

The management of risk factors associated with FIFO workers' mental ill-health.

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Within a five-year period, between 2011 and 2015, there were three Australian parliamentary inquiries into the impacts of fly-in, fly-out (FIFO) work practices in the resources sector. Apart from its potential effects on local host communities (i.e. those adjacent to mine sites) and source communities; attention was given in each inquiry to effects on workers and their families. Two state inquiries (WA, QLD) and a federal inquiry provided recommendations regarding the management of worker well-being. These addressed issues such as the impact of separation from family and friends, geographical isolation, work/home conflict, roster schedules, quality of accommodation facilities and the misuse of alcohol and drugs. The recommendations – developed from evidence given in hundreds of formal submissions from key stakeholders (mining companies, workers, individuals representing local and state governments, unions, peak bodies, academic and community groups), site visits (domestic and overseas) and public hearings are a resource that ideally could be used by the mining sector to inform their workplace health and safety (WHS) systems used to manage their FIFO workforces. It is the aim of this paper to describe the context of the inquiries and to merge and present an overview of their recommendations in a risk-based bow-tie format; well-known to the resources sector.

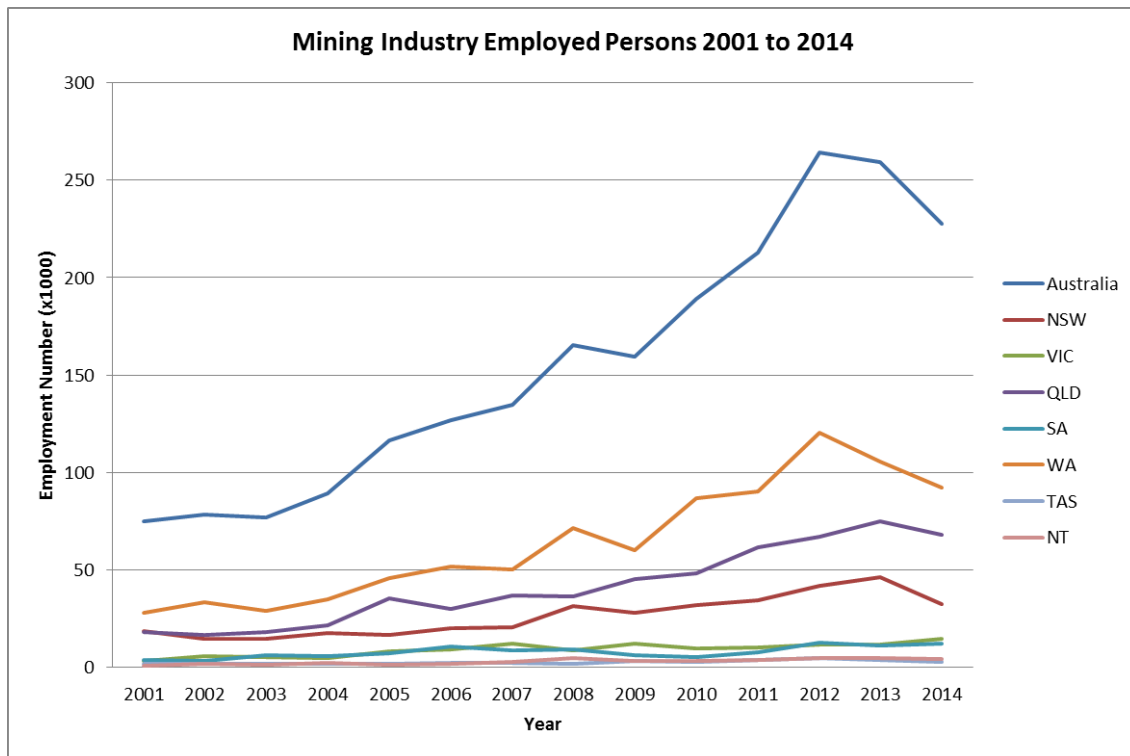
FIFO is defined as “work which is undertaken by long-distance commuting on a regular basis for an extended period at such a distance from the employee’s home that they are not able to return to their permanent residence at the end of a shift” (House of Representatives Standing Committee on Regional Australia, 2013, p. 4-5). In this paper, FIFO is used as a generic term that includes all forms of transport used by workers to commute to and from their work sites, including drive-in, drive-out (DIDO) and bus-in, bus-out (BIBO). An important feature of FIFO is its roster arrangement that generally consist of extended blocks of consecutive 12 hour-shifts (day, afternoon or night) that serve to maximise days at work as well as lengthening rest breaks at home. These are common features of the rosters worked by residential mine workers too.

