The Mental Awareness, Respect and Safety (MARS) Program Landmark Study: Insights from the Worker Survey and Interviews

Report prepared for the Western Australian Government

October 2023

Foreword from the Research Team

At a time when worker mental health is on the radar in Australian organisations, perhaps in a way it has never been before, we are pleased to present this report about the work experiences of Western Australian mining workers. The mining sector is vital for WA, not only in terms of facilitating our collective economic prosperity, but also because these workers constitute 10% of our workforce.

Our report focuses on three critical issues - creating mentally healthy workplaces, building a culture of safety and respect (and, conversely, lowering bullying and harassment), and preparing for workplace safety in future mining.

From our survey of over 2,500 workers, in-depth interviews with 60 workers, and systematic comparisons against similar samples and norms, we show there are clear strengths in the industry, most notably around physical safety. In the words of one of the workers *"you can just see a cultural change towards safety in the attitudes... we're not putting up with the old school mentality anymore."* These overall positive findings about physical safety are to be celebrated. They also show that the sector is open to, and capable of, significant positive change.

The research also highlights some key issues that need to be addressed. The first of these is worker mental health. Levels of burnout and psychological distress are high: more than one in three mining workers, for instance, report regularly feeling emotionally exhausted. This level of mental ill health presents a significant risk to an industry competing for talent. We call for concerted efforts to support people who are already experiencing poor mental health and, at the same time, strongly advocate the need to prevent harm through better work design, leadership, and organisational and team culture.

We are aware of excellent initiatives to improve the mental health and well-being of workers in several mining organisations, which we hope will continue and be shared across the industry. We urge others who are not yet making the needed investments to step up to do so. Expanded legislation around psychological injury at work makes such action imperative.

A second key issue highlighted by this research is toxic cultures of bullying and sexual harassment, especially for women. The negative impact of experiencing sexual harassment on mental health and well-being is a clear and important finding. The industry appears to have made progress in weeding out explicit and overt forms of sexual harassment, but covert forms of sexual harassment such as sexism and misogyny remain high, with 5-41% of women mining workers reported experiencing behaviours of sexist and sexual hostility sometimes, often, or very often within the

past 12 months, while 3-11% of men experienced the same. Experienced levels of sexual harassment were strongly linked to negative outcomes such as psychological distress and intention to leave. To attract more women to the workforce, retain women, and prevent harm to women, sexual harassment must not be tolerated.

Importantly, our research does not simply document these issues, but it also identifies job, organisational, team, leadership, and individual factors that affect them. This evidence from the research, as well as wider research evidence, can be drawn on to guide meaningful action. A list of advice from the research team for such actions is being submitted to the MARS Program separately.

It is our hope that this research will provide foundational insights to support evidence-based action from frontline workers, union members, CEOs, regulators, representatives from industry bodies, policymakers, and all others who are keen to put the long-term improvement of the health and well-being of mining workers front and centre. In 2025, we will repeat this research to assess change in the sector. The clear commitment from the MARS team and other key stakeholders to improve workers' experiences in this vital sector bodes well for achieving future positive change.

We thank the members of our Industry Expert Panel who have provided robust and helpful guidance along the research journey, as well as the members of our Academic Advisory Team who have willingly contributed their expertise. We also thank the many thousands of mining workers who placed their faith in us to represent their views.

John Curtin Distinguished Professor Sharon K. Parker

On behalf of the research team:

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- ARC Laureate Fellow John Curtin Distinguished Professor Sharon Parker, Chief Investigator (Centre for Transformative Work Design)
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- Professor Sharyn Burns, Academic Advisor (Collaboration for Evidence, Research and Impact in Public Health, Curtin School of Population Health)

PREFACE

The Mental Awareness, Respect and Safety in the mining industry – The MARS

Program Landmark Study is a four-year research and evaluation project led by

Professor Sharon Parker at the Centre for Transformative Work Design (CTWD),

within the Future of Work Institute, Curtin University.

The MARS Program Landmark Study was commissioned by the Western Australian (WA) Government to design and implement a project assessing the mining industry, regarding three focus areas: 1) mental health and well-being, 2) sexual harassment, assault, and a respectful culture, and 3) the future of work in mining.

The MARS Program Landmark Study comprises the following reports:

Preliminary Report 1 (completed): The first preliminary report (Duncan et al., 2022), "Towards a Healthy and Safe Workforce in the Mining Industry: A Review and Mapping of Current Practice", provides an overview and assessment of employee well-being in the Australian mining sector and develops an innovative approach to construct measures of employers' prioritisation across three focus areas: mental health and well-being, physical health and safety, and workplace culture and sexual harassment/assault.

Report 2A (completed): The second report (Yam et al., 2022), "Mental Awareness, Respect and Safety in the mining industry – The Landmark Study: A Review and Synthesis of the Literature", presents a literature review providing an overview and synthesis of the current literature concerning the three focus areas. Findings from the report guide our empirical investigations of these focus areas.

Report 2B (completed): The third report (Drane et al., 2023), "Mental Awareness, Respect and Safety in the Mining Industry – The MARS Program Landmark Study: Workplace Policy and Practice Survey" presents the results of a workplace policy and practice survey that assessed the initiatives that mining companies (as reported by Human Resources and Work Health & Safety personnel) engaged in to support worker well-being.

Report 2C (this report) presents the results of the worker survey and interviews assessing and understanding the experiences of WA mining workers in relation to the three focus areas.

Report 2C will be complemented by a separate report detailing a list of advice from research based on the evidence and findings from the worker survey and interviews. This report will be submitted separately to the MARS Program.

Report 3 (due 2025) will consist of the findings from a follow-up data collection effort. This report will evaluate the success of the initiatives implemented after the baseline data collection.

Final Report 4 (due 2026) will synthesise the findings and report on efforts across the four years, including but not limited to data collection activities to track the trajectories and changes in the three focus areas over time, and including recommendations.

THE RESEARCH TEAM

This research has been led by members of the Centre for Transformative Work Design, Curtin University. The Centre for Transformative Work Design is a Research Centre in which organisational psychology researchers and professionals work together to transform work under the directorship of Australian Research Council Laureate Fellow, Professor Sharon K. Parker (www.transformativeworkdesign.com). The Centre conducts high quality, independent, and innovative research to understand healthy and productive work across all industries.

Authors of the report are as follows:
- Dr Cheryl Yam, Lead Researcher (Centre for Transformative Work Design)
- ARC Laureate Fellow John Curtin Distinguished Professor Sharon Parker, Chief Investigator (Centre for Transformative Work Design)
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INDUSTRY EXPERT PANEL

We would like to acknowledge the Industry Expert Panel members who have provided guidance and support. The Industry Expert Panel includes members from the following groups (listed in alphabetical order):
- Association of Mining and Exploration Companies (AMEC)
- Australasian Institute of Mining and Metallurgy (AusIMM)
- Australian Manufacturing Workers' Union (AMWU)
- Australian Resources & Energy Employer Association (AREEA)
- Chamber of Commerce and Industry WA (CCIWA)
- The Chamber of Minerals and Energy of Western Australia (CME WA)
- Department of Mines, Industry Regulation and Safety (DMIRS)
- Lifeline WA
- Unions WA
- Women in Mining and Resources WA (WiMWA).

ACADEMIC ADVISORY GROUP

As well as the core team from the Centre for Transformative Work Design, several senior academics have contributed to the project:

- Professor Mark Griffin, John Curtin Distinguished Professor, Director Future of Work Institute (Curtin University)
- Assistant Professor Laura Fruhen, Behavioural Science Institute (Radboud University)
- Associate Professor Karina Jorritsma, Professor of Practice, Future of Work Institute (Curtin University)
- Professor Sharyn Burns, Professor Health Promotion, Curtin School of Population Health (Curtin University)
- Professor Peter McEvoy, Professor of Clinical Psychology, Curtin School of Population Health (Curtin University)
- Professor Alan Duncan, John Curtin Distinguished Professor, Director Bankwest Curtin Economics Centre (Curtin University).

Glossary of Terms

Abusive line manager/supervisor leadership	The extent to which workers perceive that their line manager/supervisor engages in the sustained display of hostile verbal and nonverbal behaviours.
Active coping	The proactive steps that workers take to manage their stressors.
Adaptability	The extent to which workers engage in work behaviours that contribute to how they cope with, respond to, and support change.
Automation anxiety	Perceptions of job security vis-à-vis the introductions of digital technologies in the workplace.
Automation helpfulness	The extent to which workers perceive that the use of digital technologies in the workplace will be either beneficial or harmful.
Autonomy	The degree of freedom a worker has in work scheduling and methods, and in decision making.
Being silent	Passivity in the face of witnessing sexual harassment whereby the bystander does not take any action to confront or report the harassment.
Burnout/emotional exhaustion	A state of exhaustion due to prolonged periods of stressors.
Bystander	A person who does not take action in the face of witnessing disrespectful behaviour towards an impacted person to interrupt and challenge bullying and sexual harassment.
Change management	The perceptions and experiences of workers relating to how organisational change (large or small) is managed and communicated to them in their companies.
Confidence in grievance procedures	The extent to which workers feel confident that they can address concerns with management if an incident of sexual harassment occurs.
Control variables	Variables which are extraneous to the effect(s) of interest, yet which might confound the results. In our analyses, the statistical variances associated with these variables are mathematically partialled out to examine the "true" effect of one or more variable of interest on the desired outcome.
Emotional support	Coping strategies which involve turning to others for comfort and help.
Explainable AI	The extent to which workers understand or can predict digital technology systems (e.g., automation, artificial intelligence, robotics, big data, etc.) at work.
Flexibility	The degree of flexibility that workers have, such as the option of job sharing, time off for important events or requests for different rosters.
Gender harassment	A broad range of verbal and non-verbal behaviours not aimed at sexual cooperation but that convey insulting, hostile, and degrading attitudes based on gender. The aim of these behaviours are to put people down and to push them out of the accepted "ingroup".

Gender parity	The balanced distribution of gender in the workplace and can be a powerful context in which harassment occurs - or indeed, is prevented
General experience of bullying	Experiencing any bullying in the workplace.
Information and technology resources	The extent to which workers feel that they have sufficient resources to do their job effectively.
Interactional justice	The degree to which workers are treated with respect, kindness, and dignity when raising issues of sexual harassment.
Job Crafting	Job crafting refers to worker-initiated modifications to the designs of their jobs to improve the fit between the characteristics of the job, and their own needs, abilities, and preferences, thereby increasing the perception that work is engaging and meaningful.
Job insecurity	Job insecurity refers to the perceived fear of losing one's current job due to unexpected or uncontrollable events which can interrupt the continuity of one's work experience.
Job satisfaction	A worker's feelings about work and their overall judgement of the quality of the work and workplace.
Masculinity Norms	The behaviours perceived to be normal of the traditional male gender role.
Network silence	A network phenomenon that examines the social forces contributing to the extent to which a witness of sexual harassment is willing and able to speak up and be an active bystander to support the person impacted by sexual harassment.
Not hearing	Dismissing or trivialising incidences of sexual harassment
Notifiable incidents	Incidents that arise out of the conduct of a business and include the death of a person, a serious injury or illness, and a dangerous incident.
Numeric gender parity	A 50-50 female to male representation but is more typically measured as 40% to 60% representation of either sex
Perceived co-worker support	The emotional and technical support that workers receive from their colleagues.
Perceived excessive surveillance / perceived excessive rules	Perceived excessive surveillance and perceived excessive rules are factors that together indicate the level of total institutionalisation, or the extent to which workers perceive that they are subject to strict norms, unnecessary rules, and inflexible schedules at work
Perceived line manager/supervisor support	The emotional and technical support that workers receive from their line manager/supervisor.
Perceived stigma	Mental health related stigma; when a person gets labelled by their illness and becomes part of a stereotyped group. Negative attitudes towards this group can lead to discrimination.
Physical demands	A physically demanding job is one which requires physical activity or effort.
Physically intimidating Bullying	Physical acts or verbal statements that result in the impacted person feeling physically threatened. Direct physical contact is not required for an act to be intimidating.
Possibilities for development	The extent to which workers have opportunities for development in their work.

Psychosocial safety climate	The extent to which there are shared perceptions regarding policies, practices and procedures for the protection of worker mental health and well-being.
Recovery strategies	Actions that workers take to recuperate from the demands of work.
Reportable incidents	An unplanned event or situation that results in, or has the potential to result in, injury, ill health, damage or loss.
Rigid gender roles	Resolute adherence to the stereotypical division of labour (for example, men should be the breadwinners, while women are responsible for nurturing the family), as well as rigid definitions of "masculine" and "feminine" identities.
Role clarity	The presence of adequate role-relevant information – in terms of availability and quality of information.
Safety climate	Employees' shared perception of the value of safety in the work environment.
Safety compliance	The degree to which workers follow safety procedures in the workplace.
Safety participation	The initiative by workers in participating in and promoting safe workplace behaviours.
Safety procedure participation	The opportunities for workers to provide inputs into improving workplace safety procedures.
Saturation criteria	In qualitative research this refers to a point whereby no additional data is found whereby the researcher can further diversify the findings of the study.
Sexist hostility	A type of gender-based harassment which includes behaviours that insult abilities of people of either gender, on the sole basis of their gender. Examples include sexualised practices and behaviours that are unwelcome, such as sexually degrading images and words in the surrounding environment and can involve obscene gestures and vulgar terms of address.
Sexual coercion	The attempts of or actual extortion, both explicit and implicit, of sexual cooperation in return for job-related considerations or conditions of employment.
Sexual harassment	Unwelcome physical, verbal or non-verbal conduct. It includes behaviours such as touching, fondling, brushing up against someone, unwelcome innuendos, commentary with sexual undertones, whistling, staring, sending messages or images of a sexual nature or sexual stories and jokes.
Sexual hostility	A sub-facet of gender-based sexual harassment which is to be more sexualised than sexist hostility and includes behaviours such as making offensive sexual comments directed at a person.
Silencing	Active efforts to avert complaints or actions against the harasser
Social contact	The extent to which a job provides opportunities to build informal social relationships/friendships.
Suicide ideation	Thoughts and plans about suiciding.
Supportive manager	A manager that provides technical and emotional support to the worker.
Task significance	The degree to which a job influences the lives or work of others, inside or outside the organisation
Task variety	The extent to which a job involves completing an array of tasks.

Team culture	A shared belief that the team is safe to speak out, and express views and concerns.
Thriving	A state of being energised, feeling valued, and feeling that what one does is valued. Thriving is being productive, being open to challenges presented, and having the opportunity to continuously learn and grow. It is an important positive aspect of mental health and well-being, characterised by positive states of thinking, feeling, and functioning.
Transformational line manager/supervisor leadership	The extent to which workers perceive that their line manager/supervisor motivates them by transforming their attitudes, beliefs, and values through articulating a clear vision of the future based around organisational values, as opposed to simply gaining compliance.
Turnover intention	The likelihood that a worker intends to leave their company, or the industry.
Under-reporting	A function of the number of incidents or near misses reported by the worker and the number of incidents or near misses experienced by the worker but not reported
Unwanted sexual attention	A wide range of verbal and non-verbal behaviour that is unwelcomed, unpleasant, offensive, unwanted, and unreciprocated. It can be sometimes terrifying and traumatising to the impacted person.
Upstander	A person who takes action in the face of witnessing disrespectful behaviour towards an impacted person to interrupt and challenge bullying and sexual harassment.
Upstander intervention	Actions of others in the face of disrespectful behaviour to interrupt and challenge bullying and sexual harassment
Well-being	Optimal psychological functioning and experience, which includes both experiencing happiness and the realisation of one's potential.
Witness	A person who witnesses any bullying or sexual harassment towards another person or people (the "impacted person/s") in the workplace.
Work design	The content and organisation of one's work tasks, activities, relationships, and responsibilities. The SMART Work Design model covers the key aspects of work design that are psychologically important, including: Stimulating (e.g., task variety); Mastery (e.g., role clarity); Agency (e.g., job autonomy); Relational (e.g., social support), and Tolerable (e.g., reasonable levels of workload demands).
Workload demands	The extent to which workers experience the need to complete their tasks quickly and in a pressured way.
Workplace bullying	Repeated, unreasonable behaviour directed at a worker or group of workers that creates a risk to health and safety at work.

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Executive Summary

Executive Summary

The resource industry is central to Western Australia's (WA) economy, with mining and oil and gas together contributing 46% (or $186.8 billion) of the gross state product in 2021-22[1]. The mining and mineral exploration industries contribute a significant share of employment in WA, with an average of 148,395 workers during 2020-21[2]. Indeed, the State mining industry employs approximately 10% of the WA workforce[3]. Mining is of key significance for the economic future of WA and drives key technological change through the provision of critical resources. It is therefore vital that attention is given to the sustainability of human resources in the mining industry via an evidence-based focus on worker health and safety issues.

Multiple reports investigating worker health and safety have emerged in recent times, such as those focused on FIFO worker mental health and well-being (*Impact of FIFO work arrangements on the mental health and well-being of FIFO workers*[4]) and on sexual harassment within the mining industry (e.g., *Enough is Enough – Sexual harassment against women in the FIFO mining industry*[5]). These reports are complemented by national reports on similar topics (e.g., *Respect@Work: National inquiry into sexual harassment in Australian workplaces*[6]). Finally, several reports have discussed the future of work, highlighting key trends that organisations need to consider. Incorporating the recommendations from these reports, as well as other research, helps to build upon existing government and industry responses.

Changing legislation is one reason for the growth of interest worker health and safety. It is important to recognise the legal responsibilities of all employers (or person conducting a business or undertaking) to identify and address the specific psychosocial hazards associated with work.

In this report, we focus specifically on the WA mining industry. It is noted that many in the mining industry have expressed commitment to the health and safety of all workers. More broadly, the WA Government has committed to improving safety and health outcomes for all workers in the mining industry, as demonstrated by the launch of the MARS (Mental Awareness, Respect and Safety) Program in 2021. The MARS Program is a whole-of-Government initiative that aims to improve the health, safety, and well-being of all workers in the WA mining industry.

The Landmark Study was commissioned to design and implement a research and evaluation project addressing the three main themes of the MARS Program:

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[1] Government of Western Australia Department of Jobs, Tourism, Science and Innovation, 2023
[2] Department of Mines, Industry Regulation and Safety. (2021). Industry activity indicators.
[3] Australian Bureau of Statistics. (2020-21). National Health Survey: First Results methodology.
[4] Parker, S. K., Fruhen, L., Burton, C., McQuade, S., Loveny, J., Griffin, M., ... & Esmond, J. (2018). Impact of FIFO work arrangements on the mental health and wellbeing of FIFO workers. Report produced for the WA Mental Health Commission.
[5] Legislative Assembly Community Development Justice Standing Committee. (2022). 'Enough is Enough' - Sexual harassment against women in the FIFO mining industry.
[6] Australian Human Rights Council (2020). Respect@Work: National inquiry into sexual harassment in Australian workplaces.

1. Creating mentally healthy workplaces – by managing psychosocial hazards and promoting positive practices at work that support mental health and well-being
2. Building a culture of safety and respect – with healthy, safe, gender-equitable, respectful, and inclusive workplaces
3. Preparing for workplace safety in future mining – by ensuring all workers are educated and trained in safety, addressing emerging risks, and fostering safety innovation in new technologies.

To date, three reports that have been published from the MARS Landmark Study:

1. Report 1: Towards a Healthy and Safe Workforce in the Mining Industry: A Review and Mapping of Current Practice (Duncan et al., 2022)
2. Report 2A: Mental Awareness, Respect and Safety in the mining industry – The Landmark Study: A Review and Synthesis of the Literature (Yam et al., 2022)
3. Report 2B: Mental Awareness, Respect and Safety in the mining industry – The MARS Program Landmark Study: Workplace Policy and Practice Survey (Drane et al., 2023).

The present report – the Mining Worker Study – focuses particularly on the **experiences of workers** in the WA Mining Sector. Our goals of the research were:

1. to assess worker perceptions, experiences, attitudes, and behaviours
2. to establish an industry baseline measurement on the three focus areas (against which future change arising from the multi-pronged MARS Program initiatives can be assessed)
3. to establish the evidence base to support and inform the development of initiatives and strategies for improvement.

We surveyed 2,550 WA mining workers in total and interviewed 60 mining workers to understand workers' experiences and how individual and work factors shape those experiences.

To compare results from the WA mining workers to a general population, we further surveyed 325 WA workers from non-mining industries (the "benchmark sample"). The benchmark sample comprised WA workers from similar industries based on the advice of our Industry Expert Panel, with key demographical metrices (e.g., profession) similar to the mining worker sample. We also include data metrics from other wide-ranging studies ("norm groups") to further contextualise findings from the WA mining workers.

Various key markers (outcomes) were used to assess each theme:

Mental Health and Well-being	A Respectful Culture	Safety in Future Mining
Poor mental health: • suicidal intent • psychological distress • burnout • turnover intent Optimal mental health: • job satisfaction • thriving.	Experiencing bullying: • physical bullying • generalised bullying • witnessing bullying. Sexual harassment: • sexist hostility • sexual hostility • unwanted sexual attention • sexual coercion.	Safety behaviours: • safety compliance • safety participation. Underreporting: • notifiable incidents • near misses.

In addition, potential drivers of each of these outcomes were assessed, with their choice guided by existing research. The potential drivers include demographic factors (e.g., age, gender); individual difference factors (e.g., coping style), job and team factors (e.g., workload, manager support), organisational factors (e.g., psychosocial safety climate) and FIFO specific factors.

Physical safety has purportedly been a core focus of the safety critical WA mining industry for many years. However, in recent years – particularly in the past decade – the industry reports shifting to a more holistic approach to safety and well-being for all workers, including a stronger focus on mental health and well-being. Even more recently, some report expanding this scope to include the eradication of disrespectful behaviours such as bullying and sexual harassment (which includes sexual assault).

Overview of Findings

Aligned with the historical developments of the WA mining industry's focus on these aspects, our findings reflect the varying stages of maturity of these three focus areas in the WA mining industry. Overall, from our research, we conclude:

- The strength of the WA mining industry lies in its emphasis on physical safety behaviours. Levels of safety behaviours in the WA mining sample were higher compared to the benchmark sample comprising workers from similar industries. It is pleasing to report that this commitment to physical safety appears to have been integrated within the industry to a high level, although some variation still exists.
- With regard to worker mental health and well-being, the levels of these outcomes reported by the WA mining sample are poorer compared to various comparison groups (e.g., the benchmark sample, and other available national norms). In particular, levels of burnout and psychological distress are high for at least one third of workers. Results show that, compared to a relatively similar sample from 2018 (of FIFO workers; Parker et al.), there might have been a small shift towards better mental health/well-being amongst the mining sample on some dimensions.
- Turning to a respectful culture, findings show that levels of experiencing and witnessing bullying are high, as is the experience of sexual harassment. Women in

particular experience sexual harassment at much higher rates than men. Sexual harassment in the mining industry most often tends to be covert, often manifesting as sexism and misogyny. Covert forms of sexual harassment in the mining industry were found to occur at higher rates than the benchmark sample, while the more overt, direct forms of sexual harassment were lower compared to the benchmark sample. There is some evidence of an improvement in levels of bullying compared to a relatively similar sample from 2018 (of FIFO workers; Parker et al.), suggesting that the industry might be beginning to shift in a positive direction, although there is clearly still a long way to go.

Next, we unpack these overall findings in order of the key components of the MARS project. In each case, we discuss the mean levels of each relevant outcome in the WA mining industry, including in comparison to other data such as a benchmark sample of workers from similar industries and other available norms. We then report on findings identifying subgroups that may be more or less likely to experience these outcomes. Finally, we summarise the key drivers that our data suggests are strongly related to these experiences and perceptions. These findings inform the data-driven advice submitted to the MARS Program separately.

Theme 1: Creating Mentally Healthy Workplaces

Poor Mental Health	• Within the WA mining worker sample, **30%** reported "high" or "very high" levels of psychological distress (as opposed to "low" and "moderate" levels of psychological distress). Psychological distress in the WA mining sample was higher than non-mining comparison groups, and higher compared to the general Australian working population (19%). Further the WA mining sample reported statistically significantly higher levels of psychological distress compared to the benchmark sample comprising workers from other similar industries (24% reported "high" or "very high" psychological distress). The percentage of workers with high or very high levels of distress is lower in 2023 compared to a 2018 study on FIFO worker mental health (33%). • WA mining workers reported feeling statistically significantly more burnt out than the benchmark sample. Nearly twice as many WA mining workers reported high levels of burnout (**38%**), compared to the benchmark sample (20%). The percentage of workers reporting high levels of burnout was also higher in 2023 compared to the 2018 study on FIFO worker mental health (27%). • The percentage of the WA mining worker sample reporting intent to leave their companies (**31%** reported that they were likely or highly likely to make a genuine effort to find a new job with another employer in the next 12 months) was lower compared to the 2018 study on FIFO mental health (38%). However, this turnover intent was statistically significantly higher compared to the benchmark sample (21%).
Optimal Mental Health	• About four in ten WA mining workers reported feeling satisfied with their jobs (**41%**). A larger percentage of WA mining workers were satisfied with their jobs in 2023 compared to the 2018 study on FIFO worker mental health (35%). However, levels of job satisfaction in the WA mining sample were statistically significantly lower compared to the benchmark sample (47%). • **42%** of WA mining workers reported experiencing a sense of thriving at work. This was lower in comparison to the benchmark sample (47%), however this difference was not statistically significant. A smaller percentage of WA mining workers reported thriving compared to a norm group of 6,813 workers from Australian organisations across diverse industries, roles and functions[7] (48%).

Identifying Risk Groups	• Experiences of mental health and well-being vary across different demographic groups in the mining sample.
	  o Women tended to report poorer mental health and well-being in general, however men reported higher levels of psychological distress.
	  o Younger workers generally tended to report poorer mental health and well-being compared to older workers. Workers in the youngest age group (< 24 years old) reported the highest levels of both poor mental health, as well as optimal health and well-being.
	  o Frontline workers were less likely than managers and professional workers to experience job satisfaction and a sense of thriving.

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[7] Thrive at Work. (2023). *Thrive at work benchmark survey* [Data set].

FIFO Specific Findings	• Overall, **60%** of FIFO workers in this study reported being somewhat satisfied or extremely satisfied with their accommodation. • **79%** of FIFO workers in this study reported being in permanent work-provided accommodation. This reflects an increase in permanent accommodation arrangements in comparison to a 2018 study on FIFO worker mental health (73%), which might be indicative of a shift by companies to provide more permanent accommodation arrangements for FIFO workers. • **73%** of male FIFO workers reported feeling *physically very safe* in their work-provided accommodation, while only a little over half (**53%**) of female FIFO workers reported feeling a similar level of physical safety. • **42%** of FIFO workers indicated that they had no autonomy *at all* over their rosters. However, autonomy over FIFO rosters was significantly associated with lower levels of poor mental health and higher levels of optimal mental health.

Below, we summarise the most important statistical drivers of mental health and well-being. Whilst there are many such drivers, we focus on those which are strongly correlated with mental health and well-being, as well as those that have statistically significant beta weights in regression analyses, suggesting these are the key influences. Whilst we recognise that the data shows associations not causality (a limitation we discuss in the main report), the implication is that *increasing these factors is highly likely to improve worker mental health and well-being*.

Company and organisational factors related to mental health & well-being include:

- Positive psychosocial safety climate, in which senior leaders demonstrate their genuine commitment to the mental health & well-being of workers.
- Low stigma associated with mental ill-health.
- A suite of policies and practices to support worker mental health and well-being.

Job/team factors related to mental health & well-being include:

- Jobs that provide sufficient role clarity and offer possibilities for workers to develop their skills.
- A positive team culture in which team members feel safe to speak up.
- Higher perceptions of job security.
- Low levels of work-family conflict in which workers feel able to manage their work and family expectations without excess negative spillover.
- Workloads that are tolerable.
- For FIFO workers, rosters that are short and even-time, rosters that do not rotate between day and night shifts, and having autonomy over and input into their rosters.

Individual factors related to mental health & well-being include:

- Particular strategies for coping, such as active coping and seeking emotional support.
- Taking up opportunities to craft the job through increasing social resources (e.g., building positive relationships with others).

Theme 2: Building a Culture of Safety and Respect

<table>
<tr><td rowspan="1">Bullying</td><td>

- Overall, levels of experiencing and witnessing bullying are high in WA mining workers. **16%** of WA mining workers reported having experienced bullying (women 23%, men 11%), and **22%** reported witnessing bullying (women 30%, men 18%), at least 2-3 times per month in the past 6 months.
- However, the level of bullying in the mining industry is statistically significantly higher compared to the people we sampled from other industries – more than twice as many mining workers experienced and witnessed bullying compared to the benchmark sample (6% experienced bullying; 10% witnessed bullying).
- Experiencing and witnessing bullying are less prevalent compared to the FIFO Study (Parker et al., 2018; 16% experienced bullying; 31% witnessed bullying), suggesting some positive change might have occurred (although the samples are not directly comparable, so caution is needed with this conclusion).
- Interview participants acknowledged that in the past few years, more attention has been paid to improving bullying and sexual harassment, however there is much potential to continue to improve the culture in the mining industry.

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<tr><td>Sexual Harassment</td><td>

- Overall, levels of sexist and sexual hostility experienced by WA mining workers are high, especially for women. For both men and women, covert behaviours of sexist and sexual hostility tend to be higher compared to the more overt behaviours of unwanted sexual attention and sexual coercion.
  - Across the different types of individual behaviours that fall under sexist and sexual hostility, between **5-41% of women** mining workers reported experiencing behaviours of sexist and sexual hostility sometimes, often, or very often within the past 12 months, with the exact figure depending on the behaviour. **3-11% of men** experienced the same. The most common behaviour experienced by female mining workers was *being put down or condescended to* (**41%**), followed by *offensive sexist remarks (e.g., suggesting that people of your sex are not suited for the kind of work you do*; **34%***)* ; the most common behaviour experienced by male mining workers was *receiving crude and offensive sexual remarks* (**11%**).
  Averaged across all behaviours, these levels of sexist and sexual hostility were statistically significantly higher compared to the benchmark sample (4-8% across the different behaviours).
  - Between **3-19% of women** mining workers reported experiencing behaviours of unwanted sexual attention and sexual coercion sometimes, often, or very often within the past 12 months, while **1-8% of men** experienced the same. The most common behaviour experienced by both female and male workers was *being touched in a way that made them feel uncomfortable* (women **19%;** men **8%**).
  Averaged across all behaviours, these levels were equal to or statistically significantly lower compared to the benchmark sample (3-4% across the different behaviours).
- These findings align with a key theme raised by interview participants, in which participants noted that misogyny and sexism exists, but is often covert in nature.

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Identifying Risk Groups	• Experiences of bullying and sexual harassment vary across different demographic groups in the mining sample.
	    ○ Women experience these behaviours at much higher rates (above).
	    ○ Mining workers who identified as lesbian, gay or homosexual, and bisexual mining workers (gender identity) reported experiencing significantly higher rates of sexual harassment (all facets) and bullying (including witnessing bullying) compared to heterosexual/straight workers.
	    ○ Younger workers tended to report higher levels of sexual harassment (particularly Sexist Hostility, Sexual Hostility and Unwanted Sexual Attention), and to witness bullying.
	    ○ Frontline workers were more likely than managers and professional workers to experience sexual harassment (all facets), bullying (physical and general), and witness bullying.
	    ○ Labour hire workers reported experiencing higher levels of sexual harassment (all facets) and bullying (including witnessing bullying) compared to direct employees and contractors.
	    ○ Workers in predominantly male working environments (all men or more men than women) tended to experience higher levels of Sexist Hostility compared to environments of gender parity or where there were more women than men.

Other	• Other analyses were conducted regarding reporting and being a witness to sexual harassment and/or bullying.
	    ○ **50%** of respondents reported that someone else witnessed the most recent incident. When there was a witness, only **14%** of the time did the witness try to intervene.
	    ○ When workers experienced sexual harassment themselves, **one in three** responded by confronting and/or reporting the harasser.
	    ○ Persons impacted by sexual harassment were **1.38 times** more likely to take action by confronting and/or reporting the harasser if there was a witness to the incident. The likelihood increased to **4 times** more likely if the witness displayed upstander behaviours.

Below we summarise the most important statistical drivers of a respectful culture.

Company and organisational factors positively related to respect include:

• A positive psychosocial safety climate in which workers believe senior leaders in the company are committed to their psychological well-being.
• Low levels of excessive rules and surveillance.
• Clear processes for reporting incidences of bullying and sexual harassment in which impacted workers are treated with kindness, and preferences for how to proceed are respected.
• Greater gender parity in the workplace, especially at leadership levels.

Job/team factors positively related to respect include:

• Line managers and supervisors who are not hostile, but rather behave in ways that are inspiring and motivating.
• Line managers and supervisors with the knowledge and skills to support impacted persons and manage perpetrators.
• A positive team culture in which people feel safe to speak up,
• The presence of "upstanders" who intervene and take action to interrupt and challenge disrespectful behaviours rather than passively observe ("bystanders").
• Line managers and supervisors who support impacted persons which is linked to the impacted person taking action by confronting or reporting the harasser.

Individual factors positively related to respect include:

• Low levels of one's own perceived masculinity is linked to being more likely to engage in upstander behaviours.

Theme 3: Preparing for Workplace Safety in Future Mining	
Safety Behaviours	• Overall, most WA mining workers reported adopting high levels of safety behaviours such as safety compliance (**88%**) and safety participation (**78%**). These levels are comparable to findings from a sample of FIFO workers in 2018 (Parker et al.; 91% safety compliance; 79% safety participation). Further, the safety behaviours of WA mining workers are significantly higher than workers in the benchmark sample from other industries (73% reported high levels of safety compliance; 56% reported high levels of safety participation). This finding suggests that worker safety behaviour is a strength for many in the sector. • These findings are consistent with mining being a safety critical industry in which workers' safety orientation need to be consistently held at very high levels.
Under-reporting	• Nevertheless, under-reporting of notifiable incidents and near misses exist in the mining industry – about **one in four** notifiable incidents in the past 12 months were unreported, while **one in three** near misses in the past 12 months were unreported. This rate of under-reporting – whilst something to address - is lower in comparison to the benchmark sample comprising workers from other industries.

Below, we summarise the most important statistical drivers of safety behaviours in the future of work in mining.

Company and organisational factors positively related to safety behaviours include:

• Having technology that is explainable and understandable by workers.
• A positive safety climate within the organisation, which means that senior leadership role models behaviours that prioritise the physical safety of workers.

Job/team factors positively related to safety behaviours include:

• That workers are aware of and consulted on any changes to be implemented.
• Safety procedures that take into account worker contributions.
• Well-designed work (jobs that provide task variety, possibilities for development, role clarity, and autonomy to make decisions).

Individual factors positively related to safety behaviours include:

• High levels of worker adaptability.
• Positive worker attitudes towards technologies and the belief that the technologies help, rather than hinder, them at work.

Overall, this research identifies focus areas related to the three central themes of the MARS project. The research generates insights into mental awareness, respect, and safety in the future of mining. It demonstrates areas for improvement in each theme and documents the multi-layered nature of drivers of each outcome. While some strengths and progress have been identified, ongoing work in the mining industry with a focus on mental awareness, respect, and safety in the future of mining are important. For each theme, drivers are identified, and these can be the focus of enhancements and work into addressing these themes in mining.
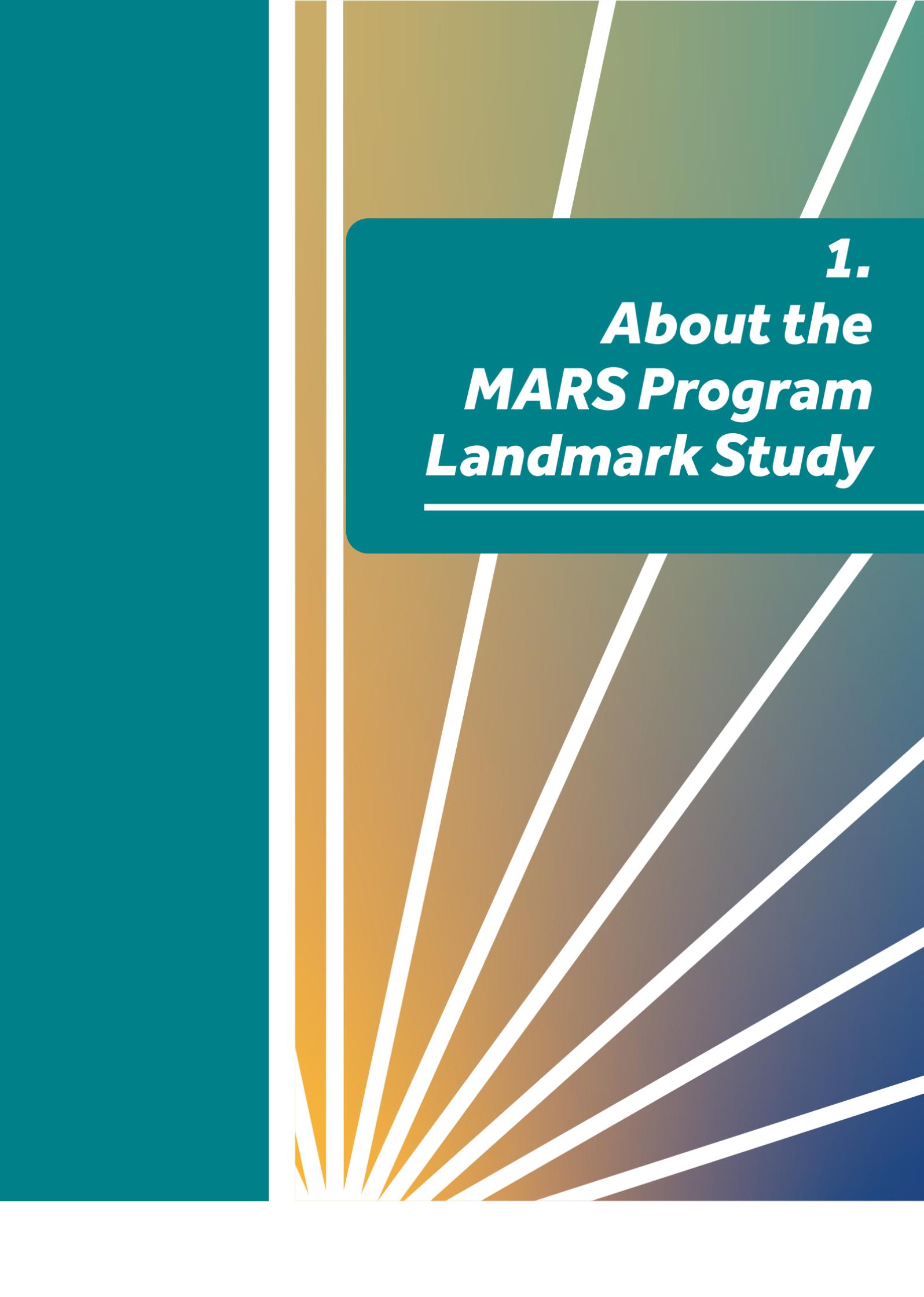
1.
About the
MARS Program
Landmark Study

Section 1.   About the MARS Program Landmark Study

1.1 Background

The extraction of natural resources has been a key cornerstone of Western Australia's (WA) social and economic development (Australian Bureau of Statistics, 2002). The sector produces more than 50 different minerals from about 1,000 operational mines in WA. The mining and mineral exploration industries together contribute a significant share of employment in WA, with an average of 148,395 workers during 2020-21 (DMIRS, 2021). Indeed, the State mining industry employs approximately 10% of the WA workforce (ABS, 2021a). It is therefore vital that attention is given to the sustainability of human resources in the mining industry via an evidence-based focus on worker health and safety issues.

