevention (Table 1). It is also worth noting that there have been later reviews published of suicide prevention activities conducted in specific occupational groups, such as emergency service workers (Witt, Milner et al. 2017), which we discuss further below. The flow chart of study selection related to workplace suicide prevention can be seen in Supplementary Figure 3 in Appendix.

As can be seen in Table 1, the majority of reports on workplace suicide prevention programs are from the United States, with fewer examples in Australia, Canada, and Japan. The target groups for these prevention initiatives are varied, with seven developed for specific occupations at elevated risk of suicide, and six general training audiences. It is worth commenting that a substantial proportion of prevention initiatives have been developed for occupations traditionally thought to be at elevated risk of suicide, such as those in construction (Incolink 2009, Gullestrup, Lequertier et al. 2011, Incolink 2013, OzHelp Foundation Ltd 2013), police (Mishara and Martin 2012, Bureau of Justice Assistance 2013), air force/military (Knox, Pflanz et al. 2010), army/military (Office of the Deputy Chief of Staff 2013), and farmers (The NSW Centre for Rural and Remote Mental Health 2013). There was also one program aimed at an Information Service Company in Japan (Nakao, Nishikitani et al. 2007). A common theme across all these initiatives is that they aim to train 'gatekeepers' with the skills needed to recognize and refer suicidal persons to professional support or treatment.

Table 1. Description of the workplace suicide prevention studies and programs included in the systematic review.

Name	Countries	Source of information	Overview	General training or occupational-specific program	Industry of occupational target group	Published results	Published evaluation
Suicide prevention in the workplace: good practices pre- and post-intervention (Forceville 2013)	USA	Mental health compass	Education and training. Emphasis on mental health promotion and reducing access to means, special care for high risk groups	Training package	Not specified	Nil	Nil
Working Minds: Suicide Prevention in the Workplace (Spencer-Thomas 2013)	USA	Best practice register SPRC	Education and training aimed at administrators and employees. The program provides advice for what to do when a person is acutely suicidal, gatekeeper training, and training regarding postvention.	Training package	Not specified	Nil	Nil
United States Air Force Suicide Prevention Program (Knox, Litts et al., 2003; Knox, Pflanz et al., 2010)	USA	Best practice register	Training and community awareness and education aimed suicidal risk detection, assessment, and support facilitation. Includes policy change.	Occupational-specific program	Air force	Yes	Yes
In Harm's Way: Law Enforcement Suicide Prevention (Bureau of Justice Assistance 2013)	USA	Best practice register	Train-the-trainers program that provides a comprehensive approach to stress management and suicide prevention for law enforcement and corrections professionals.	Occupational-specific program	Police	Nil	Nil
Applied Suicide Intervention Skills Training (ASIST) (LivingWorks 2013)	USA	Best practice register	Teaching gatekeepers suicide first-aid to help a person at risk stay safe and seek further help as needed.	Training program	Not specified	Nil	Nil
Post Traumatic Stress Management/Psychological First Aid Workshop (PTSM/PFA) & Recognizing Depression and Suicide Risk (Riverside trauma Center 2013)	USA	Riverside Trauma Center	How to assist employees following the suicide of a co-worker, and training on how to recognise the signs and symptoms of depression and suicide.	Training program	Not specified	Nil	Nil

Name	Countries	Source of information	Overview	General training or occupational-specific program	Industry of occupational target group	Published results	Published evaluation
Army G-1 Suicide Intervention Program (Office of the Deputy Chief of Staff 2013)	USA	Best practice register	Teaching soldiers to recognise those at risk, to help a person at risk stay safe and seek further help as needed.	Occupational-specific program	Army	Nil	Nil
OzHelp Foundation (OzHelp Foundation Ltd 2013)	Australia	Life Communications	Education and training aimed at administrators and employees. Targeted at blue collar workers.	Training program for blue collar workers.	Multiple	Nil	Nil
IncoLink (Incolink 2013)	Australia	Life Communications	Education and training aimed at apprentices.	Training program	Construction	Yes	Yes
Farm-link (The NSW Centre for Rural and Remote Mental Health 2013)	Australia	Life Communications	Training and education	Occupational-specific program	Agriculture	Nil	Nil
Mates in Construction (Gullestrup, Lequertier et al., 2011)	Australia	Life Communications	Education and training aimed at all construction workers, involves a buddy system and training gatekeepers.	Occupational-specific program	Construction	Yes	Yes
Together for Life (Mishara and Martin 2012)	Canada	(Mishara and Martin 2012)	Education and training. Multi modal suicide prevention campaign in the police force.	Occupational-specific program	Police	Yes	Yes
Employee Assistance Program (Nakao, Nishikitani et al., 2007)	Japan	Nakao et al., (2007)	Counselling, education and awareness	Occupational-specific program	Information service company	Yes	Yes

Source: *Milner, A., et al., Workplace suicide prevention: a systematic review of published and unpublished activities. Health Promotion International, 2015*

Evidence about workplace suicide prevention activities

Our review suggested that there has been limited evaluation of workplace suicide prevention activities. Among those programs that have been evaluated (Knox, Litts et al. 2003, Nakao, Nishikitani et al. 2007, Incolink 2009, Knox, Pflanz et al. 2010, Gullestrup, Lequertier et al. 2011, Mishara and Martin 2012, Incolink 2013), these have tended to use pre-post or quasi-observational designs, rather than a more rigorous randomised controlled designs. However, results to date appear promising. For example, Mishara and Martin's (2012) evaluation of a suicide prevention strategy among police in Canada demonstrated a noticeable decrease in suicide over an 11-year period, admittedly based on low numbers and a non-experimental design. Knox's evaluation (2003) of the US Air Force strategy found a significant reduction in suicide over a 13-year period. In Japan, Nakao's (2007) report on an EAP service trained to connect suicidal workers with care and provide education and awareness training suggests a significant reduction in workers reporting suicide ideation at 2-year follow-up.

The 'Mates in Construction' (MIC) construction suicide prevention program has conducted a number of evaluations. A process evaluation (Gullestrup, Lequertier et al. 2011) found that those who received MIC training had greater improvements in knowledge about suicide and viewed MIC as having high social validity in the industry. A second evaluation (DORAN AND LING 2014) used routinely available data on suicide deaths and found some evidence of decline in the rates of suicide occurring in the construction industry. Several other uncontrolled evaluations have also suggested that MIC is an acceptable and appropriate intervention in the construction industry (Mates in Construction 2011, Barletta and Dundas 2012, Footprints Market Research 2012, Banks 2013). Similarly, an evaluation of suicide prevention activities with young apprentices in the building and construction sector, led by Incolink, a redundancy fund, reported an increase in knowledge about suicide risk factors, and an improvement in attitudes and help-seeking behaviours over time (Incolink 2009).