Three Australian parliamentary FIFO inquiries

In August 2011 the Commonwealth of Australia's House of Representatives Standing Committee on Regional Australia (HRSCRA) was commissioned to conduct an inquiry into the effect of FIFO practices on host and source communities and worker and family well-being. It was triggered as a result of regional Australia's concern that FIFO was "now regularly being utilised to provide a permanent operational workforce adjacent to established regional towns" (HRSCRA, 2013, p. 1). All three inquiries recognised that FIFO arrangements were necessary and appropriate for mines with operations in remote locations and those in the construction phase of their projects, but they each admonished its use when nearby towns existed. And particularly when, in these circumstances a high proportion of the total workforce were non-residential workers or when workers were not given the choice to live in local towns. The results of the inquiry were tabled in a report entitled "Cancer of the bush or salvation for our cities – Fly-in, fly-out and drive-in, drive-out workforce practices in regional Australia" in February 2013.

The federal inquiry occurred at a time when the industry was near the peak of a ten-year boom on the back of Chinese demand for resources. Total mining employment numbers had more than tripled in that time from 77,200 in 2003 to 264,000 in 2012 (see Figure 1, ABS, 6291.0.55.003 - Labour Force, Australia, Quarterly, August 2003 to 2012). This was led primarily by employment growth associated with rapid increases in iron ore production in Western Australia and black coal production in Queensland. The numbers employed in the mining industry in Western Australia grew from 29,000 to 120,400 between 2003 and 2012 and those in Queensland increased from 18,300 in to 67,000 across the same time (ABS, 6291.0.55.003 - Labour Force, Australia, Quarterly, August 2003 to 2012).

During this period, the number of non-residential (FIFO) workers increased as a proportion of the total mining workforce. In 2005, the Chamber of Minerals and Energy Western Australia (CMEWA) found that 47 per cent of all mining employees in that state were employed on FIFO arrangements. Earlier booms primarily relied on residential workforces who resided with their families in remote towns, some of which were purposes-built by mining companies – such as Tom Price and Karratha in Western Australia and Moranbah and Dysart in Queensland. Factors driving increases in the FIFO workforce included a change in Australia's tax regime which made corporate support of local towns less economically viable, increasingly remote mining projects, cheaper air travel, shorter project lives, a rapid growth in the demand for labour and an undersupply of locally-residing skilled workers (SMEWA, 2011; Storey, 2010). It was also in some instances led by workers preference of FIFO work arrangements due to the better job, education and medical opportunities available to families residing in urban centres. An important associated finding in the QLD inquiry was that all tiers of government should consider their spending on regional services to better attract workers to their regions.



Note, Source = ABS, 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, August 2001 to 2014

Figure 1. Australian mining employment by state 2001 to 2014

In contrast to the community focus of the federal inquiry (including community well-being, services and infrastructure), the terms of references (and recommendations) of the state’s inquiries were primarily directed to worker well-being (see Table 1). In 2014, the parliament of Western Australia commissioned the Education and Health Standing Committee (EHSC) to investigate “the possible mental health impacts rising from FIFO work arrangements” in the resources industry (EHSC, 2015, p. 1). It was also tasked with examining current industry, government and community initiatives and to recommend improvements. The inquiry was triggered by public concern regarding media reports that nine WA FIFO workers had suicided in a 12-month period – something that the inquiry was unable to verify. The EHSC’s preliminary report “Shining a light on FIFO mental health: A discussion paper” (EHSC, 2014) was used to promote awareness of the inquiry and encourage key stakeholders to provide formal submissions. The EHSC submitted the report of its findings - “The impact of FIFO work practices on mental health” to the legislative assembly on the 18th June 2015. It identified 42 findings and 30 associated recommendations.