Multiple reports investigating worker health and safety have emerged in recent times, such as those focused on fly-in, fly-out (FIFO) worker mental health and well-being (*Impact of FIFO work arrangements on the mental health and well-being of FIFO workers*, Parker et al., 2018) and on sexual harassment within the mining industry (e.g., *Enough is Enough – Sexual harassment against women in the FIFO mining industry*, Legislative Assembly Community Development Justice Standing Committee, 2022). These more focused reports are complemented by national reports on similar topics. For example, a large-scale study across Australian workplaces (*Respect@Work: National inquiry into sexual harassment in Australian workplaces*, Australian Human Rights Council, 2020) found that sexual harassment is a concern across multiple industries; and the Productivity Commission (2020) conservatively estimated that poor mental health at work costs the Australian economy $70B annually.

Against this background, the WA Government has committed to improving safety and health outcomes for all workers in the mining industry, as shown by the launch of the MARS Program in 2021. The MARS (Mental Awareness, Respect and Safety) Program is a whole-of-Government initiative that aims to improve the health, safety, and well-being of all workers in the WA mining industry.

1.2 Focus Areas

As part of the MARS Program, the Landmark Study is a research and evaluation project regarding three focus areas:

1) Creating mentally healthy workplaces — by managing psychosocial hazards and promoting positive practices at work that support mental health and well-being.
2) Building a culture of safety and respect — with safe, gender-equitable, respectful, and inclusive workplaces.
3) Preparing for workplace safety in the future mine — by addressing emerging risks and fostering innovation in safety by design, automation, and artificial intelligence.

1.3 Underpinning Framework

The guiding structure across the MARS Program Landmark Study is the Thrive at Work framework (Parker & Jorritsma, 2021; Parker et al., 2021; see Figure 2). An integrative model of mental health strategies used in workplaces, the Thrive at Work framework was developed in consultation with industry and extensive evaluation of the academic literature.

The Thrive at Work framework aligns with the definition of mental health by the World Health Organisation (2022), a "state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community". Psychological well-being and poor mental health are two aspects that give a complete picture of the state of an individual's mental health in the mining industry. The dual-factor model of mental health considers not just the absence of mental ill-health (e.g., anxiety, depression, burnout), but also the presence of positive indicators of mental health (e.g., satisfaction, thriving). Figure 1 demonstrates the mental health spectrum. An effective investigation of mental health in the mining industry therefore needs to consider the whole spectrum of mental health, ranging from mental ill-health to thriving at work.

Figure 1. The overall mental health spectrum (Chen et al., 2020; Parker et al., in press)
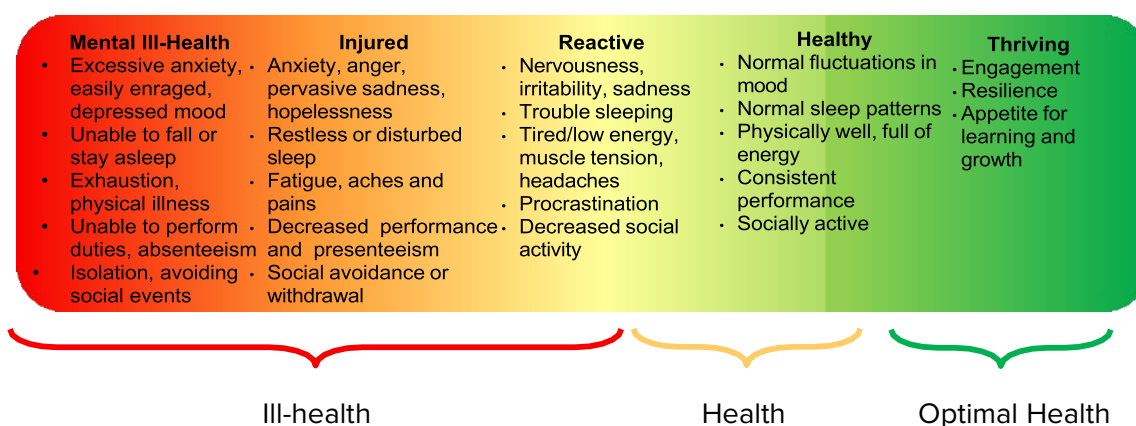
Guided by this spectrum of mental health, the Thrive at Work framework (Figure 2) consists of three over-arching pillars or categories of strategies: Mitigate Illness, Prevent Harm, and Promote Thriving. Each pillar has three building blocks. Two building blocks in each pillar focus on ways that work and work systems/ practices can be changed, and one building block within each pillar focuses on what individuals can do to change the situation.

Figure 2. The Thrive at Work Framework.

Pillar	Building Block	Key Strategies
Mitigate Illness — Monitor, accommodate, and treat illness, ill-health and injury.	✓ Detect Illness	→ Build capacity to monitor & identify illness → Create HR systems for monitoring and detection
	✓ Support and Accommodate Illness	→ Provide appropriate support → Remove barriers to support → Manage crisis & injury → Provide effective return to work processes
	✓ Increase Individual Resources for Managing Mental Ill-health	→ Raise awareness of personal mental health → Build individual willingness to seek help → Build individual capacity to recover
Prevent Harm — Minimise harm and protect against risk.	✓ Increase Job Resources	→ S Provide stimulating work → M Provide mastery resources → A Provide agency → R Foster relational resources
	✓ Ensure Tolerable Demands	→ T Create tolerable job demands: load & time, emotional, role, cognitive, environment & physical, and relational → Create tolerable organisational demands: organisational change, organisational justice & job security
	✓ Increase Personal Resources for Preventing Harm	→ Foster resilience and coping → Support job crafting & other strategies to prevent stress → Support appropriate after-work strategies
Promote Thriving — Optimise well-being and generate future capabilities.	✓ Promote Purpose & Growth	→ Provide visions & foster purpose → Foster confidence & learning → Support career progression & lifelong development
	✓ Promote Connection	→ Value connections & diversity → Foster work connections & linkages → Enable diversity and inclusion
	✓ Increase Personal Resources for Thriving	→ Support job crafting for personal growth → Foster positive psychology practices → Support community engagement

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The first pillar, Mitigate Illness, is focused on efforts to detect and support mental ill-health and poor well-being, such as establishing the provision of counselling services and helping people to return to work after illness. Most organisations tend to focus their efforts on these strategies (Parker et al., 2021).

The second pillar of Thrive at Work, Prevent Harm, refers to those practices that seek to remove or prevent psychosocial hazards, such as work design, defined as "the content and organisation of one's work tasks, activities, relationships, and responsibilities" (Parker, 2014, p. 662). The Prevent Harm pillar addresses the predominant misperception that mental health strategies in the workplace should focus almost exclusively on addressing the pre-existing mental health issues that individuals have and then bring to work (relevant to Mitigate). This approach, whilst important, fails to acknowledge that individuals can develop mental health problems as a result of the work itself, or have pre-existing conditions that are exacerbated by poor work conditions. The Prevent Harm pillar of the framework emphasises the role of work design in shaping worker mental health, rather than the predominant emphasis in industry on how mental health should be accommodated and supported at work. The framework does this via the idea of designing SMART work. The SMART work design model identifies five key themes that result in positive outcomes across jobs and industries (Parker et al., 2017). The

themes for SMART work are: Stimulating, Mastery, Agency, Relational, and Tolerable Demands. The Centre for Transformative Work Design (CTWD) developed the SMART work design model to strengthen the focus on work design as a vehicle for improving mental health, to provide a positive and holistic approach to work design, rather than the more common risk-management approach to work design (Parker et al., 2017).

The third pillar is Promote Thriving. This pillar focuses more on enhancing worker well-being than on supporting or addressing mental ill-health. It is concerned with aspects of work that help workers to realise their potential and to achieve outstanding performance. Well-being refers to optimal psychological functioning and experience (Ryan & Deci, 2001), which includes both experiencing happiness and the realisation of one's potential. The latter is referred to as 'eudemonic' well-being, and includes aspects like personal growth, feeling autonomous and independent, self-acceptance, having a clear life purpose, and positive connections (Ryff & Keyes, 1995). Supporting workers to thrive has many benefits for organisations. Research has found that thriving workers are more confident and energised, better able to respond to challenges, and recover quicker from the demands of work (Desrumaux et al., 2015).

To ensure a comprehensive approach to mental health, we covered all the Thrive at Work pillars in the Worker Survey. As discussed in Report 2B, we extended the Thrive at Work framework to include a fourth pillar, 'Mitigate and Prevent Incivility' to focus specifically on addressing sexual harassment, sexual assault, and other disrespectful behaviours in the WA mining industry, and the fostering of a positive workplace culture.

1.4 Findings to Date from the MARS Program Landmark Study

To date, three reports have been published by the Landmark Study research. Findings in the present report on workers' experiences and perceptions build on these previous studies. Figure 3 details the various elements of the MARS Program Landmark Study. We recap each of these elements briefly below.

Figure 3. Overview of elements of the MARS Program Landmark Study.
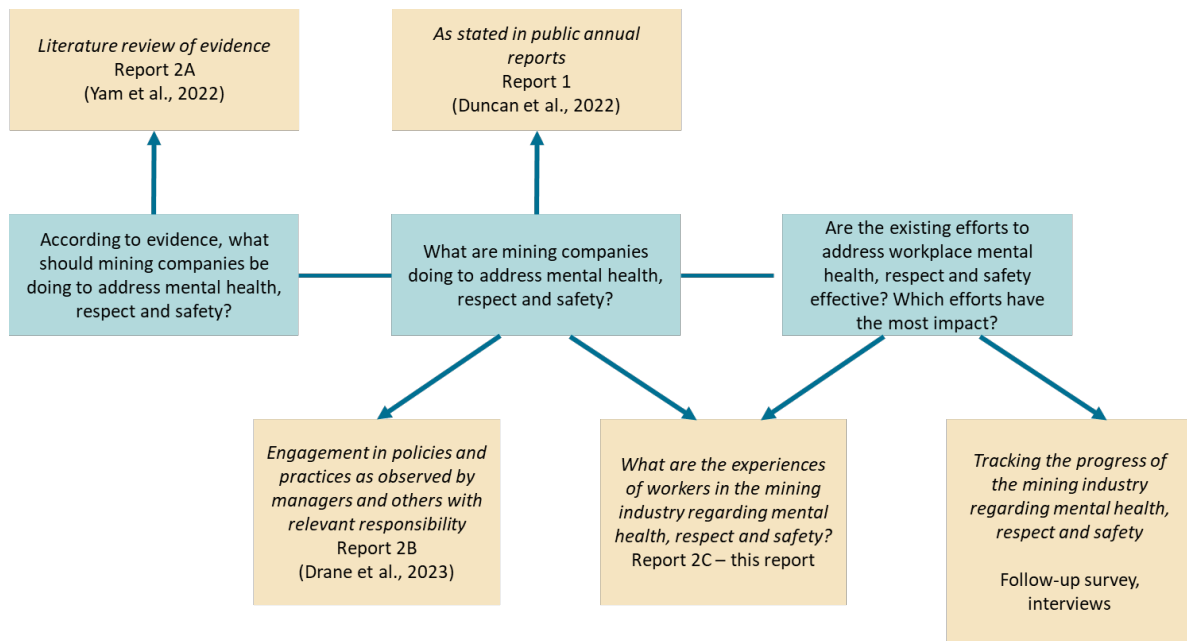
Report 1: Towards a healthy and safe workforce in the mining industry: A review and mapping of current practice (Duncan et al., 2022)

Report 1 provides an assessment of worker well-being in the mining sector and measures employers' prioritisation of three dimensions of well-being: mental health and well-being, physical health and safety, and workplace culture that protects against sexual harassment. To that end, the authors used a composite index developed based on publicly available company information (annual reports, sustainability reports, etc.). Proxies for companies' current practices relating to the three domains of mental health and well-being, physical health and safety, and workplace culture and sexual harassment were created using a content analysis method based on the frequency of concepts relating to specific keywords. Keywords (e.g., keywords relating to mental health and well-being: "mental health", "mental illness"; keywords relating to physical safety: "safety", "injury"; keywords relating to respect: "harassment", "diversity") were selected to form indicators; frequencies of these keywords in such reports indicated a higher priority area for the company.

The report concluded that, within mining companies listed on the ASX200, physical safety appeared to be of the highest priority, followed by mental health and well-being, and lastly, a respectful workplace culture. Specifically, relating to mental health and well-being, 93% of mining companies in the sample referenced the keyword well-being, however only about 33% referenced the specific sub-facet relating to loneliness, social connection, and isolation which is an important aspect of work in mining due to the proportion of FIFO workers. Relating to a culture of respect, 93% of mining companies in the sample referenced gender, women or

females, however, fewer companies made reference to bullying or intimidation (73%), and only 50% of companies referred to sexual harassment, sexual assault and/or sexism. Finally, relating to preparing for safety in the future mine site, all mining companies in the sample reported indicators relating to physical health and safety.

Companies with higher prioritisation of all three focus areas also tended to have the following characteristics:

- an above-average representation of women in management
- larger company size, explicit commitment to the United Nations' Sustainable Development Goal 5: Gender Equality
- have in place safe reporting systems that protect both survivor and bystander whistle-blowers.

Report 2A: Mental Awareness, Respect and Safety in the mining industry – The Landmark Study: A review and synthesis of the literature (Yam et al., 2022).
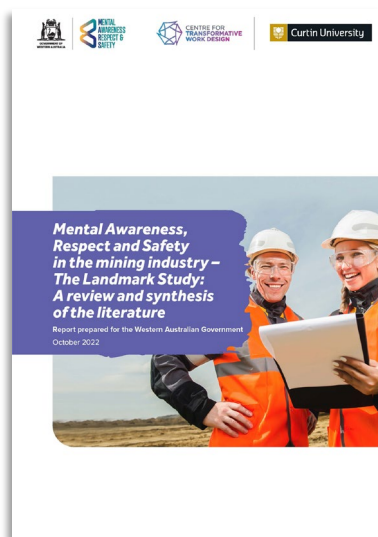
Global research suggests mental health tends to be poorer in mining compared to other sectors, and sexual harassment tends to be higher in mining.

Report 2A included a review of academic journal articles, industry reports, and government reports related to the three focus areas in mining. In total, 40 articles published between 1998-2022 relating to mental health in mining, and 34 articles published between 2013-2022 relating to sexual harassment and sexual assault in mining were systematically reviewed. Findings from a further 63 articles were synthesised to create a clearer understanding of the future of work in the mining industry, including academic and industry expert predictions of the requirements for people and technical skills in the future landscape.

Regarding Focus Area 1, mental health and well-being, key findings included:

- In most studies, mental health and well-being in the mining industry was poorer relative to non-mining samples and other available norm groups (e.g., clinical or research benchmarks) and national benchmark data. There was a small amount of variance in findings across different studies and different samples, but the overall conclusion applies to most studies.
- Four sets of factors were found to influence mental health and well-being in the mining industry:
  - individual factors (e.g., resilience, coping and recovery strategies, perceived stigma[8], alcohol and drug use)
  - job and work design factors (e.g., work design, the organisation of rosters and shifts, job role, job insecurity)
  - team factors (e.g., team culture, team leadership)
  - organisational factors (e.g., workplace policies, organisational culture).

In relation to Focus Area 2, culture and respect, key findings included:

- Incidences of sexual harassment and sexual assault were higher in mining compared to norm groups and national benchmark data.
- Most of the research focuses on sexual harassment against women in mining rather than men.
- Although prevalence rates varied across studies, younger women and those of demographical intersectionality (e.g., people of colour, those with disabilities, or Aboriginal and Torres Strait Islander peoples) were found to be more at risk of experiencing sexual harassment.
- As with mental health and well-being, factors that can predict the prevalence of sexual harassment include:

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[8] We acknowledge that the term 'stigma' may not be culturally relevant for different cultures, including Aboriginal and Torres Strait Islander Peoples. Instead, the term 'shame' is accepted as culturally significant and distinct from stigma (Byrne et al, 2021).

- o individual factors (e.g., elements of power)
- o job factors (e.g., the organisation of shifts)
- o team factors (e.g., team culture, a culture of masculinity within the team)
- o organisational factors (e.g., organisational culture, organisational sexism, gender disparity in the workplace).
- Sexual harassment was more likely to be reported to occur in regional areas (e.g., mine sites), compared to other metropolitan areas (e.g., offices in the central business district).

Finally, in relation to Focus Area 3, future safety, key findings included:

- While the specific details of how future mine sites will look and operate are uncertain, it is widely thought that this change will be driven by technology such as automation, algorithmic management, and the digital age, and as an extension, the integration of data and artificial intelligence, enabling technologies to become capable of self-directed learning and engage in complex cognitive tasks.
- Rather than replacing whole jobs, scholars argue that mundane tasks may be automated, freeing workers up to complete more complex parts of the job that require knowledge and experience that cannot yet be performed by technology.
- A general consensus is that the structure of work will change, and companies need to support their workers in ensuring that their work in the future is not only physically safe, but also mentally healthy (e.g., ensuring that jobs remain stimulating, workers have an understanding of how machines make decisions, building a culture of organisational trust to reduce uncertainties, insecurities and anxieties related to the introductions of new digital technologies), and that workers are continually upskilled and reskilled to remain relevant and current in a changing work environment.

Report 2B: Mental Awareness, Respect and Safety in the mining industry – The MARS Program Landmark Study: Workplace policy and practice survey (Drane et al., 2023).
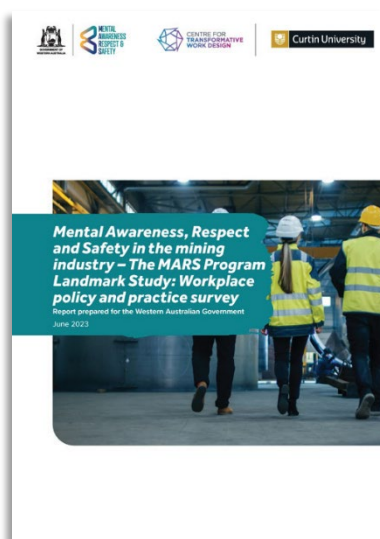
Lastly, **Report 2B** reports the results of a Workplace Policy and Practices Survey. Stakeholders such as Human Resources (HR) managers and Work Health and Safety (WHS) personnel from mining companies in WA were surveyed on the policies, practices, and initiatives that they perceive their companies engaged in. The survey was based on the Thrive at Work framework, including the extended Mitigate and Prevent Incivility pillar covering policies and practices addressing bullying, sexual harassment and sexual assault at work.

We summarise the extent of engagement in various policies and practices, mapped onto the Thrive at Work framework, in Figure 4 below.

Figure 4. Mining companies' extent of engagement in various workplace policies and practices, as reported by HR and WHS personnel

Mitigate Illness	Not at all	A little	A moderate extent	A large extent	A very large extent
Employee Assistance Programs or equivalent	7	2	8	25	58
Education of workers on available MH supports	7	12	28	27	27
Formal strategies for returning to work after psychological injury	15	20	26	27	13
Activities to reduce MH stigma in workplace	9	25	30	27	9
Line manager training (identify/manage/support workers with poor mental health)	16	32	28	16	9
Formal systems to assess and monitor worker MH	18	29	30	16	8
Training for employees to identify/manage own MH	9	37	31	16	7
Clear procedures for managing MH crisis	10	30	40	14	6

Figure — Prevent Harm (stacked bar chart, % of respondents)

Item	Not at all	A little	A moderate extent	A large extent	A very large extent
Zero-tolerance policy for alcohol/drugs during work hours	2	2	4	2	72
Reliable communication options for FIFO workers to contact home	6	7	11	39	37
Security and other safety measures in accommodation facilities	8	8	16	32	37
Programs to encourage worker participation and input	3	1	32	38	17
Systems for fatigue management	3	13	26	39	19
Clear job descriptions	4	8	35	39	14
Roster/shift structures to optimise worker well-being	4	8	35	39	14
Mechanisms for process and procedure input	3	4	32	41	2
Work flexibility policies	4	22	29	28	18
Formal limits to alcohol consumption in accommodation camps	18	9	18	2	34
Attention to work quality when implementing automation or other tech	11	24	4	17	9
Staff training in effective teamwork	4	13	44	27	11
Processes/initiatives to analyse and remove psychosocial risks	9	2	41	26	4
Highly supportive work environment	4	5	32	4	19
Monitoring job pressures to protect against stress or burnout	7	2	47	24	2
Initiatives that encourage engagement in healthy after-work activities	11	17	41	19	11
Efforts to prepare new workers/families for challenges unique to working in mining	2	27	31	18	3
Analysis of risks for MH and PH when new systems are introduced	14	28	33	19	6
Training workers to be resilient and/or cope with difficult situations	13	37	29	19	2
Job variety	3	9	45	3	12
Extensive company-specific training in task/job performance	1	19	38	3	12
Regular workload reviews	17	23	44	12	5
Job crafting opportunities	12	41	31	14	1

Legend: ■ Not at all ■ A little ■ A moderate extent ■ A large extent ■ A very large extent

Promote Thriving

Category	Not at all	A little	A moderate extent	A large extent	A very large extent
Extensive recruiting to fill positions	7	6	29	43	15
Opportunities for promotion	6	13	26	47	8
Provide nutritious food, exercise facilities etc to help PH	11	14	29	33	13
Employees receive company's financial perspective info	6	21	28	36	9
HR systems to ensure diverse representation at all levels of organisation	10	20	28	29	13
Leaders who are highly motivating & empowering	5	11	42	36	6
Initiatives to increase awareness/celebrate workforce diversity	9	21	28	29	13
Employees receive workplace strategic plan info	6	19	38	31	6
Career development programs	9	21	35	31	4
Community engagement initiatives	9	22	34	24	11
Provide social activities to help MH	13	27	32	24	4
Initiatives to foster connections/knowledge-exchange across functional areas	6	30	39	19	6
Regular attitude/engagement surveys to identify/correct morale problems	21	24	29	22	3
Life-long learning approach to development	16	31	34	16	3
Opportunities to develop strengths and craft their work to best fit them	7	35	39	14	5
Formal mentoring programs	21	37	26	12	4
Meditation/mindfulness/yoga practices during work hours	60	25	11	4	

Legend: Not at all · A little · A moderate extent · A large extent · A very large extent

Mitigate and Prevent Incivility

	Not at all	A little	A moderate extent	A large extent	A very large extent
Policies to address allegations of bullying, sexual harassment and/or assault	5	6	24	39	26
Initiatives to encourage and support employees/managers to speak-up when witnessing inappropriate behaviour	6	16	37	27	14
Line manager training so they can identify and manage bullying, sexual harassment and/or assault	14	15	32	26	12
Victim-centric systems for workers who experience bullying, sexual harassment, and/or assault	11	21	33	28	8
Employee training to identify and manage bullying, sexual harassment and/or assault	12	19	34	25	12
Systems to monitor and analyse levels of bullying, sexual harassment and/or assault	13	21	34	21	12

Relating to Focus Area 1, mental health and well-being, the Prevent Harm pillar covers aspects of work design as well as specific structures/practices to support FIFO workers. On the other hand, engagement with policies and practices falling under the Mitigate Illness pillar, which encompasses goals to support workers already experiencing illness, ill-health, and injury, was slightly lower.

Two pillars under the extended Thrive Framework are relevant to Focus Area 2 – the additional Mitigate and Prevent Incivility pillar, and to a smaller extent, the Promote Thriving pillar. Mitigate and Prevent Incivility includes strategies such as training to identify and manage, victim-centric systems for reporting, or initiatives to support speaking up when witnessing inappropriate behaviour, while Promote Thriving (among others focused more on mental health overall) includes strategies such as initiatives to increase awareness and celebrate workforce diversity.

Finally, relating to Focus Area 3, the Prevent Harm pillar includes strategies such as analysis of risks for mental and physical health when new systems are introduced, monitoring job pressures to protect against stress, attention to quality and design of work quality (e.g., how stimulating it is, the job demands) when implementing automation or other digital technologies.

Workplace engagement in these policies and practices across all areas tended to be higher for workplaces that had a higher reported psychosocial safety climate. Further, a proactive, rather than compliance approach to engaging in policies and practices was found to be of great importance for companies reporting higher engagement with policies and practices to support workers.

These findings about engagement in policies and practices do not provide insights into the *quality* or effectiveness of the policies and practices. Perceptions of effectiveness from workers are addressed in the current study.

We developed the current study based on these three reports.

1.5 Summary

In summary, the above findings indicate that the prevalence of mental health and well-being, a culture of respect, and perceptions of and preparations for work in the future mine site warrants further investigation to clearly understand these areas and their drivers (including individual, job, team, and organisational factors). These findings provide a strong evidence basis to guide the MARS Program Landmark Study Worker Survey and Interviews. In this present research, we explore these issues further from the perspective and experience of workers in the WA mining industry. We use these findings to inform evidence-based advice, which the research team provided separately to the MARS Program.

2.
The MARS Program Landmark Study Worker Survey and Interview

Section 2.   The MARS Program Landmark Study Worker Survey and Interview

2.1 Aims

This research had the following aims:

1. To assess *worker* perceptions, experiences, attitudes, and behaviours in WA mining organisations on key aspects related to the three focus areas (mentally healthy workplaces, culture of safety and respect, and future safety). While companies develop and implement strategies to support the business, these policies are perceived and interpreted subjectively by each worker in the company. This may cause some variance between the strategies that are intended versus those that are implemented, and the way that workers engage with and perceive these initiatives. To complement the findings of company priorities from Report 1 and Report 2B, this study investigates the experiences and perceptions of workers in relation to these policies and practices via surveys (quantitative) and interviews (qualitative). Combined, this methodology enables the collection of robust data regarding prevalence and relationships between drivers and outcomes, while interviews allow a deeper, richer understanding of initial findings.
2. To establish a baseline measurement relating to the three Focus Areas (mentally healthy workplaces, culture of safety and respect, and future safety) against which future change can be assessed.
3. To establish the evidence base to support and inform the development of initiatives to support mental health and well-being, and a culture of respect and safety in the WA mining industry. Specifically, we aim to gain a clearer understanding of the role of the different factors – at the person, job, team, and organisation levels – that affect mental health, well-being, respect, and safety. We then use this understanding to help inform strategies for improvement.

To address these aims, we utilised several research methods, comprising: a) the Worker Survey (including a separate survey of workers from other industries as a comparison) and b) Worker Interviews.

2.2 Worker Survey

A Worker Survey captured how mining workers in WA currently perceive and experience key aspects of their work. The Worker Survey investigated the relationship between drivers including person, job, team, and organisational factors with the extent of mental health and well-being, sexual harassment and sexual assault at work, bullying, and safety behaviours.

Understanding the link between the drivers and these outcomes can inform future actions and interventions in mining workplaces.

Figure 5. Simplified research model of drivers and key outcomes

Drivers of key outcomes

- Organisation factors
- Team and work site factors
- Job factors
- Individual factors

Key outcomes

- Levels of mental health and well-being
- Prevalence of bullying at work
- Prevalence of sexual harassment and sexual assault at work
- Safety behaviours
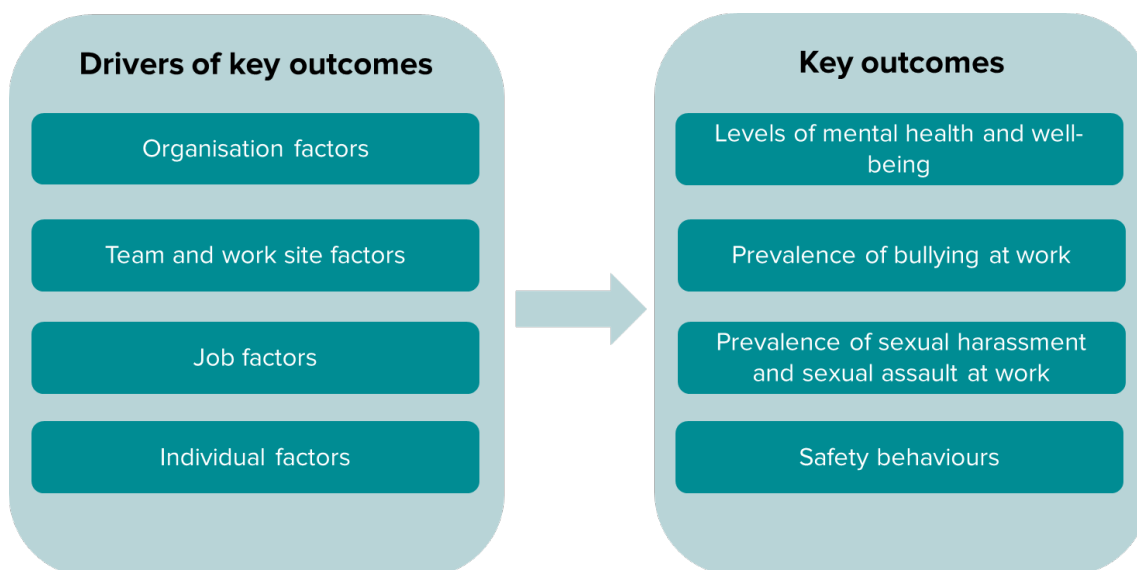
2.2.1 Survey Design

We provide a brief overview of methods.

Measures. The Worker Survey was developed through a multistage process (see Figure 6), including construct prioritisation (i.e., determining which constructs were the most pertinent in understanding the three focus areas based on the literature review), measure review and selection (i.e., identifying the most suitable measure), feedback from industry experts (i.e., consultation with the Industry Expert Panel to ensure that the language was consistently suited to the mining industry), and finally, face validation with four mining workers with diverse backgrounds (i.e., a piloting process in concordance with standard procedures for checking the usability and face validity of a survey).

Figure 6. The Worker Survey development process

Construct prioritisation → Measure review and selection → Feedback from industry experts → Mining worker face validation

Scales for each of the key factors were identified according to the following criteria:

- validity and reliability
- the extent to which the measures are established scales in their respective fields (i.e., citation rates, utilisation in national studies)
- the availability of norms, benchmarks, or comparison data.

In instances where no measure of a concept was available (for example consultation of specific safety procedures), the researchers developed items using established procedures.

The Worker Survey measured:

- mental health and well-being
- sexual harassment and sexual assault
- other forms of harassment and assault (e.g., bullying)
- safety behaviours
- factors that might drive the above outcomes – including individual, job, team, and organisation factors
- demographics.

Table 1 shows the names, descriptions and reliabilities of the key scales used for all samples (mining workers, benchmark sample) where this was applicable. Cronbach's α or Spearman-Brown coefficient reflect the internal consistency of the measures; they indicate that all scales had good reliability. Full copies of the surveys are included in a separate document made available to the MARS Program.

To manage survey length, measures were prioritised. All participants responded to core questions (e.g., demographics, outcomes critical to the MARS Program such as psychological distress, thriving, and prevalence of sexual harassment and sexual assault, and drivers theorised to underpin multiple outcomes, such as work design). Participants were then randomly presented with one of three sections comprising other drivers which were theorised to be more strongly related to one – rather than multiple – focus areas of the MARS Program, such as job crafting and leadership styles. In total, three versions of the survey were developed. The order of factor presentation was randomised in the surveys. Table 1 also indicates which questions were randomly presented across the three versions.

Prior to some sections of the Worker Survey, we included content warnings to inform participants that the questions may be upsetting to some people and that reviewing and/or answering these questions was optional. If these topics did raise any issues for participants, we also included sources of support (including details of helplines and access to information and fact sheets).

Table 1. Overview of scale names, descriptions, and reliabilities for mining workers and benchmark sample.

Scale	Description	Example item	Number of items in scale	Internal consistency
Outcome: Mental health and well-being				
Suicide Ideation[a]	Thoughts and plans about suiciding.	I have no intention of killing myself in the near future.	3	.66
Psychological Distress	The K6 (Kessler-6) measures non-specific psychological distress, including feelings of depression, restlessness, fatigue, worthlessness, and anxiety. There is data on the probability that a person will have a diagnosis of anxiety or depression (ABS, 2012, tables F and G). As high K6 scores mean a greater probability of such a diagnosis, the phrase "anxiety and depression" is used interchangeably with the term "psychological distress".	During the last 30 days … …about how often did you feel that everything was an effort?	6	.89
Burnout (Emotional Exhaustion)[+]	Burnout is a state of exhaustion due to prolonged periods of stressors experienced on the job.	Please indicate how often you feel as described in the statements below. I feel …used up/out of energy at the end of the work day	2	.79
Turnover Intention	Intention to turnover reflects the likelihood that a worker intends to leave their company or the industry.	How likely is it that you will make a genuine effort to find a new job with another employer within the next year?	2	N/A
Thriving	Thriving refers to a state of being energised, feeling valued, and feeling that what one does is valued. Thriving is being productive, being open to challenges presented, and having the opportunity to continuously learn and grow. It is an important positive aspect of mental health and well-being, characterised by positive states of thinking, feeling, and functioning.	I am confident in my ability to do my job.	8	.87

Scale	Description	Example item	Number of items in scale	Internal consistency
Job Satisfaction[1]	Job satisfaction reflects a worker's feelings about work and their overall judgement of the quality of the work and workplace.	Taking everything into consideration, how do you feel about your job as a whole?	1	N/A
Outcome: Sexual Harassment and Sexual Assault				
Gender Harassment - Sexist Hostility	Gender harassment refers to a broad range of verbal and non-verbal behaviours not aimed at sexual cooperation but that convey insulting, hostile, and degrading attitudes based on gender. The aim of these behaviours is to put people down and to push them out of the accepted "ingroup". Sexist hostility includes behaviours that insult the abilities of people of either gender, on the sole basis of their gender.	In the last 12 months, how often did you experience the following at work, at a work-related event or while looking for work? ...Made offensive sexist remarks (e.g., suggesting that people of your sex are not suited for the kind of work you do)?	3	.75
Gender Harassment - Sexual Hostility	Sexual hostility is another type of gender-based harassment, which includes sexualised practices and behaviours that are unwelcome, such as sexually degrading images and words in the surrounding environment and can involve obscene gestures and vulgar terms of address.	...Made unwelcome attempts to draw you into a discussion of sexual matters (e.g., attempted to discuss or comment on your sex life)?	6	.89
Unwanted Sexual Attention	Unwanted sexual attention includes a wide range of verbal and non-verbal behaviour that is unwelcomed, unpleasant, offensive, unwanted, and unreciprocated. It can be sometimes terrifying and traumatising to the impacted person.	In the last 12 months, how often did you experience the following at work, at a work-related event or while looking for work? ...Touched you in a way that made you feel uncomfortable?	6	.82
Sexual Coercion	Sexual coercion constitutes the attempts of or actual extortion, both explicit and implicit, of sexual cooperation in return for job-related considerations or conditions of employment.	In the last 12 months, how often did you experience the following at work, at a work-related event or while looking for work? ...Implied faster promotions or better treatment if you were sexually cooperative?	4	.91

Scale	Description	Example item	Number of items in scale	Internal consistency
Network Silence[b]	A network phenomenon that examines the social forces contributing to the extent to which a witness of sexual harassment is willing and able to speak up and be an active bystander to support the person impacted by sexual harassment.	When you saw someone being harassed, to what extent did you… …Keep quiet about what happened?	12	.90
Outcome: Bullying				
Physically Intimidating Bullying[b]	Physical acts or verbal statements that result in the impacted person feeling physically threatened. Direct physical contact is not required for an act to be intimidating.	Threats of violence or physical abuse or actual abuse.	3	.68
General Experience of Bullying	Experiencing any bullying in the workplace.	During the previous six months, have you been subjected to bullying at your workplace?	1	N/A
Witnessing Bullying	Witnessing any bullying in the workplace.	During the previous six months, did you witness anybody being bullied at your workplace?	1	N/A
Outcome: Safety in the Future of Mining				
Safety Compliance[c]	Safety compliance is the degree to which workers follow safety procedures in the workplace.	I ensure the highest levels of safety when I carry out my job.	3	.89
Safety Participation[c]	Safety participation refers to the initiative by workers to participate in and promote safe workplace behaviours.	I voluntarily carry out the tasks or activities that help to improve workplace safety.	3	.86
Explainable AI[c]	The extent to which workers understand or can predict digital technology systems (e.g., automation, artificial intelligence, robotics, big data, etc.) at work	The technologies are very reliable. I can count on them to be correct.	3	.90
Automation Anxiety[c]	Perceptions of job security vis-à-vis the introductions of digital technologies in the workplace.	Digital technologies (e.g., automation, AI) will replace human workers.	3	.72
Automation Helpfulness[c]	The extent to which workers perceive that the use of digital technologies in the workplace will be either beneficial or harmful.	Increased use of automation/digital technologies in my workplace would… Make my job harder ----- Make my job easier	3	.86

Scale	Description	Example item	Number of items in scale	Internal consistency
Organisational Factors				
Psychosocial Safety Climate	The extent to which there are shared perceptions regarding policies, practices and procedures for the protection of worker mental health and well-being.	Senior management considers employee psychological health to be as important as productivity.	4	.91
Perceived Stigma	Mental health-related stigma; when a person gets labelled by their illness and becomes part of a stereotyped group. Negative attitudes towards this group can lead to discrimination.	How much would each of these possible concerns affect your decision to receive mental health counselling or services if you ever had a mental health problem? … It would harm my career.	2	.83
Flexibility	The degree of flexibility that workers have, such as the option of job sharing, time off for important events or requests for different rosters.	Time off for important family events (e.g., birthdays, cultural and religious events).	3	.86
Perceived Excessive Surveillance[a]	Perceived excessive surveillance and perceived excessive rules are factors that together indicate the level of total institutionalisation, or the extent to which workers perceive that they are subject to strict norms, unnecessary rules, and inflexible schedules at work	When I am at work, it feels like my every movement is tracked	3	.84
Perceived Excessive Rules[a]		When I am at work, I feel unnecessary rules control just about everything I do	3	.89
Confidence in Grievance Procedures	The extent to which workers feel confident that they can address concerns with management if an incident of sexual harassment occurs.	I am confident in my company's grievance or serious complaint procedure.	2	.74
Safety Climate[c]	A climate for health and safety is based on the perception of norms and actions that help to promote safe actions. Safety climate captures workers' subjective (and shared) perceptions of the level of priority given to safety.	Management places a strong emphasis on workplace health and safety.	3	.94

Scale	Description	Example item	Number of items in scale	Internal consistency
Change Management	Change management refers to the perceptions and experiences of workers relating to how organisational change (large or small) is managed and communicated to them in their companies.	When changes are made, I am clear how they will work out in practice.	w	.81
Safety Procedure Participation[c]	Safety procedure participation refers to the opportunities for workers to provide inputs into improving workplace safety procedures. (Self-developed)	I have the chance to influence the safety procedures if I think they can be improved.	4	.93
Team Factors				
Team Culture[a]	A shared belief that the team is safe to speak out, and express views and concerns.	Members of my team are able to bring up problems and tough issues.	4	.74
Interactional Justice	The degree to which workers are treated with respect, kindness, and dignity when raising issues of sexual harassment.	If you were to speak to your supervisor about a sexual harassment complaint, your supervisor would… … Show concern for your rights as an employee	2	.91
Line Manager/Supervisor Leadership – Abusive[b]	The extent to which workers perceive that their line manager/supervisor engages in the sustained display of hostile verbal and nonverbal behaviours.	My line manager/supervisor puts me down in front of others.	3	.94
Line Manager/Supervisor Leadership – Transformational[a]	The extent to which workers perceive that their line manager/supervisor motivates them by transforming their attitudes, beliefs, and values through articulating a clear vision of the future based on organisational values, as opposed to simply gaining compliance.	My line manager/supervisor has a clear understanding of where we are going.	3	.86
Job Factors				
Possibilities for Development	The extent to which workers have opportunities for development in their work.	My work gives me the opportunity to develop my skills.	3	.85
Task Variety	Task variety refers to the extent to which a job involves completing an array of different tasks.	My job involves doing a number of different things.	3	.91

Scale	Description	Example item	Number of items in scale	Internal consistency
Role Clarity	Role clarity refers to the presence of adequate role-relevant information – in terms of availability and quality of information.	I know what is expected of me in my job.	3	.84
Information and Technology Resources	The extent to which workers feel that they have sufficient resources to do their job effectively.	I have the necessary resources (e.g. equipment, materials, supplies) to carry out my job effectively.	3	.76
Autonomy	Job autonomy is the degree of freedom a worker has in work scheduling, work methods, and in decision making.	My job gives me a chance to use my personal initiative or judgement in carrying out the work.	3	.90
Social Contact	The extent to which a job provides opportunities to build informal social relationships/friendships.	I have the opportunity to develop close friendships in my job.	3	.85
Perceived Co-worker Support	The emotional and technical support that workers receive from their colleagues.	If work gets difficult, my colleagues will help me.	3	.89
Perceived Line Manager/Supervisor Support	The emotional and technical support that workers receive from their line manager/supervisor.	I can rely on my line manager/supervisor to help me out with a work problem.	3	.91
Task Significance	Task significance reflects the degree to which a job influences the lives or work of others, either inside or outside the organisation.	The results of my job are likely to significantly affect the lives of other people.	1	N/A
Job Insecurity	Job insecurity refers to the perceived fear of losing one's current job due to unexpected or uncontrollable events that can interrupt the continuity of one's work experience. Job insecurity is a stressor which negatively impacts on worker mental health and well-being.	Chances are, I will soon lose my job	3	.89
Physical Demands*	A physically demanding job is one which requires physical activity or effort.	My job requires a lot of physical effort.	3	.96
Workload Demands	The extent to which workers experience the need to complete their tasks quickly.	My work piles up faster than I can complete it.	3	.79

Scale	Description	Example item	Number of items in scale	Internal consistency
Individual Factors				
Job Crafting[a]	Job crafting refers to worker-initiated modifications to the designs of their jobs to improve the fit between the characteristics of the job, and their own needs, abilities, and preferences, thereby increasing the perception that work is engaging and meaningful. Job crafting leads to better worker and organisational outcomes such as improved well-being and performance, and reduced turnover. While this is a bottom-up approach, companies and workplaces need to create work environments in which workers are enabled and empowered to modify aspects of their work to achieve both work and personal goals simultaneously.	I try to develop my capabilities.	9	.69
Active Coping	Active coping strategies describe the proactive steps that workers take to manage their stressors.	I concentrate my efforts on doing something about the situation I am in.	2	.72
Seeking Emotional Support	Emotional support coping strategies involve turning to others for comfort and help.	I get emotional support from others.	2	.79
Recovery Strategies	Actions that workers take to recuperate from the demands of work.	I forget about work.	4	.89
Masculinity Norms	The behaviours perceived to be normal of the traditional male gender role.	A man should never admit when others hurt his feelings.	10	.87
Adaptability[c]	Adaptability refers to the extent to which workers engage in work behaviours that contribute to how they cope with, respond to, and support change.	Learn new skills to help you adapt to changes in your core tasks	3	.79

Note. Reliability statistics of multi-item scales are presented as Cronbach's α; reliabilities of two-item scales are presented as Spearman-Brown coefficients. * Questions asked only to workers who indicated that they work on site or in a remote operating centre. [a, b, c] Scales included in each of the three versions of the survey. These questions were asked only to a randomly selected 1/3 of participants. + Originally measured on a seven-point scale but has been mathematically transformed to a five-point scale for ease of comparison to other outcomes that were measured on a five-point scale.