Another review on suicide prevention programs for protective and emergency services employees was published in 2017 and included a total of 13 studies (Witt, Milner et al. 2017). Results of this meta-analysis suggested that these programs were associated with an approximate halving in suicide rates over an average follow-up period of 5.25 years (Standard Deviation = 4.2; range: 1-11) (RR 0.45, 95% CI 0.31-0.65; five studies; I2 14.8%). By and large, these studies focused on increasing suicide prevention literacy through activities to reduce stigma, increase help-seeking, and increase awareness.

What is missing from workplace suicide prevention?

As evident from the research discussed thus far in this review, there is growing attention to the workplace as an important and under-exploited setting for suicide prevention. Indeed, in recent years, there have been a number of promising developments regarding the implementation and (to some extent) evaluation of workplace suicide prevention initiatives. However, there is much still to be done. For one, prevention initiatives have generally failed to direct attention to work-related risk factors for suicide, such as low job control, job insecurity, and job demands. Instead, they have predominately focused on awareness raising, risk recognition, referral to professional help sources. There is growing consensus, however, that current best practice in workplace mental health intervention requires attention to preventing work-related harm, as well as promoting the positive aspects of work and addressing mental health problems as they manifest in work settings (LaMontagne, Martin et al. 2014). A focus on reducing work-related risk is particularly important considering growing empirical evidence about the influence of psychosocial job stressors on suicide and related outcomes such as mental ill health (Madsen, Nyberg et al. 2017). At the same time, there is a need for more attention on the factors that might be protective against suicide in workplace, such as social support and a sense of what could be personally and organisationally meaningful at work (LaMontagne, Martin et al. 2014). Following on from above, there is also a need to better integrate what has been explicitly labelled to date as 'work-place suicide prevention' with related programs including the full spectrum of workplace mental health programs, substance abuse programs, employee assistance programs, and more.

It is also significant that there is a substantial lack of evaluation of work-place suicide prevention activities. This point not only refers to the limited number of evaluated studies in the area (as seen in our review, only a handful of interventions had published evidence of effectiveness) but also to the fact that workplace suicide prevention efforts should (if appropriate) be aligned with current "best practice" in workplace mental health more generally (e.g. (Canadian Standards Association. , Guarding Minds @ Work. , Heads Up. , Superfriend , WHO 2005, World Health Organization. 2006, Comcare 2008, National Mental Health Commission. 2014, Suicide Prevention Australia. 2014, Safework Queensland. 2017)). Each of these guidelines' advocates pre-ventive (e.g., improvement of working conditions) as well as reactive (e.g., addressing mental health problems as they arise the workplace context) measures.

Conclusion

This review presented evidence about the relationship between occupation and suicide across a number of areas. First of all, it demonstrated differences in suicide risks across different occupational groups. Those groups that have the highest burden of suicide could be described as being male-dominated and lower-skilled, and characterized by low control, low security, highly physical or demanding work (e.g., agricultural work, police, machine operators, or low skilled laboring "elementary" occupations).

The review then discussed a number of explanations for differences in the risk of suicide across different occupational groups. These factors may include: characteristics of the work, particularly psychosocial job stressors; exposure to others who have died by suicide; gendered working environments, and; characteristics of the workers. Thus far, the evidence is the strongest for the relationship between psychosocial job stressors and suicide. However, we would note that this is an emerging and dynamic area of research.

Our review then covered the evidence on workplace suicide prevention activities. Programs in several occupational groups (e.g., construction, police and emergency service work) have been shown to be effective in reducing suicide and related outcomes. We noted that many workplace suicide prevention initiatives were not evaluated. Hence, there is a need for collaboration between those persons with skills in designing and evaluating prevention initiatives with those persons who are interested in promoting and implementing these initiatives.

The limitation of this review (both in the epidemiology and prevention sections) is that it may have excluded relevant studies, most particularly those that were not published in the academic literature or in English. It is also worth noting that the review was restricted to studies within work settings and did not cover the range of non-work risks for suicide (such as substance abuse and relationship breakdown). We excluded studies that did not specifically focus on suicide or suicide prevention. Hence, we did not include studies where mental health or psychiatric conditions were the primary outcome. As we note, there are a number of methodological limitations in research on the work-related factors that might be causes of suicidality (page 25). These include the fact that the current evidence base focuses on cross-sectional studies where both information on both exposures and outcomes are drawn from self-reported sources. This presents problems of recall bias, and dependent misclassification. Job Exposure Matrix studies (JEM) are one solution to some of these problems. It is notable that studies using JEM designs (e.g., Milner, Spittal et al. 2016) also support the relationship between psychosocial job stressors and suicide outcomes.

There also needs to be further research investigating the contribution of working environments as both risk and protective factors at multiple levels organisation (e.g., worker, organisation, sector, economic climate). Work environments are complex and there may be numerous factors that influence a person's mental health and suicidality at any one time, including the type of work a person is undertaking, the influence of stigma and cultural attitudes to mental health/illness and help seeking and, the person's ability to access lethal means of suicide, and the prevailing macro-economic conditions. As we suggest above, these risks may be dynamic and interact with non-work-related risk factors for suicide. Consideration of all risk and protective factors is critical for the development of optimally-tailored workplace prevention activities.

Another research gap concerns the evaluation of workplace suicide prevention. There is a real opportunity for improved partnership and collaboration between practitioners and evaluators/researchers. Related to this, we would encourage work between industry, labour, government and academia to better integrate the development, implementation, and evaluation of workplace suicide prevention strategies. To some extent, these partnerships are beginning to develop, but this remains a necessary area of future investment. Considering the sheer number of people who are employed at the time of the death by suicide, and the fact that humans are spending more time at work than ever before, prevention in the work context represents a real opportunity to reduce suicide in the working age population.

References

Agerbo, E., D. Gunnell, J. P. Bonde, P. Bo Mortensen and M. Nordentoft (2007). "Suicide and occupation: the impact of socio-economic, demographic and psychiatric differences." Psychol Med 37(8): 1131-1140.

Agerbo, E., S. Simkin, B. Platt and R. J. Mellanby (2011). "Risk of suicide in medical and related occupational groups: a national study based on Danish case population-based registers. ." J Affect Disord 134(1-3): 320-326.

Banks, C. (2013). MATES in Construction: ASIST Workers Survey Report Brisbane, Cate Banks Consulting.

Barber, C. W. and M. J. Miller (2014). "Reducing a suicidal person's access to lethal means of suicide: a research agenda." Am J Prev Med 47(3 Suppl 2): S264-272.

Barletta, J. and V. Dundas (2012). A Report on the Development of a Life Skills Program for Construction Apprentices. The Grange, Qld, The Grange Practice.

