

Work-related suicide: evolving understandings of aetiology & intervention

Tony LaMontagne

Professor of Work, Health & Wellbeing



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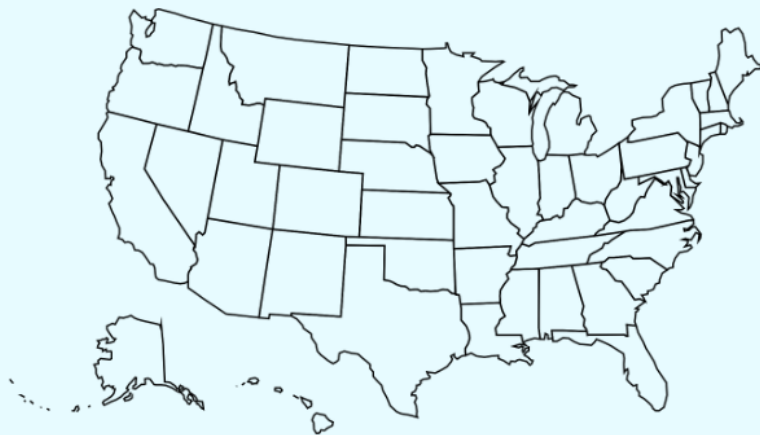
**In the event that any of the content of
this presentation causes distress...**

USA & CANADA

Suicide help line:

Call or text 9-8-8

Support available 24/7



The 988 Lifeline is a national network of local crisis centers that provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week in the United States. We're committed to improving crisis services and advancing suicide prevention by empowering individuals, advancing professional best practices, and building awareness.

ABOUT THE LIFELINE

Context

- Suicide a leading cause of death worldwide
- Major contributor to global BoD
- Unemployment increases risk ↔ being in work protective
- But unemployed up to 5-10% of working age pop, whereas up to 2/3 working
- Most suicide deaths among working population
- **What role does work play as a modifiable risk or protective factor?**
- Growing international attention: policy, practice, & research
- Dramatic clusters in recent decades have drawn renewed attention



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The Observer
Apple

Life and death in Apple's forbidden city

In an extract from his new book, Brian Merchant reveals how he gained access to Longhua, the vast complex where iPhones are made and where, in 2010, unhappy workers started killing themselves

Brian Merchant

Sun 18 Jun 2017 18.30
AEST



664



Only part of the story?
More occurring that may not
be recognised as work-
related?

Not a new problem: Media coverage of workplace suicide clusters from 2014 & 2017

Social impact
Guardian
sustainable
business

Burnout in France: focus turned to workplace health after spate of suicides

High-profile cases involving France Telecom and Renault led to review of work pressures, but are companies doing enough?

Richard Venturi

Wed 12 Feb 2014 18.00
AEDT



Outline

AIM

To provide a high-level summary of current evidence on aetiology & intervention to inform evolving policy & practice

OUTLINE

- A proposed definition
- Known and suspected work-related causes of suicide
 - Case-based evidence
 - Epidemiologic evidence
- Schema of potential work-related causes
- Implications for policy & practice



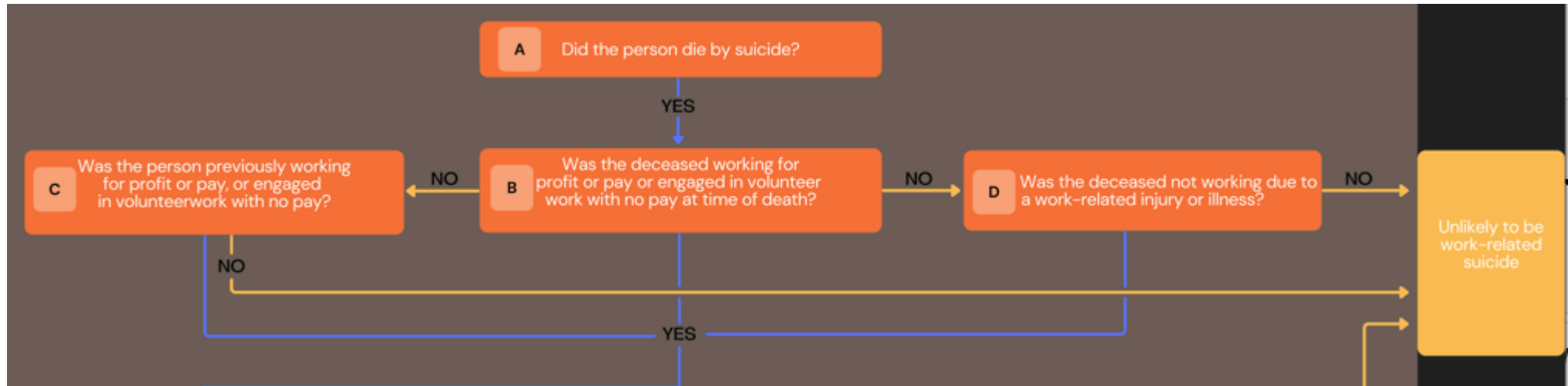
Defining work-related suicide: An OH&S perspective

Death by suicide that is caused in whole or in part by work or working conditions

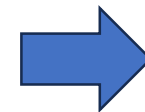
- Among persons working for profit or pay at time of death
- Also includes volunteers, those not working due to occup illness or injury, influence of past jobs
- Refers to the work or working conditions of the person who died by suicide
- Not necessarily during working hours or at workplace, can involve any means



Eligible for consideration of work-relatedness:



Potential work-related causes



Individual case-based approach

- Based on documentation from case investigations by police, medical examiners, coroners, or others; ‘psychol autopsy’ studies
- Work-relatedness can be suggested by:
 - Circumstances of the death
 - Attribution to work by the deceased (e.g., in a note)
 - Attribution to work by family, friends or co-workers
 - Work location of the death
 - Accessing means of suicide at or through work