Distribution of Worker Survey. Web links and paper surveys were provided to distribute the surveys via various channels. The surveys and information about the project were distributed by CTWD, and the Industry Expert Panel (organisations representing industry, unions, the MARS Program, and mental health organisations). They used briefing packs created by CTWD, providing information for the distribution of the survey aligned with the study's ethical approval. Each party used a wide range of distribution strategies, such as internal email invitations, making posters and flyers available, promoting at pre-start meetings, distributing briefing packs informing about the survey, newsletters, LinkedIn, and Facebook posts.

Across all three versions of the survey, participants took 26.38 minutes to complete the survey (median score), with the longest being version 1 of the survey taking 27.62 minutes (versions 2 and 3 took 26.30 minutes and 25.97 minutes respectively; median scores reported).

As is common in online survey research, not all responses were useable. We screened the data (based on Ward & Meade, 2017) to ensure its quality. 80% of the initial sample of n = 3,197 passed the screening, leaving the final sample n = 2,550.

Mining Worker Sample Demographics. Following the data screening process, the following demographics were obtained for the mining worker sample.

Personal Characteristics. The current mining worker sample (n = 2,550) consisted mainly of men (64%) with an average age of 42.95 years (see Table 2 for an overview of the sample demographics). Almost 70% of participants were married or in a domestic relationship. Out of all the participants, 55% had dependents. Of the sample, 3% were of Aboriginal or Torres Strait Islander origin[9]. The highest level of education for the sample was university undergraduate degree (26%), followed by Tafe, College (22%).

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[9] The research team acknowledges that the mental health and well-being of all Aboriginal and Torres Strait Islander individuals is complex and rooted in a history of colonisation, inter-generational trauma, spirituality, cultural practices, and protocols. At the time of publication, the research team is in the process of consulting with Aboriginal and Torres Strait Islander peoples to better understand the nuances of experiences with mental health and well-being, as well as strategies to support mental health and well-being of Aboriginal and Torres Strait Islander Peoples in the mining industry.

Table 2. Personal characteristics of the sample of WA mining workers

Characteristic	Percentage (%)
Gender	
Male	64%
Female	36%
Non-binary, gender queer, gender-fluid, different term	1%
Age	
< 24	3%
25–34	23%
35–44	29%
45–54	28%
55+	17%
M(SD)	42.95(11.08)
Cultural background	
Anglo/Caucasian	79%
Aboriginal/Torres Strait Islander	3%
Southern European/Mediterranean	3%
Chinese/Southeast Asian	3%
Pacific Islander	1%
Indian	2%
African	1%
Other	8%
Marital status	
Single, never married	20%
Married/domestic partnership	70%
Widowed, divorced, separated	10%
Highest level of education	
Primary school	0.3%
Secondary school	16%
Apprentice	7%
Tafe, College	22%
University undergraduate degree	26%
Postgraduate degree	21%
Other training courses	8%
Children	
0	45%
1	15%
2	25%
3	10%
4	3%
5	1%
6 or more	1%

Workplace and Employment Characteristics. When considering the workplace and employment characteristics of the participants in the mining worker sample (see Table 3), 86% were principal employees (i.e., employed directly by the mining company), 10% by a contracting company, and 4% by a labour-hire company.

Regarding the main location of work, 65% of the sample was based on a mine site, 21% based in an office environment, 3% in a remote operating centre.

Most of the mining sample participants (62%) were FIFO, drive-in, drive-out (DIDO), or bus-in, bus-out (BIBO) workers. Most were in a professional/technical (34%), managerial (31%), or operator (13%) role. Most of the sample worked full-time (92%). On average, workers have been working in the WA mining industry for 12.75 years, with an average company tenure of

4.92 years. Specific to FIFO workers, the most common rosters were 8 days on, 6 days off (43%) and 2 weeks on, 2 weeks off (13%), and 2 weeks on, 1 week off (12%).

Table 3. Workplace and employment characteristics of the sample of WA mining workers

Characteristic	Percentage (%)
Profession	
Administrative	6%
Managerial	31%
Professional/Technical	34%
Operator	13%
Technician or Trade/Maintainers	10%
Camps and catering	0.2%
Logistics and supply chain	1%
Other	4%
Employment	
Principal employee	86%
Contractor	10%
Labour hire	4%
Employment situation	
Full time	92%
Part time	3%
Casual	4%
Other	1%
Roster	
4 weeks on/1 off	0.1%
3 weeks on/1 off	0.7%
2 weeks on/1 off	12%
2 weeks on/2 off	13%
8 days on/6 off	43%
8 days on/6 off; 7 days on/7 off (days and nights)	1%
7 days on/7 off	4%
5 days on/2 off	6%
4 days on/3 days off	7%
Other	14%
Commute	
FIFO	56%
DIDO	6%
BIBO	0.5%
Daily commute	38%
Phase of site	
Construction	6%
Operational	92%
Decommissioning	0.3%
Shut down	3%
Tenure and shift length	
Years in WA mining industry	$M = 12.75$, $SD = 9.63$
Years in company	$M = 4.92$, $SD = 5.24$

Respondents worked in 226 different companies. This information was obtained via open-ended questions, which were then grouped and recoded. The number of participants per company ranged from 1 to 407, with one person per site being the most frequent occurrence (i.e., the modal score) and the median score. It should be noted that 380 participants did not indicate a company.

Representativeness (Comparing Sample Breakdown with ABS Data where Applicable). The sample of mining workers was highly representative of the WA mining worker population as it sampled individuals of different ages, gender, tenure within mining, role, etc. The large number of participants also ensured that maximum representativeness was achieved.

Compared to data from the ABS Census Survey (2021), Table 4 shows that the industry and gender distribution between the WA mining population and the worker survey sample are well matched.

Table 4. Demographic characteristics of survey sample compared to the wider WA mining population

	WA mining population	Survey sample
Gender		
Men	80%	64%
Women	20%	36%
Non-binary/gender queer/gender-fluid/different term		1%
Age		
< 24	7%	3%
25–34	25%	23%
35–44	28%	29%
45–54	23%	28%
55+	17%	17%

The above shows that not all groups are exactly equally represented, however, they are representative of the population. Further, we sought to oversample women; sexual harassment and sexual assault, covered by the survey, are highly gendered in nature, with women more likely than men to report an experience of sexual harassment (Australian Human Rights Commission, 2020; 2022) across almost all industries. Specific to the Australian mining workforce, 62% of women reported having experienced sexual harassment, compared to 25% of men in the last five years (Australian Human Rights Commission, 2022). This oversampling accounts for the larger representation of women in the final sample. Overall, the broad distribution of the survey ensured mining workers were well reached and captured a representative sample of the population of mining workers in Western Australia.

Minimum Group Size for Reporting. To uphold participant confidentiality, where group sizes are smaller than $n = 20$, data for that group will not be presented.

2.2.2 Comparing Findings to Other Data

Comparing findings to other available data allows us to compare results from the target sample (in this case, WA mining workers) to a general population. Contextualising findings from the mining worker sample against other samples provides a useful contrast to identify any differences with regards to mental health and well-being, sexual harassment and sexual assault, and other forms of harassment and assault of both groups. Simply put, we use various data metrics as points of comparison. We discuss them in turn.

Use of Normative Data. Where possible, normative (or norm) data was used for comparison purposes. Norm data is data that already exists. These norm values have been measured in a representative group and can be used as a baseline against which to compare the mining worker sample. The goal is to see if the sample of mining workers differs from the norm data, which could, for example, be the Australian population.

The same measure needs to be used in order to be able to compare the scores, which means that, depending on the measure that was used, a different norm group is applicable as well. The norm group can consist of a national Australian sample or a more specific group.

The norm data used for comparison in this study included the FIFO Study (Parker et al., 2018), data from the Australian Bureau of Statistics, Thrive at Work, and the AHRC Respect@Work survey, where applicable.

Benchmark Survey and Sample. In addition to norm data, we also collected data from a similar group of Western Australian workers outside of the mining industry, but carrying out similar sorts of work. This allows for direct comparisons between the mining and non-mining samples, and areas where these two groups differ can be analysed to identify statistical differences.

The survey designed for the benchmark sample was almost identical to the mining workers' survey, except that items applicable to a mining work environment were removed or edited for clarity. As the available participant pool was limited (the data collection company, The ORU, estimated a maximum feasibility of $n = 400$ from their panels based on the requested parameters), participants were required to complete all questions in the survey, as opposed to a random subset of questions for the mining workers. To manage survey length, scales were prioritised for inclusion. Scales were prioritised based on the relevance to the MARS Program, as well as theoretically important drivers that are strongly related to the outcomes. Similar to the Worker Survey, the order of factor presentation was randomised in the surveys.

A challenge of utilising a comparison sample within a study is attaining a sample that is as similar as possible to the target sample. To achieve sufficient similarity, we provided The ORU with specific sample requirements to ensure the recruitment of a mirrored sample for comparison, to the extent possible. The main demographics for workers – identified in consultation with the Industry Expert Panel – were matched (gender, currently employed, aged between 18 and 70 years old, and from Western Australia). Further, the industries that we prioritised for the benchmark sample were identified in conjunction with our Industry Expert Panel, prioritising similar industries such as construction, oil and gas, manufacturing, etc.

Where mining workers had a chance of winning one in five vouchers and sometimes received an invite to participate through their industry associations, unions or their employers, participants in the benchmark sample received remuneration for their time and were recruited via The ORU. This gives the two groups slightly different motivators to be involved in the study. To ensure good quality of data, the benchmark sample data was screened the same way as the mining worker sample for response quality.

After screening, the benchmark sample comprised $n = 325$ participants. A post-hoc power analysis indicated that the benchmark sample was sufficient to detect even small effect sizes[10].

By setting up quotas, we ensured that the majority of the benchmark sample consisted of respondents from similar industries as were included in the mining worker sample. 51% of the sample identified as Male[11]. The age of this sample ranged from 23-76 years (M_{age} = 50.9 years, SD = 11.90 years) years and 70% were married or in a domestic relationship. Of the sample, 45% had dependents. In this sample, there were 0.6% of respondents of Aboriginal or Torres Strait Islander origin. Over 57% of the sample had completed a university undergraduate or postgraduate degree. The majority of the benchmark sample worked in Professional, Scientific and Technical services (26%), Construction (11%), and Oil and Gas (8%) and in a Professional/Technical (34%) or Managerial (26%) role. Respondents in the benchmark sample had been in their jobs on average for 11.2 years. See Appendix A for the full demographic breakdowns of the benchmark sample. Based on the demographics of the benchmark sample, we assess the benchmark sample to be sufficiently similar to the worker sample to allow a meaningful comparison.

2.2.3 A Note on Statistical Analyses

Demographic Variables as Control Variables and Variables of Interest. There are two ways of working with demographic variables in the analyses that follow in this report: as control variables or as variables of interest. Control variables are broadly defined as extraneous to the effect(s) of interest, and the statistical variances associated with these variables are mathematically partialled out to examine the "true" effect of one or more variables of interest on the desired outcome. General statistical advice cautions that the inclusion of control variables for such reasons needs to be purposeful, as these variables may share variance with variables of interest (see Carlson & Wu, 2012; Spector & Brannick, 2011; Spector et al., 2000).

On the other hand, demographic variables typically used as statistical controls are likely also variables of interest that directly impact outcomes. Using these demographics as variables of interest can be important in identifying relationships that are more, or less, prominent in certain groups. Where appropriate for and indicated in each analysis, demographic variables may be included as either control variables or variables of interest.

Statistical Significance, Effect Sizes, and Power. In statistical analyses, inferences about a population are made from sample data, as in practice it is not possible to obtain data from each person that is part of the targeted population. Statistically significant results are found if the results are not attributed to chance. In statistics, it is about probability, as it is not possible to find one hundred per cent certainty. Therefore, the risk of finding an outcome that is random must be reduced. Commonly, a cut-off of 5% is used, which means that there is a 5% chance that the results found were actually random. Sometimes a stricter cut-off (of 0.5% or 0.1%) is chosen if it seems necessary to reduce this risk even more. Research will indicate the

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[10] Power (1 − β err prob) = .99; α err prob = .05.
[11] Due to the gendered nature of the experiences of key outcomes, a post-stratification weight was applied to the benchmark sample to statistically adjust for the difference in gender distribution between the benchmark sample and the mining worker group.

probability values (*p*-values) of their findings for declaring a statistically significant finding. Conventionally, for the 5% cutoff, this is a *p*-value smaller than .05.

For the comparison sections, the conventional *p*-value of .05 is chosen. Where appropriate, we note that the effect might be quite small even though statistically significant. We adopt this approach because for some factors even small effects can be important (Lance & Vandenberg, 2009) and it is important to consider the implications of these effects (for example, on suicidal risk). This approach aligns with a typical risk assessment where probability and severity are considered together.

Because of the large sample size of the study, even very small effects can be statistically significant at the .05 probability level. Regressions have high statistical power for identifying small effects. This power gives us confidence in assessing the differences between groups. However, to ensure that statistically significant effects are also large enough to be meaningful, we adopt a conservative approach and set a threshold at the .005 (i.e., 0.5% chance that results found were random) and .001 (i.e., 0.1% chance that results found were random) probability levels for the regression analyses involving only the core questions which all participants answered, and retain the threshold of .05 for regressions involving questions that only a third of the participant sample answered.

2.3 Interview Study

2.3.1 Background and Scope

The interview study was designed to capture mining workers' experiences and perceptions regarding the three focus areas of mental health and well-being, a respectful culture, and preparing for safety in future mines. It concentrated on both the positive and negative aspects of work in mining, as well as any supports, strategies, or initiatives in the working environment that best support workers. The interview study focused on detailed descriptions of both individual and workplace environments that may affect workers. It should be noted that a key focus of the interview study is on the workplace supports and strategies utilised by workers because of the limited research available and the lack of standardised and validated measures to adequately capture such supports and strategies solely via a survey.

2.3.2 Interview Study Method

Due to the need to balance the breadth and depth of the topics, we elected to conduct two separate interview streams to cover the broad topics of mental health and well-being (including experiences with the implementation of new technologies) and sexual harassment, while allowing enough time for conversations and lines of questioning to probe deeper into these topics.

Sample Size. Participants were recruited via several methods. First, some participants reached out to the research team over the course of the study either directly or through online EOI forms listed on the WA Government MARS Program website, or the CTWD MARS Program Landmark Study website expressing a desire to share their lived experiences through interviews. Second, the Worker Survey included a portal separate to individual responses for participants to indicate if they were willing to participate in a follow-up interview. Unless otherwise requested, participants were assigned at random to either one of two interview groups, each focussing on:

1. experiences with mental health and well-being/introduction of new technologies, and

2. sexual harassment.

Across the two separate interview schedules, a total of $n = 60$ ($n = 30$ on each topic) participants were interviewed. These numbers go above the minimum interview saturation criteria (Francis et al., 2010). Saturation criteria in qualitative research refers to a point whereby no additional data is found whereby the researcher can further diversify the findings of the study.

Interview Questions. We used a semi-structured interview methodology to further investigate WA mining workers' experiences and perceptions. Semi-structured interviews are based on a schematic outline of questions or topics to be explored by the interviewer and include probing questions to understand the underlying thoughts of some of the responses provided. These interview schedules serve the purpose of systematically and comprehensively conversing with many respondents while keeping the interview focused on the desired line of outcomes. Further, all interviews concluded with a section to allow participants the time and space to discuss anything related to the topics of mental awareness, respect, or safety that the interview schedules did not specifically cover.

Interviews took 45 minutes to complete and were conducted over the telephone, online, or face-to-face, depending on participants' preference. Out of the total of 60 interviews, 57 were conducted via an online Microsoft Teams meeting. With participant consent, audio recordings from the interviews were made, and destroyed after the interviews were transcribed and de-identified.

Ethical Considerations. A distress protocol was developed and followed by the research team throughout the interview process. Participants were also provided with a list of resources and support services that they could access if they experienced any distress post-interview. At the time of publication, no adverse events had been reported to the Curtin University Human Research Ethics Committee.

Interview Analysis Strategy. Data was analysed using a qualitative method of thematic analysis. This established method of analysis allows the systematic classification of themes and patterns in interviewee responses that can be replicated and identifies the frequencies and nature of coded content.

Interviews were analysed using NVivo 12, a qualitative data analysis software program. Deductive thematic analyses were performed on the transcripts. Thematic analysis is a widely used and flexible approach that allows the researchers to identify and understand the perspectives and experiences of participants (Braun & Clarke, 2006; Liamputtong, 2013). A deductive approach is a method of analysis using pre-determined categories. Based on the findings of the MARS Program Worker Survey, separate themes were identified for each focus area.

In line with Braun and Clarke's formalised approach (2006; 2022), the process of thematic analysis involved various stages. To determine credibility and maintain dependability, the research team first familiarised themselves with the data by reading through each transcript several times. One member of the research team independently identified meaningful units of data, or topic codes, in the transcripts, which supported the pre-determined themes. To enhance confirmability, the topic codes were synthesised and categorised into the over-arching themes. The themes identified were then discussed with the broader research team. Direct quotes from the interviews are provided to help illustrate each of the themes. Some

quotes were lightly edited for readability purposes; however, the meaning of each quote remains unchanged.

2.4 Strengths and Limitations

The research has strengths and limitations. As far as possible, the research team sought to mitigate against the limitations.

Strengths of the research include:

- It is based on a comprehensive analysis of existing research.
- A multi-method approach was used that enabled quantitative breadth (a large and diverse sample of WA mining workers completed the survey) as well as qualitative depth (detailed interviews with a sub-sample of WA mining workers).

The research also has limitations:

- Most importantly, the cross-sectional nature of the research means it is not possible to establish the causal impact of mining work on creating mentally healthy workplaces, a culture of respect, and preparing for safety in future mines. Doing so definitively would require a randomised control group design in which workers are measured, and then randomly allocated to carry out either mining work or non-mining work, with both groups then being re-assessed over time.
- The sample obtained for the Worker Survey might not be representative of the WA mining working population. However, it is not possible to know whether participants in the research are fully representative of the WA mining working population. Participants in any research do so voluntarily and it is possible that confounding attributes affect participation (e.g., those most negative about mining work might be more likely to do the survey; equally, those most negative about mining work might be more likely to not do the survey).

Mitigating Causality Limitations. Concerning causality, as well as cross-sectional survey comparisons, the weight of evidence is enhanced by the diversity of the research methods. For example:

- With respect to the main worker survey, as well as comparing the mental health and well-being, experiences relating to a respectful culture, and safety behaviours, of WA mining workers against a benchmark sample and norms, regression analyses were conducted to understand which individual, work, family, and team factors statistically predict these outcomes amongst WA mining workers.
- The interviews provide detailed descriptions of mining workers' lived experiences, showing how, in the eyes of mining workers themselves, these aspects of their work affect their experiences of mental health and well-being, a respectful culture, and safety at work.

Whilst each research method individually can be critiqued, as in research in other complex domains, it is the triangulation of findings across multiple methods that tends to be most informative.

Mitigating Representativeness. The research team took steps to obtain as representative a sample as possible. The survey distribution strategy deliberately relied on multiple

stakeholder groups (e.g., unions, industry groups). The size of the sample of WA mining workers is also large, which increases the likelihood the sample is representative.

2.5 Structure of the Results

The results across the three focus areas of the MARS Program Landmark Study are presented in turn, one focus area at a time, in the following sections.

3.
Findings Related to Mental Health and Well-being

Section 3. Findings Related to Mental Health and Well-Being

One of the main aims of the research was to establish the baseline levels of key mental health and well-being outcomes, and to understand the impacts of the different drivers on these outcomes. We report the findings from the Worker Survey, Worker Interviews, and benchmark survey here.

3.1 Experiences of Mental Health and Well-Being in the WA Mining Sample

We present the various mental health and well-being outcomes included in this study in accordance with the mental health spectrum (Chen et al., 2020; Parker et al., in press), ranging from negative markers of mental health and well-being (i.e., poor mental health) to positive markers of mental health and well-being (i.e., optimal health), see Figure 7. The figure is colour-coded such that green bars indicate positive outcomes (i.e., percentage of participants scoring low on poor mental health, and scoring high on optimal health), red bars indicate negative outcomes (i.e., percentage of participants scoring high on poor mental health, and scoring low on optimal mental health).

Figure 7. Percentage of WA mining workers reporting low, moderate, or high on markers of mental health and well-being
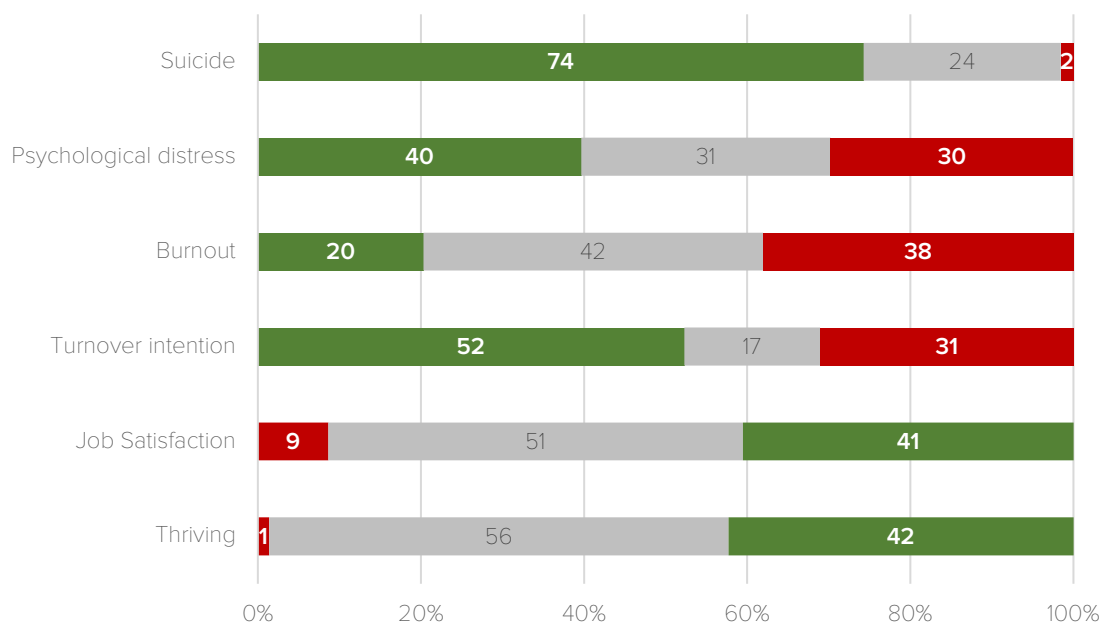
Note. Green bars represent the percentage of participants who responded positively (low on poor mental health, or high on optimal health). In the case of poor mental health indicators, this equates to a response of 1 or 2 on a 5-point scale (indicating low levels of suicide ideation, burnout, and turnover intention), or a score that indicates low levels of psychological distress. In the case of optimal mental health indicators, this equates to a response of 4 or 5 on a 5-point scale (indicating high levels of job satisfaction and thriving).

First, we discuss the findings for psychological distress and burnout (indicators of poor mental health):

- Consistent with research-based recommendations for the use of this measure, the psychological distress (K6) scores were grouped to represent different levels of psychological distress: low, moderate, high, and very high[12,13]. As demonstrated in Figure 7, nearly one in three mining workers exhibited either high (19%) or very high (11%) levels of psychological distress. This means almost one-third of the sample (30%) reported a level of psychological distress that would benefit from intervention.
- Burnout, or the state of exhaustion due to prolonged presence of stressors on the job, was high, with 38% of mining workers reporting feeling burnt out at least once a week. Burnout also emerged as a theme in the interviews, with about half of the interviewees mentioning feelings of burnout.

> Personally, I've been concerned about the workload in my organisation, not just for myself, but [also] others. And I have believed for some time that it really is an issue, and I don't think that has been given the priority that it deserves. Whether or not you call it 'burnout', I have seen some really strong people fall down.
>
> (Managerial, office-based employee)

- Turnover is an important indirect indicator of mental health and well-being and has economic implications for companies, with costs associated with turnover estimated at up to two times a worker's annual salary (Erikson, 2016). In this sample of mining workers, nearly one in three (31%) mining workers reported being likely or highly likely to seek employment with a different company.

Turning to the indicators of optimal mental health and well-being:

- 41% of mining workers reported being very or extremely satisfied with their jobs.
- 42% of mining workers reported feeling a strong sense of thriving at work. Thriving is an indicator of optimal mental health, where workers who thrive are engaged and motivated at work.

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[12] The sample for this study consisted of respondents with complete K6 data. 32 participants did not complete the entire K6 scale, these responses were excluded from all analyses involving the K6.
[13] The categories were calculated to be comparable to K-10 categories allowing direct comparisons with norm data (section 3.2.5.2)

Many of the participants we interviewed spoke of their positive experiences with and perceptions of their jobs overall.

> I love it. Absolutely love it. I've left (the industry) and I keep coming back.
>
> (Frontline, FIFO employee)

> I thoroughly enjoy my job. This is probably the best job I've ever had.
>
> (Frontline, FIFO employee)

The overall picture of mental health and well-being is that many workers have reasonably high levels of job satisfaction, with about half of those sampled experiencing thriving, yet at the same time, many experiencing high levels of burnout, distress, and turnover intentions.

In the following sections, we examine at-risk groups on these indicators and assess the potential drivers that may contribute to workers' levels of job satisfaction and thriving, and burnout, distress, and turnover intentions.

3.2 Comparisons of Mental Health and Well-Being Across Various Subgroups

People of different groups can experience different levels of mental health and well-being. In this section, we investigate key demographic variables where mental health and well-being may vary. This can help to identify at-risk groups that may benefit more from certain policies. Below, we identify several demographic variables that may influence mental health and well-being outcomes.

Gender. Gender differences in experiences of mental health and well-being are found consistently in epidemiological studies, such as the World Health Organisation World Mental Health Surveys, with the prevalence of different facets of mental health and well-being differing across genders. For example, previous research suggests that women are more likely than men to report anxiety and depressive symptoms than men, while men are more likely to report higher rates of externalising and substance use disorders than women (Kuehner, 2003; Pigott, 1999; Seedat et al., 2009).

From our Worker Survey, Table 5 presents the scores of mental health and well-being by gender.

Table 5. Percentage of mining workers (split by gender) reporting high levels of positive and negative markers of mental health and well-being.

	Men (n = 1,586) % scoring high/ very high	Women (n = 890) % scoring high/ very high
Suicide Ideation	2%	1%
Psychological Distress	38%	34%
Burnout	35%	44%
Turnover Intention	29%	34%
Job Satisfaction	42%	39%
Thriving	42%	43%

Note. Red indicates the percentage of participants scoring high on negative markers, while green indicates the proportion of participants scoring high on positive markers.

Men tended to report higher levels of generalised anxiety and depression (psychological distress) compared to women, ($F_{(1, 1401.77)}$ = 24.09, p < .001, η^2 = .01). However, women tended to score more poorly on burnout ($F_{(1, 1664.27)}$ = 48.68, p < .001, η^2 = .02) and turnover intention ($F_{(1, 1529.04)}$ = 8.58, p = .003, η^2 = .004) compared to men. There was no significant difference in gender for suicide ideation ($F_{(1, 435.85)}$ = 1.10, p = .310, η^2 = .002). On the optimal health end of the spectrum, women and men were just as likely to experience job satisfaction ($F_{(1, 1641.02)}$ = 4.34, p = .04, η^2 = .002) and thriving ($F_{(1, 1585.03)}$ = 0.28, p = .60, η^2 = .000).

Consistent with the wider literature, these findings suggest that there is a gender difference in mining workers' experiences of mental health.

Age. Age is reported to be a protective factor for mental health. It has been positively linked to the availability of more personal resources such as resilience (Ng & Feldman, 2015) and emotion regulation (Hansen & Slagsvold, 2012). Older individuals tend to have more experience with managing their personal resources, and as a result may experience better mental health and well-being. Table 6 presents the scores of mental health and well-being split by age groups.

Table 6. Percentage of mining workers (split by age groups) reporting high levels of positive and negative markers of mental health and well-being

		18-24 yrs (n = 87) % scoring high/very high	25-34 yrs (n = 558) % scoring high/very high	35-44 yrs (n = 712) % scoring high/very high	45-54 yrs (n = 684) % scoring high/very high	55+ yrs (n = 426) % scoring high/very high
Mental ill-health	Suicide Ideation	n < 20	2%	1%	3%	0%
.	Psychological Distress	48%	40%	31%	24%	21%
.	Burnout	56%	46%	40%	33%	28%
.	Turnover Intention	28%	37%	31%	31%	26%
Optimal health	Job Satisfaction	48%	36%	37%	42%	47%
	Thriving	47%	34%	42%	46%	45%

Note. Red indicates the percentage of participants scoring high on negative markers, while green indicates the percentage of participants scoring high on positive markers.

The highest percentage in suicide ideation (3%) was found in those aged 45-54 years. However, Kruskal-Wallis tests indicated that there were no significant differences across age groups for suicide ideation ($H(4) = 4.43$, $p = .35$).

Significant differences were found across age groups for psychological distress ($H(4) = 120.82$, $p < .001$), burnout ($H(4) = 101.29$, $p < .001$), turnover intention ($H(4) = 24.58$, $p < .001$), job satisfaction ($H(4) = 17.11$, $p = .002$) and thriving ($H(4) = 26.05$, $p < .001$). Post-hoc pairwise comparisons suggested significant differences between the older and younger age groups, indicating that younger workers report significantly poorer mental health across various markers compared to older workers, with the exception of workers below the age of 24 years old. While workers in this youngest age group tended to report more frequent feelings of anxiety and depression, they were also most likely to be satisfied with their jobs and experience thriving at work. In contrast, workers in the 25-34 age group were least likely to feel satisfied with their jobs or feel a sense of thriving at work and were most likely to consider seeking employment elsewhere (see Appendix B for full results of post-hoc pairwise comparisons). It is possible that this might reflect the 'life stage' of these individuals, with a higher likelihood of having young children and hence family pressures.

Education. In the wider research literature, education level is also associated with personal resources, with lower education associated with lower personal resources to deal with daily stressors at work, resulting in poorer mental health and well-being outcomes than higher levels of education (Niemeyer et al., 2019). However, no significant differences were found across education groups on any of the outcomes of mental health and well-being in the mining worker sample.

Role. Frontline workers, including operators (i.e., heavy mobile equipment, process plant, train, truck or crane drivers, driller, blast crew) and technicians and trade/maintainers (i.e., boilermakers, fitters, electricians) have previously been found to have poorer mental health and well-being than other job roles (FIFO study; Parker et al., 2018). Table 7 presents the scores of mental health and well-being split by professional role.

Table 7. Percentage of mining workers (split by professional role) reporting high levels of both positive and negative markers of mental health and well-being

	Administrative ($n = 138$) % scoring high/very high	Managerial ($n = 792$) % scoring high/very high	Professional ($n = 852$) % scoring high/very high	Frontline ($n = 599$) % scoring high/very high	Other ($n = 135$) % scoring high/very high
Suicide Ideation	0%	1%	2%	2%	0%
Psychological Distress	36%	26%	30%	35%	27%
Burnout	41%	39%	37%	37%	39%
Turnover Intention	34%	31%	30%	32%	32%
Job Satisfaction	37%	44%	42%	35%	41%
Thriving	40%	49%	43%	35%	40%

Note. Red indicates the percentage of participants scoring high on negative markers, while green indicates the percentage of participants scoring high on positive markers.

Kruskal-Wallis tests indicated that there were no significant differences across professional roles for any of the indicators of poor mental health.

However, significant differences were found for both indicators of optimal health – job satisfaction ($H(4) = 25.60$, $p < .001$) and thriving ($H(4) = 39.22$, $p < .001$). Post-hoc pairwise comparisons suggested significant differences between the frontline workers and the professional and managerial groups on both indicators. Specifically, frontline workers were less likely to experience optimal mental health and well-being (see Appendix C for full results of post-hoc pairwise comparisons).

3.3 Potential Drivers of Mental Health and Well-Being in the Workplace

The previous section reported the average level of mental health and well-being for different groups of workers in mining. To further understand the nature of mental health and well-being in mining, and what can be done to better support workers, we now explore workplace factors that may contribute to experiences of poor or optimal mental health. Specifically, we conduct analyses to statistically model the key predictors of mental health and well-being. This approach means we identify the points of leverage that are most likely to be important for reducing poor mental health and promoting optimal mental health.

For the important predictors, we then report on the levels of these factors. This approach provides an evidence-based way of identifying where to focus changes and interventions effectively when looking to address mental health and well-being.

Mitigate Illness - Job and Organisational Factors That Help People Experiencing Poor Mental Health. The Mitigate Illness pillar includes aspects of the job and organisation that may help people who are experiencing poor mental health, this includes:

- the belief that their companies do not prioritise health and safety including mental health and well-being (Psychosocial Safety Climate)
- that they would face negative consequences such as leadership treating them differently in ways that would negatively impact their careers if they sought mental health support (Perceived Stigma).

The importance of examining **perceived stigma** is also highlighted in the literature. Research has found that this is associated with poor mental health, leading employees to be reluctant to discuss and seek support for mental health challenges (Torkington et al., 2011) due to a fear of embarrassment, discrimination, or being punished at work, or facing consequences in their career progression (Corrigan et al., 2000). Stigma and discrimination can therefore lead to worsened symptoms, lower self-esteem, and more difficulties at work.

Importantly, when there is stigma associated with poor mental health, individuals will also experience difficulties with social relationships, a lack of understanding from co-workers and friends and become socially isolated (Link et al., 2001). Low social support can in turn make some symptoms, such as depression, worse (Ozbay et al., 2007).

Notably, Report 2B found that while many organisations reported having policies and practices relating to reducing stigma, 34% of organisations reported no, or little engagement

with these policies and practices, further suggesting perceived stigma was important to examine.

Similarly important, **psychosocial safety climate** is considered a foundational protective factor for mental health and well-being. Studies indicate that the establishment and preservation of a positive psychosocial safety climate can mitigate numerous psychosocial hazards (Dollard, 2016). Furthermore, it is associated with job performance, organisational effectiveness, job satisfaction, and overall psychological functioning.