Bartram, D. J. and D. S. Baldwin (2008). "Veterinary surgeons and suicide: influences, opportunities and research directions." Vet Rec 162(2): 36-40.

Bartram, D. J. and D. S. Baldwin (2010). "Veterinary surgeons and suicide: a structured review of possible influences on increased risk." Vet Rec 166(13): 388-397.

Battams, S., A. M. Roche, J. A. Fischer, N. K. Lee, J. Cameron and V. Kostadinov (2014). "Workplace risk factors for anxiety and depression in male-dominated industries: a systematic review." Health Psychol Behav Med 2(1): 983-1008.

Bedeian, A. (1982). "Suicide and occupation: a review." Journal of Vocational Behavior 21: 206-223.

Bhatia, M. S., A. Rathi and N. Kaur (2014). "Confounders in studies of suicide by occupation." Br J Psychiatry 204: 402.

Bovopoulos, N., A. F. Jorm, K. S. Bond, A. D. LaMontagne, N. J. Reavley, C. M. Kelly, B. A. Kitchener and A. Martin (2016). "Providing mental health first aid in the workplace: a Delphi consensus study." BMC Psychol 4(1): 41.

Boxer, P. A., C. Burnett and N. Swanson (1995). "Suicide and occupation: a review of the literature." J Occup Environ Med 37(4): 442-452.

Bureau of Justice Assistance (2013). "In Harm's Way: Law Enforcement Suicide Prevention." http://policesuicide.spcollege.edu/crisisIHW.htm. Accessed 11 Nov 2013.

Canadian Standards Association. "Psychological health and safety in the workplace." Retrieved 9 March, 2017, from http://shop.csa.ca/en/canada/landing-pages/z1003-landing-page/page/z1003-landing-page?utm_source=redirect&utm_medium=vanity&utm_term=z1003&utm_content=folder&utm_campaign=general&utm_language=en.

Chan, C. H., E. D. Caine, S. You, K. W. Fu, S. S. Chang and P. S. Yip (2014). "Suicide rates among working-age adults in South Korea before and after the 2008 economic crisis." J Epidemiol Community Health 68(3): 246-252.

Choi, B. (2018). "Job strain, long work hours, and suicidal ideation in US workers: a longitudinal study." Int Arch Occup Environ Health 91(7): 865-875.

Comcare (2008). Working well: An organisational approach to preventing psychological harm. http://www.comcare.gov.au/__data/assets/pdf_file/0005/41369/PUB_47_Working_well.pdf, Australian Government.

Crosby, A. E., L. Ortega and C. Melanson (2011). Self-directed Violence Surveillance: Uniform Definitions and Recommended Data Elements. https://www.cdc.gov/violenceprevention/pdf/Self-Directed-Violence-a.pdf, CDC.

Doran, C. M. and R. Ling (2014). The economic cost of suicide and suicide behaviour in the NSW construction industry and the impact of MATES in Construction suicide prevention strategy in reducing this cost. Spring Hill QLD 4004, Mates in Construction.

Ferrie, J. E., M. J. Shipley, S. A. Stansfeld and M. G. Marmot (2002). "Effects of chronic job insecurity and change in job security on self reported health, minor psychiatric morbidity, physiological measures, and health related behaviours in British civil servants: the Whitehall II study." J Epidemiol Community Health 56(6): 450-454.

Footprints Market Research (2012). MATES in Construction: Program Evaluation, report of Findings Brisbane, Footprints Market Research.

Frank, E. and A. D. Dingle (1999). "Self-reported depression and suicide attempts among U.S. women physicians." Am J Psychiatry 156(12): 1887-1894.

Fridner, A., K. Belkic, M. Marini, D. Minucci, L. Pavan and K. Schenck-Gustafsson (2009). "Survey on recent suicidal ideation among female university hospital physicians in Sweden and Italy (the HOUPE study): cross-sectional associations with work stressors." Gend Med 6(1): 314-328.

Fridner, A., K. Belkic, D. Minucci, L. Pavan, M. Marini, B. Pingel, G. Putoto, P. Simonato, L. T. Lovseth and K. Schenck-Gustafsson (2011). "Work environment and recent suicidal thoughts among male university hospital physicians in Sweden and Italy: the health and organization among university hospital physicians in Europe (HOUPE) study." Gend Med 8(4): 269-279.

Gould, M. S. and A. M. Lake (2013). The contagion of suicidal behavior. Contagion of Violence: Workshop Summary. F. o. G. V. P. B. o. G. H. I. o. M. N. R. Council. Washington (DC), National Academies Press (US): Available from: https://www.ncbi.nlm.nih.gov/books/NBK207262/.

Guarding Minds @ Work. Retrieved 9 March, 2017, from www.guardingmindsatwork.ca.

Gullestrup, J., B. Lequertier and G. Martin (2011). "MATES in construction: impact of a multimodal, community-based program for suicide prevention in the construction industry." Int J Environ Res Public Health 8(11): 4180-4196.

Gunnell, D., R. Harbord, N. Singleton, R. Jenkins and G. Lewis (2004). "Factors influencing the development and amelioration of suicidal thoughts in the general population: Cohort study." Br J Psychiatry185(5): 385-393.

Hawton, K., E. Agerbo, S. Simkin, B. Platt and R. J. Mellanby (2011). "Risk of suicide in medical and related occupational groups: a national study based on Danish case population-based registers." J Affect Disord 134(1-3): 320-326.

Hawton, K., D. Zhal and R. Weatherall (2003). "Suicide following deliberate self-harm: Long term follow-up of patients who presented to a general hospital." Br J Psychiatry 182: 537-542.

Heads Up. "Taking action." Retrieved 9 March, 2017, from www.headsup.org.au/creating-a-mentally-healthy-workplace/taking-action.

Incolink (2009). Incolink: The importance of early intervention programs for young men. Senate Community Affairs References Committee. Melbourne, Victoria, Incolink.

Incolink (2013). "Incolink: A joint enterpise of employer associations and unions in the building and construction industry." http://www.incolink.org.au/Home.aspx Accessed 11 Nov 2013.

Israel, B. A., E. A. Baker, L. M. Goldenhar, C. A. Heaney and S. J. Schurman (1996). "Occupational stress, safety, and health: conceptual framework and principles for effective prevention interventions." J Occup Health Psychol 1(3): 261-286.

Johan Hauge, L., A. Skogstad and S. Einarsen (2007). "Relationships between stressful work environments and bullying: Results of a large representative study." Work & Stress 21(3): 220-242.

Johnston, A. K., J. E. Pirkis and P. M. Burgess (2009). "Suicidal thoughts and behaviours among Australian adults: findings from the 2007 National Survey of Mental Health and Wellbeing." Aust N Z J Psychiatry 43(7): 635-643.