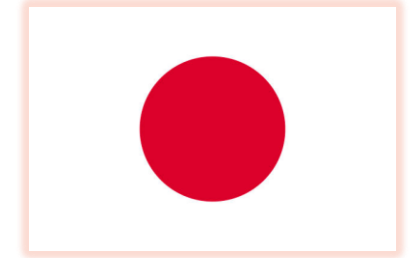


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Case-based approach (Japan)



- Work-related suicide, *karo-jisatsu*, has long been recognised in Japan
- Japanese National Police Report on 24,025 suicide deaths nation-wide in 2015
- Reasons for the deaths determined by police in ~ 18,000 of these cases
- **Estimated 12% of cases involved work-related issues**



Yamauchi et al (2017): Overwork-related disorders in Japan: recent trends and development of a national policy to promote preventive measures. *Industrial Health* 55:293-302



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Case-based approach (France)



- French National Public Health Agency proposed criteria for potential work-relatedness:
 - Occurred in the workplace
 - Note left by deceased implicated working conditions
 - Deceased in work clothes
 - Testimony of relatives implicated work-related difficulties
 - Work-related difficulties identified by investigators
- Sample of 1,135 suicide deaths from 2018
- **10% met one or more of these criteria**
- Criteria were designed as triggers for further investigation, not as evidence *per se* of work as a contributing cause

Gigonzac et al (2021): Etudes & Enquetes: Surveillance des suicides en lien potentiel avec le travail. Paris: Sante Publique France.



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Case-based approach (Australia)



- Sample of 3775 suicide deaths over a 7-year period
- 642 identified by police or coroner as ‘broadly work-related’
- Work-relatedness categorised into
 - 55% - involved reports of work stressors
 - 32% - jumped, laid, or moved in front of a moving train or heavy vehicle
 - 7% - involved a work location
 - 6% - involved work as a means (e.g., firearm)
- However, many cases unemployed or NILF (n = 246)
- Conservatively, the $642 - 246 / 3775 \sim 10\%$ **potentially work-related**

Routley & Ozanne-Smith (2011): Work-related suicide in Victoria, Australia: a broad perspective. *International J Injury Control & Safety Promotion* 9(2):131-4.



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Case-based approach (USA)



- Analysis of 89,389 suicides from 35 US states from 2013-2017
- Work-relatedness = indication on death certificate or work problem mentioned in documentation
- **Estimated 13.5% work-related**
- Further analysis suggested work a 'major factor' in one fourth of work-related suicides (~3%)

Peek-Asa et al (2021): Characteristics and circumstances associated with work-related suicides from the National Violent Death Reporting System, 2013–2017. *Intl J Environ Research & Public Health* 18(9538):11



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Case-based approach - summing up

- Various indicators of ‘work-relatedness’ applied
 - Some suggest work as a contributing cause (e.g., work difficulties)
 - Some not necessarily (e.g., wearing work clothes at time of death)
 - Some include persons not working at time of death
 - Some include the use of the work or workplace of others as a means--among persons not working at time of death (e.g., rail suicide)
- Estimates from four countries similar (12%, 10%, 10%, 13.5%)
- Valuable in advancing understanding and informing intervention
 - Japan National Prevention Strategy for Overwork-related disorders



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Epidemiologic approach

- Substantial literature on patterning of suicide by occupation or sector
 - Valuable for identifying priority groups for general suicide prevention
 - Sometimes explained at least in part by access to means
 - Paramedics (medicinal drugs)
 - Protective services workers (firearms)
 - Some occupations at high risk also characterised by adverse working conditions
 - Excessive working hours, high exposures to trauma and other psychosocial working conditions (paramedics)
 - Strictly speaking, such evidence supports hypotheses on work-related causes, more so than evidence of work-related causes *per se*
- Focus on recently expanding literature on specific exposure—outcome associations...



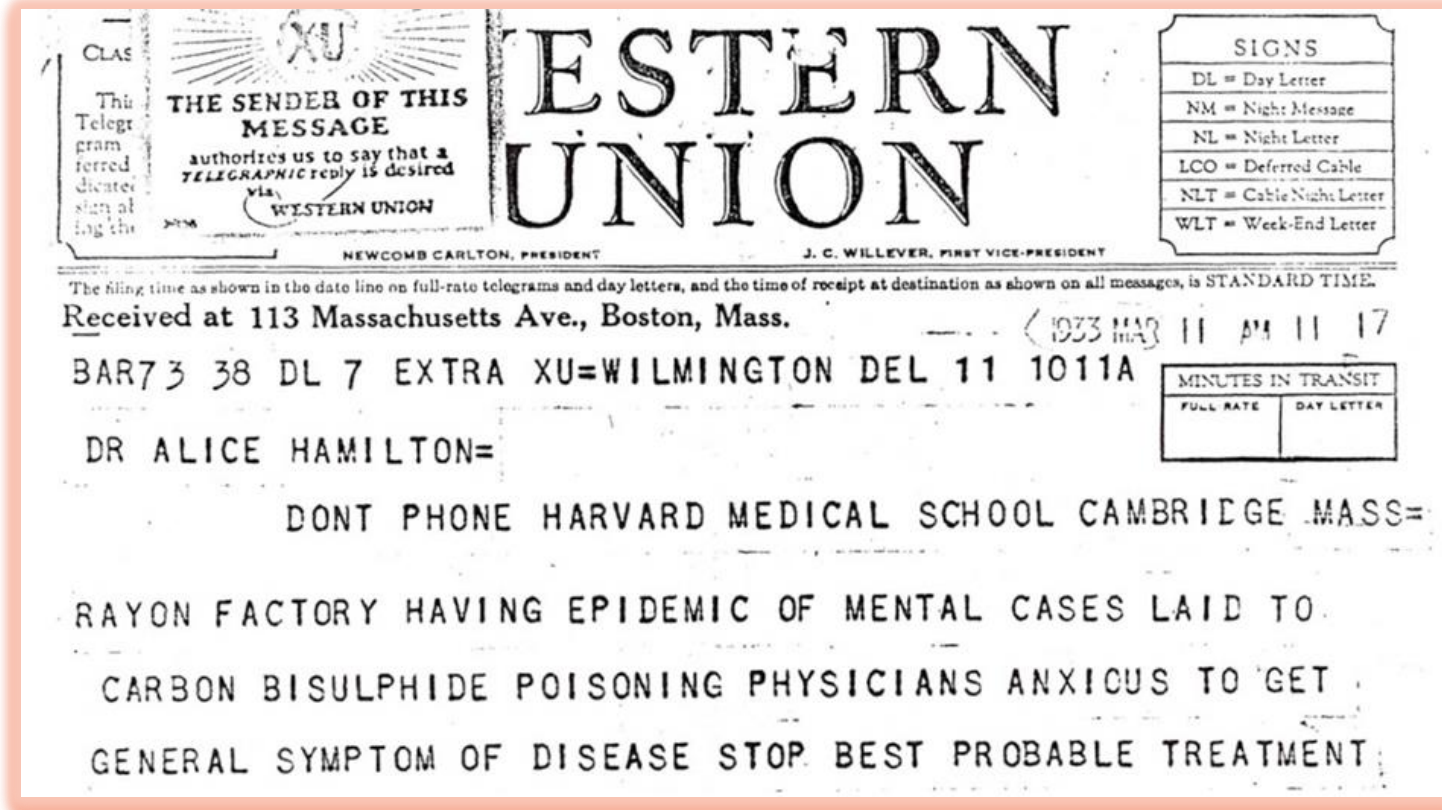
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Chemical Exposures: CS₂ (1)