Consistent with this wider evidence base, results from the Worker Survey showed that the organisational drivers **psychosocial safety climate** and **perceived stigma** were strongly related to markers of mental health and well-being. In other words, workers who held stronger beliefs that they would face negative consequences such as being discriminated against if they sought mental health support, tended to experience poorer mental health and well-being. Further, psychosocial safety climate was strongly and consistently related to most mental health and well-being outcomes. Workers who perceived a more positive psychosocial safety climate within their companies also tended to fare better across the board, with lower psychological distress, burnout, and intention to leave their companies, and higher job satisfaction and thriving.

Mitigate Illness - Individual Factors That Help People to Cope When Experiencing Poor Mental Health.
The Mitigate Illness pillar also includes individual factors that help people cope when experiencing poor mental health. This includes:

- how people deal with stress at work in the moment (Active Coping or Seeking Emotional Support)
- what activities people engage in after the workday (Recovery).

Active coping is an important factor in the way individuals manage and protect their mental health and well-being. Specifically, it refers to the way in which employees try to manage the demands of a stressful situation (Gaudreau, 2018). These responses are designed to try and change the nature of the stressful situation to improve it, or to change the way it is thought of, and therefore the individual's reaction to it (Carroll, 2013).

Recovery from work, or the process of recuperating and recharging after work-related stress and exertion (Sonnentag et al., 2022), is essential in helping employees cope when experiencing poor mental health and/or stressful situations. It has also been shown to be an important factor in preventing burnout, sustaining performance at work, and improving employees' overall mental well-being (Sonnentag, 2009; Verbeek, 2019).

Across the board, in the Worker Survey, these individual factors were not as strongly related to poor mental health in comparison to the organisational drivers. Both coping strategies – **active coping** and **seeking emotional support** – were more strongly related to higher levels of optimal mental health than lower levels of mental ill-health. Recovery was moderately related to lower levels of mental ill-health, but not optimal mental health.

Prevent Harm - Job and Team Factors that Prevent Harm/ Address Psychosocial Risks.
Under the Prevent Harm pillar, the job and organisational factors that prevent harm and

address psychosocial risks are work design factors. These refer to the content and organisation of a worker's tasks, roles, responsibilities, and relationships at work (Parker, 2014), which have been identified as psychosocial hazards (Commission for Occupational Safety and Health, 2022; Safe Work Australia, 2022). These job/organisational factors are aspects that companies have a direct influence over, such as ensuring that psychosocial hazards like poor work design are managed well.

Work design is recognised as a fundamental strategy for preventing harm in workplaces (e.g., Parker, 2014) and is therefore important to examine. Effective work design reduces job stress, burnout, absenteeism, turnover, and other negative mental health outcomes, whilst also boosting job satisfaction, thriving, and other positive well-being indicators (Parker, 2014).

Studies have shown that jobs with sufficient job resources (such as job autonomy, task variety, and role clarity) are associated with lower absenteeism and higher organisational commitment (Bakker et al., 2005). Jobs lacking such job resources lead to stress, poorer physical and mental health, and increased compensation claims (LaMontagne, et al., 2014; SafeWork Australia, 2012).

High job demands such as excessive workloads, resource constraints, time pressure or difficult physical environments have been shown to lead to fatigue, burnout and poor mental health. Well-designed work also goes hand in hand with a positive psychosocial safety climate (Safe Work Australia, 2022; Lawrie et al., 2018), and contributes to effective performance and productivity (Knight & Parker, 2020).

Overall, aspects of work design, such as excessive demands and work pressure, or insufficient autonomy, impair psychosocial safety climate in the organisation, as well as directly contribute to lowered mental health and well-being.

While Report 2B showed that companies have implemented several policies and practices aimed at protecting workers against stress and burnout (e.g., monitoring job pressures, ensuring reliable communication, fatigue management and resilience training), engagement with these policies and practices varied substantially, further justifying the examination of work design factors.

We investigated several work design factors related to mental health and well-being:

- Job resources, including:
  - possibilities for development
  - task variety
  - information and technology resources
  - role clarity
  - decision-making autonomy
  - support from coworkers
  - support from manager
  - team culture
  - task significance.
- Job demands, including:
  - physical demands
  - workload
  - work family conflict

o job insecurity.

These work design factors tended to be more strongly related to mental health and well-being compared to the individual, and even the organisational, predictors under the Mitigate Illness pillar. Job resources such as **possibilities for development, role clarity, autonomy, and support from coworkers and managers**, were especially positively related to optimal mental health. Within the interviews, coworker support was a main theme that many interview participants consistently spoke to as a protective factor of their mental health and well-being:

> We got pretty good with the team too. You can pick when someone's down, get around them and if they're having problems or the workload gets to them, we go and help you through it pretty quick. Yeah, we're a pretty good team"
>
> (Frontline, FIFO employee)

On the other hand, the job demands such as **workload** and **work-family conflict** were more strongly related to poor mental health. As one interview participant mentioned:

> I've just got to be mindful of how much work I do when I'm at home and make sure I'm properly rested. Recently, my partner said, "you're too tired, you can't go to work" and [so I] had a week off just purely from fatigue
>
> (Professional, FIFO employee)

Prevent Harm - Individual Factors that Prevent Harm/Address Psychosocial Risks. We further consider individual-level actions that represent a bottom-up approach to reducing psychosocial hazards at work. Job crafting is an individual behaviour where workers seek to modify aspects of their jobs to improve the fit between the job and their own needs, abilities, and preferences. While this is a worker-initiated approach, companies and workplaces can encourage job crafting by creating work environments in which workers are empowered to modify aspects of their work to achieve both work and personal goals simultaneously. Individual level factors in the Prevent Harm pillar include various types of job crafting, such as **worker-initiated seeking of support from co-workers**, **actively seeking development**, or trying to decrease the demands of work. Compared to other job and organisational predictors in Prevent Harm, job crafting has a weaker relationship with poor mental health but is related to optimal mental health and well-being (job satisfaction and thriving).

Bullying and Sexual Harassment as a Psychosocial Risk. While we discuss the topic of bullying and sexual harassment in greater detail in Section 4, research consistently demonstrates the negative effect of experiencing harmful behaviours at work such as bullying and sexual harassment, on workers' mental health and well-being (McDonald, 2012; Nielson & Einarsen, 2012; Topa et al., 2008; Willness et al., 2007). We therefore also investigate these

here as drivers of mental health and well-being at work by including the dimensions of sexual harassment in the workplace in the model predicting mental health and well-being.

As we will expand later in Section 4, sexual harassment that is more overt tends to be less common. Examples of overt sexual harassment include Sexual Coercion[14], that is, seeking sexual favours in exchange for career-related benefits, and Unwanted Sexual Attention, that is, unwanted and unreciprocated attention, touching, and leering. However sexual harassment that is gender-based and more covert occurs more frequently (ABS, 2021b). Examples of gender-based covert harassment include Sexist Hostility, that is, hostility and discrimination on the basis of a person's sex, and Sexual Hostility, which is hostility that is sexual in nature but not aimed at sexual cooperation. Although less covert, these types of harassment negatively impact on mental health and well-being (Nielsen & Einarsen, 2012; Houle et al., 2011; McDonald, 2012). Sexual harassment of all types is considered a chronic stressor at work because it puts targeted workers under physical and mental stress in their day-to-day work activities (Houle et al., 2011). In this sample of mining workers, experiences of gender-based hostility are related to poor mental health.

> "
> I was being habitually harassed and it just wore me down to the point where I just couldn't take it anymore. It was really demoralising.
>
> (Professional, FIFO employee)

3.3.1 Considering All Potential Drivers of Mental Health and Well-Being Together

As the next step in statistical modelling, we conduct analyses to model these predictors against the various outcomes of mental health and well-being. To that end, we utilise Multiple Linear Regression analyses. Multiple Linear Regression analysis indicates how much variance in each mental health and well-being outcome a group of factors explains by itself, and to what extent each predictor considered within each group of factors contributes to the amount of variance explained. In the first step of the regression, professional role was entered[15], so that in the subsequent step, the effect of the specific groups of factors of interest can be identified while controlling for the under-representation of frontline workers in the sample.

Referring to the Thrive at Work framework, potential predictors or drivers of mental health and well-being in the workplace included in this study fall mainly under the Mitigate Illness and Prevent Harm pillars, with a stronger focus on Prevent Harm. This is because of the focus on psychosocial hazards in the workplace and addressing psychosocial hazards to improve mental health and well-being. Therefore, in the second and third steps of the regression, the organisational and individual predictors of mental health and well-being that fall under

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[14] See pgs 95-96 for definitions and explanations of these concepts.

[15] Professional role was the demographic variable that was the least representative of the WA mining industry. The current sample underrepresents frontline workers. Therefore, it is imperative to statistically partial out the effects of this underrepresentation.

Mitigate Illness were entered respectively. The next two steps in the regression separated the predictors under Prevent Harm according to job/organisational and individual factors. Finally, we included the sexual harassment factors. We discuss each step in turn.

The organisational predictors under the Mitigate Illness pillar explained between 8-29% of the variance across the outcomes of poor mental health, and between 20-40% of the variance in optimal mental health and well-being. Of these predictors, **perceived stigma** was linked to higher levels of psychological distress (β = .17, p < .01), while **psychosocial safety climate** was linked to lower turnover intention (β = -.23, p < .001) and higher job satisfaction (β = .20, p < .001). These findings suggest that mining companies that actively work to improve psychosocial safety climate (such as through showing genuine concern for worker mental health and well-being) and reduce perceived stigma (such as through providing resources for, and promoting awareness of, mental health and well-being support structures and encouraging leaders to role model anti-stigma behaviours), are likely to also see mental health benefits in their workforce, particularly in lower levels of psychological distress and turnover, as well as more satisfied workers.

Compared to the organisational factors under the Mitigate Illness pillar, the individual predictors of coping and recovery tended to be less strongly related to mental health and well-being overall; they explain far less variance in poor mental health (0-4%) and optimal mental health and well-being (1-10%). Overall, this suggests addressing these individual factors may be less effective, compared to organisational factors when aiming to enhance mental health and well-being in mining. Nevertheless, active coping and seeking emotional support appear important for fostering optimal mental health. In particular, **active coping** was linked to higher levels of thriving (β = .14, p < .001), indicating that focusing efforts on doing something constructive to improve a stressful situation is linked to higher levels of thriving. Mining companies can support their workforce by increasing workers' abilities to cope actively with pressures (such as by solving problems and working towards changing or improving their situation), thereby complementing preventative strategies undertaken by the companies.

The job and team predictors related to the Prevent Harm pillar explained 2-14% of unique variance in poor mental health outcomes, and 18%-21% of unique variance in optimal mental health outcomes, above and beyond the Mitigate Illness predictors. In particular, job resources such as **possibilities for development** (β = .24-.29, p < .001) and **role clarity** (β = .24, p < .001) were strongly related to the markers of optimal mental health and well-being job satisfaction and thriving. Role clarity (β = -.19, p < .01) was also negatively related to turnover intention (a marker of poor mental health). On the other hand, job demands were more strongly linked to the markers of poor mental health compared to optimal mental health and well-being. **Workload** (β = .25, p < .001) and **work-family conflict** (β = .25, p < .001) were linked to burnout, while **job insecurity** was linked to turnover intention (β = .22, p < .001) and job satisfaction (β = -.16, p < .001). These findings suggest that mining companies that ensure that jobs are well designed, with job demands that are tolerable, coupled with appropriate levels of job resources to meet these demands, are more likely to have mentally healthy workers with higher well-being.

Together, the individual factor predictors under the Prevent Harm pillar, job crafting, further explained only about 1-2% of the variance in poor mental health outcomes. These patterns are similar when investigating the markers of optimal mental health and well-being (0%-2%). However, the crafting approach of trying to develop oneself at work (**increasing structural job**

resources) was positively linked to thriving (β = .18, p < .001), suggesting that mining companies that encourage and facilitate the bottom-up process of worker-led changes to job resources, such as through nurturing a workplace that values learning and development are likely to also encourage optimal mental health amongst workers.

After accounting for the variance explained by the other predictors, the experience of sexual harassment in addition to the presence of all other aspects of the individual and work explained an additional 0-2% of the variance in poor mental health outcomes, and 0 % of the variance in the positive markers of mental health and well-being. Of the four aspects of sexual harassment, **sexist hostility** was related to increased experiences of burnout (β = .15, p < .05), indicating that people who received hostile comments such as those about their suitability for their roles based solely on their gender were also more likely to report feeling emotionally exhausted at work. This suggests that sexual harassment, particularly sexist hostility, has a stronger effect on poor mental health, rather than optimal health.

Summary of Key Findings: Prevent and Mitigate for Mental Health and Well-Being. Overall, job and organisational predictors of mental health and well-being are more strongly associated with worker mental health and well-being than individual predictors. Addressing psychosocial hazards at work such as through good work design (e.g., higher job resources and lower job demands) explains variance in mental health and well-being above and beyond the climate of the organisation and individual strategies to Mitigate Illness.

These findings align with the wider research on mental health and well-being, in which individual approaches to workplace mental health and well-being, such as improving resilience, can be useful, but their positive impacts are limited (Panagioti et al., 2017). In fact, substantial evidence points to redesigning the work itself, as well as the organisational environment, as being impactful above and beyond merely individual approaches (West et al., 2016).

A Statistical Note. Amongst the predictors of mental health and well-being, significant inter-correlations are also observed. Of note, experiences of sexual harassment (including sexist hostility, sexual hostility, unwanted sexual attention and sexual coercion) were negatively correlated with psychosocial safety climate (r = -.14 – -.34, p < .001) and job resources such as possibilities for development (r = -.16 – -.28, p < .001), coworker support (r = -.16 – -.30, p < .001), manager support (r = -.17 – -.32, p < .001) and team climate (r = -.24 – -.44, p < .001). Experiences of sexual harassment were also positively correlated with job demands such as work-family conflict (r = .14 – .30, p < .001) and job insecurity (r = .09 – .23, p < .001). These correlations were stronger for experiences of sexist hostility and sexual hostility compared to unwanted sexual attention and sexual coercion. This suggests that sexual harassment tends to coexist in poorer work environments with other psychosocial hazards. Appendix D reports the full correlation matrix between all the predictors of mental health and well-being.

While there are some inter-correlations observed among the predictors of mental health and well-being, examinations of the collinearity statistics (Tolerance and Variance Inflation Factors) indicated that these predictors were not exhibiting levels of multicollinearity that would bias the statistical models presented above.

It is also important to note that these results do not imply causality but rather an association between predictors and key outcomes of mental health and well-being. Appendix E reports these regression analyses in full.

3.3.2 Prevalence of Important Drivers of Mental Health and Well-being

As demonstrated above, predictors of mental health and well-being are not associated with outcomes equally. In the following subsections, we discuss the prevalence of predictors that are strongly related to mental health and well-being outcomes yet at the same time, not very widespread or prevalent on average. This analysis helps to identify drivers that the mining industry can prioritise to improve mental health and well-being at work. We also discuss predictors that are prevalent at higher levels, identifying areas that the industry should continue to preserve through monitoring and those that can be enhanced.

Figure 8. Percentage of WA mining workers scoring low, moderate, or high on drivers of mental health and well-being
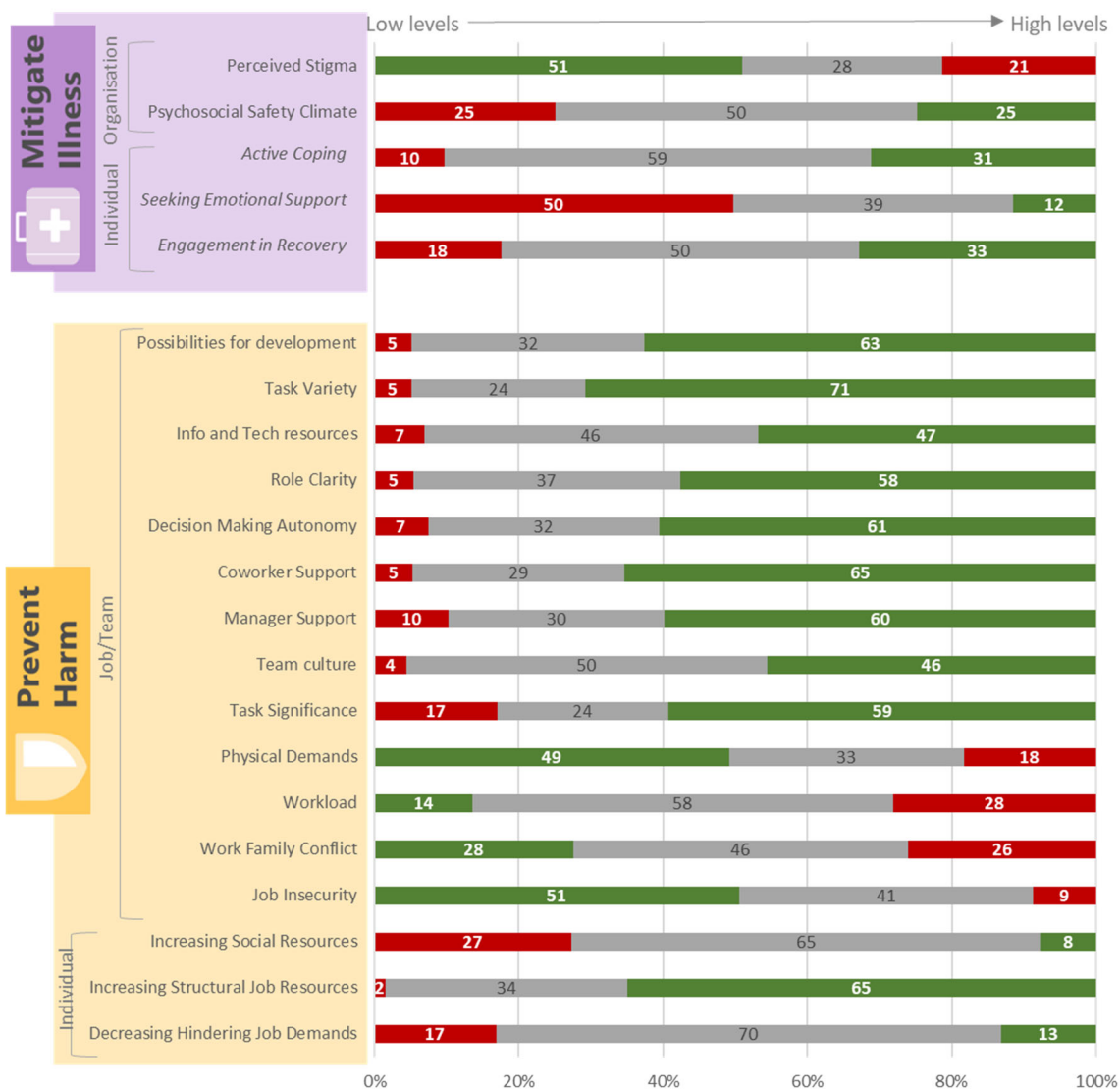
Note. Percentages are rounded to the nearest whole number. Green bars represent the percentage of participants who responded positively. In the case of positively framed drivers, this equates to a response of 4 or 5 on a 5-point scale (indicating high levels of positive experiences and perceptions). In the case of negatively framed drivers, this equates to a response of 1 or 2 on a 5-point scale (indicating low levels of negative experiences and perceptions).

Mitigate Illness – Organisational Factors that Help People Experiencing Poor Mental Health. As discussed in the previous section, perceived stigma is linked to poorer mental health and well-being, while a more positive psychosocial safety climate is linked to better mental health and well-being. Among WA mining workers, about one in five (21%) workers believed that they would face negative consequences such as being discriminated against if they sought mental health support (perceived stigma).

Consistent with this, about one in four (25%) participants reported a negative psychosocial safety climate (i.e., low organisational commitment to mental health and well-being). This means about one in four mining workers believe that their companies do not prioritise their mental health and well-being. On the other hand, an equal percentage of workers (25%) reported a positive psychosocial safety climate, suggesting they believe that their organisations prioritise their mental health and well-being.

Psychosocial safety climate was a consistent theme in the interviews, with participants sharing examples of positive and negative psychosocial safety climates within their own companies.

> That's been quite a big shift that I've noticed in recent years... there's a lot more acceptance and encouragement for people to support their mental well-being at work.
>
> (Professional, FIFO employee)

> As soon as they flagged that they needed some assistance, they got taken off site, and there was a monetary impact. So I know if I am in that situation [of needing mental health support], that would be one of the things I would consider before I put my hand up for help, because I know there would be a financial implication of saying I need some assistance.
>
> (Professional, FIFO employee)

Mitigate Illness – Individual Level Factors that Help People Experiencing Poor Mental Health. Of the three individual strategies that prior research shows help people deal with stress at work, active coping and coping via seeking emotional support were more strongly related to optimal mental health and well-being, compared to poor mental health. While mentally disengaging from work can be a helpful strategy, the relative association with mental health and well-being outcomes were lower in this sample. Focusing on the predictors that may be leveraged to support mental health and well-being, one in three (31%)

> I do a lot of journaling to just try and get any chaotic thoughts out, unentangle them and put a plan in place.
>
> (Professional, residential employee)

people reported the tendency to actively seek ways to improve their work situation, and a smaller percentage of people (12%) reported seeking emotional support from others.

Prevent Harm – Job and Organisational Factors that Prevent Harm or Address Psychosocial Risks. Most of the work design resources were related to reduced poor mental health, and all these resources demonstrated strong relationships with optimal mental health. Further, the work demands were more strongly related to poor mental health, compared to optimal mental health.

Between 46-71% of the mining workers surveyed appeared to have jobs that provided them with a good amount of job resources. Of these job resources, participants were most likely to experience task variety (71% of participants) and coworker support (65% of participants) at work. Other job resources that were present in more than half of participants' jobs were possibilities for development (65%), role clarity (58%), and decision-making autonomy (61%). The presence of these resources is consistently found to have strong links to mental health and well-being (in WA mining workers, but also in the wider research literature), as well as other important work outcomes such as safety (as we will discuss in Section 5; see also Haas et al., 2018) and performance (Andrei & Parker, 2018).

Work design factors were also identified by interview participants as important in supporting their mental health and well-being at work, such as their sense of thriving. Some participants also drew links between positive work design and their ability to perform well at work.

> " I can learn and I can teach other people. My job nowadays, it's the best job I've ever had... I get to do a lot of different things all the time.
>
> (Frontline, FIFO employee)

> " There's a job where you're just literally sitting in a car for 12 hours a day [opening and shutting a gate for others]. You can feel your brain cells dying there...Yeah that's pretty soul destroying.
>
> (Frontline, FIFO employee)

Overall, the findings signal that job and organisational factors that prevent harm are relevant to mental health and well-being in mining. They also show that they are present in many mining workers' jobs.

Between 14-51% of participants experienced tolerable job demands at work – most participants experienced job security (51%), with far fewer participants experiencing tolerable workload levels (14%). However, more than one in four participants reported having intolerable

workload levels (28%) and work-family conflict (26%). These findings are particularly relevant to an industry (and sample) where a large proportion of workers are away from their families for long periods and working long hours in safety-critical environments. In a previous study on the mental health and well-being of FIFO workers (Parker et al., 2018), separation from family was strongly associated with poorer mental health and well-being in FIFO workers. Further, intolerable levels of work demands is a critical work stressor that can often lead to workers feeling overwhelmed or unable to cope, especially when these demands exceed workers' abilities to cope.

Prevent Harm – Individual Factors that Prevent Harm/address psychosocial risks. Of the ways that mining workers can craft their jobs, most survey participants (65%) reported increasing their structural job resources, such as through increasing their skills and seeking development.

Prioritising the Drivers of Mental Health and Well-Being. Above, we discussed drivers that are strongly associated with mental health and well-being, and the prevalence of these in mining. The figures below summarise these critical pieces of information in a matrix. The vertical axis shows the strength of the association between potential predictors with poor mental health. The strength of association figures, or correlations, depicted are absolute values (that is, positive/negative signs removed; see Appendix D for the full correlation table). Factors presented in green have positive associations with optimal mental health, and negative associations with poor mental health, while factors presented in red are negatively associated with optimal mental health, and positively associated with poor mental health.

The horizontal axis shows the levels of the predictors. For example, sixty percent on this axis means "sixty percent of participants agreed or strongly agreed on this aspect".

Together, these dimensions create four quadrants, depicted in Figure 9.

Figure 9. Matrix of strength of association and proportion of people experiencing high levels
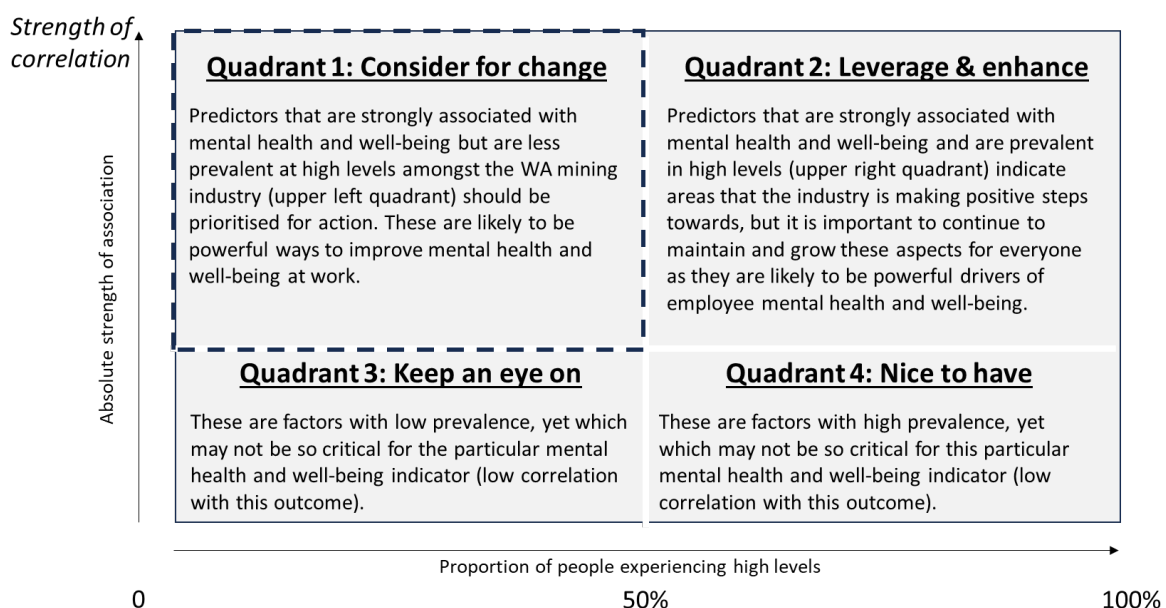
Figure 10 shows this matrix for indicators of poor mental health (psychological distress, burnout and turnover intention).

> Our data suggests the most important levers to reduce poor mental health (**consider for change**) are as follows:
> - increase psychosocial safety climate
> - reduce the perceived stigma of mental ill-health
> - reduce job insecurity
> - reduce work-family conflict
> - improve workloads to make them more tolerable
> - ensure a positive team culture.
>
> Important aspects to **leverage and enhance**, to ensure they exist for all workers, include:
> - ensuring that workers have clarity and autonomy in their work
> - ensuring sufficient information and technological resources
> - improving manager and coworker support
> - increasing possibilities for development.

Figure 10. Prevalence of potential drivers and strength of association with poor mental health (psychological distress, burnout, and turnover intention)

Note. Drivers that are underlined indicate areas that strongly and uniquely contribute to outcomes of poorer mental health. Drivers in italics indicate personal strategies.

Figure 11 shows the same matrix for optimal mental health (job satisfaction and thriving).
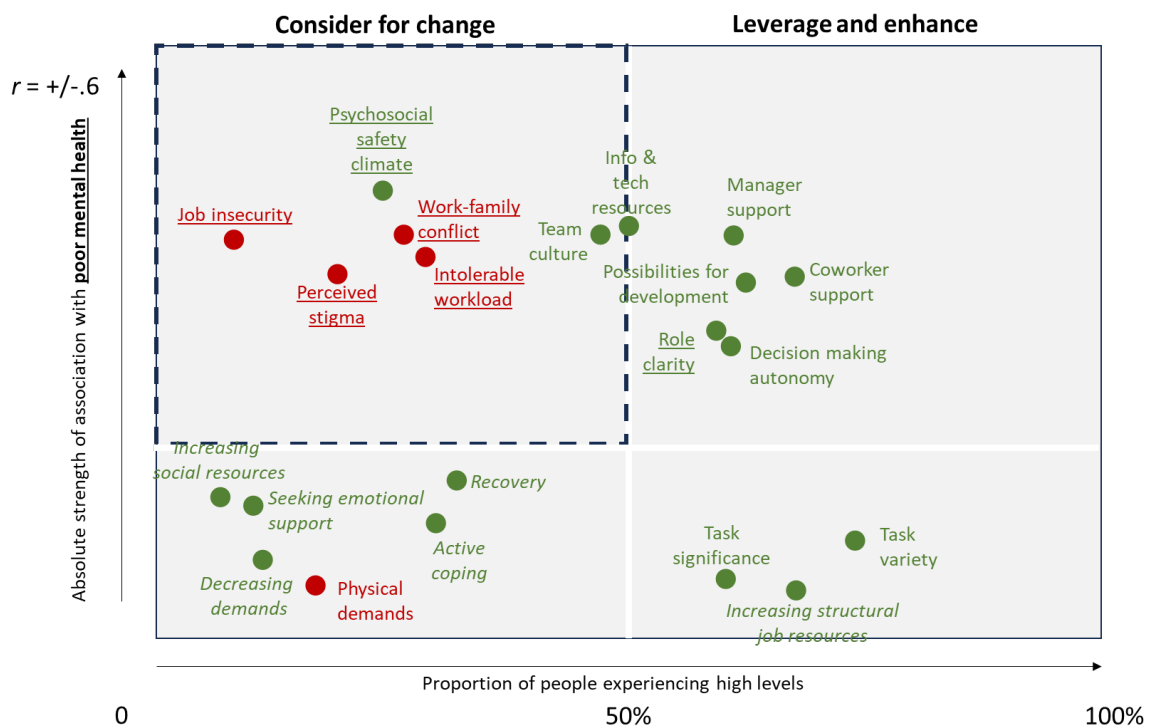
> Our data suggests the most important levers to increase optimal mental health (**consider for change**) are as follows:
> - increase psychosocial safety climate
> - reduce job insecurity
> - reduce the perceived stigma of mental ill-health
> - improve workloads to make them more tolerable
> - ensure a positive team culture
> - enhance individual level strategies for coping, such as through active coping and seeking emotional support
> - enhance job crafting through increasing social resources.
>
> Important aspects to **leverage and enhance**, to ensure they exist for all workers, include:
> - ensuring sufficient information and technological resources
> - improving manager and coworker support
> - increasing variety and possibilities for development
> - ensuring that workers have clarity and autonomy in their work
> - enhancing job crafting through increasing structural job resources.

Figure 11. Prevalence of potential drivers and strength of association with optimal mental health
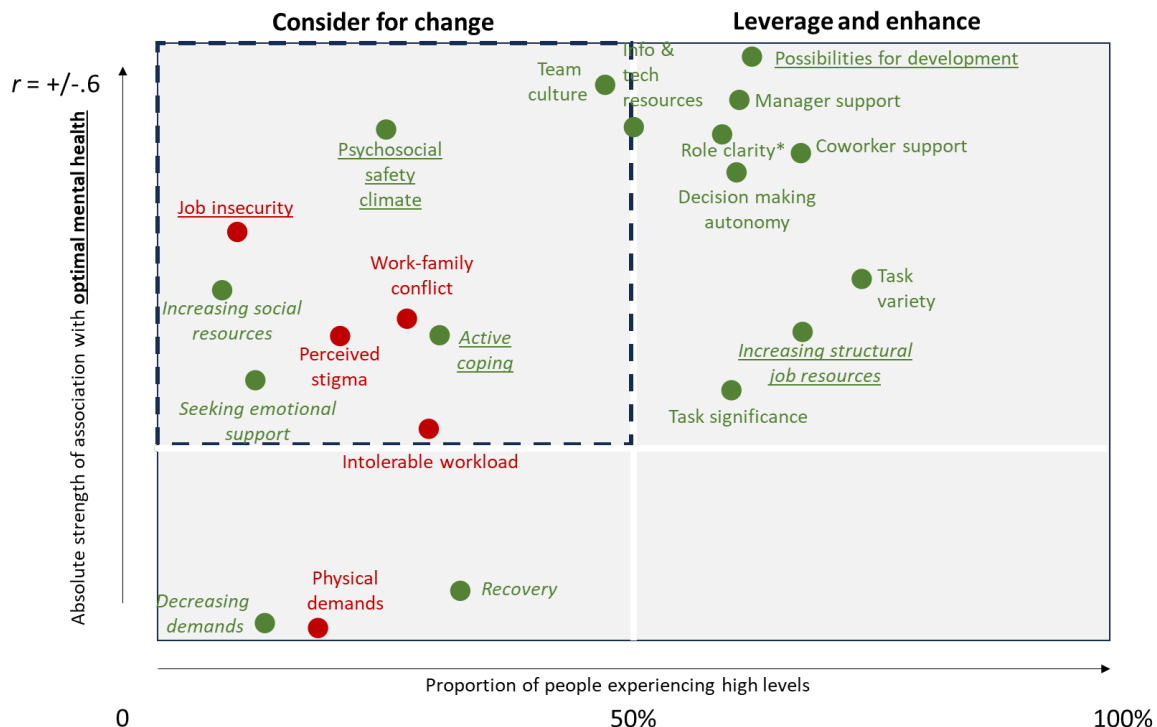
Note. Drivers that are underlined indicate areas that strongly and uniquely contribute to outcomes of optimal mental health. Drivers in italics indicate personal strategies.

3.4 Policies and Practices Related to Mental Health and Well-being

Complementary to Report 2B which reports an overview of the supports (i.e., policies and practices) available to workers from a HR and WHS perspective, this survey provides insights into workers' perspectives of those supports. First, participants were presented with a list of policies, practices, and initiatives, and asked if they had engaged in any of these. Of those who had, they were asked a follow-up question regarding their perceptions of the usefulness of each specific policy, practice, or initiative that they had engaged in. Figure 12 reports the percentages of participants who engaged in the policies, practices, and initiatives relevant to mental health and well-being as well as the related perceived usefulness. Following, we demonstrate the link between engagement in these policies and practices with worker mental health and well-being.

Figure 12. Percentage of WA mining workers who have engaged with policies, practices and other initiatives, and the perceived usefulness.
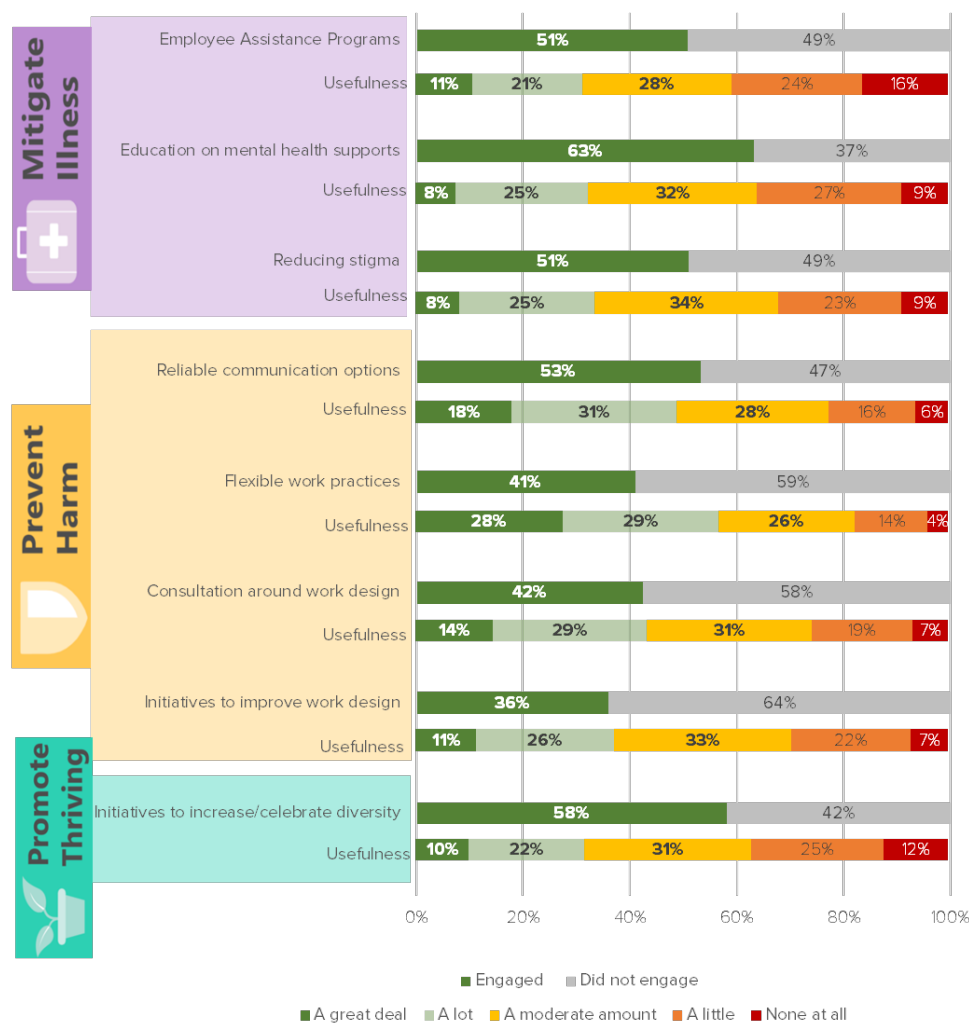
Note. Survey participants were asked their perception of usefulness of each policy/practice/initiative only if they indicated that they had engaged in it. Percentages are rounded to the nearest whole number.

Of the eight policies and practices most related to mental health and well-being, *Education on mental health supports* had the highest engagement (Mitigate Illness), at 63%, followed by *Initiatives to increase and celebrate diversity* (Promote Thriving), at 58% worker engagement. Companies' engagement (as reported by HR, WHS, and other relevant professionals) in these policies and practices – reported in Report 2B – were slightly lower, 54% of companies reported high levels of engagement (engaging to a large + very large extent) in *Educating workers on available mental health supports*, while 42% of companies reported high levels of engagement in *Initiatives to increase and celebrate workforce diversity*. 64% and 63% of workers who engaged in *Education on mental health supports* and *Initiatives to increase and celebrate diversity* respectively found that these initiatives were at least moderately useful in supporting them at work.

Formal mental health supports were frequently discussed by interviewees. While there was a variance in experiences with formal supports, the general consensus was that when these supports were implemented well, the positive impact on their mental health was substantial.