Karasek, R. and T. Theorell (1990). Healthy work: Stress, productivity, and the reconstruction of working life. . New York, Basic Books.

Klonsky, E. D. (2011). "Non-suicidal self-injury in United States adults: prevalence, sociodemographics, topography and functions." Psych Med41(9): 1981-1986.

Knox, K. L., D. A. Litts, G. W. Talcott, J. C. Feig and E. D. Caine (2003). "Risk of suicide and related adverse outcomes after exposure to a suicide prevention programme in the US Air Force: cohort study." BMJ 327(7428): 1376.

Knox, K. L., S. Pflanz, G. W. Talcott, R. L. Campise, J. E. Lavigne, A. Bajorska, X. Tu and E. D. Caine (2010). "The US Air Force suicide prevention program: implications for public health policy." Am J Public Health 100(12): 2457-2463.

Kunde, L., K. Kõlves, B. Kelly, P. Reddy and D. De Leo (2017). "Pathways to Suicide in Australian Farmers: A Life Chart Analysis." Int J Environ Res Public Health 14(4): 352.

LaMontagne, A. D., T. Keegel, A. M. Louie and A. Ostry (2010). "Job stress as a preventable upstream determinant of common mental disorders: A review for practitioners and policy-makers." Advances in Mental Health 9(1): 17-35.

LaMontagne, A. D., A. Martin, Page KM, N. J. Reavley, A. Noblet, A. Milner, T. Keegel and P. Smith (2014). "Workplace mental health: Developing an integrated intervention approach." BMC Psychiatry 14: 131. doi:110.1186/1471-1244X-1114-1131.

Law, C. K., J. Sveticic and D. De Leo (2014). "Restricting access to a suicide hotspot does not shift the problem to another location. An experiment of two river bridges in Brisbane, Australia." Aust N Z J Public Health 38(2): 134-138.

Leach, L. S., C. Poyser and P. Butterworth (2017). "Workplace bullying and the association with suicidal ideation/thoughts and behaviour: a systematic review." Occup Environ Med 74(1): 72-79.

Lester, D. (2000). Decades of suicide research: Wherefrom and whereto? Suicide Science: Expanding the Boundaries. T. E. Joiner. Massachusetts, USA, Kluwer Academic Publishers. 9-18.

Linde, K., J. Treml, J. Steinig, M. Nagl and A. Kersting (2017). "Grief interventions for people bereaved by suicide: A systematic review." PLOS ONE 12(6): e0179496.

Lindeman, S., E. Laara, H. Hakko and J. Lonnqvist (1996). "A systematic review on gender-specific suicide mortality in medical doctors." Br J Psychiatry 168(3): 274-279.

London, L., A. J. Flisher, C. Wesseling, D. Mergler and H. Kromhout (2005). "Suicide and exposure to organophosphate insecticides: Cause or effect?" Am J Ind Med47(4): 308-321.

Madge, N., A. Hewitt, K. Hawton, E. J. de Wilde, P. Corcoran, S. Fekete, K. van Heeringen, D. De Leo and M. Ystgaard (2008). "Deliberate self-harm within an international community sample of young people: comparative findings from the Child & Adolescent Self-harm in Europe (CASE) Study." J Child Psychol Psychiatry 49(6): 667-677.

Madsen, I. E. H., S. T. Nyberg, L. L. Magnusson Hanson, J. E. Ferrie, K. Ahola, L. Alfredsson, G. D. Batty, J. B. Bjorner, M. Borritz, H. Burr, J. F. Chastang, R. de Graaf, N. Dragano, M. Hamer, M. Jokela, A. Knutsson, M. Koskenvuo, A. Koskinen, C. Leineweber, I. Niedhammer, M. L. Nielsen, M. Nordin, T. Oksanen, J. H. Pejtersen, J. Pentti, I. Plaisier, P. Salo, A. Singh-Manoux, S. Suominen, M. ten Have, T. Theorell, S. Toppinen-Tanner, J. Vahtera, A. Väänänen, P. J. M. Westerholm, H. Westerlund, E. I. Fransson, K. Heikkilä, M. Virtanen, R. Rugulies, M. Kivimäki and I. P. D. W. C. for the (2017). "Job strain as a risk factor for clinical depression: systematic review and meta-analysis with additional individual participant data." Psych Med 47(8): 1342-1356.

Mahon, M. J., J. P. Tobin, D. A. Cusack, C. Kelleher and K. M. Malone (2005). "Suicide among regular-duty military personnel: a retrospective case-control study of occupation-specific risk factors for workplace suicide." Am J Psychiatry 162(9): 1688-1696.

Maslinska, D., I. Lewandowska and J. Prokopczyk (1981). "Effect of prolonged acetylcholinesterase inhibition on postnatal brain development in rabbit. I. Level of serotonin in different brain regions." Acta Neuropathol Suppl 7: 52-55.

Mates in Construction (2011). Life Skills Course – Pilot Project Evaluation. Brisbane, Arkaen.

Milner, A. and T. King (under review). "Men's work, women's work and suicide: A retrospective mortality study assessing the contributions of socio-economic status, age, mental illness and gendered occupational context to suicide." Aust N Z J Public Health.

Milner, A., H. Maheen, M. Bismark and M. J. Spittal (2016). "Suicide by health care professionals: a retrospective mortality study in Australia, 2001–2012." MJA 205(6): 260-265.

Milner, A., S. Morrell and A. LaMontagne (2014). "Economically inactive, unemployed and employed suicides in Australia by age and sex over a 10-year period: What was the impact of the 2007 economic recession?" Int J Epidemiol 43(5): 1500–1507.

Milner, A., H. Niven and A. D. LaMontagne (2014). "Suicide by occupational skill level in the Australian construction industry: Data from a national register of deaths over the period 2001 to 2010." Aust N Z J Public Health 38(3): 281-285.

Milner, A., K. Page, S. Spencer-Thomas and A. D. Lamotagne (2015). "Workplace suicide prevention: a systematic review of published and unpublished activities." Health Promot Int 30(1):29-37

Milner, A., K. Page, K. Witt and A. LaMontagne (2016). "Psychosocial Working Conditions and Suicide Ideation: Evidence From a Cross-Sectional Survey of Working Australians." J Occup Environ Med 58(6): 584-587.

Milner, A., A. J. Scovelle and T. King (2018). "Treatment seeking differences for mental health problems in male and non-male dominated occupations: prospective evidence from the HILDA study." Epidemiology and Psychiatric Sciences https://doi.org/10.1017/S2045796018000367.

Milner, A., M. J. Spittal, J. Pirkis, J.-F. Chastang, I. Niedhammer and A. D. LaMontagne (2016). "Low Control and High Demands at Work as Risk Factors for Suicide: An Australian National Population-Level Case-Control Study." Psychosom Med 79(3): 358-364.