- Psychotropic, neuropsychiatric effects noted from the late 1800s in Europe
- Case reports of depression, acute mania, suicide attempts, commitments to mental institutions



Hamilton A. Some new and unfamiliar industrial poisons.
New Engl J Med 1936 215(10):425-432.



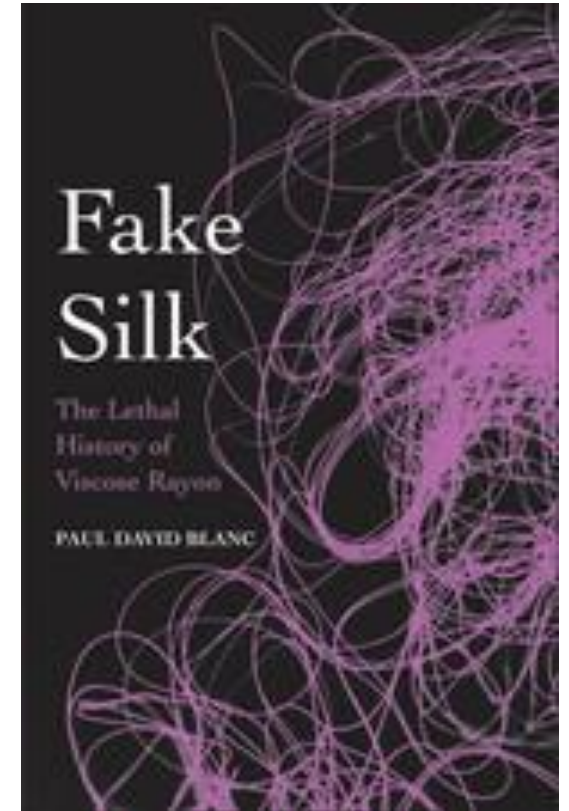
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Chemical Exposures: CS₂ (2)

- One of the first etiologic epi studies of a work-related cause of suicide
- US retrospective cohort rayon workers exposed from 1938-1948, followed to 1968
- Up to **4-fold elevated suicide mortality rates** compared to the US working age population
- Suicides likely under-ascertained
- “Carbon monoxide in garage”, “gunshot in mouth” coded as ‘accidents’ on death certificates



Mancuso & Locke (1972): Carbon disulphide as a cause of suicide: Epidemiological study of viscose rayon workers. *J Occup Med* 14(8):595-606



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Chemical Exposures: Pesticides & Solvents



- Unintentional occupational exposures to some pesticides & solvents associated with excess of suicides in some studies
- Plausible links to suicide through increased depression risk
- Further supported by elevated rates in exposed occupations
 - Farmers, automotive workers
- Systematic review pesticide exposure, depression and suicide found mixed evidence of associations
- Further research needed

Freire & Koifman (2013): Pesticides, depression and suicide: A systematic review of the epidemiological evidence.

Int J Hyg Environ Health 216(4):445-460.



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Physical Exposures?

- Noise exposure associated w/ psychol effects and behaviour changes
- Interactions w/ psychosocial hazards in job-related stress?
- Korean national survey: occup noise 'annoyance' associated with depressive sx and suicidal ideation
- Inconclusive, warrants further research



Yoon et al (2014): Occupational noise annoyance linked to depressive symptoms and suicidal ideation: a result from nationwide survey of Korea. *PLoS ONE* 9(8):e105321



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Psychosocial working conditions (1)

- Substantial growth in etiologic epi studies over last decade
- First systematic review in 2018 (22 studies)
- Exposures assoc w/ elevated risk of suicidal ideation and behaviour
- But limited by...
 - cross-sectional designs, dependent misclassification
 - confounding (e.g., health selection, SES)
 - many summary estimates small and marginally significant
 - few studies including suicide deaths (n = 6)



Milner et al (2018): Psychosocial job stressors and suicidality: A meta-analysis and systematic review. *Occup & Environ Med* 75(4):245-53



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Psychosocial working conditions (2)

- Updated search from 2018 SR → 7 new studies incl death outcomes
- Most working population-based (n = 85,000 to 3,000,000)
- All prospective cohorts from Sweden, France, and Denmark

Niedhammer et al (2020): Psychosocial Work exposures of the job strain model and suicide in France: Findings from the STRESSJEM prospective study of 1.5 million men and women over 26 years of follow-up. *Psychother & Psychosom* 89(6):398-401

Magnusson Hanson et al (2020): Work related sexual harassment and risk of suicide and suicide attempts: prospective cohort study. *BMJ* 370:m2984.