> [Having] someone [in each office] who's trained and is aware of things to watch out for...and keep an eye on people and be known in amongst the rest of the office community as the person you can go and talk to might be your first port of call if you have a particularly bad day...[the training is available for] anyone who wants to do the mental health support training...I think it's great.
>
> (Professional, office-based employee)

The policies and practices that workers felt were the most useful were: *Flexible work practices* (83%), *Reliable communication options* (78%), and *Consultation around work design* (74%). These policies and practices are all related to the Prevent Harm pillar. However, both HR/WHS professionals reporting on company engagement (46%, 76%, and 55% respectively) and workers' reporting on their own engagement with the policy or practice (41%, 53%, and 42% respectively) were lower relative to other policies, practices, and initiatives. These findings, when taken considering the link between work design and mental health and well-being as established above, indicate that this is an area in which companies may consider investing resources to improve. Job resources – particularly possibilities for development and role clarity – were strongly related to various markers of mental health and well-being. On the other hand, job demands – particularly workload and work-family conflict – were linked to markers of poor mental health. Taking these findings together, results suggest that good work design is linked to better worker mental health. Further, workers report that policies and practices around improving work design are useful in supporting them at work. Therefore, work design is an important area of opportunity for companies to engage more extensively in order to support workers.

Research indicates that there is a link between supportive organisational policies and various markers of worker mental health and well-being (e.g., Shantz et al., 2016; Van De Voorde et al., 2016; Zheng, 2015). However, it is important that workers engage with these policies and practices, rather than the existence of these intended policies and practices within companies, which is likely to determine the effectiveness of such policies and practices on mental health and well-being (Wright & Nishii, 2007). For example, some interviewees stated

that there were policies and practices that they were aware of but did not engage with or find them useful for various reasons.

"
There's a chaplain on site but I'm not a religious person...Talking for the rest of my life won't achieve anything. What's the point?

(Frontline, FIFO employee)
"

We therefore investigate the link between workers' engagement with and perceived usefulness of policies and practices and worker mental health outcomes. Table 8 displays the correlations between the perceived usefulness of policies and practices, and the markers of mental health and well-being.

Table 8. Correlations between perceived usefulness of policies and practices and mental health and well-being outcomes

	Perceived usefulness of...	Mental Health and Well-Being Outcomes					
		Suicide Ideation	Psychological Distress	Burnout	Turnover Intention	Job Satisfaction	Thriving
Mitigate Illness	Employee Assistance Programs	.03	.04	.00	-.02	-.01	.00
	Education on MH supports	-.05	-.14**	-.09**	-.16**	.19**	.18**
	Reducing Stigma	-.11^	-.16**	-.12**	-.17**	.21**	.21**
Prevent Harm	Reliable communication options	-.04	-.10**	-.10**	-.14**	.18**	.17**
	Flexible Work Practices	-.09^	-.11**	-.07**	-.14**	.16**	.16**
	Consultation Around Work Design	-.07	-.17**	-.14**	-.19**	.23**	.25**
	Initiatives to Improve Work Design	-.05	-.13**	-.15**	-.19**	.23**	.25**
Promote Thriving	Initiatives to Increase Awareness /Celebrate Diversity	-.05	-.12**	-.08**	-.18**	.21**	.21**

Note. p < .05 is reported for smaller sample sizes where factors were displayed at random to a third of all participants. ^ *p* < .05, * *p* < .005, ** *p* < .001.

In general, workers who found that company policies and practices that support mental health and well-being were useful in supporting them at work also reported better mental health and well-being. Regression analyses were conducted to indicate the amount of variance that engaging in policies and practices explained in each mental health and well-being outcome. In the first step of the regression, professional role and employment type[16] was entered, so that in the subsequent step, the effect of the specific factors of interest can be identified while controlling for the underrepresentation of frontline workers in the sample as well as any differences in availabilities of company policies and practices to direct employees, contractors, and labour hires.

Across the indicators of poor mental health, being consulted around work design was linked to lower psychological distress (β = -.09, p < .001) and a lower intention to leave the company (β = -.09, p < .001), while engaging in initiatives to increase awareness of and celebrate diversity was also linked to lower intention to leave the company (β = -.08, p < .001). Turning to the indicators of optimal mental health and well-being, engagement with nearly all policies and practices uniquely contributed to higher job satisfaction (β = .09 – .10, p < .001) and thriving (β = .07 – .12, p < .001).

Taken together, these findings strongly support the notion of having a suite of supports available for workers to draw on. It is important for mining workers to have a variety of formal and informal supports addressing individual, job, and organisational factors to help them tailor the best course of action for them to tackle the different and unique stressors and challenges that mining workers face.

" [The support I use] depends on the problem. It depends on how personal it is, and which one I am the most comfortable using for that.

(Professional, office-based employee)

The full regression analyses are reported in Appendix F.

It is important to note here that these results do not imply causality but rather an association between workers engaging with these supports and their levels of mental health and well-being. For example, while we demonstrate here that workers who are consulted on their work design tend to also report lower psychological distress, we cannot conclude that being consulted on work design in and of itself leads to lower psychological distress (the reverse could be true, for instance, such that less distressed people get involved in consultation processes).

To illustrate further, engagement with Employee Assistance Programs (EAPs) was linked to poorer mental health and well-being on both positive (β = -.12, p < .001) and negative (β = .06 – .12, p < .001) markers. This does not indicate that engaging with EAPs leads to poorer mental health and well-being. Instead, it is more likely the case that workers with poor mental health seek out support from EAPs. EAPs are an important tool to support workers (Beulah et al., 2018). Use of EAPs represents a strategy that workers tend to utilise reactively, that is, workers tend to engage with EAPs when signs and symptoms of poor mental health are

---

[16] Companies' policies and practices were reported by HR, WHS and other relevant professionals to apply to contractors to varying degrees.

beginning to present or are already present. Two interview quotes below recount interviewees' experiences with EAPs:

> "I have used the EAP in the past when I was having a really, really tough time... it was really good to go and talk to someone independent.
>
> (Professional, office-based employee)

> "I got into a situation where I was quite burnt out to the point where I actually had to reach out to [the EAP provider].
>
> (Professional, office-based employee)

3.5 A Deeper Dive into FIFO[17] Workers in Mining

Rosters. A key finding from the FIFO Study (Parker et al., 2018) was that FIFO workers on even-time and shorter rosters reported significantly better outcomes on all mental health and well-being measures compared to FIFO workers on longer rosters. This is likely to be because people need rosters to be of sufficient length to enable recovery and detachment from work, as well as to have quality time with family and friends. In the FIFO Study (Parker et al., 2018), FIFO workers on 4 weeks on, 1 week off (4/1) and 3 weeks on, 1 week off (3/1) and 2 weeks on, 1 week off (2/1) rosters reported significantly poorer outcomes on all mental health and well-being measures compared to rosters such as 5 days on and 2 days off.

It is important to note that in the current study, compared to the 2018 study, there was a much smaller proportion of participating FIFO workers on a 4/1 roster (0.1%; $n = 1$), 3/1 (0.7%; $n = 11$), or a 2/1 (13%; $n = 186$) roster who took part in the survey[18, 19]. This suggests a positive shift and effort by industry away from longer on-site rosters with less time for recovery, in response to recommendations to improve the working conditions of FIFO workers. The majority of our Industry Expert Panel members anecdotally agreed that there has been a shift away from such rosters towards more family-friendly rosters such as the 8/6 rosters.

We investigated FIFO rosters in relation to the mental health and well-being of WA mining workers. As presented in Figure 13, more than 60%[20] of workers on an 8/6-7/7 rotating roster reported high and very high levels of psychological distress. Workers on this roster had the highest level of distress and a level that was statistically higher than other groups. This roster emerged from the "Other (please state):" open-ended option. It is important to note that this roster is the only roster type where workers explicitly noted that they were on "rotating" or "days and nights". Workers on 2 weeks on, 2 weeks off rosters reported the lowest levels of

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[17] We included workers who indicated that they were FIFO, DIDO, or BIBO.

[18] In contrast, FIFO workers on these rosters made up 6% (4/1; $n = 175$), 2% (3/1; $n = 49$) and 16.6% (2/1; $n = 489$) respectively of the sample in the FIFO Study (Parker et al., 2018).

[19] Due to the sample size, we do not report on findings from the 4/1 or 3/1 roster types.

[20] The sample size of the 8-6/7-7 rotating rosters was $n = 18$. Due to the statistical and practical significance of these findings, we believe that it is important to report on these findings. However, findings should be interpreted in light of the relatively smaller sample sizes. We recommend further investigation of this roster.

psychological distress. These differences remained statistically significant after controlling for the effects of professional role, $F(9,1364) = 3.27$, $p < .001$.

Figure 13. Percentage of FIFO mining workers experiencing high and very high levels of psychological distress by roster

Psychological Distress
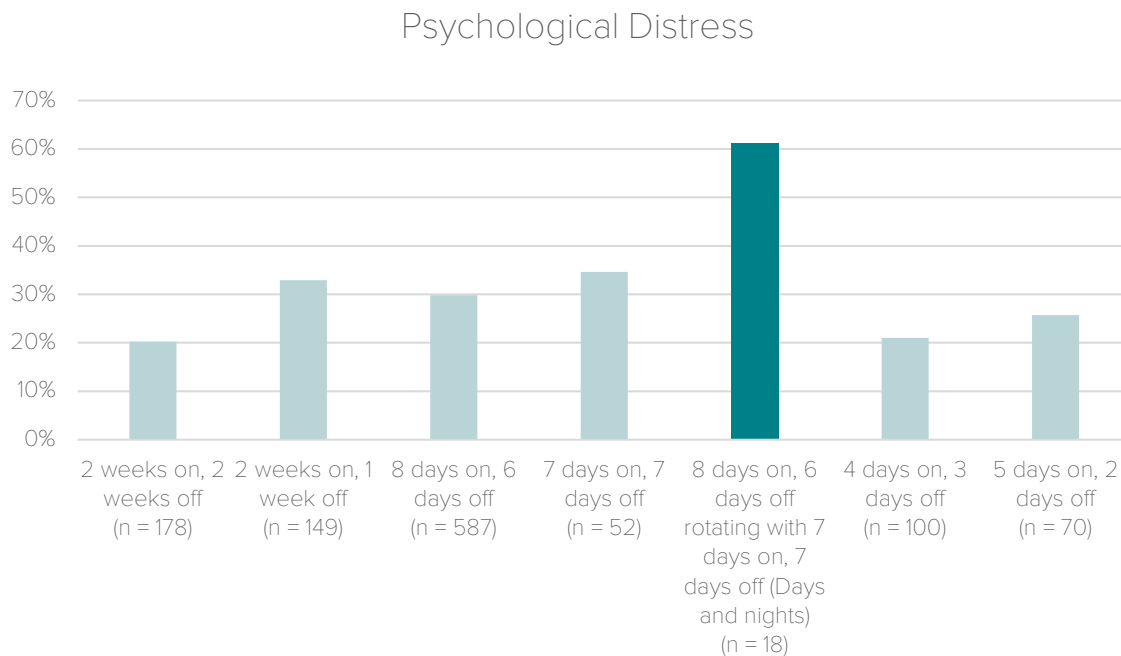
As presented in Figure 14, more than four in ten workers on an 8/6-7/7 rotating roster (44%) and workers on a 2/1 roster (41%) reported high levels of turnover intent, the highest compared to other roster types. After controlling for professional role, there was only a significant difference in turnover intention between workers on the 2/1 roster and workers on the 2 weeks on, 2 weeks (2/2) off roster, such that workers on the even-time roster (i.e., 2/2) were less likely to intend to look for a new job compared to workers on the 2/1 roster.

Figure 14. Percentage of FIFO mining workers experiencing high levels of turnover intention by roster

Turnover Intention
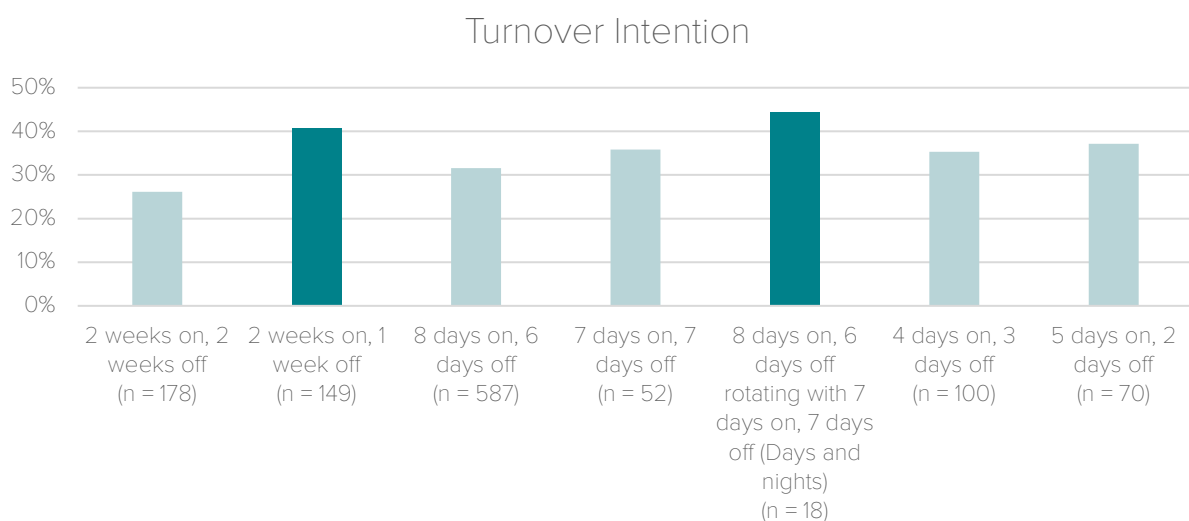
Several FIFO worker interview participants reflected on their previous experiences on a 2/1 roster and compared those experiences with their current shorter rosters. The general sentiment was that workers preferred the shorter rosters.

> [Following a change to a 2 and 1 roster] it was so bad that I had to eventually just take time off and took more sick leave, stress leave, whatever you want to call it, I ended up taking about five months off... It's advertised as a family friendly roster and so on. It's anything but. It is a really tough roster to do and to be away from your loved ones for two weeks. And then in that one week, you're home, you're just exhausted, and then you're straight off doing that again, I really disagree with the 2 and 1 roster... it's tough on families.
>
> (Professional, FIFO employee on an 8/6 roster)

> The 2 and 1 roster really kept the good people away. I mean, there's definitely some good people there. Yeah, but people, I felt, realised that money wasn't the [most important] thing. It was more about being at home with your family, mental health. I felt like this was a culture shift.
>
> (Professional, FIFO employee on a 2/1 roster)

Further, we asked FIFO workers how much autonomy they had over their rosters. There is a wide range of research demonstrating that providing FIFO workers with flexibility over and input into their rosters is key to bridging work and home lives (Fruhen et al., 2023; Peetz & Murray, 2011). When workers are on rosters that best suit their lives and personal commitments, they would be better positioned to address the demands of FIFO work, which can help buffer against poor mental health. Contrary to the general negative sentiment around the 2/1 rosters, one interview participant discussed how they wanted to work on a 2/1 roster as opposed to an even-time roster because of the better total remuneration. However, they were finding it difficult to change their rosters to their preferred 2/1 roster permanently:

> When [previous company] got rid of the 2 and 1, that sort of limited my options. And I said well, okay, I'll go over to [other company], they're still doing 2 and 1 and paying a bit more. The 2 and 1 roster is better for my lifestyle, and my situation... I don't want to lose hours. I don't want to lose money. I'm single, I want to work... If I'm at home, I can't do so many things because I need to save up... I can't go anywhere because I'm trying to save... I've been paying off a lot of debt, and I'm trying to save up for a deposit for a house. [Moving from a 2/1 to an even time roster] the pay cut, that's money I'm gonna lose for a deposit on a house...
>
> (Frontline, FIFO employee on an 8/6 roster)

In this sample of FIFO mining workers, workers with no autonomy over their rosters reported poorer mental health (i.e., higher levels of suicide ideation, psychological distress, burnout, and turnover intention), and lower levels of job satisfaction and thriving. This finding is illustrated in Figure 15. Even after controlling for professional role, autonomy over rosters was significantly associated with lower levels of poor mental health and higher levels of optimal mental health (see Appendix G for full regression output).

Figure 15. Mental health of FIFO workers across varying degrees of autonomy over rosters.
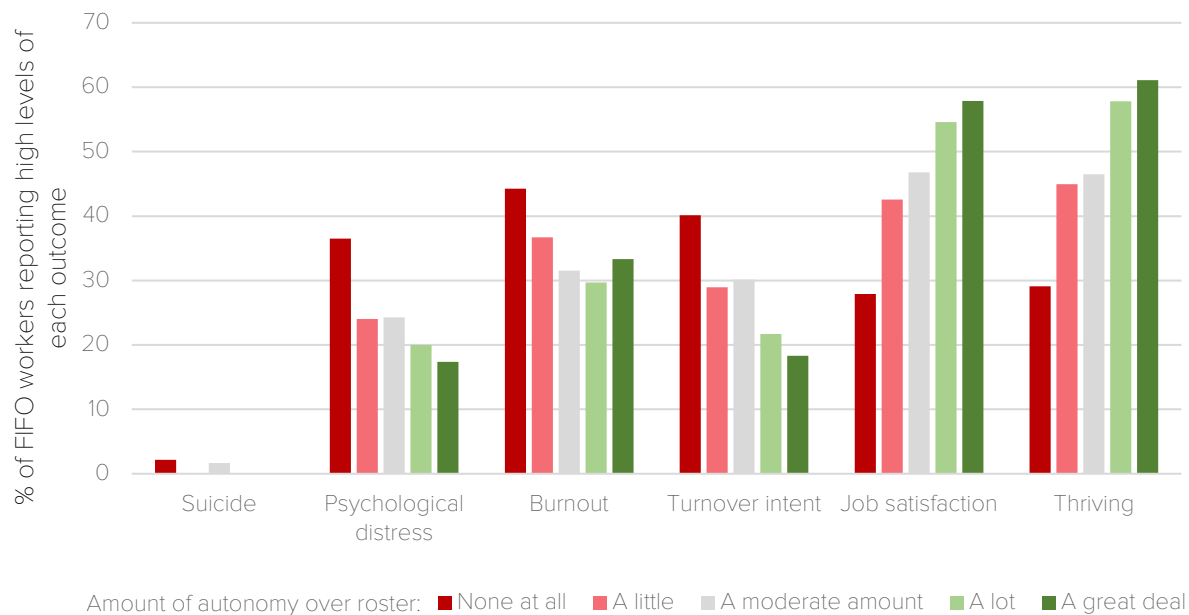
As can be seen in Figure 16, 42% of FIFO workers indicated that they had no autonomy *at all* over their rosters. This high prevalence of a lack of autonomy, coupled with the strong relationships of lack of autonomy with poorer mental health and well-being, indicates that this is an area (**Consider for Change**) that companies might prioritise to improve the mental health and well-being of FIFO workers.

Figure 16. Percentage of FIFO workers who feel that they have autonomy over their roster
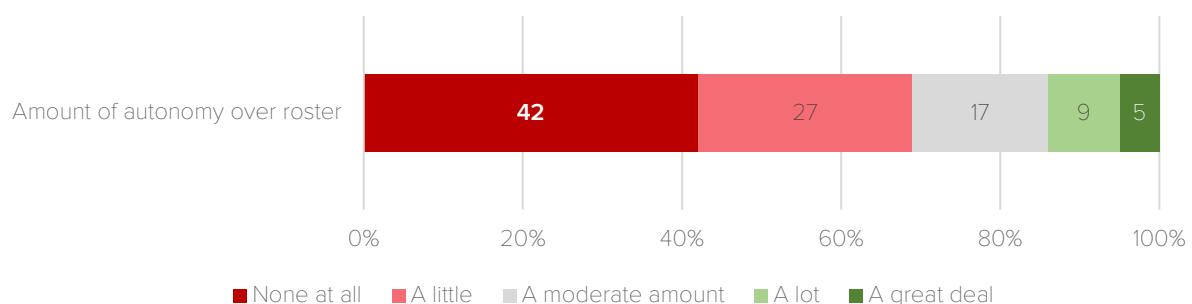
Note. Percentages are rounded to the nearest whole number.

Accommodation factors – Room Arrangements. Another finding from the 2018 FIFO Study (Parker et al., 2018) was that workers who had a permanent room – that is, the same room that they return to each swing – reported significantly better mental health and well-being

compared to other accommodation arrangements. It is likely that having a permanent room is associated with a greater sense of belonging and community, and encourages a sense of security and ownership.
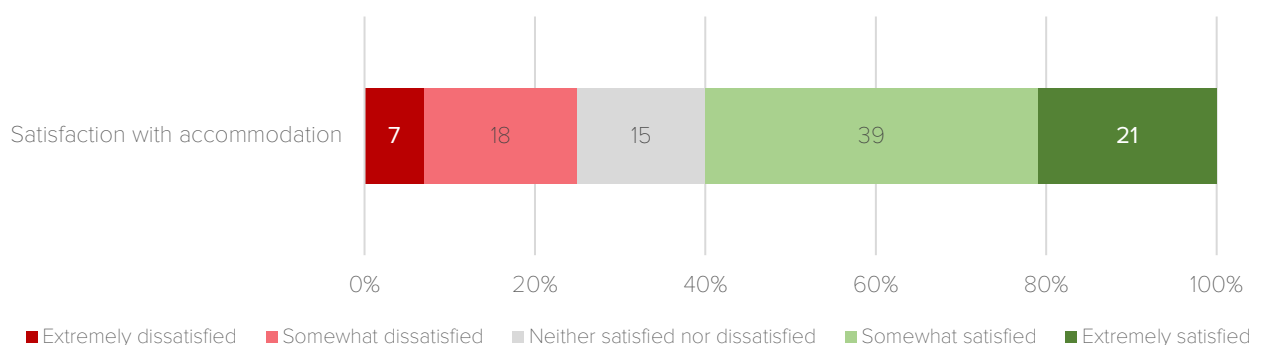
In line with the findings from the FIFO Study (Parker et al., 2018), FIFO mining workers in this survey in permanent rooms reported better mental health. Specifically, they reported significantly lower levels of turnover intention compared to FIFO workers in rotational rooms, Z = 2.70, p = .01. Logically, direct employees are more likely to be in permanent rooms, as contractors and labour-hire workers may be more transient on site. After statistically controlling for the nature of employment, there was no longer a significant association between room arrangements and mental health and well-being, which means it is difficult to tease out the benefits of a permanent room.

79% of FIFO workers in this study reported being in permanent work-provided accommodation. This reflects an increase in permanent accommodation arrangements in comparison to 73% in the FIFO Study (Parker et al., 2018), which might be indicative of a shift by companies to provide more permanent accommodation arrangements for FIFO workers.

Accommodation factors – Satisfaction. In this sample of WA mining workers, FIFO workers who were more satisfied with all aspects of their accommodation on the whole were also more likely to report lower levels of poor mental health, and higher levels of optimal mental health (see Appendix H for full correlation table). As can be seen in Figure 17, 60% of FIFO workers reported being somewhat satisfied or extremely satisfied with their accommodation, with 40% neutral or dissatisfied, indicating that accommodation satisfaction may be an area where companies could continue to **leverage and enhance** to further support FIFO worker mental health and well-being. Recent efforts to improve accommodation for FIFO workers in some companies are likely to be positively received and helpful to FIFO worker well-being.

Figure 17. Percentage of FIFO workers who feel satisfied with their accommodation

| Satisfaction with accommodation | 7 | 18 | 15 | 39 | 21 |

■ Extremely dissatisfied ■ Somewhat dissatisfied ■ Neither satisfied nor dissatisfied ■ Somewhat satisfied ■ Extremely satisfied

Note. Percentages are rounded to the nearest whole number.

Accommodation factors – physical safety. The Enough is Enough Parliamentary Inquiry Report (2022) found that companies have committed significant resources to improving camps, with a focus on improving physical safety in camps and villages and acknowledged that this was an important first step towards protecting mining workers on site against sexual harassment.

In this sample of WA mining workers, FIFO workers who reported feeling physically safer at their work-provided accommodation were more likely to report fewer incidences of bullying and sexual harassment (see Appendix I for full correlation table).

Further, submissions from the *Enough is Enough Parliamentary Inquiry Report (2022)* noted that females, in particular, experienced harassment in camps and villages. In this study, we found that 73% of male FIFO workers reported feeling *very safe* in their work-provided accommodation, while only a little over half (53%) of female FIFO workers reported feeling a similar level of physical safety (see Figure 18). This difference was statistically significant, Welch's t-tests[21] showed that female FIFO workers reported feeling significantly less safe compared to men ($F_{(1,1472)}$ = 20.89, p < .001) in work-provided accommodations.

This finding suggests that companies should prioritise improving the experiences of female FIFO workers who do not currently feel safe in their accommodation (**Consider for Change**). The Enough is Enough Parliamentary Inquiry Report (2022) noted that some companies have committed significant resources to improve physical security in camps, including improving door security (e.g., key cards, security screens), camp lighting, and safety in laundry and other common areas. Importantly, as we will discuss in Section 4, these improvements must be complemented by a deeper cultural and climate shift.

Figure 18. Percentage of FIFO workers who feel safe in their work-provided accommodation, split by gender (men [M] and women [W]).
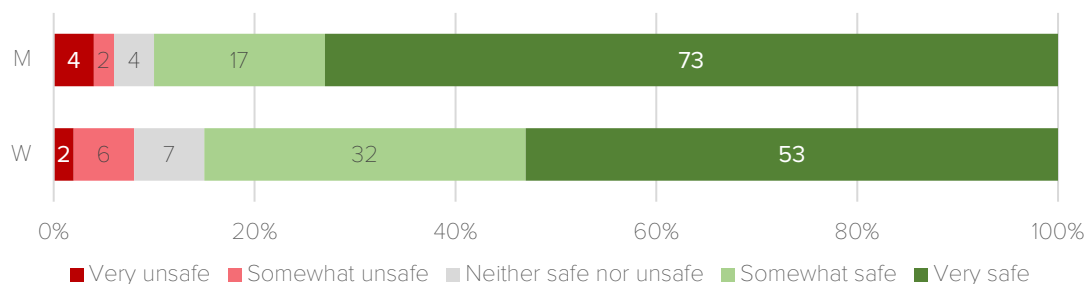
Note. Percentages are rounded to the nearest whole number.

3.6 Interview Findings related to Mental Health and Well-Being

In addition to the quotes that are provided throughout the report so far, we further give a brief overview of some of the themes identified from the interviews with a focus on mental health and well-being. 30 mining workers participated in the interviews relating to mental health and well-being. Of these, 13 participants were professionals, 9 were frontline workers, 6 were managers, 1 participant was from camps and accommodation, and 1 was from transport and logistics. 17 participants were currently FIFO workers.

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[21] A Welch's t-test is a non-parametric method of comparing between two groups. This statistical method is most suitable when sample sizes are unequal, the data is not normally distributed, and/or the variances are not equally distributed.

The interviews explored the aspects of work that contributed to mining workers' sense of mental health and well-being. Several themes at the person, job, team/site and organisation levels that impact mining workers' mental health emerged as common themes during the interviews. These themes are mapped onto the Thrive at Work pillars. They were further coded based on their effectiveness in supporting worker mental health as indicated by the participants in the interview. These themes, the number of interview participants who discussed each theme, and the extent to which participants felt these supports were helpful or unhelpful are summarised in Figure 19 below. The full interview analysis is available in Appendix J.

Figure 19. Summary of key interview themes related to mental health and well-being

Pillar	Theme	n	
Mitigate Illness Monitor, accommodate and treat illness, ill-health and injury	Formal mental health support strategies		
	Employee Assistance Programs (online/phone)	22	43% / 37% / 23%
	Face to face professional supports	14	50% / 33% / 17%
	Peer support and other training	22	60% / 18% / 22%
	Mental health and well-being policies	26	49% / 23% / 29%
	Informal mental health support strategies		
	Family support	8	63% / 25% / 13%
	Individual strategies	20	57% / 21% / 21%
	Resilience	19	54% / 29% / 18%
Prevent Harm Minimise harm and protect against risk	Senior leadership support	18	30% / 17% / 52%
	Work design factors		
	Task and skill variety	27	49% / 36% / 15%
	Task identity	16	74% / 11% / 16%
	Decision making autonomy	28	33% / 46% / 22%
	Scheduling autonomy	21	52% / 33% / 15%
	Change consultation	15	24% / 33% / 43%
	Manager support	22	44% / 29% / 26%
	Coworker support	8	75% / 8% / 17%
	Tolerable workload	23	18% / 55% / 27%
	Job crafting	18	39% / 39% / 21%
	Policies addressing work-family conflict	24	23% / 42% / 35%
	Accommodation factors	19	34% / 32% / 34%
Promote Thriving Optimise well-being and generate future capabilities	Promoting connectedness	18	60% / 6% / 33%
	Diversity and inclusion factors	17	32% / 36% / 32%
	Mentoring	9	67% / 17% / 17%

Note. While 17 interview participants were currently FIFO workers, two other participants who previously worked on FIFO rosters reflected on their experiences and compared FIFO to their current work.

3.7 Comparing Findings to Other Available Data

In addition to the WA mining workers, we also collected data from a similar group of WA workers outside of the mining industry (the "benchmark sample"; see Appendix A for details on the sample). This allows for direct comparisons between the mining and non-mining

samples, and areas where these two groups differ can be analysed to identify statistical differences. For further contextualisation, we also present previously recorded data from the 2018 FIFO study, and national and/or industry norms where available (see Table 9).

Table 9. Levels of mental health and well-being compared to a benchmark sample and other norm data

	MARS Program Landmark Study	Benchmark Sample	FIFO Study (Parker et al., 2018)	Other norms
Suicide ideation	1%	n/a	1%	N/A
Psychological distress	30%	24%	33%	19% (ABS, 2021a)
Burnout	38%	20%	27%	N/A
Turnover Intention	31%	21%	38%	N/A
Job Satisfaction	41%	47%	35%	N/A
Thriving	42%	47%	N/A	48% (Thrive at Work[22])

Note. The percentages presented refer to the percentage of participants who responded positively on each outcome. In the case of poor mental health indicators, this equates to a response of 1 or 2 on a 5-point scale (indicating low levels of psychological distress, suicide ideation, burnout, and turnover intention). In the case of optimal mental health indicators, this equates to a response of 4 or 5 on a 5-point scale (indicating high levels of job satisfaction and thriving). Percentages are rounded to the nearest whole number.

3.7.1 Benchmark Sample

First, we present the proportion of WA mining workers scoring high on each marker of mental health and well-being, compared to a benchmark sample comprising workers from a variety of industries.

As can be seen in Table 9, across all markers of mental health and well-being, a larger proportion of the mining sample reported poorer mental health, and lower levels of optimal mental health.

Comparing the levels of poor mental health between the WA mining sample and the benchmark sample, Welch's t-tests showed significantly higher levels of psychological distress ($F_{(1,2496)} = 11.75$, $p < .001$), burnout ($F_{(1,2524)} = 46.60$, $p < .001$), and turnover intention ($F_{(1,2530)} = 16.22$, $p < .001$), in the mining workers than in the benchmark sample, suggesting that they experience poorer mental health compared to the benchmark sample.

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[22] The Thrive at Work Survey data was completed by 6,813 workers from Australian organisations between 2020 and 2023. They consist of workers from diverse industries, roles, and functions.

Comparing levels of optimal mental health, the mining sample experienced lower levels of job satisfaction (F(1,2720) = 9.87, p < .001) compared to the benchmark sample, but there were no significant differences in thriving between both samples (*F*(1,2533) = 3.57, p = .06).

3.7.2 Available Norm Data for Comparisons

In Table 9, we also present the levels of mental health and well-being in the present study compared to available norm data. We identified three norm sample datasets as suitable for comparison with the mining worker sample. The first norm group that we use as a comparison is the group of FIFO workers who took part in a study of FIFO worker mental health (Parker et al., 2018). It is important to note here that the FIFO study included WA FIFO workers, and was not specific to the mining sector, such that workers who were not in the mining sector (e.g., oil and gas) were included in the sample. Comparisons should therefore be interpreted with this in mind.

The second norm group we identified as suitable for comparison is data reported by the ABS for the overall Australian population for the year 2021. The ABS reports data on psychological distress, and we compared the mining worker samples' scores on this scale to the reported norm data. Overall, psychological distress in the WA mining sample is high compared to the general Australian population (ABS, 2021a). However, the levels of high and very high psychological distress are lower compared to the sample of FIFO workers. While turnover intention is also lower, levels of burnout in the WA mining sample is higher compared to the FIFO sample.

3.8 Summary: Mental Health and Well-Being

Across all findings reported in the survey results section regarding mining workers' mental health and well-being, notable results are summarised in this section. These notable results are derived based on the insights generated from the description of the level of mental health in the mining worker sample, the comparison with other data sets and samples, as well as the analysis focussed on factors associated with the mental health outcomes.

- Levels of psychological distress and burnout are higher in WA mining workers than in other samples. 30% of workers reported high or very high levels of psychological distress and 38% reported feeling burnt out at least once a week, compared to 24% and 20% respectively in the benchmark sample. While psychological distress is slightly lower here compared to the FIFO Study (Parker et al., 2018), the proportion of mining workers experiencing high and very high psychological distress is greater compared to the general Australian population in 2021. Burnout levels are higher than in the FIFO Study (Parker et al., 2018).
- About four in ten mining workers reported feeling satisfied with their jobs (41%) and that they experience a sense of thriving at work (42%) This was lower compared to the levels of job satisfaction (47%) and thriving (47%) reported by the benchmark sample.
- Experiences of mental health and well-being vary across different demographic groups in the mining sample:
  - **Women** tended to report poorer mental health and well-being in general, however, men reported higher levels of psychological distress.
  - **Younger workers** generally tended to report poorer mental health and well-being compared to older workers. Workers in the youngest age group (< 24

years old) reported the poorest mental health, as well as high levels of optimal mental health.

  o **Frontline workers** were less likely than managers and professional workers to experience job satisfaction and a sense of thriving.

- The strongest predictors of mental health and well-being were job and organisational factors, particularly a positive psychosocial safety climate and a well-designed job. The data suggests that key drivers the mining industry can leverage to improve mental health and well-being at work relate to **reducing perceived stigma** in the workplace, creating a more **positive psychosocial safety climate**, increasing **team culture** where workers have a shared belief that it is safe to speak out, and express views and concerns within their team, and having **possibilities for development** at work.

- Mining workers who engaged with company policies and practices that support mental health and well-being also tended to report better mental health and well-being. In particular, being consulted on work design was linked to lowered levels of ill-health, while engagement with nearly all policies and practices was linked to higher scores on optimal mental health and well-being.

- Formal coworker and managerial supports (e.g., providing training to identify mental health requirements) and informal supports (e.g., catching up over coffee, informal check-ins, etc.) were commonly cited as being helpful for protecting mining workers' mental health and well-being at work.

- We identify some positive trends and developments in the roster and accommodation provision for FIFO workers in the mining industry. Compared to data from 2018, a shift towards more workers being employed in even-time rosters and permanent accommodation was identified in 2023.

4.
Findings Related to a Respectful Culture (Bullying and Sexual Harassment)

Section 4.   Findings Related to a Respectful Culture (Bullying and Sexual Harassment)

A respectful culture at work includes multiple aspects of treating people kindly and showing care for how one's actions may impact others at work. Features of a disrespectful culture at work include bullying and sexual harassment.

Workplace bullying is defined as repeated, unreasonable behaviour directed at a worker or group of workers that creates a risk to health and safety at work (Safe Work Australia, n.d.). Bullying can include behaviour that is victimising, humiliating, intimidating, or threatening. It can be physical or more generalised hostile behaviours. We therefore report on participants' experiences with general bullying, as well as physical bullying, such as physically intimidating behaviours.

Sexual harassment is the dominant term used to refer to 'unwelcome physical, verbal or non-verbal conduct' and can include behaviours such as touching, fondling, brushing up against someone, unwelcome innuendos, commentary with sexual undertones, whistling, staring, sending messages or images of a sexual nature or sexual stories and jokes (Botha, 2016; Rubin et al., 2017). Scholars tend to use sexual harassment as an umbrella term, referring to several specific facets of behaviour (Fitzgerald et al., 1995). Below, we discuss each of these facets in turn.

- First, *sexual coercion* refers to attempts, both explicit and implicit, to make the conditions of or advancements in employment, contingent on sexual cooperation (Cortina & Areguin, 2021). An example of this behaviour includes reports from the Submission to the Enough is Enough Parliamentary Inquiry by the Western Mine Workers' Alliance (2021, p. 7) of female workers being pressured "into sexual activity in order to access training and job opportunities". However, research suggests that while this is often the first thing that people think about when they hear the term sexual harassment, this is by far the rarest form of sexual harassment.
- Second, *unwanted sexual attention* involves expressions of sexual interest that are unwelcome, unreciprocated, unpleasant, and can be terrifying and traumatising to the impacted person (Cortina & Areguin, 2021). Examples include repeated attempts at establishing a romantic relationship, unwanted touching, cornering, and even sexual assault.
- The third dimension of sexual harassment is *gender-based harassment*. Unlike the previous two facets discussed, it does not have sexual cooperation as a goal, instead it refers to communicating demeaning, hostile, or degrading sentiment based on the

impacted person's gender or sex (Cortina & Areguin, 2021), and can create a hostile work environment even for those who are not the person being harassed (Fitzgerald et al., 1995). Gender-based harassment can be further divided into two sub-facets – *sexist hostility and sexual hostility.* Sexist hostility includes insulting remarks based on the impacted person's gender, with examples including comments such as "people of your gender do not make good {profession}". Sexual hostility tends to be more sexualised, including behaviours such as making offensive sexual comments directed at a person. Although gender-based harassment poses serious personal and professional consequences and is a form of gender discrimination, research has found that women who experience gender-based harassment are up to seven times less likely to label their experiences as sexual harassment compared to women who experience either sexual coercion or unwanted sexual attention (Holland, & Cortina, 2013), therefore these experiences of sexual harassment tend to be less reported (Kabat-Farr & Crumley, 2021).

Figure 20 captures the sexual harassment behaviours described above. This iceberg metaphor, adapted from Cortina and Areguin (2021), illustrates how sexual coercion and unwanted sexual attention represent a smaller portion of sexual harassment experiences that occur in workplaces, yet is what typically finds its way into the media headlines or high-profile cases. Gender-based harassment, while far more prevalent (constituting the bulk of the iceberg), is depicted under the surface, because it seldom breaks through to public awareness. The academic literature further suggests that organisational policies remain weak on gender harassment across industries (Cortina & Areguin, 2021). But as the iceberg illustrates, gender harassment provides a base for more sexually threatening acts of harassment, abuse, and violence. In other words, unwanted sexual attention and sexual coercion rarely take place without a foundation of gender-based hostility and contempt (Cortina & Areguin, 2021).