Milner, A., M. J. Spittal, J. Pirkis and A. D. LaMontagne (2013). "Suicide by occupation: systematic review and meta-analysis." Br J Psychiatry 203(6): 409-416.

Milner, A., L. S. Too and M. J. Spittal (2018). "Cluster Suicides Among Unemployed Persons in Australia Over the Period 2001–2013." Soc Indic Res 137(1): 189-201.

Milner, A., K. Witt, A. D. LaMontagne and I. Niedhammer (2017). "Psychosocial job stressors and suicidality: a meta-analysis and systematic review." Occup Environ Med 75(4): 245-253.

Milner, A., K. Witt, H. Maheen and A. D. LaMontagne (2017). "Access to means of suicide, occupation and the risk of suicide: a national study over 12 years of coronial data." BMC Psychiatry 17(1): 125.

Milner, A. J., H. Niven and A. D. LaMontagne (2015). "Occupational class differences in suicide: evidence of changes over time and during the global financial crisis in Australia." BMC Psychiatry 15: 223.

Mishara, B. L. and N. Martin (2012). "Effects of a comprehensive police suicide prevention program." Crisis 33(3): 162-168.

Nakao, M., M. Nishikitani, S. Shima and E. Yano (2007). "A 2-year cohort study on the impact of an Employee Assistance Programme (EAP) on depression and suicidal thoughts in male Japanese workers." Int Arch Occup Environ Health 81(2): 151-157.

National Centre for Suicide Research and Prevention of Mental lll-Health (2013). "Suicide attempts in Sweden." accessed from https://ki.se/en/nasp/suicide-attempts-in-sweden on 28th August 2018.

National Mental Health Commission. (2014). "Mentally Healthy Workplace Alliance." Retrieved 9 March, 2017, from www.mentalhealthcommission.gov.au/our-work/mentally-healthy-workplace-alliance.aspx.

Nock, M. K., G. Borges, E. J. Bromet, C. B. Cha, R. C. Kessler and S. Lee (2008). "Suicide and Suicidal Behavior." Epidemiol Rev 30(1): 133-154.

Office of the Deputy Chief of Staff (2013). "Army G-1 Suicide Intervention Program " http://www.armyg1.army.mil/hr/suicide/default.asp 11th Nov 2013.

Oquendo, M. A. and J. J. Mann (2000). "The biology of impulsivity and suicidality." Psychiatr Clin North Am 23(1): 11-25.

Ostry, A., S. Maggi, J. Tansey, J. Dunn, R. Hershler, L. Chen, A. M. Louie and C. Hertzman (2007). "The impact of psychosocial work conditions on attempted and completed suicide among western Canadian sawmill workers." Scandinavian Journal of Public Health 35(3): 265-271.

OzHelp Foundation Ltd (2013). "OzHelp Foundation " https://ozhelp.org.au/site/ Accessed 11th Nov 2013.

Pickering, W. S. F. and G. Walford (2000). Durkheim's Suicide. [electronic resource] : a century of research and debate, London ; New York : Routledge, 2000.

Pilkington, A., D. Buchanan, G. A. Jamal, R. Gillham, S. Hansen, M. Kidd, J. F. Hurley and C. A. Soutar (2001). "An epidemiological study of the relations between exposure to organophosphate pesticides and indices of chronic peripheral neuropathy and neuropsychological abnormalities in sheep farmers and dippers." Occup Environ Med 58(11): 702-710.

Pirkis, J., M. J. Spittal, G. Cox, J. Robinson, Y. T. Cheung and D. Studdert (2013). "The effectiveness of structural interventions at suicide hotspots: a meta-analysis." Int J Epidemiol 42(2): 541-548.

Preston, J. A. (1999). "Occupational gender segregation Trends and explanations." The Quarterly Review of Economics and Finance 39(5): 611-624.

Raines, K. W., F. J. Seidler and T. A. Slotkin (2001). "Alterations in serotonin transporter expression in brain regions of rats exposed neonatally to chlorpyrifos." Brain Res Dev Brain Res 130(1): 65-72.

Rajendra, W., P. C. Oloffs and E. W. Banister (1986). "Effects of chronic intake of diazinon on blood and brain monoamines and amino acids." Drug Chem Toxicol 9(2): 117-131.

Reisch, T., T. Steffen, A. Habenstein and W. Tschacher (2013). "Change in suicide rates in Switzerland before and after firearm restriction resulting from the 2003 "Army XXI" reform." Am J Psychiatry 170(9): 977-984.

Roberts, S. E., B. Jaremin and K. Lloyd (2013). "High-risk occupations for suicide." Psychol Med 43(6): 1231-1240.

Safework Queensland. (2017). "People at Work." Retrieved 9 March, 2017, from www.worksafe.qld.gov.au/injury-prevention-safety/mental-health-at-work/tools-and-resources/people-at-work.

Schernhammer, E. S. and G. A. Colditz (2004). "Suicide rates among physicians: a quantitative and gender assessment (meta-analysis)." Am J Psychiatry 161(12): 2295-2302.

Siegrist, J. (1996). "Adverse health effects of high-effort/low-reward conditions. ." J Occup Health Psychol. 1(1): 27-41.

Singh, S. and N. Sharma (2000). "Neurological syndromes following organophosphate poisoning." Neurol India 48(4): 308-313.

Skegg, K., H. Firth, A. Gray and B. Cox (2010). "Suicide by occupation: does access to means increase the risk?" Aust N Z J Psychiatry 44(5): 429-434.

Stack, S. (2001). "Occupation and Suicide." Social Science Quarterly 82(2): 384-396.

Stallones, L. and C. Beseler (2002). "Pesticide poisoning and depressive symptoms among farm residents." Ann Epidemiol 12(6): 389-394.

Suicide Prevention Australia. (2014). Work and suicide prevention: Position statement. Sydney, Suicide Prevention Australia.

Superfriend. "Promoting positive mental health in the workplace - Guidelines for organisations." Retrieved 9 March, 2017, from www.superfriend.com.au/resources/promoting-positive-mental-health-in-the-workplace/.

Sverke, M. and J. Hellgren (2002). "The nature of job insecurity: understanding employment uncertainty on the brink of a new millennium." Appl Psychol 51: 23–42.

The NSW Centre for Rural and Remote Mental Health (2013). "Farm-Link Suicide Prevention Project " http://www.newcastle.edu.au/engage/#!/addressing-mental-health-needs-in-rural-communities Accessed 11 Nov 2013.

Joiner, T Jr. (1999). "The Clustering and Contagion of Suicide." Curr Dir Psychol Sci 8(3): 89-92.