Blomqvist et al (2022): Perceived job insecurity and risk of suicide and suicide attempts: a study of men and women in the Swedish working population. *Scand J Work Environ & Health* 48(4):293-301



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Psychosocial working conditions (3)



- Register-based outcomes, individual & JEM-based exposures
- All (conservatively) adjusted for or excluded those w/ history of mental illness or previous suicide attempt
- Included adjustments or sensitivity analyses for a range of other potential confounders

Åberg et al (2022): Psychosocial job stressors and risk of suicidal behaviour— an observational study among Swedish men. *Scan J Work Env Health* 48(6):435-45.

Almroth et al (2022): Job control, job demands and job strain and suicidal behaviour among three million workers in Sweden. *Occup Environ Med* 79(10):681-9.



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Psychosocial working conditions (4)

- Increased risk of suicide death assoc w/ low control, poor social support, job strain, isostrain, passive jobs, job insecurity, bullying, sexual harassment, and occup violence; active jobs protective
- Job demands findings varied, most either null or *protective* for males, but sometimes higher risk for females
- 2023 bullying meta-analysis with the earlier positive study, risk still elevated but attenuated and included the null after adj for baseline mental health problems

Conway et al (2022): Workplace bullying and risk of suicide and suicide attempts: A register-based prospective cohort study of 98 330 participants in Denmark. *Scan J Work Env Health* 48(6): 425-434

Magnusson Hanson et al (2023): Association of workplace violence and bullying with later suicide risk: a multicohort study and meta-analysis of published data. *Lancet Public Health* 8(7):e494-e503



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Psychosocial working conditions (5)

- Collectively, recent studies addressed most shortcomings noted in 2018 review
- Adds substantial weight to evidence of hazard
- Common exposures across working populations...
- Population attributable fractions for suicide deaths:
 - 5% among men & 9% among women attributable to job strain (France)
 - 6% attributable to sexual harassment at work (Sweden)
 - 6% attributable to job insecurity (Sweden)
- Many of these exposures co-occur, PAF's may be less than additive?

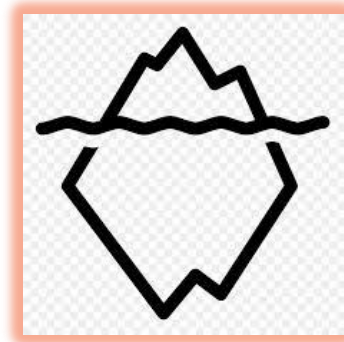


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Revisiting the scale of the problem

- How much overlap between psychosocial working conditions evidence and case-based 10-13%?
- Exposures to chronic psychosocial working conditions are represented in the case record-based determinations of work-relatedness ?
- Case-based investigations likely emphasise acute stressors or recent events, less likely to capture chronic exposures?
- Combined w/ psychosocial working conditions... could well exceed the case record-based 10-13% of suicides in working populations?
- Requires further study... tip of the iceberg?



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Exposure to suicide, other deaths or trauma

- Refers to witnessing bodily injury or death, incl suicide, in the course of one's work
 - First responders, military, social workers, mental healthcare providers
- Scoping review of 25 studies: 32-95% of first responder and mental health professionals exposed to suicide on the job
- Trauma exposure → PTSD → Suicidal ideation & behaviour
- Supported by excess suicide risk in many exposed occupations



Lyra et al (2021): Occupational exposure to suicide: A review of research on the experiences of mental health professionals and first responders. *PLoS ONE* 16(4):e0251038



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Exposure to suicide, other deaths or trauma (2)

- Australian survey of 15,000 first responders
- Career period prevalence of exposure to trauma = 51%
- → 4.5-fold higher odds of PTS symptoms (PTSD proxy)
- Population attributable fraction = 65% of PTS symptoms
- PTS symptoms → suicidal ideation & planning suicide attempt
- Trauma exposure may also operate independently through 'acquired capability' (Joiner's interpersonal theory)



Kyron et al (2019): Work-related and nonwork stressors, PTSD, and psychological distress: Prevalence and attributable burden among Australian police and emergency services employees. *Psychol Trauma* 14(7):1124–1133



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Adverse experiences arising from work-related injury or illness



- Large Korean study (n ~ 700,000): elevated suicide mortality amongst those with occup injuries compared to economically active population



- US study: elevated suicide mortality among injured workers requiring 7+ days leave compared to those w/ injuries requiring only medical expense compensation



- Australian study: elevated rates of hospital admission for self-harm have been observed among workers' compensation claimants
 - Mechanisms complex: depression, pain, adversarial insurance processes...