Figure 20. Iceberg of sexual harassment, adapted from Cortina and Areguin (2021)

4.1 Experiences of a Respectful/Disrespectful Culture in the WA Mining Sample

We acknowledge that harassment can be a universal experience; people of all genders, sexual orientations, professional roles, and working conditions may indeed experience sexual harassment at work. Indeed, sexual harassment scholars acknowledge that the sexual harassment experiences of groups other than women (e.g., men and lesbian, gay, bisexual, transgender, queer, intersex, asexual and gender-diverse [LGBTQIA+] populations) require further research. Nevertheless, many studies have demonstrated that women are much more likely to experience sexual harassment (Australian Human Rights Commission, 2020; Our Watch, 2019) and bullying at work, particularly in environments where women are visibly in the minority (Zapf et al., 2020), such as in the mining industry. Therefore, in this section, we present all breakdowns by gender.[23]

We present the various indicators of a respectful workplace culture at work. First, Figure 21 displays the percentage of participants who have experienced or witnessed bullying sometimes, often, or very often in the past *6 months*. All survey participants were presented with a content notice and asked if they would like to answer the following set of questions. 2,090 participants opted to answer these questions on bullying, the findings below are based on this group. The bullying questions in the survey were preceded with a definition aligned to Safe Work Australia, "repeated and unreasonable behaviour directed towards a worker or a group of workers that creates a risk to health and safety, including behaviour that is victimising, humiliating, intimidating or threatening.".

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[23] The number of participants identifying as non-binary/gender queer/gender fluid did not meet the minimum threshold for reporting ($n < 20$).

Figure 21. Percentage of WA mining workers who have experienced physical bullying, or experienced or witnessed general bullying in the past 6 months for men (M) and women (W).
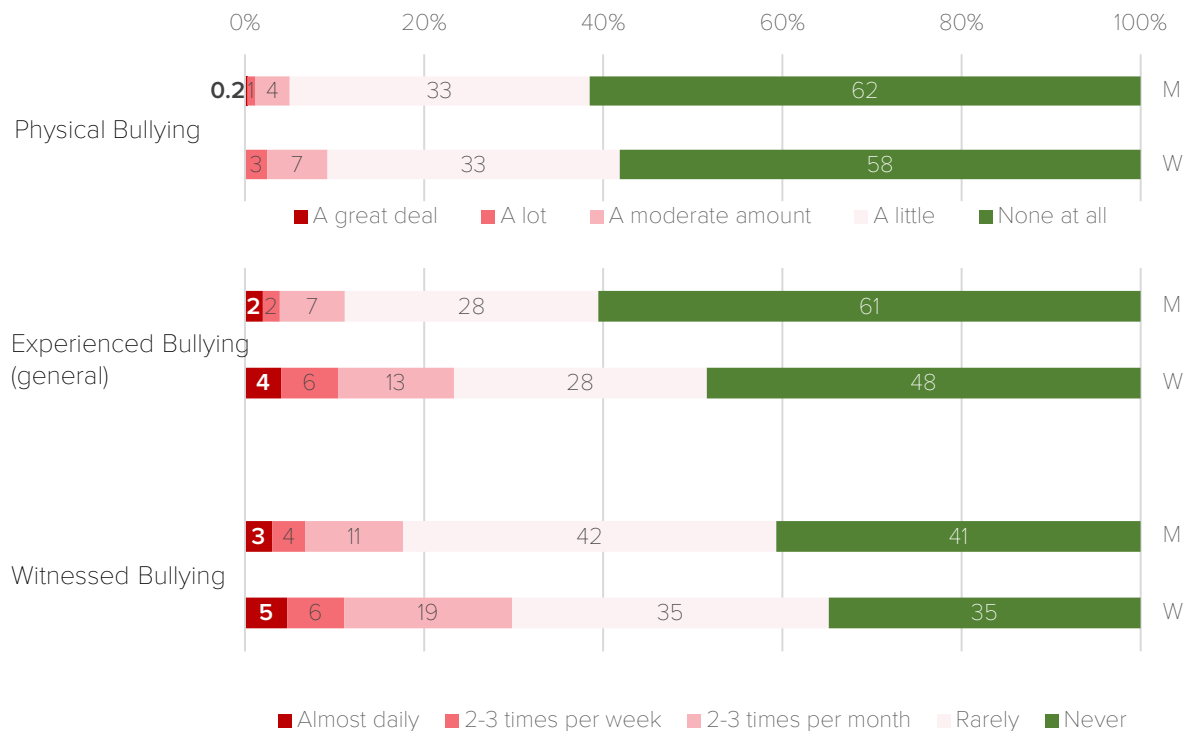
Focusing on exposure to bullying in the past 6 months, 10% of women and 5% of men reported experiencing physical bullying a moderate amount, a lot, or a great deal in the past 6 months, while 23% of women and 11% of men reported experiencing bullying more generally 2-3 times per month or more frequently in the past 6 months. In general, these experiences were positively correlated (r = .51 p < .001), indicating that people who experienced general bullying w ere also more likely to experience physical bullying.

A larger percentage of participants reported witnessing bullying; 30% of women and 18% of men reported witnessing another person being bullied at their workplace at least 2-3 times a month in the last 6 months.
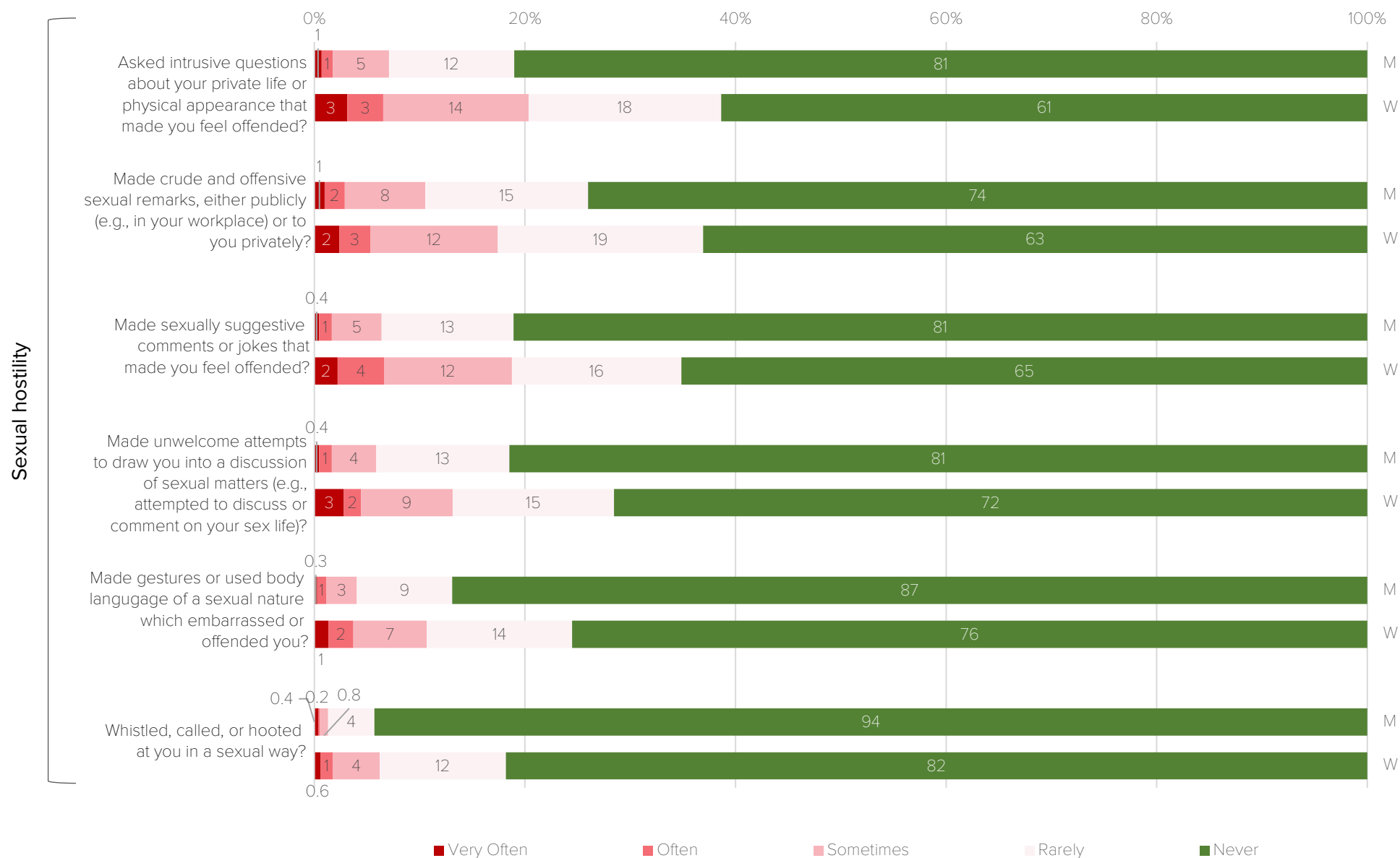
Turning to experiences of sexual harassment, as there are several indicators (that is, behaviours) under each facet of sexual harassment[24], Figure 22 displays the experiences of participants who experienced, in the past *12 months*, the behaviours relating to each facet. All survey participants were presented with a content notice and asked if they would like to answer the following set of questions. 1,889 participants opted to answer these questions; the findings below are based on this group. The sexual harassment items in the survey were preceded with a definition aligned with Safe Work Australia, "Sexual harassment is defined as any unwelcome sexual advance, unwelcome request for sexual favours or other unwelcome
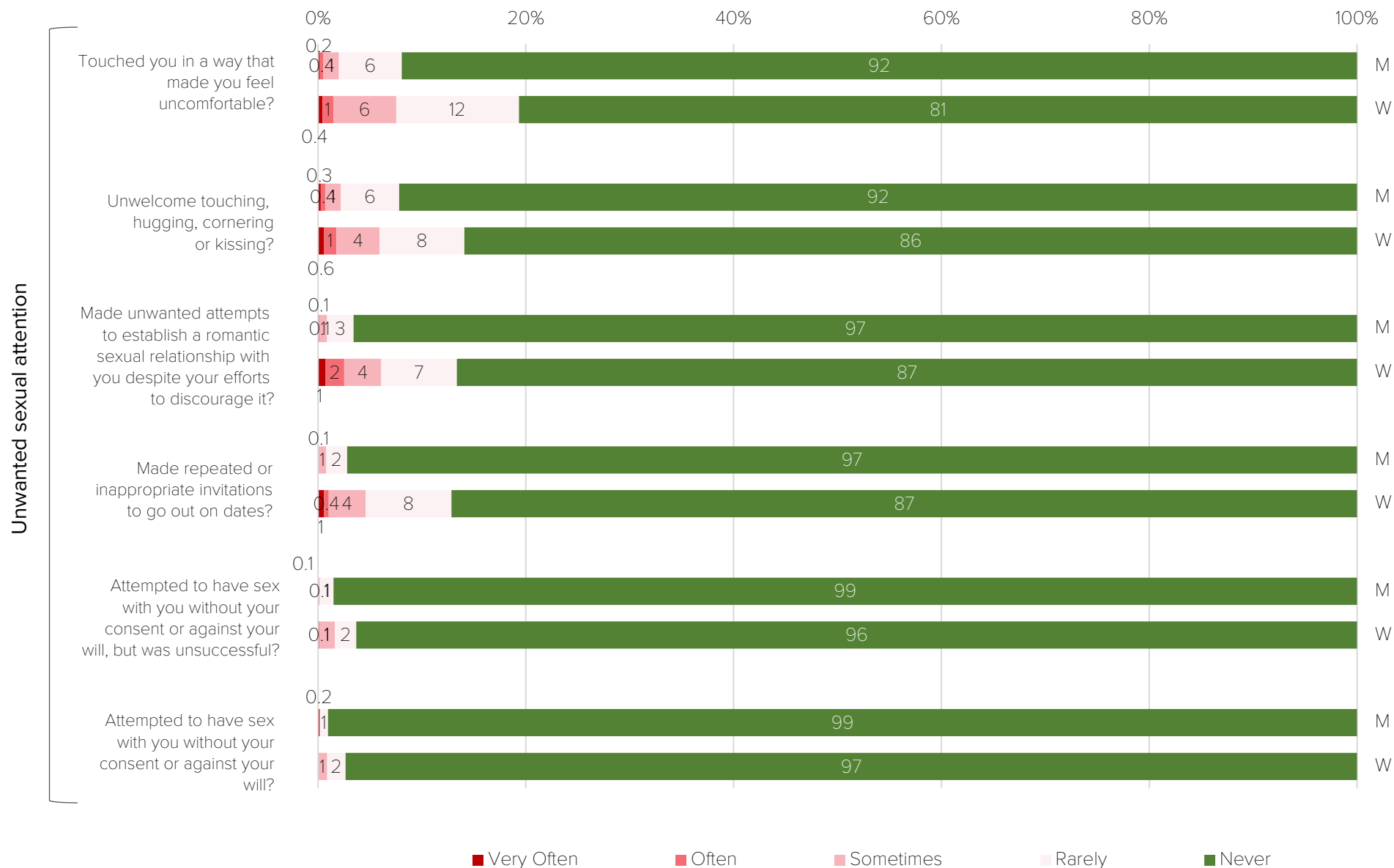
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[24] In the Mining Industry Summit 2023: Driving Respect, we used a more conservative approach and presented data as a combined score across multiple items. Presenting the data at the item-level here is important to 1) demonstrate differences across specific behaviours, and 2) compare to available norms, where item-level data is reported.

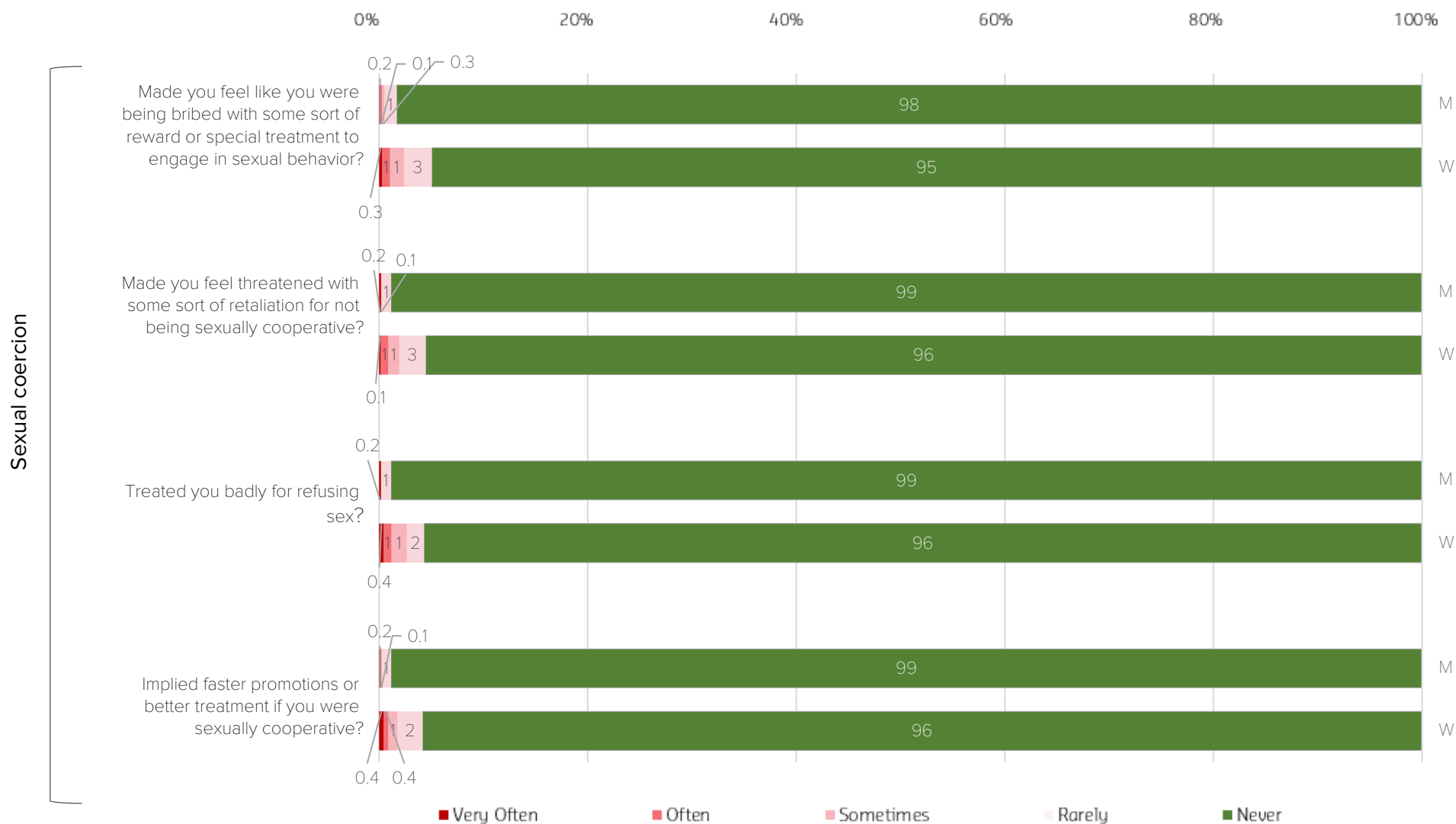conduct of a sexual nature. It can include behaviour that is offensive, humiliating or intimidating. Sexual assault can be any sexual behaviour or act which is threatening, violent, forced, coercive or exploitative and to which a person has not given consent or was not able to give consent. When considering the following questions, remember that the behaviours could have occurred in-person, online or in a digital space."

Figure 22. WA mining workers' experiences with sexual harassment in the past 12 months for men (M) and women (W). Charts are presented in order of most to least frequently occurring.

Sexual hostility

Asked intrusive questions about your private life or physical appearance that made you feel offended?
- M: 1, 1, 5, 12, 81
- W: 3, 3, 14, 18, 61

Made crude and offensive sexual remarks, either publicly (e.g., in your workplace) or to you privately?
- M: 1, 2, 8, 15, 74
- W: 2, 3, 12, 19, 63

Made sexually suggestive comments or jokes that made you feel offended?
- M: 0.4, 1, 5, 13, 81
- W: 2, 4, 12, 16, 65

Made unwelcome attempts to draw you into a discussion of sexual matters (e.g., attempted to discuss or comment on your sex life)?
- M: 0.4, 1, 4, 13, 81
- W: 3, 2, 9, 15, 72

Made gestures or used body language of a sexual nature which embarrassed or offended you?
- M: 0.3, 1, 3, 9, 87
- W: 1, 2, 7, 14, 76

Whistled, called, or hooted at you in a sexual way?
- M: 0.4, 0.2, 0.8, 4, 94
- W: 0.6, 1, 4, 12, 82

Legend: ■ Very Often ■ Often ■ Sometimes ■ Rarely ■ Never

Unwanted sexual attention

Touched you in a way that made you feel uncomfortable?
- M: 0.2 | 0.4 | 6 | 92
- W: 0.4 | 1 | 6 | 12 | 81

Unwelcome touching, hugging, cornering or kissing?
- M: 0.3 | 0.4 | 6 | 92
- W: 0.6 | 1 | 4 | 8 | 86

Made unwanted attempts to establish a romantic sexual relationship with you despite your efforts to discourage it?
- M: 0.1 | 0.1 | 1 | 3 | 97
- W: 1 | 2 | 4 | 7 | 87

Made repeated or inappropriate invitations to go out on dates?
- M: 0.1 | 1 | 2 | 97
- W: 1 | 0.4 | 4 | 8 | 87

Attempted to have sex with you without your consent or against your will, but was unsuccessful?
- M: 0.1 | 0.1 | 99
- W: 0.1 | 2 | 96

Attempted to have sex with you without your consent or against your will?
- M: 0.2 | 1 | 99
- W: 1 | 2 | 97

Legend: ■ Very Often ■ Often ■ Sometimes ■ Rarely ■ Never

Sexual coercion

Made you feel like you were being bribed with some sort of reward or special treatment to engage in sexual behavior?

M: 0.2, 0.1, 0.3, 1, 98
W: 0.3, 1, 1, 3, 95

Made you feel threatened with some sort of retaliation for not being sexually cooperative?

M: 0.2, 0.1, 1, 99
W: 0.1, 1, 1, 3, 96

Treated you badly for refusing sex?

M: 0.2, 1, 99
W: 0.4, 1, 1, 2, 96

Implied faster promotions or better treatment if you were sexually cooperative?

M: 0.2, 0.1, 1, 99
W: 0.4, 0.4, 1, 2, 96

Legend: ■ Very Often ■ Often ■ Sometimes ■ Rarely ■ Never

- Across all sexual harassment behaviours, women reported experiencing these behaviours in the past 12 months sometimes, often, or very often more frequently than men.
- Aligned with the wider sexual harassment literature, in the WA mining worker sample, behaviours under the dimensions of sexist hostility and sexual hostility were reported to occur most frequently, while behaviours of unwanted sexual attention and sexual coercion – behaviours that are often what people envisage when they hear the term sexual harassment – are less frequent.
- Similarly, within each facet, the more commonly experienced behaviours are those that tend to be less overt (e.g., *Asked intrusive questions about your private life or physical appearance that made you feel offended*), while behaviours that tend to be more explicit, visible, or conspicuous tend to be less commonly experienced (e.g., *Whistled, called, or hooted at you in a sexual way*).
- The most common sexual harassment experience for women in this sample was *Put you down or was condescending to you because of your sex* (41%) while the most common sexual harassment experience for men was *Made crude and offensive sexual remarks, either publicly (e.g., in your workplace) or to you privately* (11%).

These survey findings aligned with the interview findings where, despite acknowledging that workplace culture was improving, interview participants identified that the workplace culture generally continued to shape and reinforce expectations about how men should conduct themselves. Further, while efforts from companies have been made to reduce overt discrimination, there has been a noticeable shift towards more discreet behaviours. Quotes from some interview participants illustrate these experiences below:

> I was asked by a manager to apply for a Superintendent role and when I shared that with a co-worker, he said 'you know they are only asking you to apply for that because they want some more women.'. I have two university degrees, I'm more than capable of doing my role, but have that constantly diminished.
>
> (Female employee)

> There is a norm of the way that men are expected to behave, which is probably more towards a misogynistic, over-sexualisation of everything...
>
> (Male employee)

Specific to the experiences of being put down or condescended based on one's sex, a common theme that interviewees discussed was gender diversity, which provide some insights into this area. Some participants expressed an understanding and appreciation for the need to increase diversity, for example:

> I've noticed more women in mining nowadays. I think it's good. It makes people around here more well-behaved. The way [women] do things are different, they have a different approach to things, and I think it's working out for the better.
>
> (Female employee)

However, the overwhelming sentiment from workers of all genders was that women had to be hired based on merit, rather than being driven by quotas.

> I know companies have KPIs and all that they've got to follow, you know, they want to get a certain female to male ratio, but sometimes they don't put the right person in the job for what they're capable of... I think it (having more women) is a good thing, but the companies are going about it the wrong way.
>
> (Male employee)

> I understand the inclusion and diversity component, getting increased participation of the female workforce and everything like that. I completely agree with it. But it needs to be based on merit, not because you tick a box... I've had very good female leaders that if they said they had a job, I would jump in and work for them for free, that's how great they have been. And then I've had female leaders that I just look at and go, why are you even here?
>
> (Female employee)

Interviewees further noted the disservice that a quota-driven approach does to women, potentially perpetuating hostile attitudes and behaviours towards them:

> I've worked with some incredible women who are so good at their job. And I find it very disingenuous to them. The amount of times I've heard management saying, 'Oh, we're trying to hire someone, we've got a shortlist of five people. And one of them is a woman. They (the company) are trying to make me hire her because that's a woman.' ... There are plenty of women that fully deserve that job. But because that system even exists, I've seen that happen before where [a woman] was clearly not cut out for the role, but the company was pushing this line. And all it does is just create animosity with everybody else.
>
> (Male employee)

> But if they don't know how to be a [occupation], they're not gonna cut it as a [occupation]. You know, [by forcing it] you're gonna destroy the mining industry. And it degrades the perception of the female workforce who are actually there on merit.
>
> (Male employee)

Characteristics of Incident. Specific to experiences of sexual harassment, where mining workers indicated that they had experienced any sexual harassment behaviours, we also asked follow-up questions on the location, number of harassers, gender of the main harasser, and relationship of the main harasser to the impacted person. All questions were asked in reference to "the most recent incident that occurred". Of the mining workers who reported having experienced any form of sexual harassment "sometimes", "often", or "very often" in the past 12 months:

- Mining workers reported being most likely to experience sexual harassment at their workstations or where they worked (34%), followed by social areas for workers, such as break or lunchrooms (27%).
- The number of harassers present involved ranged from 1-15, with the most common (modal; 61%) experience of sexual harassment involving one harasser. 18% of sexual harassment experiences involved two harassers, while 21% of sexual harassment experiences involved three or more harassers. That is, nearly four in ten people who experience sexual harassment at work are likely to be harassed by multiple people in the same incident.
- The main harasser was more likely to be male (75%) and a co-worker at the same level (34%).

Witnesses and Reactions to Harassment. We also asked if there were any witnesses to this most recent incident, what the witness did, and any follow-up action that the impacted person themselves took.

- 50% of respondents reported that someone else witnessed the most recent incident. However, when there was a witness, only 14% of the time did the witness try to intervene.
- Further, when workers experienced sexual harassment themselves, only one in three responded by confronting and/or reporting the harasser. Research suggests that reasons preventing increased reporting of sexual harassment included a lack of knowledge around complaints procedures and policies, a lack of knowledge regarding individual rights, a resistance to put colleagues in a 'bad position', and a fear of retaliation or victimisation (Botha, 2016; Kansake et al., 2021).

We report these analyses in full in Appendix L.

4.2 Comparisons of Experiences of Respectful Behaviours Across Subgroups

As mentioned and demonstrated above, bullying and sexual harassment is not an experience isolated to certain groups of people. People of all backgrounds, genders, sexual orientations, professional roles, and working conditions may indeed experience sexual harassment at work. However, existing research indicates that harassment is not experienced in the same way and at the same frequency by everyone (Our Watch, 2019). Below, we explore several demographic variables that may influence experiences of bullying and the various facets of sexual harassment. This analysis enables us to reflect on some subgroups that are more at risk of exposure to disrespectful behaviour and thus may warrant attention when it comes to addressing this issue in mining workplaces.

Gender. As we have discussed, harassment tends to be a gendered experience – women are much more likely to experience sexual harassment (Australian Human Rights Commission, 2020; Our Watch, 2019) and bullying at work, particularly in environments where women are visibly in the minority (Zapf et al., 2020), as is the case for the mining industry. Independent samples Kruskal-Wallis tests indicated that women, compared to men, experienced significantly higher rates of sexual harassment across all facets (sexist hostility (H(1) = 354.34, $p < .001$); sexual hostility (H(1) = 64.17, $p < .001$); unwanted sexual attention (H(1) = 84.67, $p < .001$); sexual coercion (H(1) = 31.70, $p < .001$)) as well as Experiencing Bullying in general (H(1) = 43.80, $p < .001$) and witnessing bullying (H(1) = 22.94, $p < .001$), but not physical bullying. These findings show that women's exposure to bullying and sexual harassment, compared to men, is more frequent, and is overall aligned with patterns found in workplaces in Australia generally.

Sexual Orientation. Research notes an ongoing need to acknowledge sexual harassment in areas of intersectionality such as LGBTQIA+ populations (Bashwira et al., 2014; Bashwira & van der Haar, 2020). LGBTQIA+ populations have been shown to be particularly vulnerable to sexual harassment (Australian Institute of Health and Welfare, 2020). In our study, the proportion of participants identifying as queer or using a different gender term did not meet the minimum threshold for reporting ($n < 20$). However, the proportions of the survey sample identifying as lesbian, gay or homosexual, and bisexual, were sufficiently large for further analyses.

Independent samples Kruskal-Wallis tests indicated that workers in both minority groups (that is, lesbian, gay or homosexual, and bisexual) experienced significantly higher rates of sexual harassment compared to heterosexual/straight workers across all facets of sexual harassment (sexist hostility (H(2) = 44.39, $p < .001$); sexual hostility (H(2) = 29.64, $p < .001$); unwanted sexual attention (H(2) = 14.82, $p < .001$); sexual coercion (H(2) = 15.76, $p < .001$)). A similar pattern was observed for bullying, where lesbian, gay or homosexual, and bisexual workers were more likely to experience and witness bullying (physical bullying (H(2) = 7.30, $p = .026$); experienced bullying in general (H(2) = 19.76, $p < .001$); witnessing bullying (H(2) = 16.43, $p < .001$)).

The mining industry, like many others, has taken some steps to support the minority groups discussed here. Our results show that lesbian, gay or homosexual and bisexual workers are at a higher risk of bullying and sexual harassment, suggesting that more and possibly different changes may be warranted. One interviewee discussed supports available to LGBTQIA+ workers and highlighted some limitations to these supports that could be addressed:

> "
> The company I'm at has an LGBT support network, but even though it's something that's out there, there are still a lot of misconceptions about why it exists. I've heard people refer to it as a 'social club'. ... That's not what this is about. I think that they are there, but there are significant barriers still, for many people...
>
> (Female employee)

These findings so far show that women, compared to men are more likely to experience bullying and sexual harassment in mining. They also highlight that lesbian, gay or homosexual and bisexual workers are also at higher risk of bullying and sexual harassment. We recognise that steps are being taken by the industry to address these issues, but our findings suggest that further actions are needed. We believe that addressing these issues will support the mining industry in attracting more women in the long term.

Age. In the wider research on sexual harassment in mining, some research has found that older women tended to report lower levels of sexual harassment, resulting in higher levels of job satisfaction (Rubin et al., 2017), while other studies found that younger women faced a higher risk of sexual violence in mining communities (Kotsadam et al., 2017). Overall, studies tend to find that younger women are more likely than older women to report being harassed (YouGov Au, 2017).

In this sample of WA mining workers, overall across gender, younger workers tended to report higher levels of sexual harassment – particularly sexist hostility ($H(4) = 68.88$, $p < .001$), sexual hostility ($H(4) = 56.42$, $p < .001$), and unwanted sexual attention ($H(4) = 34.40$, $p < .001$). Workers in the 18-24 and 25-34 age groups experienced the highest rates of these forms of sexual harassment compared to older workers in other age groups. They were also more likely than older workers to report witnessing bullying ($H(4) = 25.45$, $p < .001$).

Roles. In Section 3.2, we discussed that frontline workers (including operators, technicians, and trade/maintainers) experienced significantly lower levels of optimal mental health and well-being compared to other professional roles. Further, frontline workers have also previously been found in a separate study to have poorer mental health and well-being (FIFO study, Parker et al., 2018).

Independent samples Kruskal-Wallis tests found that frontline workers experienced higher levels of sexual harassment on the whole (sexist hostility ($H(4) = 18.05$, $p = .001$); sexual hostility ($H(4) = 12.02$, $p = .02$); unwanted sexual attention ($H(4) = 19.64$, $p < .001$); sexual coercion ($H(4) = 13.562$, $p = .01$)), as well as experiences of and witnessing bullying (physical bullying ($H(4) = 27.84$, $p < .001$); experienced bullying general ($H(4) = 33.82$, $p < .001$); Witnessed Bullying ($H(4) = 35.23$, $p < .001$)), particularly in comparison to Managerial/Leadership and Professional workers.

Overall, these findings suggest that bullying and sexual harassment are more commonly occurring in frontline settings. This means that they are still present in roles at managerial and professional levels, but less so.

Nature of Employment. The nature of employment impacts various aspects of work. For example, workers hired directly by mining companies may experience greater levels of security and belongingness such that they are more likely to develop support networks at work. In contrast, labour hire arrangements in third-party providers supply and are responsible for the pay, benefits and supports available to labour hire workers are less likely to have these positive work experiences. Within mining, labour hire workers tend to be more transient on sites and are less likely than direct employees to spend longer periods on site which can facilitate the development of close friendships and support networks. Large scale national studies investigating employment factors indicate that across all industries, labour hire workers tend to experience poorer job satisfaction (e.g., from the HILDA survey; Buddelmeyer et al., 2013) compared to other workers.

Importantly, regulatory changes now require organisations to take additional steps to equally protect all employees (including contractors and labour hire) from psychosocial hazards and sexual harassment. For example, changes to the *Fair Work Act 2009* have expanded the Fair Work Commission's duties and authority related to sexual harassment jurisdiction, and changes to the *Work Health and Safety Act 2020* state that it is an organisation's responsibility to eliminate or prevent as far as reasonably practicable, exposure to psychosocial harm (including sexual harassment). Therefore, identifying any differences in mental health and well-being according to employment type is pivotal from both a moral and legislative perspective.

Results from our study point to some of the urgency around protecting labour hire workers more in the mining industry. Independent samples Kruskal-Wallis tests found that labour hire workers tended to report significantly higher rates of sexual harassment compared to direct employees and contractors across all facets of sexual harassment (sexist hostility ($H(2)$ = 8.83, p = .01); sexual hostility ($H(2)$ = 12.18, p = .002); unwanted sexual attention ($H(2)$ = 10.23, p = .006); sexual coercion ($H(2)$ = 15.65, p < .001)). A similar pattern was observed for bullying, where labour hire workers experienced and witnessed significantly higher levels of bullying (experienced bullying general ($H(2)$ = 12.43, p = .002); witnessed bullying ($H(2)$ = 22.49, p < .001)) compared to direct employees and contractors.

4.3 Potential Drivers of a Respectful Culture in the Workplace

The previous section reported on some variations in exposure to bullying and sexual harassment between different groups of workers in mining. To further understand the nature of bullying and sexual harassment in mining and what can be done about it, as a next step we explore workplace factors that may contribute to more or less frequent exposure to bullying and sexual harassment. As with Section 3.3 in which we linked key predictors with mental health, we conduct analyses to statistically model the key predictors of bullying and sexual harassment outcomes here. This approach means we identify the points of leverage that are most likely to be important for reducing incidences of bullying and sexual harassment. Second, for the important predictors, we then report on the levels of these factors. This approach provides an evidence-based way of identifying where to focus changes and interventions effectively when looking to address bullying and harassment.

Organisational Drivers. We investigated three organisational drivers in relation to individual experiences of bullying and sexual harassment in the workplace – psychosocial safety climate, excessive surveillance, and excessive rules.

A positive psychosocial safety climate is one in which senior leadership prioritises and communicates the protection of workers' mental health and well-being through policies, practices, and procedures. In the context of bullying and sexual harassment, a positive psychosocial safety climate signals to workers, that senior management values the protection of workers, and that the prevention of psychosocial hazards, including bullying and sexual harassment, involves all levels of the company.

The reasons for examining psychosocial safety climate in the context of a respectful culture, echo those discussed under mental health and well-being (Section 3.3), where psychosocial safety climate is considered a foundational protective factor and can help mitigate psychosocial hazards (Dollard, 2016). Specifically, in this context, research has identified psychosocial safety climate as a key predictor of bullying and harassment behaviour (Law et al., 2011).

On the other hand, perceived excessive surveillance and perceived excessive rules are factors that together indicate the extent to which workers believe that they are subject to strict norms, unnecessary rules, and inflexible schedules at work. Surveillance and rules are typically – and rightfully – utilised by organisations as strategies to mitigate and prevent sexual harassment and assault. However, research finds that when these occur at *excessive* levels, it may breed fertile ground for problematic forms of power-related social interactions to unfold in organisational and societal contexts (Geppert & Pastuh, 2017). As discussed above, bullying and sexual harassment tend to arise from a power-related perspective of "putting people down" and "pushing them out". Therefore, it is likely that workplaces with excessive levels of surveillance and rules may breed fertile ground for disrespectful behaviours to occur.

Together, these organisational drivers signal behaviours and model values deemed to be acceptable or unacceptable to employees, contractors and labour hire workers.

It is important to note here that a common theme that emerged in the interviews was a perception that company responses to addressing sexual harassment are in reaction to the increased media attention and changes to psychosocial hazard requirements. Many interview participants (37%) felt that these responses were inadequate, non-genuine, or damaging. This further highlights the importance of a positive psychosocial safety climate where senior leadership demonstrates and role models these values, with these values integrated throughout all levels of management.

> After the Royal Commission, they did a little bit [of training] but it was presented so poorly that I even made a complaint about it...it created a big uproar. They presented it in a safety meeting, and it was given by a safety rep who was a male, a bit of a tick and flick type person.
>
> (Female employee)

Correlation analyses indicated that:

- **Psychosocial safety climate** was related to less frequent incidences of experiencing and witnessing bullying, as well as less experienced sexual harassment across all facets.
- **Excessive surveillance** and **excessive rules** were related to more frequent incidences of experiencing general bullying and witnessing bullying, and more experienced sexual harassment across all facets – sexist hostility, sexual hostility, unwanted sexual attention, and sexual coercion.

Job and Team Drivers. Line manager/supervisor behaviours are important in establishing the culture and norms of the team. Further, the line manager/supervisor is often listed as one of the main points of contact for workers to report incidents or to seek formal support (e.g., Australian Human Rights Commission, n.d.; Fair Work, n.d.). Therefore, it is imperative that the line manager/supervisor exhibits conduct that is supportive of the worker.

To that end, we investigated several manager behaviours – abusive supervision, transformational leadership, and manager support. A line manager/supervisor who is abusive is one who displays sustained hostile verbal and nonverbal behaviours towards the worker, while a transformational line manager/supervisor is motivating and models organisational vision and values. Finally, a supportive manager is one that provides technical and emotional support to the worker.

Abusive supervision has been shown to erode an organisation's respectful culture in several ways. Abusive supervisors role model behaviour to other individuals in the organisation, who in turn, consciously or unconsciously mimic the behaviour, creating a cycle of abuse (Tepper et al., 2017; Pradhan & Jena, 2018). Further, continued abusive supervision sends a clear message to both impacted persons and perpetrators of bullying and sexual harassment that there will be few consequences for disrespectful behaviour. Meta-analytic evidence has found that abusive supervision is strongly and negatively associated with employee perceptions of distributive justice, interactional justice, interpersonal justice, and procedural justice and can therefore undermine employees' trust that they will be treated with respect and fairness when making a complaint (Mackey et al., 2015).

Key research by Kearney and Gebert (2009) supports the notion that transformational leaders can be effective in managing diverse teams. One way that transformational leaders can be effective is in reducing perceived differences between demographically diverse team members, which is a key driver in negative interpersonal interactions. By motivating teams to work towards shared goals rather than emphasising the difficulties of accommodating different backgrounds, transformational leaders foster a sense of belonging to the team for all members.

Therefore, from a bullying and sexual harassment perspective, a line manager/supervisor who is abusive is likely to be one source of bullying and/or sexual harassment, while a transformational and/or supportive leader is likely to be a protective factor against such disrespectful behaviours.

The conduct of the line manager/supervisor also establishes the culture and norms that team members reinforce. We therefore also investigate team culture and coworker support. Team culture refers to the shared perception that workers can speak up and express their concerns.

Supportive coworkers refer to coworkers who provide technical or emotional support. From the perspective of bullying and sexual harassment, positive team culture and supportive coworkers are likely to be protective factors against disrespectful behaviours.