Wada, K., H. Eguchi, D. Prieto-Merino and D. R. Smith (2016). "Occupational differences in suicide mortality among Japanese men of working age." J Affect Disord 190: 316-321.

Wall, M., K. Schenck-Gustafsson, D. Minucci, M. G. Senden, L. T. Lovseth and A. Fridner (2014). "Suicidal ideation among surgeons in Italy and Sweden - a cross-sectional study." BMC Psychol 2(1): 53.

WHO (2005). MENTAL HEALTH POLICIES AND PROGRAMMES IN THE WORKPLACE. http://www.who.int/mental_health/policy/workplace_policy_programmes.pdf, WHO

WHO (2014). Preventing suicide: a global imperative. http://www.who.int/topics/suicide/en/, WHO.

WHO (2018). Mental health: Suicide data. http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/, Accessed 31st of May 2018.

WHO (2018). "Suicide mortality rate (per 100 000 population), by WHO region, 2016." accessed from http://apps.who.int/gho/data/node.sdg.3-4-viz-2?lang=en on 28th August 2018.

Witt, K., A. Milner, A. Allisey, L. Purnell and A. D. LaMontagne (2017). "Effectiveness of suicide prevention programs for emergency and protective services employees: A systematic review and meta-analysis." Am J Ind Med 60(4), 394-407

Woo, J. M. and T. T. Postolache (2008). "The impact of work environment on mood disorders and suicide: Evidence and implications." Int J Disabil Hum Dev 7(2): 185-200.

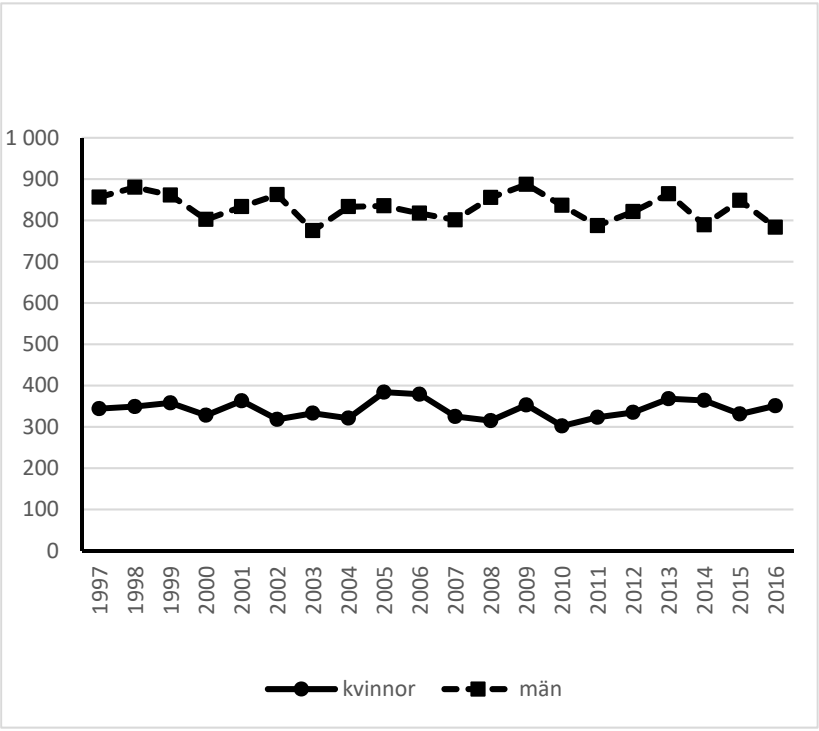
World Health Organization. (2006). Preventing suicide: A resource at work. Geneva, World Health Organization.

Yip, P. S., C. K. Law, K. W. Fu, Y. W. Law, P. W. Wong and Y. Xu (2010). "Restricting the means of suicide by charcoal burning." Br J Psychiatry 196(3): 241-242.

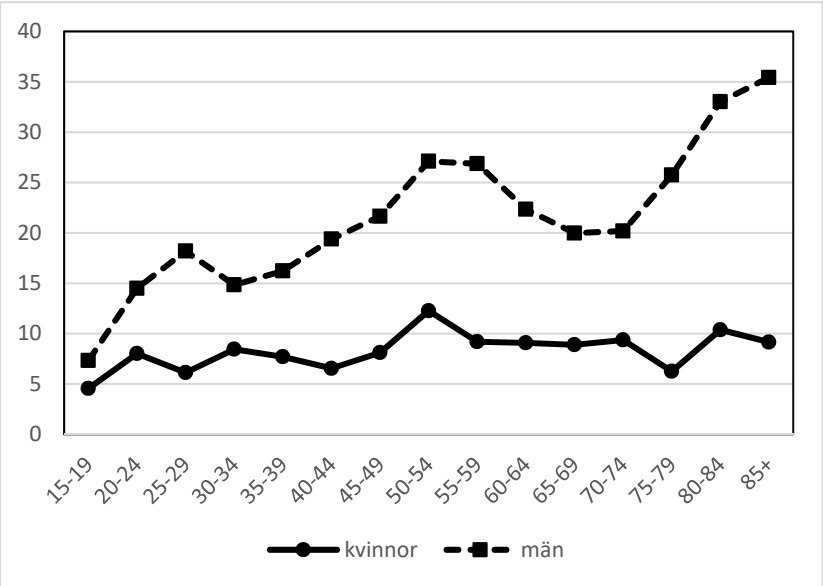
Redaktörernas slutord

Antalet självmord i Sverige och har varit tämligen konstant under de senaste 20 åren och betydligt vanligare hos män, figur 1. Med tanke på att befolkningen har ökat, så har antalet fall per 100 000 minskat något över tid. Relativt sett ökar självmord med åldern för män men inte alls lika mycket för kvinnor, figur 2. Den åldersstandardiserade incidensen i Sverige ligger strax under genomsnittet för Europa (14,8 per 100 000 jämfört med 15,4 för Europa). Incidensen för självmordsförsök i Sverige är nästan 7 gånger högre och varje år har 10-15 % av befolkningen tankar på självmord.