Lee et al (2021): Increased risk of suicide after occupational injury in Korea.
Occup Environ Med 78(1):43-4

King et al (2023): Associations between workers' compensation and self-harm: A retrospective case-series study of hospital admissions data.
Lancet Reg Heal - West Pacific 30: 100614



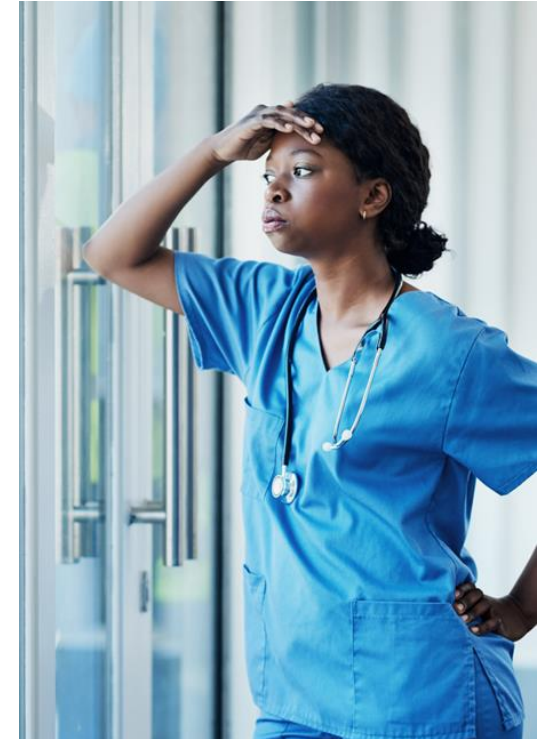
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Access to means at or through work

- Access to means through one's job or workplace is a well-established risk factor for suicide
 - Police (firearms), veterinarians (euthanising drugs), healthcare professionals (medicinal drugs), agricultural workers (pesticides)
- Australian national study: Persons in occupations with access to firearms, medicines or drugs, and carbon monoxide more frequently used these methods to end their lives than those without access to means



Milner et al (2017): Access to means of suicide, occupation and the risk of suicide: A national study over 12 years of coronial data. *BMC Psychiatry*. 2017;17(125):1-7



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Normative work environments with high stigma or discouragement of helping behaviours

- Norms within a workplace can vary in the extent to which they inhibit or foster help-seeking
- Levels of stigma are related to suicidal ideation, and can hinder help-seeking
- Masculine norms emphasising self-reliance and repudiating help-seeking assoc with suicidal ideation
 - Contributing to high suicide rates in male-dominated sectors such as construction?
- Levels of stigma, help-seeking norms, or mental health literacy: working conditions subject to OH&S prevention & control?
 - Whether yes or no, they are clearly important modifiable work-related risk factors

King et al (2020): Expressions of masculinity and associations with suicidal ideation among young males. *BMC Psychiatry* 20(228):1-10



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Broad cultural norms that promote extreme orientation to work

- Societies vary in normative orientations to work
- Focus on macro level cultural norms that drive exposure to psychosocial hazards
- Example: *karo-jisatsu* in Japan representing an interaction between PWC (e.g., excessive demands, long working hours) and powerful social and cultural norms around the expectation that workers prioritise the goals of one's organisation over one's own wellbeing
- Example: the Foxconn story in China – *compelling or enforcing* extreme orientation to work?

Kawanishi (2008): Why do Japanese workers work themselves to death?

Int J Ment Health 37(1):61-74

Targum & Kitanaka (2012): Overwork suicide in Japan: A national crisis.

Innov Clin Neurosci 9(2):35–38.



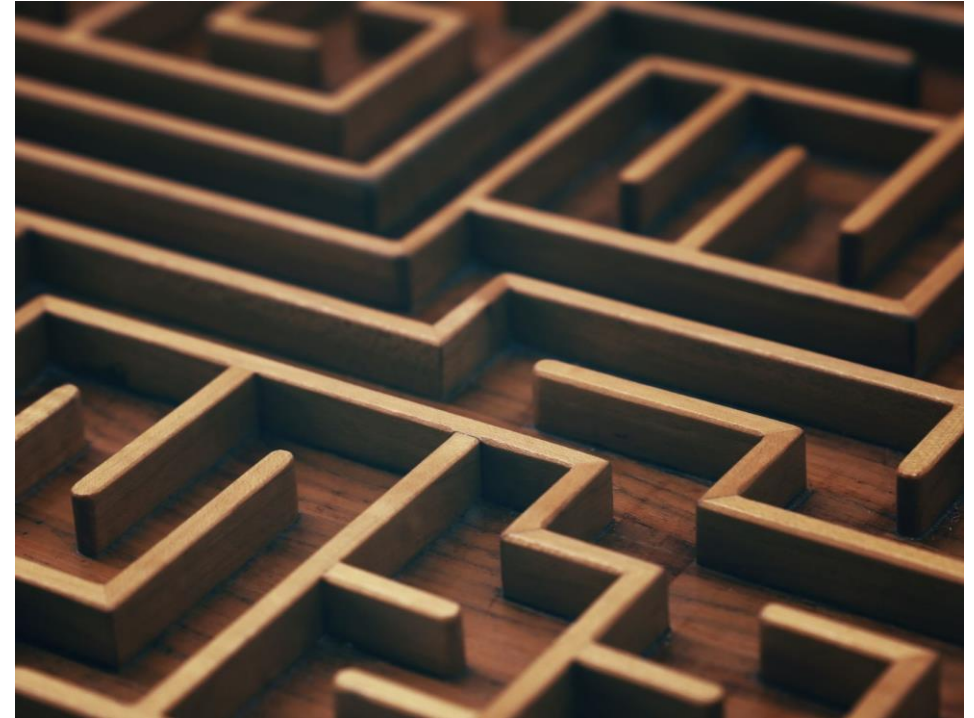
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Summarise evolving understanding of aetiology