Correlation analyses indicated that:

- **Abusive supervision** was related to more frequent incidences of experiencing and witnessing bullying, as well as more experienced sexual harassment across all facets.
- Having **transformational** and **supportive managers**, as well as a **positive team culture** and **supportive coworkers** were related to less frequent incidences of experiencing and witnessing bullying, as well as less experienced sexual harassment across all facets.

Appendix M reports these correlations in full.

Further, we investigated the extent to which the gender distribution of the working environment drives disrespectful behaviours. *Gender parity* refers to the balanced distribution[25] of gender in the workplace and can be a powerful context in which harassment occurs - or indeed, is prevented (Dhatt et al., 2017; Morgan & Gruber, 2008). We discuss the effect of gender parity vis-à-vis all other drivers in the next section.

4.3.1 *Considering all potential drivers together*

Further analyses indicated that after controlling for professional role, **work environments with more men than women** were associated with higher levels of sexist hostility (β = -.08, *p* < .05) compared to environments where there was gender parity or where there were more women than men. There was no significant effect of gender distribution on sexual hostility, unwanted sexual attention or sexual coercion.

Taken together, this suggests that mining workplaces with more men than women are associated with more covert sexual harassment behaviours such as hostile comments based on one's sex, but not overt sexual harassment behaviours such as inappropriate touching or suggesting that career opportunities are contingent on sexual favours. However, these effects of a male-dominated work environment no longer held when the job and organisational factors were included in the model. When we considered gender parity alongside other workplace attributes, we found that these other attributes were better at explaining exposure to bullying and sexual harassment than gender parity. Overall, this suggests that while gender parity is important, it doesn't have a unique effect above and beyond other factors, which we address next.

We linked the job and organisational factors of psychosocial safety climate, abusive supervision, manager support, coworker support and workload to the experiences of bullying and sexual harassment. Out of these organisational and job factors, the findings were as follows:

- **Psychosocial safety climate** was significantly related to less frequent experiences of and witnessing bullying (β = -.15 – -.17, *p* < .001) as well as less experienced sexist hostility (β = -.20, *p* < .001), sexual hostility (β = -.18, *p* < .001) and unwanted sexual

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[25] Numeric gender parity is defined as a 50-50 female to male representation but is more typically measured as 40% to 60% representation of either sex (Raj et al., 2020)

attention (β = -.11, *p* < .01), but not sexual coercion. In other words, experiences of such disrespectful behaviours tended to occur in environments with more negative psychosocial safety climates.

- **Abusive supervision** was significantly related to more frequent experiences of and witnessing bullying (β = .20 − .29, *p* < .001) and all types of sexual harassment (β = .11 − .15, *p* < .05), which indicates that teams reporting to line managers/supervisors who frequently display hostile verbal and non-verbal behaviours tend to be "fertile ground" for behaviours such as bullying and sexual harassment.

- Finally, manager and coworker support were significantly related to different aspects of disrespect as protective factors. Higher levels of **manager support** were associated with lower levels of sexual hostility (β = -.12, *p* < .05), while higher levels of **coworker support** were associated with lower levels of experiences of general bullying (β = -.13, *p* < .01) and witnessing bullying (β = -.09, *p* < .05).

Overall, these findings suggest that psychosocial safety climate and support from managers and coworkers are protective factors in relation to the experience of bullying and various forms of sexual harassment in mining work settings. Mining companies that actively work to create a more positive psychosocial safety climate (such as through actively role modelling inclusive and respectful behaviours) are likely to also have work environments with a lower prevalence of bullying and sexual harassment.

In addition, mining companies that seek to foster more supportive work environments such as through improving managerial and worker capability (such as through identifying and addressing harassment appropriately, ensuring that line managers/supervisors and workers alike have the procedural knowledge and non-technical skills to support others after bullying or sexual harassment incidents) tend to also cultivate respectful working environments with lowered incidences of bullying and sexual harassment.

On the other hand, abusive supervision and higher levels of workload were found to be more likely to occur in mining work environments where workers also reported more bullying and sexual harassment. This indicates that mining companies that prioritise eliminating abusive supervision styles in line managers/supervisors (such as through developing emotional intelligence skills and ensuring that line managers/supervisors are appropriately selected/promoted, developed and managed) are also likely to nurture more respectful working environments.

4.3.2 Prevalence of Important Drivers of a Respectful Culture

Workplace attributes that commonly are manifestations of a respectful culture are associated with different outcomes. In this section, we identify the prevalence of predictors that are representations of a respectful workplace culture, identifying predictors that the mining industry may prioritise in driving respect at work, as well as where the industry can continue to monitor and enhance.

The chart in Figure 23 below is colour-coded such that red indicates the percentage of participants scoring high on negative aspects, while green indicates the percentage of participants scoring high on positive aspects.

Figure 23. Percentage of mining workers scoring low, moderate, or high on drivers of respect
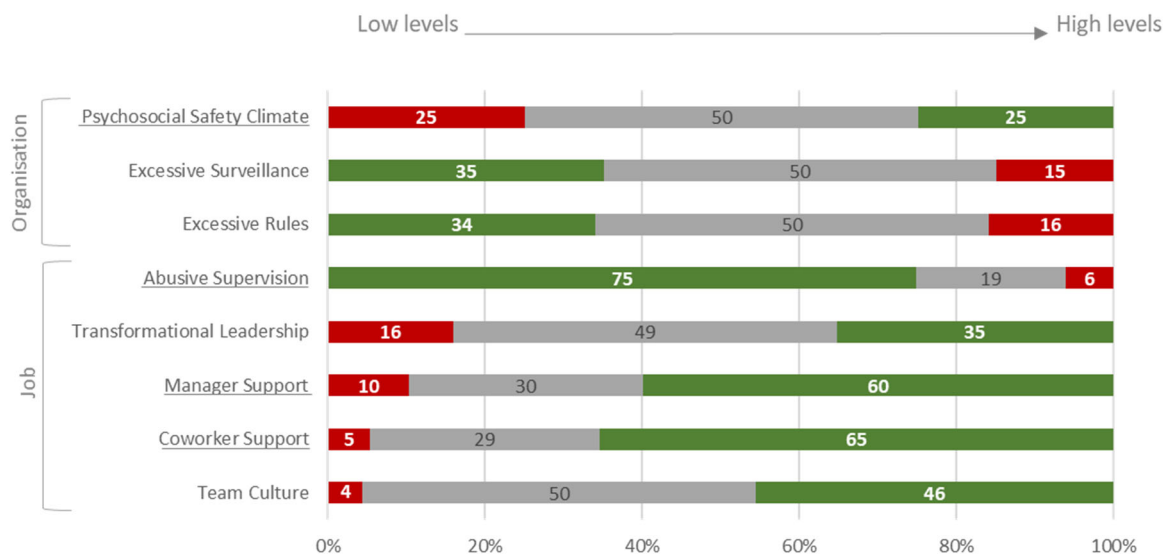
Note. Drivers that are underlined indicate areas that strongly and uniquely contribute to the prevalence of safety behaviours. Percentages are rounded to the nearest whole number. Green bars represent the percentage of participants who responded positively. In the case of positively framed drivers, this equates to a response of 4 or 5 on a 5-point scale (indicating high levels of positive experiences and perceptions). In the case of negatively framed drivers, this equates to a response of 1 or 2 on a 5-point scale (indicating low levels of negative experiences and perceptions).

Excessive surveillance and excessive rules are associated with disrespectful behaviours, particularly experiences of bullying. High levels of excessive surveillance and rules[26] were reported by 15-16% of mining workers, suggesting that this is a somewhat frequent experience by workers. Abusive supervision was one of the most strongly related to all types of disrespectful behaviours, with this effect holding even above and beyond other organisational and team factors. Of note, 6% of workers reported experiencing high levels of abusive supervision, while three in four participants reported low levels of such experiences. With regard to these drivers, the lower the prevalence, the better the outcomes for a respectful culture.

Turning to protective factors, team culture was one of the most strongly related drivers of disrespectful behaviours, but less than 1 in 2 workers reported a positive team culture where people felt safe to speak up. Importantly, psychosocial safety climate and transformational leadership were strongly correlated to a reduced prevalence of disrespectful behaviours, however, only 25% and 35% of respondents respectively reported high levels of these drivers. This finding is in line with report 2B where, overall, HR and WHS personnel reported low to moderate psychosocial safety climate scores in their companies. This suggests that team

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[26] Strict rules and surveillance may be a response to higher levels of harassment and bullying. Given that surveillance and rules are commonly implemented to protect workers, it needs to be considered that this finding may demonstrate some possible unintended consequences of these reinforcement methods. This question can be addressed in the follow-up data collection.

culture and psychosocial safety climate are key factors that the industry can work towards improving when looking to address bullying and sexual harassment.

Finally, manager support and coworker support were strongly related to a more respectful culture. A majority of respondents reported having strong manager support (65%) and coworker support (60%), suggesting that this is already experienced by most workers with some room to leverage this strength that is already in place in many mining workplaces. With regard to these drivers, the higher the prevalence, the better the outcomes for a respectful culture.

With regards to gender distribution, 74% of workers reported working in environments of all men or more men than women (Figure 24); such environments were associated with higher levels of sexist and sexual hostility compared to environments of gender parity or where there were all women or more women than men. While significant efforts have been made to increase the proportion of women in the mining industry, these efforts need to be communicated and managed well to facilitate the successful integration of women into work environments.

Figure 24. Gender composition of work environment reported by WA mining workers
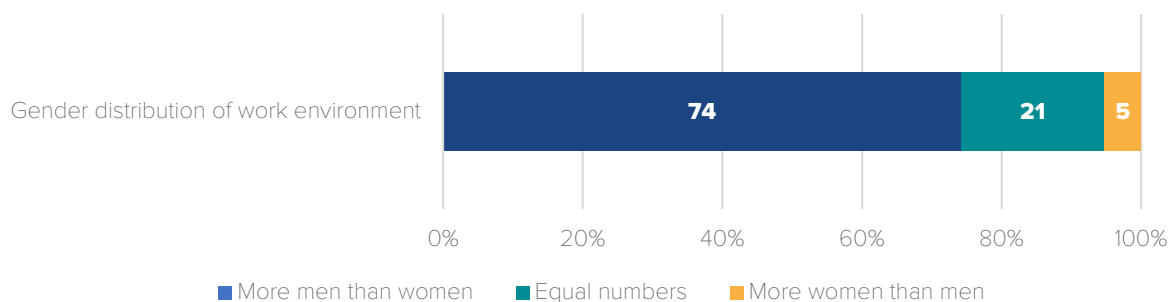
Note. Percentages are rounded to the nearest whole number.

Prioritising the Drivers of a Respectful Culture. Figure 25 presents a matrix of the prevalence of high levels of these drivers in the sample (prevalence levels presented on the horizontal axis) relative to the strength of association between the predictors with **individual experiences of sexual harassment** (aggregate correlations are presented on the vertical axis; see Appendix M for the full correlation table). By doing so, we highlight the points of leverage that are important to focus on. Predictors that are strongly associated with experiences of sexual harassment but are less prevalent in high levels amongst the WA mining industry (upper left quadrant) indicate that these may be drivers the mining industry can leverage to reduce incidences of sexual harassment. Predictors that are strongly associated with reduced experiences of sexual harassment and are prevalent in high levels (upper right quadrant) indicate areas that the industry is making positive steps towards.

> Our data suggests that the most important levers to increase a respectful culture (**Consider for change**) are as follows:
> - eradicate abusive supervision and abusive leadership styles,
> - encourage leadership that is inspiring and motivating,
> - increase psychosocial safety climate,

> - foster a positive team culture, and
> - reduce *excessive* rules and surveillance.
>
> Important aspects to **leverage and enhance**, to ensure they exist for all workers, include:
> - improving manager and coworker support.

Figure 26 presents the same information, focusing on **bullying** as the outcome. It is important to note that there is a significant crossover between the levers of bullying and sexual harassment, suggesting a dual benefit of focusing on these levers.

The strengths of associations are presented in absolute values; factors presented in green have positive associations with a respectful culture, while factors presented in red are negatively associated with a respectful culture.

Figure 25. Prevalence of potential drivers and strength of associations with individual experiences of sexual harassment
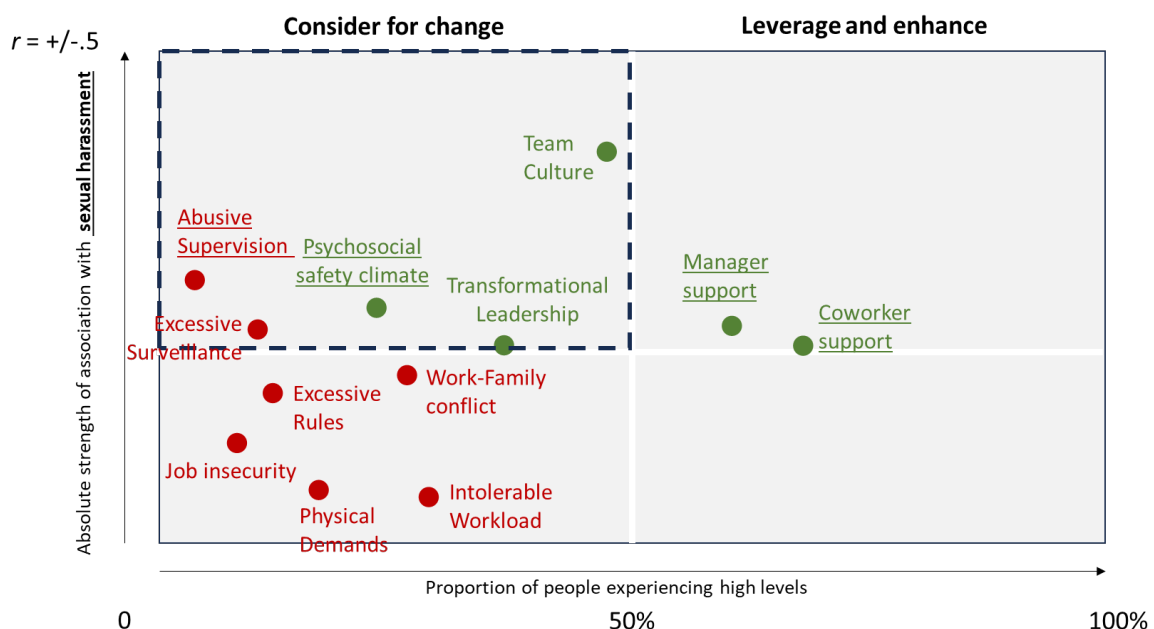
Note. Drivers that are underlined indicate areas that strongly and uniquely contribute to the prevalence of sexual harassment.

Figure 26. Prevalence of potential drivers and strength of associations with experiences of bullying
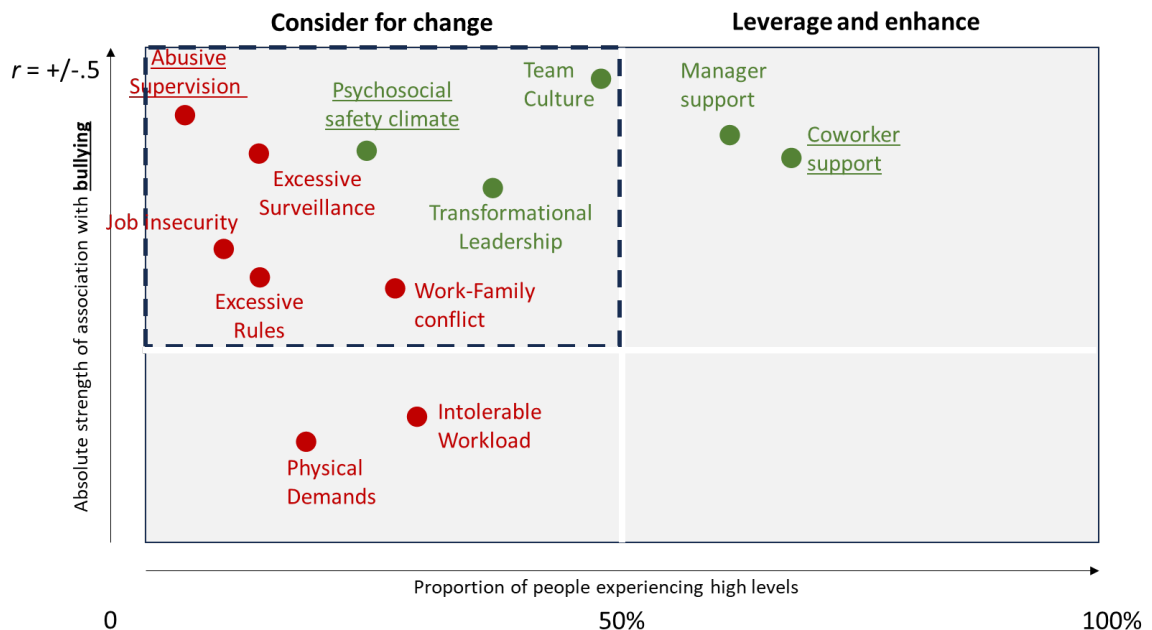
Note. Drivers that are underlined indicate areas that strongly and uniquely contribute to the prevalence of bullying.

4.3.3 Drivers of Reactions to Sexual Harassment and Upstander or Bystander Behaviours

We next focus on the potential drivers associated with actions taken by impacted persons of sexual harassment themselves. This involves understanding the factors that facilitate impacted persons confronting and/or reporting the harasser. The levers that we focus on here include climate and culture organisational factors (psychosocial safety climate) and job/team factors (team culture, coworker support). We further include two drivers specific to reporting incidences of sexual harassment – confidence in grievance procedures (confidence in their companies' procedures when dealing with grievances) and interactional justice (a belief that they would be treated with kindness and concern if they were to raise a sexual harassment complaint).

Reporting Behaviours. As the outcome was a binary variable (action vs. inaction), we used Multiple Logistic Regressions. After controlling for professional role in the first step, psychosocial safety climate, team culture, coworker support, confidence in grievance procedures and interactional justice were all not significantly related to the likelihood of the impacted person taking action against the harasser. However, manager support was positively and significantly associated with the impacted person taking action either by confronting and/or reporting the harasser (B = .43, $SE(B)$ = .19, p = .02), suggesting that manager support is the key facilitating factor when it comes to taking action against disrespectful behaviours in the mining industry.

Upstander Intervention. Aside from the person who experienced the behaviour themselves, considering the action or inaction of those who witness or are present when disrespectful behaviour occurs is important to understand the social dynamics around such behaviour.

Actions of others in the face of disrespectful behaviour to interrupt and challenge bullying and sexual harassment are commonly labelled "upstander behaviours" (Nelson et al., 2011; Parrott et al., 2020). Central to upstander behaviour is the intervention of those who witness disrespectful incidents (in this case captured from the perspective of the impacted person). After controlling for professional role in the first step, psychosocial safety climate, team culture, manager support, confidence in grievance procedures and interactional justice were all not significantly related to the likelihood of the witness intervening (i.e., being an upstander). However, coworker support was positively and significantly associated with the witness intervening (B = 1.67, $SE(B)$ = .63, p = .01). Accordingly, coworker support is key in facilitating upstander behaviours when witnessing disrespectful incidents.

In line with the general findings related to taking action in Section 4.1, which showed that only one in three workers who experienced being sexually harassed responded by confronting and/or reporting the harasser, persons impacted by sexual harassment were 1.38 times more likely to take action by confronting and/or reporting the harasser if there was a witness to the incident. Notably, this likelihood to confront and/or report the harasser increased to four times (Odds Ratio = 4.01, 95% CI [1.96, 8.18]) if the witness displayed upstander behaviours (i.e., also tried to intervene).

Research suggests that the presence of an upstander may help create an environment where persons impacted by sexual harassment feel more supported (Puigvert et al., 2022). In line with this finding, the Australian Human Rights Commission (2012) notes that enlisting the help of witnesses can be effective in raising awareness of sexual harassment, as well as contribute to improved workplace practices and cultures, increasing reporting rates and reducing the prevalence of sexual harassment. While many participants surveyed in Report 2B noted the existence of initiatives that encourage and support employees/managers to speak up when witnessing inappropriate behaviour, engagement with these policies was low to moderate.

Hence, upstander training may be an effective tool in helping to prevent sexual harassment (DeGue et al., 2014). Upstander training can include not only **supporting impacted persons emotionally** but also instrumentally by **validating individual rights** and **providing knowledge and support around grievance procedures**.

Bystander Silence. Research consistently links masculine norms – that is, collectively held attitudes on gender ideologies that reflect and reinforce broader social and economic arrangements (Jost et al., 2004; Sibley et al., 2006; Luyt, 2015) – with gender-based harassment and violence, particularly against women (Suarez & Gadalla, 2010; Grubb & Turner, 2012; van der Bruggen & Grubb, 2014). In this survey, we investigated two facets of masculinity that have been associated with attitudes that passively acquiesce to the occurrence of sexual harassment in the community (Webster et al., 2021). First, *rigid gender roles* refer to a resolute adherence to the stereotypical division of labour (for example, men should be the breadwinners, while women are responsible for nurturing the family), as well as rigid definitions of "masculine" and "feminine" identities (for example, men are cast as being more "active" while women are more "passive"; Webster et al., 2021). Second, *hostility towards women* is rooted in gender relations in which members of the gender in the position of power strive to maximise advantage over members of other genders. These norms have been linked to community attitudes that are more likely to foster environments in which sexual harassment may be condoned, excused, or trivialised (for example, brushing off sexual harassment as jokes; Webster et al., 2021).

In this Worker Survey, we measured both facets of masculine norms, and also asked survey participants if they had *themselves* witnessed an incident of sexual harassment or sexual assault that occurred to someone else – and if so, the degrees to which they were complicit in perpetuating a network of silence or speaking up[27]. *Not Hearing* refers to dismissing or trivialising incidences of sexual harassment; *Being Silent* refers to passivity in the face of witnessing sexual harassment whereby the bystander does not take any action to confront or report the harasser; *Silencing* refers to active efforts to avert complaints or actions against the harasser (Hershcovis et al., 2021).

Results from a multivariate linear regression indicated that *hostility towards women* was a significant positive predictor of all forms of network silence. That is, the stronger these attitudes, the more likely a bystander was to perpetuate a network of silence. However, when *rigid gender roles* was also included in the model, attitudes of *hostility towards women* were no longer associated with all forms of network silence. **Rigid gender roles** was found to predict unique variance in *not hearing* above and beyond the effect of *hostility towards women*, but not the other forms of network silence.

These results suggest that **education that challenges and dismantles masculinity** as a multi-faceted phenomenon can be an effective tool in changing the environment and network forces that may foster a culture of complicity and may work well in combination with bystander training.

4.4 Policies and Practices Related to a Respectful Culture

As in Section 3.4, we first report the proportion of participants who engaged in the policies, practices, and initiatives relevant to a respectful culture as well as the related perceived usefulness (Figure 27). While we linked individual engagement with supports to individual experiences of mental health and well-being in Section 3.4, it is not suitable for us to do the same for a respectful culture due to an incompatibility of the question framing. While we ask individual participants about their engagement with such supports, this does not logically link to explaining variance in the key outcome variables (experiences of sexual harassment or bullying by the same participant).

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[27] A random 1/3 of the sample was presented with these questions. Of these, 62 participants reported having witnessed an incident of sexual harassment occur to someone else and therefore answered the questions on network silence. While the sample size is small, a post-hoc power analysis indicates that this sample size is sufficient to detect medium effect sizes (f = .2, α = .05, β = .86).

Figure 27. Percentage of WA mining workers engaged with policies, practices, and initiatives relating to a respectful culture, and perceptions of perceived usefulness
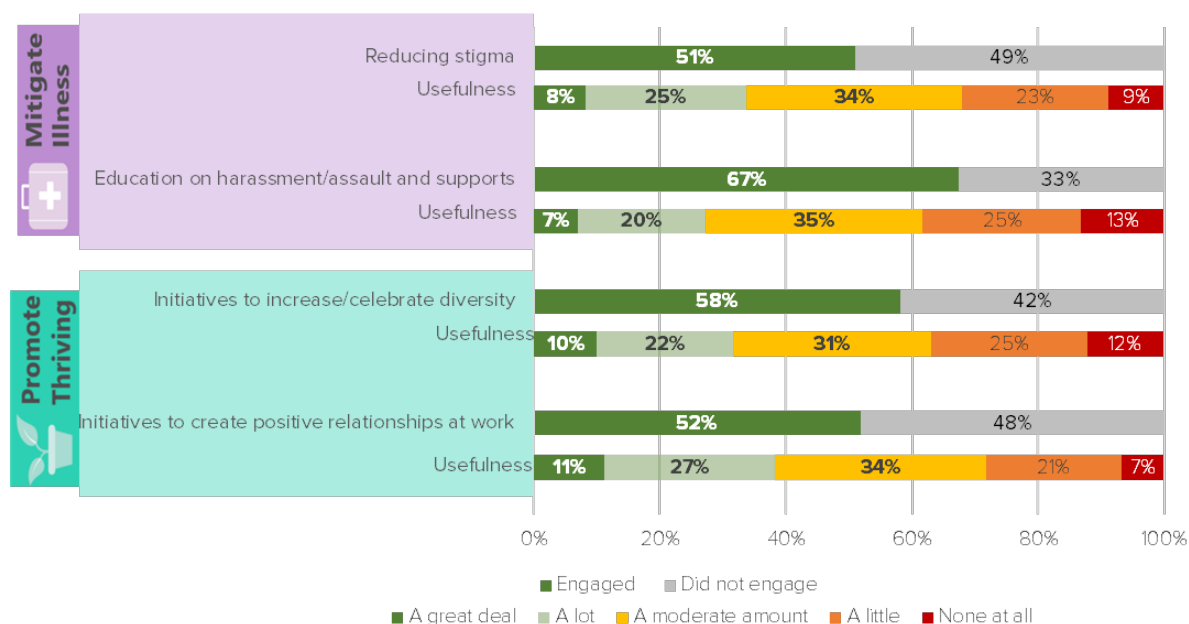
Note. Survey participants were asked about their perception of the usefulness of each policy, practice, or initiative only if they indicated that they had engaged in it.

Whilst worker engagement with each of these policies and practices was reasonably high, (51-67% of mining workers had engaged in these policies and practices), the utility of perceived usefulness was relatively lower, with most workers who engaged reporting that the policies and practices were moderately useful (i.e., the modal response).

Of all policies and practices related to harassment and sexual harassment, *education on harassment and assault and related supports* had the highest worker engagement at 67%. However, workers tended to find this policy and practice the least useful in supporting them at work, with 62% of workers finding that it was at least moderately useful in supporting them at work. Companies' engagement (as reported by HR, WHS, and other relevant professionals) in these policies and practices – reported in Report 2B – were lower, with about 37% of companies reporting high levels of engagement (engaging to a large and very large extent).

On the other hand, the policy and practice *activities to reduce stigma in the workplace* had the lowest worker engagement at 51%, however, 68% of workers found this at least moderately useful in supporting them at work. Similarly, companies' engagement (as reported by HR/WHS personnel) in activities to reduce stigma in the workplace was lower, with about 36% of companies reporting high levels of engagement.

Both policies and practices falling under the Promote Thriving pillar, *initiatives to increase/celebrate diversity* and *initiatives to create positive relationships at work* had high worker engagement at 58% and 52% respectively. Companies' engagement in these was slightly lower, with about 42% of HR/WHS personnel reporting high levels of company engagement (engaging to a large + very large extent) in such supports. 63% and 72% of workers who engaged in *initiatives to increase and celebrate diversity* and *initiatives to create*

positive relationships at work respectively found that these initiatives were at least moderately useful in supporting them at work.

4.4.1 Policies and Procedures that may Attenuate the Negative Effects of Disrespect

In addition to the list of policies and procedures, we asked the extent to which mining workers were confident in their companies' procedures in dealing with grievances (confidence in grievance procedures), as well as the extent to which they believed they would be treated with kindness and concern if they were to raise a sexual harassment complaint (interactional justice).

While confidence in grievance procedures and interactional justice did not explain additional variance in an impacted person's likelihood to confront and/or report the harasser after taking into account professional role and other organisational and job aspects, research suggests that the *degree* to which workers feel able to address the sexual harassment will mitigate its negative effects (Hershcovis et al., 2010). We investigate these as two ways in which workers may feel more supported when experiencing bullying and sexual harassment, in turn lessening the negative impacts of disrespect on workers' well-being.

As discussed in Section 3.3, bullying and sexual harassment are psychosocial hazards that have implications for mental health and well-being, with these effects (particularly for sexist hostility on feeling emotionally exhausted) holding above and beyond role, organisational, job, and individual aspects. Therefore, it is important to better understand the effects of having a robust grievance procedure to better support workers who may experience bullying and sexual harassment at work.

Confidence in grievance procedures was found to buffer the negative effects of sexist and sexual hostility on optimal mental health, but not poor mental health. Persons impacted by sexist and sexual hostility who had lower levels of confidence in their companies' grievance procedures were also less likely to experience optimal mental health, compared to impacted persons with higher levels of confidence in their companies' grievance procedures.

Further, **interactional justice** – the extent to which impacted persons believed they would be treated with kindness and concern if they were to raise a sexual harassment complaint – was also found to buffer the negative effects of sexist and sexual hostility on thriving, such that persons impacted by sexist and sexual hostility who perceived that they would not be treated with kindness and concern were also less likely to experience thriving (sexist hostility $B(SE)$ = -.04, p = .01; sexual hostility $B(SE)$ = -.05, p = .01). Interactional justice was further found to buffer the negative effects of all types of sexual harassment on burnout, such that the association between sexual harassment and feeling emotionally exhausted was attenuated in the presence of interactional justice (sexist hostility $B(SE)$ = -.12, p = .003; sexual hostility $B(SE)$ = .15, p = .001; unwanted sexual attention $B(SE)$ = .28, p = .003; sexual coercion $B(SE)$ = .26, p = .02).

4.5 Interview Findings Related to a Respectful or Disrespectful Culture

In addition to the quotes we have provided from the interviews so far, we give an overview of the general themes identified from the interviews focused on disrespectful culture. In total, 30 mining workers participated in the interviews relating to sexual harassment and sexual assault. Of these, 9 participants were professionals, 11 were frontline workers, 8 were managers, 1 participant was from camps and accommodation, and 1 was from transport and logistics. Further, 19 participants were FIFO workers.

This section of the interview explored mining workers' perceptions of their current workplace culture relating to disrespect. The interviews also expanded upon workers' experiences of sexual harassment and sexual assault in the mining industry, as well as policies and practices relating to sexual harassment and sexual assault. Several themes at the person, job, team and organisation emerged as common themes during the interviews. These themes and the number of interview participants who discussed each theme are summarised below in Table 10. The full interview analysis is available in Appendix O.

Table 10. Summary of themes related to respectful culture from interviews with WA mining workers

	Sub-theme	*n*
Theme 1 Perceptions of current workplace culture	Positive workplace culture	17
	The industry is striving to improve	29
	Misogyny and sexism occurs, and is often covert	20
	Reacting to the media spotlight versus a proactive response	11
Theme 2 Sexual harassment and sexual assault within the mining industry	Disparate perspectives regarding the prevalence of sexual harassment and sexual assault	30
	Ability to define and identify sexual harassment and sexual assault varies	30
	Unfair dismissal is problematic	5
	Unique factors within the industry that impact sexual harassment and sexual assault	30
	Gender imbalance	21
	Alcohol consumption	9
	Forming close ties with your work crew	4
	The form of work	30
	The 'types' of people who work in the mining industry	8
Theme 3 Strategies and programs focused on prevention and response	The effectiveness of in person training	27
	Understanding policy	28
	Management of sexual harassment and sexual assault	30
	Reporting experiences and pathways	30
	Reporting of incidents to the broader workplace	28

4.6 Comparing Findings to Other Available Data

In Table 11, we provide an overview of the responses to the Worker Survey in the context of data that was collected from the benchmark sample (see Appendix A for details on the sample) and the previously recorded data from the 2018 FIFO study.

Table 11. WA mining workers' experience of bullying and sexual harassment compared to benchmark sample and FIFO Study (2018)

	MARS LMS Worker Survey	Benchmark (weighted)	FIFO Study (2018)
Bullying			
Physical bullying	3%	-	-
* Experienced bullying (general)	16%	6%	19%
* Witnessed bullying	22%	10%	31%
Sexist Hostility			
* Put you down or was condescending to you because of your sex?	19%	8%	-
* Made offensive sexist remarks (e.g., suggesting that people of your sex are not suited for the kind of work you do)?	18%	5%	-
Sent/showed you sexually explicit pictures, posters or gifts that made you feel offended (either in person or online)?	4%	4%	-
Sexual Hostility			
* Asked intrusive questions about your private life or physical appearance that made you feel offended?	12%	5%	-
* Made crude and offensive sexual remarks, either publicly (e.g., in your workplace) or to you privately?	13%	5%	-
* Made sexually suggestive comments or jokes that made you feel offended (either in person or online)?	11%	5%	-
* Made unwelcome attempts to draw you into a discussion of sexual matters (e.g., attempted to discuss or comment on your sex life)?	9%	4%	-
Made gestures or used body language of a sexual nature which embarrassed or offended you?	7%	4%	-
Whistled, called, or hooted at you in a sexual way?	3%	4%	-
Unwanted Sexual Attention			
Touched you in a way that made you feel uncomfortable?	4%	3%	-
Unwelcome touching, hugging, cornering or kissing?	4%	4%	-

	MARS LMS Worker Survey	Benchmark (weighted)	FIFO Study (2018)
Made unwanted attempts to establish a romantic sexual relationship with you despite your efforts to discourage it?	3%	4%	-
Made repeated or inappropriate invitations to go out on dates	2%	3%	-
* Attempted to have sex with you without your consent or against your will, but was unsuccessful?	0.7%	4%	-
* Attempted to have sex with you without your consent or against your will?	0.5%	3%	-
Sexual Coercion			
* Made you feel like you were being bribed with some sort of reward or special treatment to engage in sexual behaviour?	0.9%	3%	-
* Made you feel threatened with some sort of retaliation for not being sexually cooperative (e.g., by mentioning an upcoming review)?	1%	4%	-
Treated you badly for refusing sex?	1%	3%	-
Implied faster promotions or better treatment if you were sexually cooperative?	1%	4%	-

Note. Percentages reported refer to the percentage of respondents who experienced each of these behaviours sometimes, often, and very often. The benchmark sample was weighted by gender, as the gender distribution of the benchmark sample was the most dissimilar to the Worker Survey. Items indicated with an asterisk (*) indicate that there were significant differences between the WA mining sample and the benchmark sample.

4.6.1 Benchmark Sample

As can be seen in Table 11, compared to the benchmark sample, the mining sample reported higher levels of experiencing (general) and witnessing bullying, as well as behaviours of sexist and sexual hostility. Welch's t-tests indicated that the mining sample reported significantly higher levels of all sexist and sexual hostility behaviours, except for the items "*Sent/showed you sexually explicit pictures, posters or gifts that made you feel offended (either in person or online)?*", "*Made gestures or used body language of a sexual nature which embarrassed or offended you?*" and "*Whistled, called, or hooted at you in a sexual way?*", where there was no significant difference between the two samples.

Turning to overt forms of sexual harassment, while there were no significant differences in unwanted sexual attention between the mining sample and the benchmark sample on most behaviours, the **mining sample reported a significantly lower prevalence of attempted sexual assault and sexual assault. Similarly, the mining sample reported similar or lower levels of sexual coercion**, with the mining sample reporting significantly lower prevalence on the items "*Made you feel like you were being bribed with some sort of reward or special*

treatment to engage in sexual behaviour?" and "*Made you feel threatened with some sort of retaliation for not being sexually cooperative (e.g., by mentioning an upcoming review)?*".

Appendix P reports these Welch's t-tests in full.

These findings suggest that while the mining industry has seen some success in weeding out the overt forms of sexual harassment (relative to the benchmark sample comprising other industries), the more covert forms of sexual harassment appear to be tolerated within the culture.

4.6.2 Available Norm Data for Comparisons

Both experiencing (general) and witnessing bullying were lower in the mining sample compared to the FIFO study (2018)[28]. While the sample make-up between both studies are slightly different, these findings broadly suggest that there has been a general positive shift in culture within the past five years.

This aligns with sentiments from interview participants, where participants expressed a belief that the mining industry was working towards improving conditions for employees. Many participants believed that they had seen a genuine shift away from adverse conditions that would have negatively impacted employees previously working in the industry.

> I think we're working in the right direction. First, it's getting comfortable talking about it and I think the mining companies are developing quite an appetite for that conversation...this sector is absolutely trying to show their vulnerabilities.
>
> (Female employee)

The AHRC's (2022) *National survey on sexual harassment in Australian workplaces* is perhaps one of the most extensive nationwide studies of sexual harassment. We contextualise our findings in the context of the AHRC's report and note that items from the MARS Program Landmark Study Worker Survey are highly aligned with the items from the AHRC study, with a few key differences. First, the AHRC study was conducted over the telephone, while the Worker Survey was an online or paper-and-pen survey. More importantly, the AHRC study has a stronger focus on the facets of Sexual Hostility and Unwanted Sexual Attention (including one item each under the Sexist Hostility and Sexual Coercion facets). It is also important to note that while the items included in the AHRC study align with these facets, it does not explicitly map items onto the same framework. Due to the findings specific to sexual harassment in the mining industry (see for example the Enough is Enough Parliamentary Inquiry), the Worker Survey includes more items under these two facets for a more nuanced understanding of the landscape in mining.

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[28] It is worth noting that bullying may also occur online. Online bullying may be more covert, with less witnesses to the bullying. Because the FIFO study (2018) did not define bullying as such, we used the same item to make direct comparisons.

Further, we take a more conservative estimate in discussing occurrences of sexual harassment – whereas the AHRC study includes responses of "*rarely*", "*sometimes*", "*often*", and "*very often*" in understanding the occurrence of sexual harassment, we have above used the more conservative "*sometimes*", "*often*" and "*very often*" categories in discussing the prevalence of sexual harassment in the mining industry above. To make meaningful comparisons between the AHRC study and the mining sample in this study, we recalculated the occurrence of sexual harassment in alignment with the AHRC study. Whereas 19% of the general Australian public sample (AHRC, 2022) reported having experienced *any* type of sexual harassment in the past 12 months, 57% of the mining sample in the Worker Survey reported having experienced any type of sexual harassment in the past 12 months[29].

The mining industry has made commendable progress in raising awareness, promoting reporting mechanisms, and preventing overt forms of sexual harassment, such as physical sexual abuse. However, our data shows that the prevalence of covert and subtle forms of sexual harassment remains alarmingly high and is strongly correlated with negative mental health outcomes.