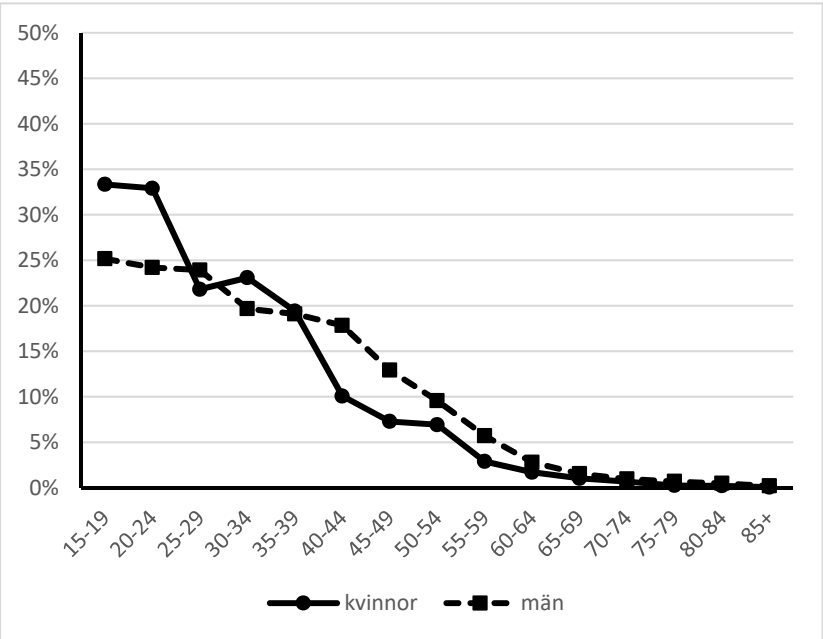
Självmord utgör drygt 1 procent av alla dödsfall och är en förhållandevis vanlig dödsorsak i yrkesverksamma åldrar, figur 3. Det innebär t ex att mer än vart femte dödsfall i åldrarna under 40 år beror på självmord och det innebär att när en yngre människa dör på en arbetsplats så är det inte så sällan beroende på ett självmord.



Figur 1. Antalet självmord i Sverige (källa: Socialstyrelsen).



Figur 2. Antalet självmord per 100 000 personer 2015-2016 (källa: Socialstyrelsen).



Figur 3. Andel självmord bland samtliga dödsorsaker i olika åldrar 2015-16 (källa: Socialstyrelsen).

Det är sedan länge känt att självmord är vanligare män än bland kvinnor och att det är vanligare i vissa yrken. Däremot är orsaken till skillnaderna mindre väl kända. I denna kunskapsöversikt beskrivs det nuvarande kunskapsläget om eventuella samband mellan arbetsmiljön och risken för självmord. I vissa länder har man också börjat med förebyggande åtgärder. I översikten finns också en beskrivning av innehållet i dessa.

Det finns en rad svårigheter när man ska studera orsaker till självmord. En uppenbar sådan är att personen som själv skulle kunna förklara orsakerna är avliden. Det finns därför studier där man försökt få bättre kunskaper om orsakerna genom att intervjua närstående personer (kallas ibland ”psychological autopsy” i engelskspråkig litteratur). Ett annat angreppssätt har varit att man intervjuar personer som gjort självmordsförsök eller att man samtidigt frågar personer om olika förhållanden och om man funderat på att begå självmord. De senare typerna av studier innebär tolkningssvårigheter när man ska generalisera till självmord. Det är t ex vanligare att kvinnor vårdas för självmordsförsök, medan det betydligt vanligare med fullbordade självmord bland män (National Centre for Suicide Research and Prevention of Mental lll-Health 2013). När man samtidigt frågar om t ex arbetsförhållanden och om personen funderar på självmord så är det troligt att en person som är deprimerat oftare beskriver sin arbetsmiljö som problematisk och samtidigt kan funderar på självmord vilket kan leda till att man ser samband mellan dålig arbetsmiljö och självmordstankar (det brukar betecknas som ”common method bias” i engelsk litteratur). Genom att efterforska arbetsmiljön oberoende av de man intervjuar kan sådan bias minskas. Man kan också studera hur vanligt självmord är i olika yrken, men det är då svårt att veta om skillnader beror på att sårbara personer är mer vanliga i vissa yrken, dvs selektionseffekter, eller på faktorer i arbetsmiljön i dessa yrken.

Kunskapsöversikten beskriver dels förekomsten av självmord i olika yrkesgrupper där den generella tendensen är att det är vanligast bland personer med enkla jobb och låg utbildning. Genom att analysera studier från flera olika länder fann man t ex att de med enkla jobba hade mer än dubbelt så hög risk för självmord som personer med hög utbildning i kombination med arbetsledande uppgifter (relativa risken för de förstnämnda var 1,84 respektive 0,68 jämfört med genomsnittet, se sid 8 i *nuvarande manus*).

Flera förklaringar har framförts till skillnaderna riskerna. De faktorer i arbetsmiljön som fr a diskuterats ha samband med förekomsten av självmord är olika dimensioner av den psykosociala arbetsmiljön såsom förekomst av stressande faktorer och kränkande särbehandling. Man menar också att det finns stöd för att tillgången till olika metoder för självmord, t ex tillgång till skjutvapen eller mediciner/gifter, påverkar risken men kanske framför allt hur självmordet sker. T ex använder poliser och lantbrukare oftare skjutvapen och läkemedel används oftare bland sjuksköterskor och läkare. Det finns också

studier som indikerar att arbete med personer som avlidit eller begått självmord ökar risken. Attityder och könsroller inom en yrkesgrupp anses också kunna ha viss betydelse. Författarnas slutsats är att utifrån dagens kunskap är förekomsten av olika psykosociala stressorer den bäst belagda förklaringen till skillnader i förekomst av självmord i olika yrkesgrupper.

På några håll i världen, fr a USA och Australien, har man startat olika arbetsplatsinriktade program för att förebygga självmord. De har ofta riktats mot speciella yrkesgrupper där självmord är vanligare än genomsnittet i befolkningen, t ex inom militären, jordbruk, polis eller byggindustri. Några av programmen har gjort utvärderingar som tyder på att åtgärderna haft effekt. De behövs dock mer omfattande utvärderingar innan man kan dra helt säkra slutsatser om effekterna. Ett program kan innehålla bl a utbildning under 1-2 dagar av vissa personer på en arbetsplats så de bättre kan känna igen arbetskamrater med ökad risk för suicid och de får träning i hur man bemöter sådana arbetskamrater och hjälper dem till professionell vård.