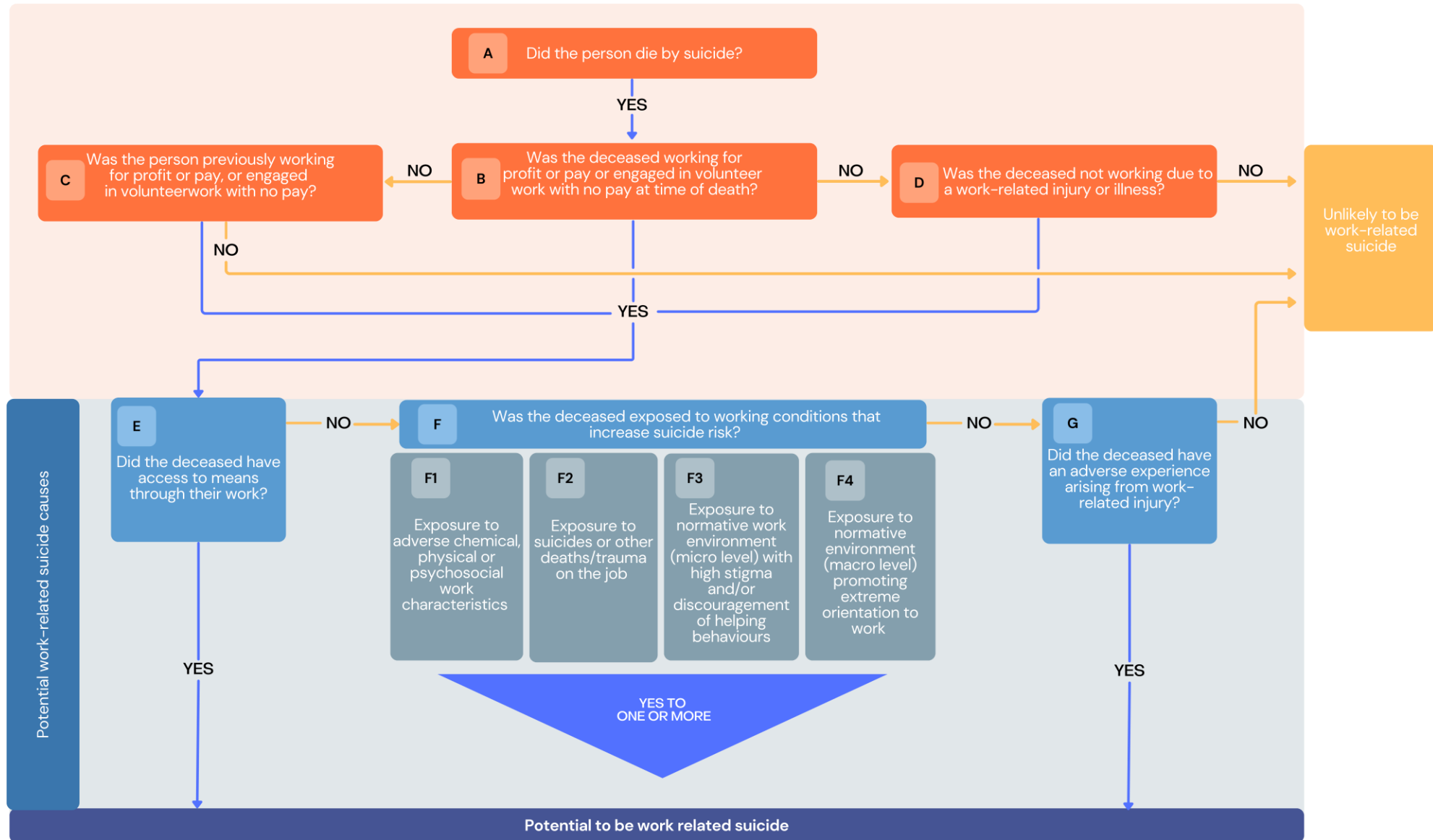
- Integrate:
 - Case-based and epidemiologic evidence to date
 - Established links with access to means at or through work
 - Evidence from related fields – sociology, psychology
- Summarised in schema of potential work-related causes of suicide



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Potential work-related causes of suicide



Potential work-related causes of suicide: Uses for schema

- Summary of current etiologic evidence
- Application to investigations:
 - Occupational history in recent years?
 - Access to means?
 - If yes, used?
 - Exposures to workplace hazards—known?
 - Complement w/ JEM-based estimates?
 - If deceased not working due to work-related injury or illness, circumstances?
 - For examples, on workers' compensation claim , other temporary disability cover? Severe pain or disability?
 - Deceased working in an occup with exposure to trauma?
 - Prevailing attitudes to talking about mental health or other problems in the workplace? Workplace culture?



Strengths & Limitations

- Focus on mortality outcome: for brevity, objective
 - Suicidal ideation and attempts also warrant attention
- What counts as 'work'?
 - Distinction blurring b/w work and not working
 - Assessing potential influence of past jobs?
- Suicide deaths usually involve multiple factors/causes
 - Non-work causes more potent (e.g., depression, previous attempt)
 - Work may be a major or minor contributor
- Have not delved into suicide theory
 - Consistency b/w main theories and a role for work
 - Access to means, mediation through depression, Joiner's theory
 - Further discussion in HSE report, new theory of work-related suicide



HSE Workplace Health Expert Committee (2022): *Work-related suicide*.WHEC-18.
London: UK Health & Safety Executive.

Howard et al (2021): Work and suicide: An interdisciplinary systematic literature review.
J Org Behavior 43(2):260-285



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Implications for OH&S Policy & Practice

OH&S perspective:

- Where working conditions contribute to suicide risk, they should be identified, assessed and controlled just like any other occup hazard
- Hierarchy of controls approach
- Psychosocial working conditions likely most significant contributors – already recognised as priorities due to assoc w/ depression, anxiety, burnout, CVD, and more
- Evidence adequate to justify action
- Adds further justification to need for *work-directed* prevention & control



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Implications for OH&S Policy & Practice (2)

- Yet... prevalent practice disproportionately focuses on worker- and illness-directed intervention, with inadequate work-directed
- Massive growth of workplace mental health intervention over last two decades, including workplace 'suicide prevention'
 - 2018 systematic review found observational evidence of improvement in awareness, literacy, attitudes towards suicide, improved helping behaviours
 - 2017 meta-analysis of first responders showed halving of suicide rate over 5 years f/u

Milner & LaMontagne (2018): *Systematiska kunskapsöversikter: Suicide in the employed population : A review of epidemiology, risk factors and prevention activities*. Arbete och hälsa. Göteborgs universitet.