4.7 Summary: A Respectful Culture

- Overall, levels of experiencing and witnessing bullying are high in WA mining workers. 16% of WA mining workers reported having experienced bullying, and 22% witnessed bullying, at least 2-3 times per month in the past 6 months. While this is lower relative to the FIFO Study (Parker et al., 2018), these levels remain high compared to the benchmark sample and the general Australian working sample (AHRC, 2022). Interview participants acknowledged that in the past few years, more attention has been paid to improving bullying and sexual harassment. However, there is still significant scope to improve the culture in the mining industry.
- Overall, levels of sexist and sexual hostility experienced by WA mining workers are high. The more subtle behaviours of sexist and sexual hostility tend to be higher compared to the more overt behaviours of unwanted sexual attention and sexual coercion. These findings align with the main themes raised by interview participants in which participants noted that misogyny and sexism exist, but that it is often covert.
  - Between 5-41% of women mining workers reported experiencing behaviours of sexist and sexual hostility sometimes, often or very often within the past 12 months, while 3-11% of men experienced the same. On the whole, the levels of sexist and sexual hostility were equal to or higher compared to the benchmark sample.
  - Between 3-19% of women mining workers reported experiencing behaviours of unwanted sexual attention and sexual coercion sometimes, often or very often within the past 12 months, while 1-8% of men experienced the same. On the whole, the levels of unwanted sexual attention and sexual coercion were equal to or lower compared to the benchmark sample.
- While both men and women in the WA mining industry experience bullying and sexual harassment, women experience these behaviours at much higher rates. Specifically,

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[29] Taking a more conservative approach which excludes the additional items under the Sexist Hostility and Sexual Coercion facets, 47% of the mining sample reported having experienced sexual harassment in the past 12 months.

23% of women reported experiencing bullying in general, and 30% reported witnessing bullying, at least 2-3 times per month or more frequently, in the past 6 months, compared to 11% and 18% of men, respectively.

- Other groups that tended to report higher incidences of sexual harassment include:
    - **Lesbian, gay or homosexual, and bisexua**l mining workers reported experiencing significantly higher rates of sexual harassment (all facets) and bullying (including witnessing bullying) compared to heterosexual/straight workers.
    - **Younger** workers tended to report higher levels of sexual harassment – particularly Sexist Hostility, Sexual Hostility and Unwanted Sexual Attention – as well as witnessing bullying.
    - **Frontline workers** were more likely than managers and professional workers to experience sexual harassment, bullying (physical and general), and witness bullying.
    - **Labour hire** workers reported experiencing higher levels of sexual harassment (all facets) and bullying (including witnessing bullying) compared to direct employees and contractors.
    - Workers in **predominantly male working environments** (all men or more men than women) tended to experience higher levels of Sexist Hostility and Sexual Hostility compared to environments of gender parity or where there were more women than men.
- The strongest drivers of experiencing sexual harassment were organisational and job factors, particularly a negative psychosocial safety climate and various aspects of the leader and the team. The data suggests that the key drivers that mining industry can leverage to improve sexual harassment at work include creating a more **positive psychosocial safety climate**, and enhancing **managerial and co-worker supports**. While levels of abusive supervision across the industry are relatively low, the strength of the association between abusive supervision and experiencing sexual harassment indicates that companies should continue to monitor and **reduce abusive supervision**.
- The stronger the **masculine norms** held by individuals, the more likely they were to perpetuate a **network of silence** as a witness to sexual harassment. Therefore, education that challenges and dismantles masculinity can be an effective tool in changing the work environment and network forces that may foster a culture of complicity and may work well in combination with bystander training.
- **Confidence in grievance procedures** and a perception of **interactional justice** were found to attenuate the negative effects of bullying and sexual harassment on mental health and well-being.

Significant work has been done to diversify the mining sector workforce which is reflected by the increasing representation of skilled minorities. However, many participants viewed the strive for gender parity and hiring of minority workers as tokenistic. These views are detrimental to the mental health of both minority employees (via increased challenges for integration) and existing employees (via perceived organisational injustice) and create an increased risk of stigmatisation, bullying and harassment of vulnerable employees. Addressing this area is likely to lead to benefits outlined in the literature which include increased retention of employees from culturally diverse backgrounds, and a more culturally safe and inclusive workplace.

5.
Findings Related to Safety in Future Mining

Section 5.   Findings Related to Safety in Future Mining

The global work environment is on the brink of a fourth industrial revolution, with emerging technologies being highly autonomous and intelligent (Schwab, 2017) – so too is the mining industry. Preliminary Report 2A identified that while the specific details of how the future of mining will look are uncertain, it is widely thought that this change will be driven by technology such as automation, algorithmic management, and the digital age. As an extension of this, the integration of data and artificial intelligence (AI) will enable technologies to become capable of self-directed learning and engaging in complex cognitive tasks (Frey & Osborne, 2017), such as analytical and rational processing (Ferràs-Hernández, 2018).

While technology may improve workplace safety (e.g., by removing workers from dangerous environments by using drones or autonomous vehicles) and may offer some relief from repetitive tasks; there may also be adverse effects. The risk of physical workplace injuries may lessen due to the introduction of technology – but, conversely, mental well-being issues may increase.

In these new aspects of work, the general attitudes and behaviours related to safety, as well as the organisational, job, and individual factors that may support or hinder such safety behaviours, are critical in understanding how best to position the mining industry to thrive in an uncertain future.

5.1 Safety Behaviours in the WA Mining Industry

In the face of technological advancements and the future of work, the mining industry remains a safety-critical industry. In this section, we present two key safety behaviours reported by mining workers: safety compliance (the extent to which workers report complying with safety procedures) and safety participation (the extent to which workers report being involved in activities to improve and promote safety). Both are key behaviours that are related to a positive safety culture (Ismail, 2021) and research shows that these safety behaviours predict workplace injuries and accidents (Neal and Griffin, 2006). Figure 28 shows the percentage of mining workers who report low, moderate, and high levels of safety compliance and safety participation.

Figure 28. Percentage of mining workers reporting low, moderate, and high levels of safety compliance and safety participation
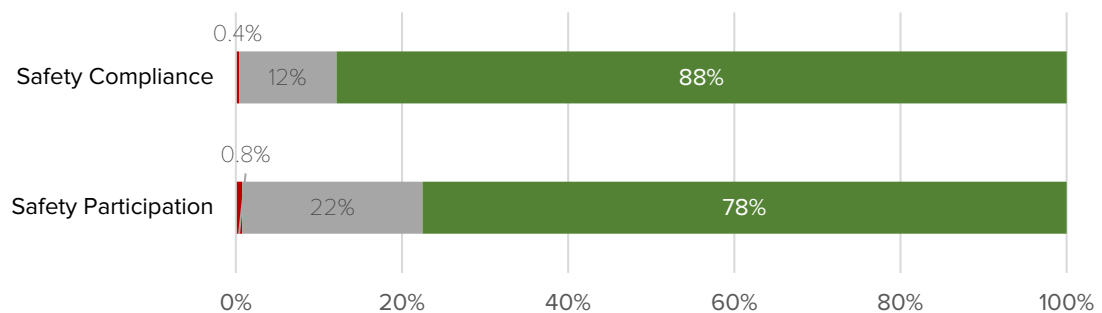
Nearly nine in ten workers (88%) agreed or strongly agreed that they followed safety procedures in the workplace – that is, a very high percentage of workers reported a high degree of safety compliance. The percentage of workers reporting high levels of safety participation was also high, nearly eight in ten (78%) workers agreed or strongly agreed that they took the initiative to participate in and promote safe workplace behaviours. However, 12% and 22% of workers respectively neither agreed nor disagreed that they displayed these behaviours at work.

We further investigated reporting and under-reporting behaviours of workers when experiencing near misses and notifiable incidents. Under-reporting can result in organisations not receiving information that could be critical in preventing a major safety event, or information that could reveal trends and patterns that would inform effective safety interventions and is therefore important to examine. We align our definition of under-reporting to research (Probst & Brubaker, 2008) as a function of both (1) the number of incidents or near misses reported by the worker, as well as (2) the number of incidents or near misses experienced by the worker but not reported. As the discrepancy between the number of unreported and reported accidents increases, under-reporting can be said to increase. Research further argues that under-reporting is not adequately captured simply by the number of unreported accidents. Rather, to understand the depth of the problem, both the number of unreported as well as the number of reported notifiable incidents or near misses need to be ascertained (Probst & Brubaker, 2008).

Notifiable incidents are those that arise out of the conduct of a business and include the death of a person, a serious injury or illness, and a dangerous incident, whether that occurs to an employee, contractor, visitor, or a member of the public. These incidents can include exposure to psychosocial hazards and the occurrence of psychosocial injuries. There are specific requirements for WA mining operations, defined in the Work Health and Safety (Mines) Regulations 2022, which contains details of what constitutes a reportable incident. Failure to report a 'reportable incident' is an offence and penalties may apply.

Most participants indicated to not have experienced and reported or unreported any incidents or near misses in the past 12 months (*Mode* = 0). Of all notifiable incidents experienced in the past 12 months, 26% were unreported. This number of notifiable incidents that are unreported is a concern, as these include serious injuries or illnesses, or dangerous incidents which should be reported to the Regulator without delay. In addition, 36% of all experienced near misses in the past 12 months were unreported, which reflects a high degree of non-reporting.

Altogether, the high number of unreported events is important, as research shows that major accidents are always preceded by warning signs, such as near misses, so this data suggests that hazards may not be under control. Identifying and managing unreported incidents – especially the number of near misses – is crucial to preventing serious accidents (UK HSE, 2004). Further, acting on reports and providing feedback (closing the loop) provides a clear signal to workers that they are being listened to and that their concerns will be addressed – which in turn encourages future reporting. Table 12 reports the range of reported and unreported number of notifiable incidents and near misses experienced by workers in the past 12 months.

Table 12. Range of reported and unreported number of notifiable incidents and near misses experienced by workers in the past 12 months

	Notifiable incidents		Near misses	
	Reported	Unreported	Reported	Unreported
n (number of respondents)	654	659	661	663
Number of Incidents	711	250	640	361
Range	0 – 50	0 – 50	0 – 35	0 – 50

Note. The modal (most frequently occurring) number for all reported and unreported notifiable incidents and near misses was 0.

5.2 Potential Drivers of Safety Behaviours

As with Sections 3.3 and 4.3, we first conduct analyses to statistically model the key predictors of safety behaviours. This approach means we identify the points of leverage that are most likely to be important for improving safety behaviours. Second, for the important predictors, we report on the levels of these factors. This approach provides an evidence-based way of identifying where to focus.

Organisation Factors. Two organisation drivers relevant to safety behaviours in a changing environment were considered – safety climate and change management.

Safety climate is a similar concept to psychosocial safety (discussed in Section 3.3 and 4.3) but is focused on physical safety, where workers perceive that their organisation is concerned for their physical well-being. Extensive evidence from the safety literature demonstrates that if workers perceive that their organisation is concerned for their well-being (such as through modelling safety values and managing change well), workers will develop an implicit obligation to reciprocate by carrying out behaviours that benefit the organisation (such as through increased safety behaviours; Hoffman & Morgeson, 1999; Neal & Griffin, 2007). Safety climate is particularly important as the industry experiences rapid change.

Despite **change management** being identified as an important factor impacting safety behaviours, literature shows that it is common for new technologies to be implemented without considering the impact on work design (Horberry, 2012). This was also found within the specific Western Australian mining context, where our Worker Survey reflected that one in five workers reported that change was managed and handled well in their company.

Correlation analyses indicated that both more positive perceptions of safety climate and change management were strongly related to higher scores of safety behaviours in the Worker Survey data. In addition, change management emerged as a consistent theme in interviews when participants discussed the introduction of new technologies in their workplaces. One interview participant discussed how the successful introduction of new technologies, and the safe adoption of the technologies by frontline workers was highly dependent on the way that the change was managed by their company.

> For the most part, it's been a generally positive experience. But that that was largely due to the implementation of those technologies, in a divisional culture where the employees felt safe.
>
> (Professional, office-based employee)

Job Factors. Of the work design and other job factors relevant to safety behaviours in a changing environment, having adequate job resources (task variety, possibilities for development, role clarity, decision-making autonomy, a chance to contribute to safety procedures, and perceptions that the technology is understandable) are strongly related to safety behaviours. This means that one way to foster higher levels of safety compliance (adhering to procedures) and safety participation (getting involved in improving safety processes) is to create meaningful and positive work design, including having varied tasks, having work in which people have the opportunity to develop and learn new skills, providing opportunities for people to contribute to safety procedures, giving workers' autonomy over decisions in their work, and ensuring the technology is understandable. Prior research shows that these sorts of work designs build a sense of commitment and loyalty to the organisation, which then motivates workers to work more safely (Parker et al., 2001).

More generally, research suggests that there is a risk in implementing new technologies without considering aspects of work design (Parker & Grote, 2022). For example, when some tasks become automated due to the introduction of autonomous or algorithmically managed, there is a risk that work becomes poorly designed. Workers may be relegated to mundane work (e.g., extensive monitoring), be unclear about how machines or algorithms make decisions (e.g., being kept 'out of the loop'), or be unable to make decisions to improve safety and performance.
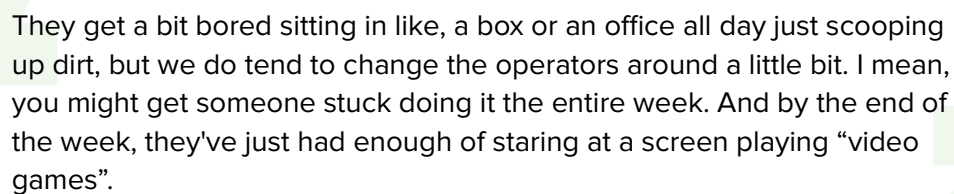
Studies show that the automation of work rarely removes the human but changes the nature of the human contribution (Bainbridge, 1983). One of the 'ironies of automation' is that workers can experience reduced situational awareness (Endsley, 2017).

In uncertain work environments such as when new technologies are initially implemented, improving work design is appropriate because it provides an opportunity for employees to learn about the environment, tasks, and requirements, which in turn leads to improved safety and performance (Leach et al., 2013; Wall et al., 2002). Further, the future of work in mining

may require workers to take the perspective of continuous learning and development, as current and relevant skills will be required to support workers in dealing with increasing changes associated with working in the future mines (e.g., automation, understanding big data, new and different minerals, etc.).

Automation, AI, and associated technologies may replace some work (often described as 'dull, dirty, and dangerous work'), but the non-technical skills that cannot easily be automated (such as creativity, teamwork and abstract problem solving) may be in higher demand.
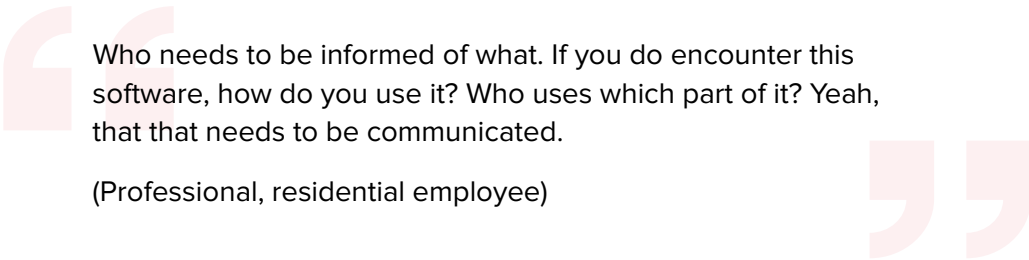
Findings from the Worker Survey and research in general around work design align with sentiments gleaned from interview participants who had experienced introductions of new technologies in their work. For example, the introduction of new technologies in some cases had detrimental impacts on work design. On mine sites, some employees expressed frustration that work automation had reduced their task and skill variety, making their jobs more monotonous. However, they also noted that efforts had been made to manage this demand by rotating the operators.

> They get a bit bored sitting in like, a box or an office all day just scooping up dirt, but we do tend to change the operators around a little bit. I mean, you might get someone stuck doing it the entire week. And by the end of the week, they've just had enough of staring at a screen playing "video games".
>
> (Managerial, FIFO employee)

Other workers noted that in some cases new software had lowered their role clarity, as they felt unsure who was responsible for aspects of new software and how to best work together using it.

> Who needs to be informed of what. If you do encounter this software, how do you use it? Who uses which part of it? Yeah, that that needs to be communicated.
>
> (Professional, residential employee)

Individual Factors. Individual factors relevant to safety behaviours in a changing environment include both an individual's ability to adapt in the face of uncertainty, as well as individual perceptions of how helpful or likely technology is to replace workers. Research suggests that such individual factors can impact an individual's capacity to respond to changes in their work environment (Yukl and Lepsinger, 2004). For example, workers high in individual adaptability may be better equipped to change their behaviours to best suit any new technologies introduced in their workplaces, whereas workers who perceive that those technologies are not only helpful, but will not replace them at their jobs, are more likely to interface with the technologies safely. Further, when workers distrust technological systems, they may become less efficient or make more errors.

Of these individual factors investigated from a safety behaviour perspective, adaptability, and a perception that technology is helpful were strongly associated with safety behaviours. On the other hand, anxiety around technology replacing workers in the future was not associated with safety behaviours. Adaptability and perceptions that technology would help, rather than hinder, consistently emerged in the interviews. In particular, mine workers identified that individual adaptability led them to seek continual improvements in understanding how best to work with and alongside new technologies.

> And if we can make it better, we'll find better ways of doing it. But a lot of people who have been in the industry for long enough, they may feel, "I've done it a certain way without the procedure, why should I have to follow the procedure now?"
>
> (Frontline, FIFO employee)

> I haven't seen that technology is a negative thing. If anything, it's a positive thing. I'm someone who always educates myself if I don't know something.
>
> (Professional, FIFO employee)

Further analyses included all these factors together to identify the factors that strongly and uniquely contributed to safety behaviours (see Appendix Q for the results of full regression analyses) for priority consideration. After controlling for the effects of professional role, **possibilities for development**, **task variety**, **the opportunity to contribute to safety procedures** and **individual adaptability** were significantly and positively associated with both safety compliance and safety participation. Further, **role clarity** and **tolerable physical demands** were uniquely associated with using the correct safety equipment and procedures (safety compliance), while **perceptions that technology is helpful** were associated with behaviours that voluntarily promote safety within the workplace (safety participation).

Together, these results suggest that mining companies that actively seek to design jobs well (such as through ensuring that workers are actively involved in the design of their work, worker suggestions are considered, etc.) also tend to foster environments where workers exhibit safety behaviours critical to the industry. Further, mining companies that prioritise developing workers' adaptability (such as by providing training and creating developmental opportunities that address skills such as critical thinking, creativity, collaboration, and situational awareness) and developing positive views of technology (such as through ensuring that introductions of new technologies are managed well) are likely to uphold safety behaviours to a high standard in the future of work in mining.

5.2.1 Prevalence of Potential Drivers

Next, we report on the prevalence of drivers of safety behaviour in Figure 29.

Of the drivers that are *strongly and uniquely* associated with both safety compliance and safety participation, around two-thirds of mining workers reported high levels of possibilities for development (63%), task variety (71%), being able to contribute to safety procedures (64%) and individual adaptability (72%). There is scope to improve these aspects for the approximate one-third of workers who were not positive about these aspects.
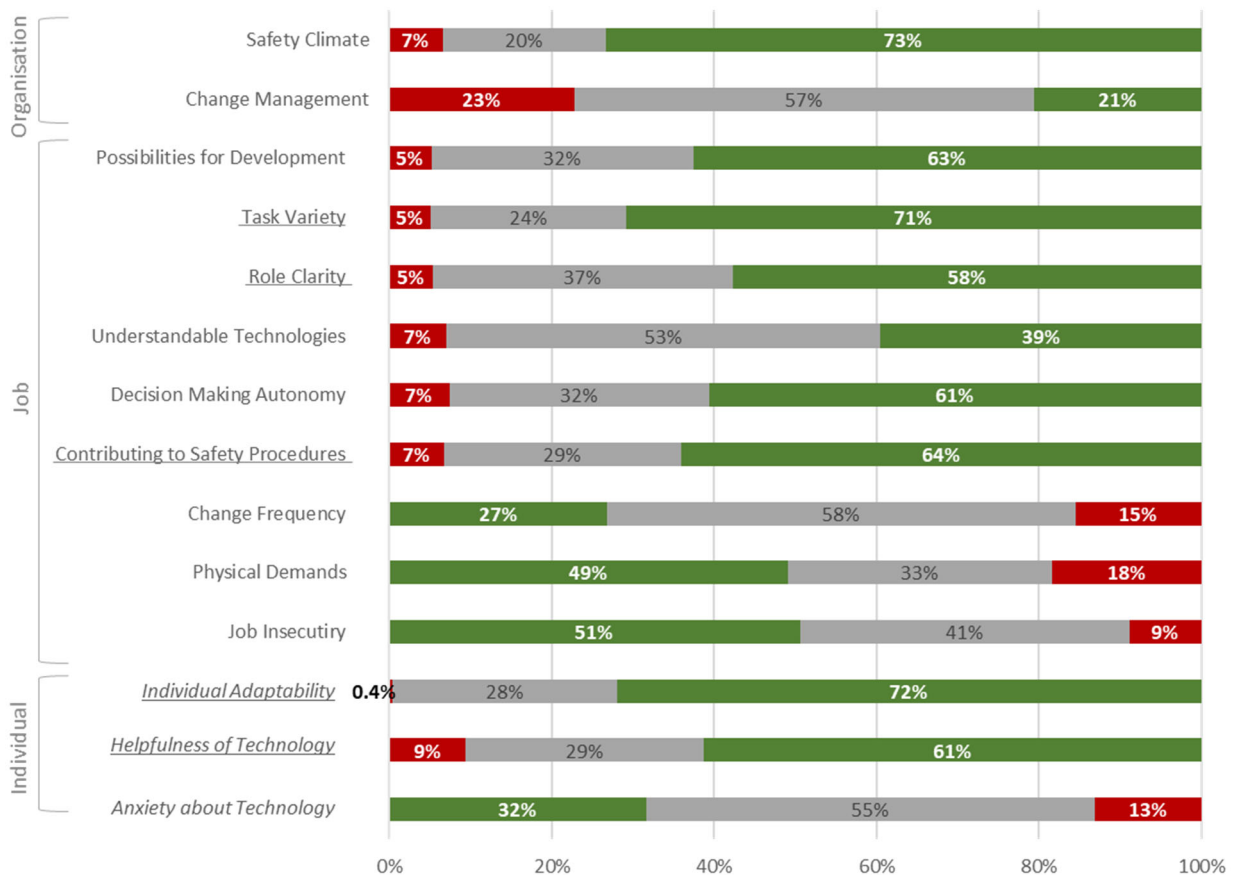
Of the drivers that were *strongly and uniquely* associated with safety compliance, 58% of workers reported high levels of role clarity, while 49% of workers reported tolerable levels of physical demands. This data suggests that improving demands and role clarity for workers will contribute to greater safety.

Of the drivers that were *strongly and uniquely* associated with safety participation, 61% of workers reported perceptions that new technologies in the workplace are helpful.

Other drivers that were strongly associated with safety behaviours were also reasonably prevalent in the mining worker sample, with 73% of workers reporting positive safety climates. However, only one in five workers reported that change was managed and handled well in their companies; nearly three in five workers neither agreed nor disagreed that change was managed well in their companies.

The (poor) management of change is a key finding for the industry, as this is frequently associated with incidents and dangerous occurrences. Changes can introduce new hazards or reduce the effectiveness of existing hazard controls. Effective management of change processes is essential to ensure that health and safety risks are managed before changes are implemented. This applies to all types of changes - including changes to equipment, procedures, operating conditions, and organisational changes.

Figure 29. Percentage of mining workers scoring low, moderate, or high on drivers of safety behaviour


Note. Drivers that are underlined indicate areas that strongly and uniquely contribute to the prevalence of safety behaviours. Drivers that are italicised indicate individual level drivers. Green bars represent the percentage of participants who responded positively. In the case of positively framed drivers, this equates to a response of 4 or 5 on a 5-point scale (indicating high levels of positive experiences and perceptions). In the case of negatively framed drivers, this equates to a response of 1 or 2 on a 5-point scale (indicating low levels of negative experiences and perceptions).

Figure 30 shows the matrix of the prevalence of drivers relative to their strength of association with safety behaviours (safety compliance and safety participation).

> The most important levers our data suggests increasing safety behaviours (**consider for change**) are as follows:
> - improving change management processes, and
> - ensuring that technology is explainable and understandable by workers.
>
> Important aspects to **leverage and enhance**, to ensure they exist for all workers, include:
> - ensuring a positive safety climate within the organisation,
> - providing opportunities for workers to contribute to improving safety procedures,
> - providing task variety,

- providing possibilities for developing and upskilling workers,
- ensuring that workers are clear about their roles and responsibilities,
- ensuring workers have the autonomy to make decisions related to their jobs,
- increasing adaptability of workers, and
- facilitating the integration of workers and technologies such that technology is seen as a help rather than a hindrance.

Figure 30. Prevalence of potential drivers and strength of association with safety behaviour
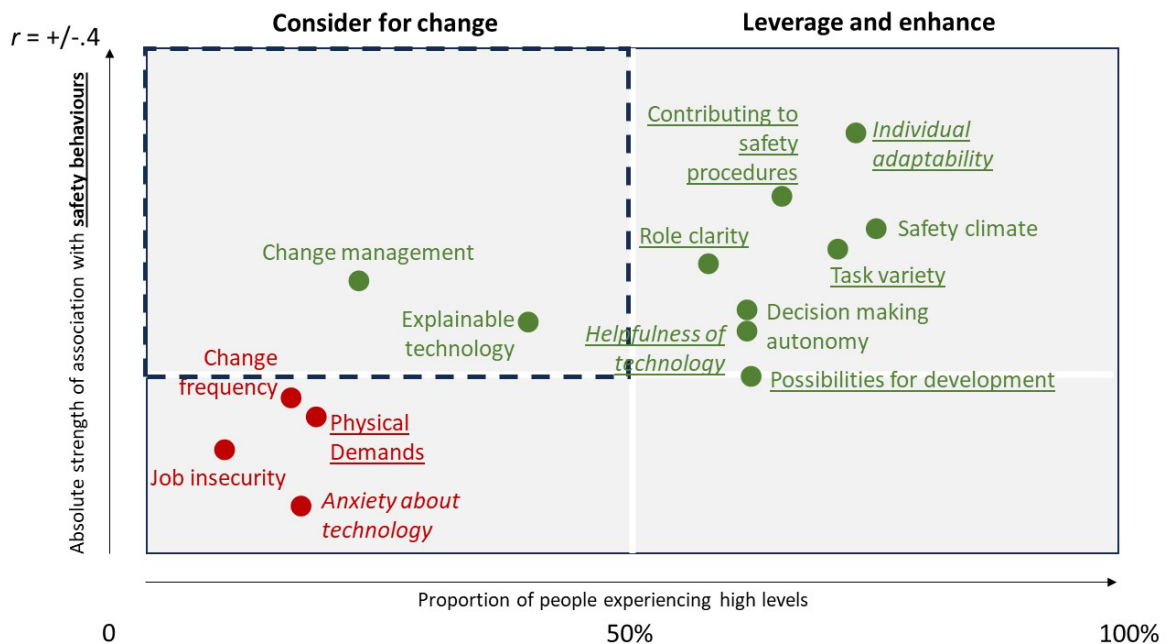
Note. Drivers that are underlined indicate areas that strongly and uniquely contribute to the prevalence of safety behaviours. Drivers that are italicised indicate individual level drivers.

5.3 Policies and Practices Related to Safety Behaviours

In contrast to Report 2B, which reports an overview of the supports (i.e., policies and practices) available to workers from the perspective of HR / OHS managers and related professionals, this survey provides insights into workers' perceptions of those supports. Figure 31 reports the percentages of participants who engaged in various policies, practices, and initiatives relevant to safety behaviours as well as the related perceived usefulness. Following, we demonstrate the link between engagement in these policies and practices with safety behaviours.

Figure 31. Percentage of mining workers engaged in policies and practices related to safety behaviours, and their perceived usefulness
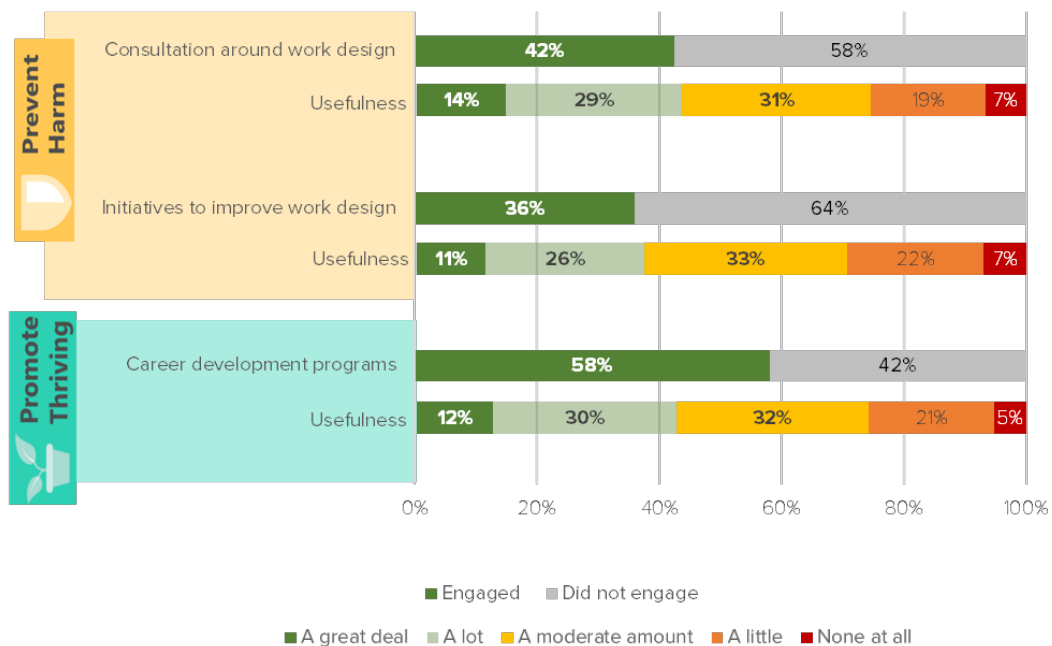
As discussed in Report 2A, changes in the future of work in mining can be planned and developed so that they strategically support the design of future work aligned with good work design. Proactive efforts to design good work that integrates human-centred technologies are likely to generate safety, performance, and well-being benefits, while techno-centric changes that do not consider other factors are more likely to fail (Parker & Grote, 2020). It is therefore important for companies to consider how the design of work might change in tandem with technological advancement, as well as how work design and other factors might play a key role in future mines.

To that end, policies and practices centred on consultation, and centred on continually improving work design, are likely to drive the successful and safe implementation of new technologies on the ground. About four in ten workers reported engaging in policies and practices aimed at reviewing and improving their work design, while 74% of workers who had been consulted in their work design and 71% of workers who had engaged with initiatives to improve their work design felt that these policies and practices were useful in supporting them in their work. In comparison to work design-related policies and practices in Report 2B reported by HR and WHS personnel, 30% of companies engaged in analysing and removing psychosocial risks (including poor work design) to a large and very large extent, 26% engaged in monitoring job pressures to protect against stress and burnout, and 15% actively implemented job crafting opportunities for workers.

Further, as we have discussed, the development and upskilling of workers to ensure that their skills remain relevant and current in a changing environment is critical in the future of work in mining. As mundane tasks are automated by technologies, workers need to be upskilled and developed in their careers to take on more complex and knowledge-based work. Organisational policies and practices that support upskilling through career development programs can help to support these processes. 58% of mining workers reported having engaged in career development programs; nearly three in four workers who engaged in

career development felt that it was at least moderately useful in supporting them at work, however only 35% of companies engaged in career development programs to a large or very large extent.

We further investigate the relationship between workers' perception of the usefulness of policies and practices and worker safety behaviours (Table 13). In general, workers who engaged with company policies and practices that support consultation, better work design, and career development also reported higher levels of safety behaviours.

Next, we conducted regression analyses. The analyses indicated that, after controlling for role and employment type, amongst all three policies and practices, perceptions that **career development programs** were useful in supporting workers at work was uniquely related to both safety compliance ($\beta = .32$, $p = .02$) and safety participation ($\beta = .27$, $p = .056$) above and beyond the positive associations of work design policies and practices with safety behaviours. Sentiments from the interviews support these findings, with a key theme from participants being that upskilling and continuous training support the safe and effective implementation of new technologies.

Table 13. Correlations between perceived usefulness of policies and practices and safety behaviours.

Policies and Practices	Safety Compliance	Safety Participation
Consultation Around Work Design	.29**	.14^
Initiatives to Improve Work Design	.30**	.18**
Career Development Programs	.28**	.16**

Note. $p < .05$ is reported for smaller sample sizes where factors were displayed at random to a third of all participants. ^ $p < .05$, * $p < .005$, ** $p < .001$.

5.4 Interview Findings Related to Preparing the Workforce for the Future of Mining

The interviewees[30] who participated in the interviews pertaining to mental health and well-being were also asked about their experiences with technological changes in their work. First, we report the different new technologies mentioned by participants in Figure 32. Then we summarise the themes of the supports, structures, and individual attributes that participants perceived to help or hinder the adoption and implementation of these new technologies in the workplace in Table 14. The full interview analysis can be found in Appendix R.

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[30] Of the 30 mining workers (Professionals – 13; Frontline workers – 9; Managers – 6; Camps & accommodation – 1; Transport and logistics – 1), 17 participants were currently fly-in, fly-out workers.

Figure 32. New technologies mentioned by interview participants
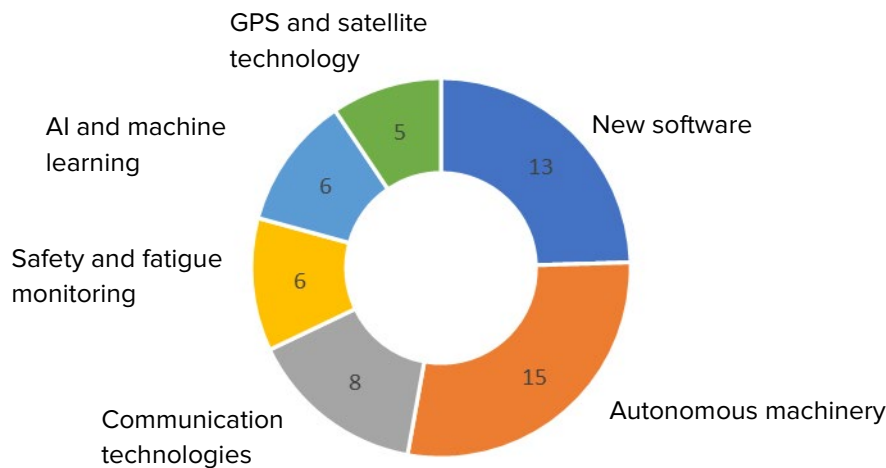
Note. Values depict the number of participants who mentioned each type of new technology. Some interview participants mentioned multiple technology types.

Table 14. Themes of supports, structures, and attributes that help or hinder technology integration

	Helps Technology Integration	Hinders Technology Integration
Organisation	✓ Change consultation ✓ Training and upskilling ✓ Systemic changes	× Lack of transparency × Inadequate roll-out planning × Monotonous work × Low role clarity
Individuals	✓ Adaptability ✓ Technological aptitude ✓ Monitoring tolerance ✓ Analytic skills	× Knowledge or skills gaps × Job insecurity fears

5.5 Comparing findings to other data

We present a summary of safety behaviours in WA mining workers, the benchmark sample, and the FIFO Study 2018 sample in Table 15. Across all safety behaviours, a larger proportion of the mining sample reported higher levels of safety behaviours compared to the non-mining benchmark sample. Welch's t-tests showed significantly higher levels of safety compliance ($F_{(1,1110)}$ = 32.52, p < .001) and safety participation ($F_{(1,1110)}$ = 56.33, p < .001) in the mining workers than in the benchmark sample, suggesting that mining workers report higher levels of safety behaviours compared to workers from other industries. This is a positive finding. The mining worker sample also showed lower rates of underreporting compared to the benchmark sample from other industries.

Compared to the FIFO Study sample (Parker et al., 2018), safety behaviours remained very high, with at least eight in ten surveyed participants reporting high levels of safety behaviours.

Table 15. Comparison of safety behaviours reported by WA mining workers, the benchmark sample, and the FIFO Study

	MARS LMS Worker Survey	Benchmark	FIFO Study (Parker et al., 2018)
Safety compliance	88%	73%	91%
Safety participation	78%	56%	79%
Underreporting of notifiable incidents	26%	45%	n/a
Underreporting of near misses	36%	46%	n/a

Note. Percentages of safety compliance and safety participation reported refer to the percentage of survey respondents who agreed or strongly agreed. Under-reporting is calculated as the number of notifiable incidents (or near misses) that were experienced and not reported as a percentage of all notifiable incidents (or near misses, respectively).

5.6 *Summary: Safety in Future Mining*

- Overall, there is a very large percentage of WA mining workers adopting high levels of safety behaviours such as safety compliance (88%) and safety participation (78%). These levels are comparable to findings from a sample of FIFO workers in 2018 (Parker et al.). These findings are consistent with mining being a safety-critical industry where workers' safety-orientation is consistently held at very high levels. Further, the reported safety behaviours of WA mining workers are significantly higher than workers in the benchmark sample from other similar sorts of industries.
- Although the rate of under-reported is not as high as in the benchmark sample, it is still too high for a safety-critical sector. Under-reporting of notifiable incidents and near misses exists in the mining industry – about one in four notifiable incidents in the past 12 months were unreported, while one in three near misses in the past 12 months were unreported. This data presents a risk to the sector because non-reporting creates lost opportunities for improving safety and because non-reporting is linked to the number of major accidents that occur.
- Organisational drivers that are strongly associated with increased safety behaviours include safety climate and the way that change is managed by senior leadership and throughout the organisation.
- Job drivers that are strongly associated with increased safety behaviours include adequate job resources (task variety, possibilities for development, role clarity, decision-making autonomy, contributing to safety procedures and perceptions that technology is helpful and understandable). Most of these job-level drivers uniquely contributed to safety behaviours, even in the context of all other drivers.
  - o Less than half of the mining workers surveyed reported engaging in any policies or practices related to their work design, however, 71-74% of workers who engaged in work design-related policies and practices felt that it was useful in supporting them at work.
  - o Workers' perceived usefulness of these policies and practices was related to their safety behaviours.

- o Less than one in three companies indicated that they engaged in any work design-related policies and procedures to a large or very large extent.
- Individual factors that are strongly associated with safety behaviours include individual adaptability and perceptions that technologies would help, rather than hinder the way that work is conducted. These individual drivers uniquely contributed to safety behaviours, even in the context of all other drivers. These individual factors can be enhanced through upskilling and development of workers to ensure that they are able to meet the unique needs and challenges of a changing workplace.
    - o 58% of mining workers surveyed reported engaging in career development programs. A high proportion of workers who engaged in career development programs felt that it was useful in supporting them at work.
    - o Workers' perceived usefulness of career development programs was related to their safety behaviours.
    - o However, only about one in three companies indicated that they engaged in career development programs to a large or very large extent.

The data collection via the Worker Survey and Interviews will be repeated in two years' time. This will allow the research team to identify any changes in relation to these three focus areas as well as the drivers that have been found to be associated with these focus areas.

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