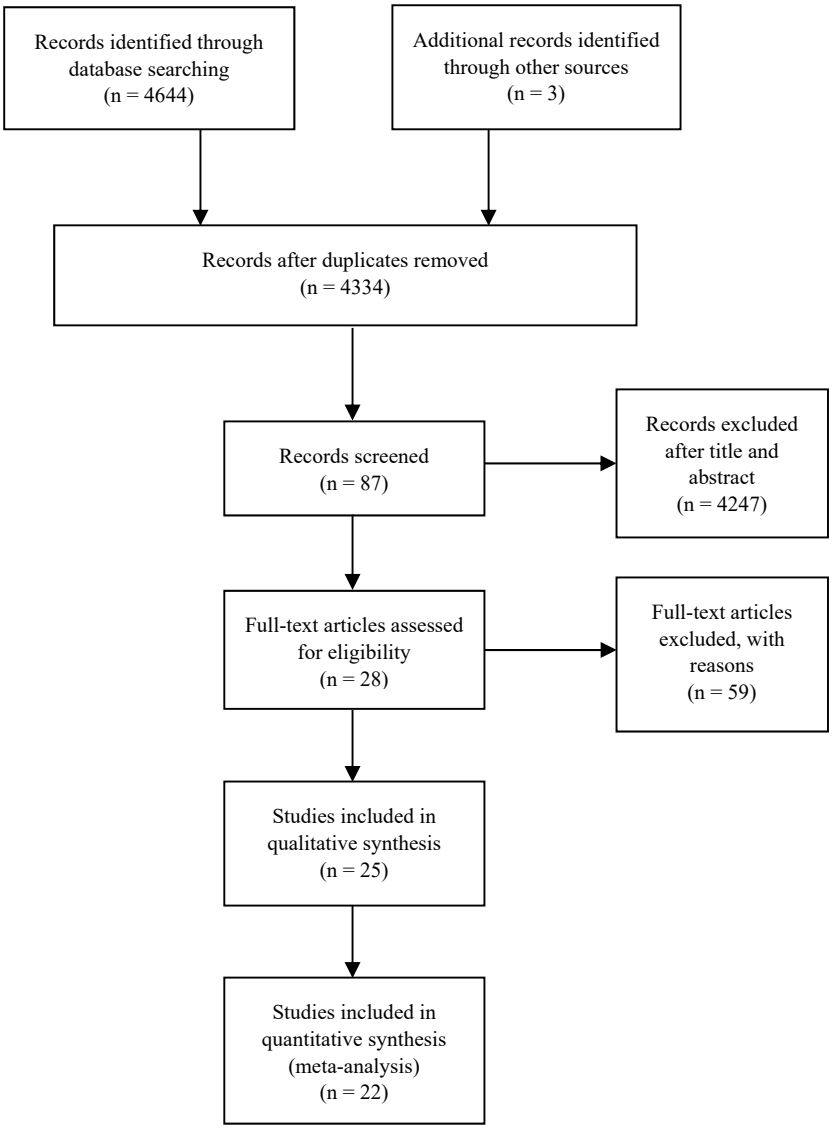
Kunskapsöversikten visar på att det sedan länge är känt att risken för självmord varierar mellan olika yrken, men att det fortfarande finns stora kunskapsluckor i hur man ska förklara skillnaderna. Mycket pekar dock mot att en bra psykosocial arbetsmiljö kan verka förebyggande. Det finns också visst stöd för att särskilda ganska enkla förebyggande insatser på arbetsplatsen i hur man upptäcker och bemöter personer i riskzonen kan ha positiva effekter och vara ett komplement till övriga insatser i samhället för att förebygga självmord. Metoderna för dessa insatser behöver dock utvecklas och ytterligare utvärderas.

Referenser

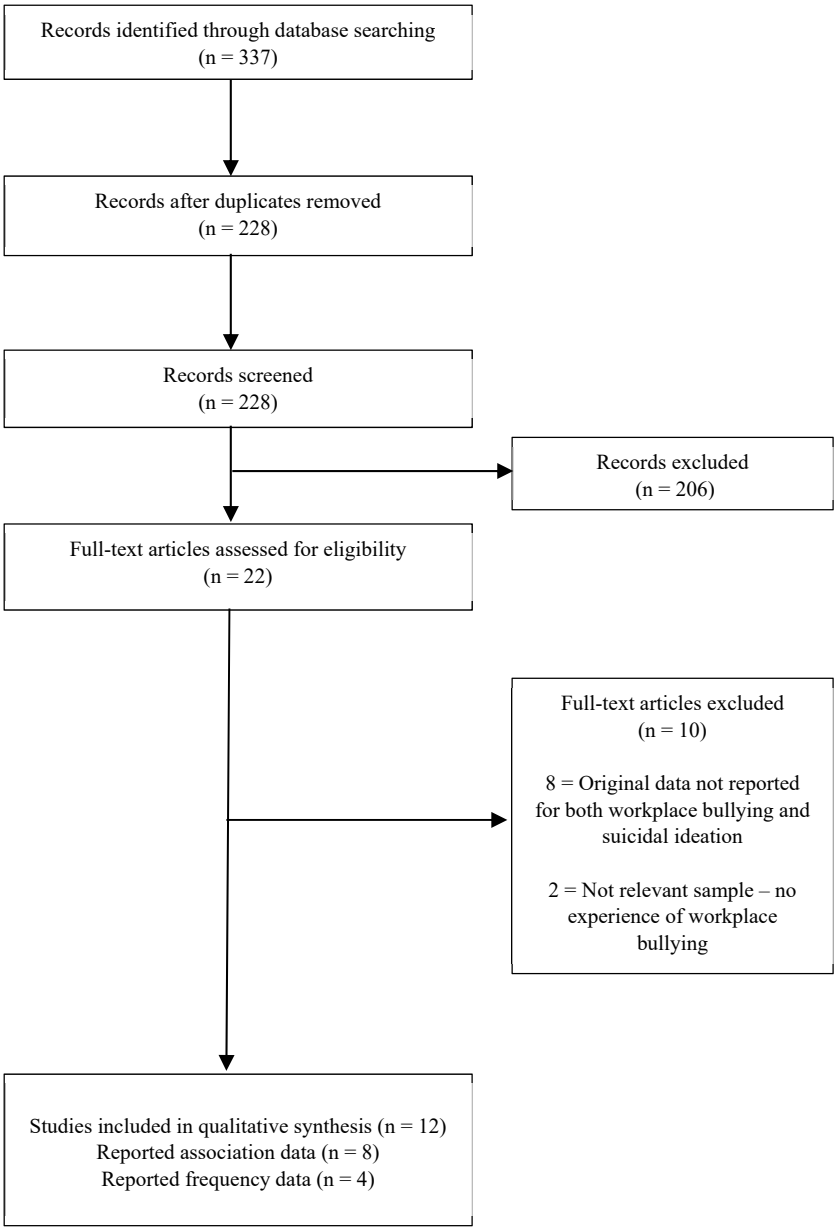
Nationellt centrum för suicidforskning och prevention (2013). "Suicide attempts in Sweden." (https://ki.se/en/nasp/suicide-attempts-in-sweden kontrollerad 2018-10-18).

Appendix

Supplementary Figure 1. Study selection concerning the role of workplace psychosocial exposures on suicide, suicide attempt and suicide ideation (drawn from Milner et al., (2017)).



Supplementary Figure 2. Study selection concerning the role of workplace bullying on suicide, suicide attempt and suicide ideation (drawn from Leach et al., (2017)).



Supplementary Figure 3. Study selection for review on workplace suicide prevention (drawn from Milner et al., (2014) and Witt et al.,(2016)).