Witt et al (2017): Effectiveness of suicide prevention programs for emergency and protective services employees: A systematic review and meta-analysis. *American J Ind Medicine* 60(4):394-407



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Implications for OH&S Policy & Practice (3)

- **Gap:** Most workplace SP programs utilise the workplace as a setting for general SP, usually without addressing working conditions
 - Despite policy recommendations to do so as far back as 2006 (WHO)
- Prevalent workplace SP programs valuable contributors to preventing suicide independent of cause
 - Many in occup or sectors with high suicide rates (e.g., construction)
- Ethical critique of general SP: overly individual/illness-focused, neglecting social determinants
- **Close the gap:** Workplace SP will only reach its full potential by strengthening and integrating work-directed intervention

Fitzpatrick (2018): Reshaping the ethics of suicide prevention: Responsibility, inequality and action on the social determinants of suicide. *Public Health Ethics*, 11(2), 179–190



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Implications for Policy & Practice: Access to Means



- Pesticides warrant particular mention WRT access to means at or through work
- Intentional pesticide self-poisoning most common method in LMIC
- Efforts to eliminate / reduce / restrict access of paramount importance both from OH&S and general population perspective
- Aligns w/ OH&S authorities having extended purview to protect the public (as well as workers) from risk arising from work / workplaces

Gunnell et al (2017): Prevention of suicide with regulations aimed at restricting access to highly hazardous pesticides: a systematic review of the international evidence.
Lancet Glob Health 5(10):e1026-e1037



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OH&S Authority Investigation of Suicide Attempts & Deaths

- Suicide attempts or deaths *at work* should trigger immediate investigation by OH&S authorities
- Where occur *outside of work* and may be work-related, also should trigger OH&S investigation
- Suspicion of work-relatedness would be determined by police, coroner, others → Notify OH&S authority
- OH&S authority would focus on work-related causes (schema, JEMs, etc.), complementing police, coroner, other investigations
- **Close surveillance loop:** apply findings to primary prevention, in affected workplace and elsewhere



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Workers' Compensation



- Work-related suicide acknowledged and eligible for WC in some jurisdictions
 - France, Japan, Australia, Canada
- Where work-related causes contribute to a particular suicide, such deaths (attempts) should be covered by WC

Yamauchi et al (2017): Overwork-related disorders in Japan: recent trends and development of a national policy to promote preventive measures.

Industrial Health 55:293-302



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Summing Up



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How far have we come?

"There was a famous rubber factory where they put bars on the second story windows because so many workers had a tendency to jump out and kill themselves."

-- Dr. Paul Blanc, author of *Fake Silk*, CBC Radio interview 2017



China

● This article is more than 13 years old

Foxconn offers pay rises and suicide nets as fears grow over wave of deaths

- Families look for motives for suicides at plant in China
- Labour activists point to harsh conditions in factory

Jonathan Watts
in Longhua,
Guangdong
province

📧 @jonathanwatts
Sat 29 May 2010 04.35
AEST



Conclusions

- Many workers dying from preventable work-related suicide
- Likely > 10-13% of suicide deaths
- PWC most prevalent contributors
- Various principles- and evidence-based intervention strategies available... but inadequate focus on working conditions
- Moving in the right direction, but a long way to go
- Causes for optimism
 - Increasing recognition, expanding prevention & control, advocacy




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Report & podcast


LaMontagne & King (August 2023): *Work-related Suicide: A Discussion Paper*.
Suicide Prevention Australia, 46 pages.

www.suicidepreventionaust.org, under “Latest Research”



Reach In, Reach Out
<https://feed.podbean.com/IASP/feed.xml>

2.3K Downloads | 18 Episodes



Work-Related Suicide: An Occupational Health & Safety Perspective
7 days ago

Dr. Sally Spencer-Thomas interviewing Tony LaMontagne & Tania King for the International Association for Suicide Prevention Workplace Special Interest Group podcast (September 2023)



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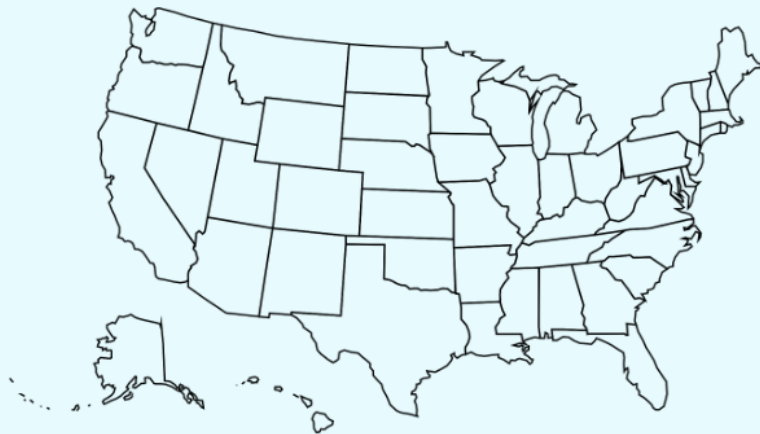
**In the event that any of the content of
this presentation causes distress...**

USA & CANADA

Suicide help line:

Call or text 9-8-8

Support available 24/7



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ABOUT THE LIFELINE

**Dedication: to the memory of treasured
colleague & friend A/Prof Allison Joy Milner
(1983—2019)**



Thank you

Prof Tony LaMontagne

tony.lamontagne@deakin.edu.au

Find me on ResearchGate



iht.deakin.edu.au

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Are suicide rates among Australian construction workers changing over time?

- Construction workers at elevated risk of suicide death compared to other working males
- Australian national analysis 2001-2019
- Over entire 19-year period (pooled):
 - Male construction workers = 26.6/100,00 workers (95% CI 25.8, 27.4)
 - Males in other occupations = 13.2/100,000 workers (95% CI 12.9, 13.4)
- Compared rates over time between the two groups using join point regression and comparative measures of Average Annual Percentage Change (AAPC)

Maheen H et al (2022): Are suicide rates among Australian construction workers changing over time? A trend analysis from 2001-2019. *Scientific Reports* 12:20201

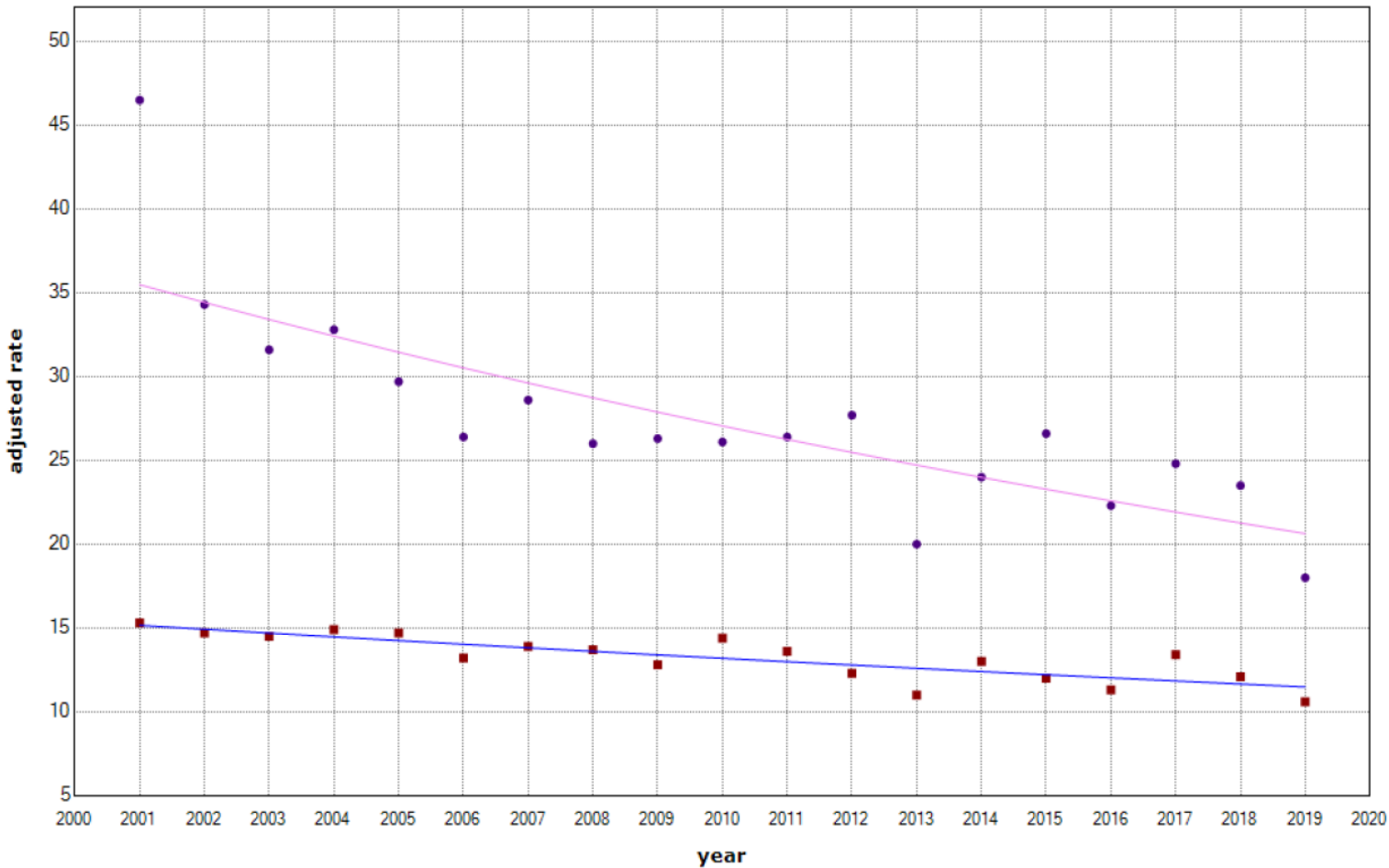


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Are suicide rates among Australian construction workers changing over time?



| | Construction workers | Other workers |
|---------------|----------------------|----------------------|
| AAPC (95% CI) | -3.0 (-4.0, -2.0) | -1.5 (-2.1, -1.0) |
| AAPC compare | 1.4 (0.4, 2.5) | |

Maheen H et al (2022): Are suicide rates among Australian construction workers changing over time? A trend analysis from 2001-2019. *Scientific Reports* 12:20201

Are suicide rates among Australian construction workers changing over time?

- If trends are real/confirmed... a very hopeful sign
- Bucks the trend in Australia—overall male suicide rate increasing
 - 16.2/per 100,000 2011 to 18.6 per 100,000 in 2020
- What might explain findings?
 - Employed males have lower risk of mental illness and suicide (HW effect)
 - Employed males benefit more from expanded MH & SP services?
 - Population-level MH literacy, stigma reduction, including male-tailored elements
 - Sector-specific SP: first substantive policy attention in a 2003 Royal Commission, MATES in Construction from 2008 (reach ~300,000) and other programs (state-based)
- Net effect of these intervention efforts could plausibly have an impact on suicide rates among construction workers



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In the event that any of the content of this presentation causes distress...



Government
of Canada

Gouvernement
du Canada

Suicide help line:

Call or text 9-8-8

Support available 24/7



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