In October of the same year, the report of the findings of the Queensland inquiry, entitled “Inquiry into fly-in, fly-out and other long distance commuting work practices in regional Queensland”, was completed by the Infrastructure, Planning and Natural

Resources Committee (IPNRC) and tabled in the Queensland parliament. Running concurrently was a parliamentary review (May to July, 2015) of existing 100 per cent FIFO mining project approvals in Queensland and the economic impact of FIFO on communities adjacent to mines and source communities (Department of State Development, 2015). It made recommendations with respect to existing approvals and the future approval process of mining projects in Queensland. These will not be discussed in this paper.

Table 1. Summary of Australian Parliamentary Inquiries into the impact of FIFO Practices used by the Resources Sector

Inquiry	Dates	Focus	Evidence	Recommendations (worker focussed)
Federal: HRSCRA	Aug 2011 to Feb 2013	FIFO effects on host & source communities	26 public hearings; 232 formal submissions; site visits; visits to sites in Canada & Mongolia	21 (4)
WA: EHSC	Aug 2014 to June 2015	Possible mental health impacts arising from FIFO work	26 public hearings; 130 formal submissions; 4 site visits	30 (30)
QLD: IPNRC	March 2015 to Oct 2015	Possible mental health impacts arising from FIFO work	12 regional hearings; Brisbane hearings; 235 formal submissions	19 (19)

Note, HRSCRA = The House of Representatives Standing Committee on Regional Australia; EHSC = Education and Health Standing Committee; IPNRC = Infrastructure, Planning and Natural Resources Committee

The inquiries' terms of reference for workers' health had similar objectives and these were generally to identify impacts of FIFO arrangements on workers' health and to assess current strategies used to optimise the FIFO experience for workers and to recommend improvements. Table 2 displays the key issues raised in the recommendations which have been sorted according to whether they represent primary or tertiary health interventions. Primary interventions are those focused on the prevention of illness and tertiary interventions provide treatment for chronic

illness. These issues were thoroughly addressed within each of the reports. The recommendations were directed to government agencies and/ or mining companies or more broadly the resources sector. Some issues were common across all three inquiries, such as the development of an industry code of practice or best practice guideline for FIFO work arrangements that “should provide guidance of best practice to promote improved mental and emotional health and wellbeing amongst the workforce” (EHSC, forward) and to help achieve WHS standards. While others were unique to a particular inquiry, such as the attention paid by the WA Inquiry to mental health (and suicide) or the recommended changes of the QLD Inquiry to include FIFO workers’ health as a criterion for social impact assessments. A notable admission was that of the profiling or screening of employees at the time of recruitment to ensure that only people ‘suited’ to FIFO were employed. The WA inquiry strongly advised that this not occur and likened it to “saying that the solution to the challenge of working safely at heights is to employ only those with exceptional balance, rather than addressing safety risks by providing harnesses and safety railings” (EHSC, p.61). Instead they suggested that the industry’s focus should be on better managing mental health and well-being within the workplace.

Table 2. Key Issues and Strategies Identified in the Recommendations from the Federal, Western Australian and Queensland Inquiries into the Effects of FIFO Work Practices on Worker Well-being

Issue highlighted in recommendation	Federal	WA	QLD
<i>Primary Interventions</i>			
More accurate methods for measuring numbers of FIFO workers	✓	✓	✓
Funding of research into the mental health impacts of FIFO work arrangements to inform health policies	✓	✓	✓
Funding of research into the use of illicit drugs by FIFO workers, particularly the use of short-acting illicit and new synthetic substances, and the impact on mental health		✓	
Legislative changes: WHS		✓	
Legislative changes: project approval processes (i.e. social impact assessment to include FIFO factors affecting workers; accommodation standards)			✓
Development of a code of practice / best practice guide that addresses FIFO work arrangements (including commuting) and their impacts on workers’ mental health	✓	✓	✓
FIFO worker access to effective workplace		✓	✓

health initiatives (e.g. appropriate to the demographic profile of workforce, recognising workforce is vulnerable to suicide)			
Rosters (encouraging use of even-time rosters)		✓	✓
Commuting			✓
Fatigue Management		✓	✓
Workplace cultures that are supportive of good mental health and well-being		✓	
Improved anti-bullying procedures		✓	
Availability of high quality, reliable and accessible communications technology in FIFO accommodation facilities		✓	✓
Accommodation: Minimum standards for FIFO accommodation facilities (inc. room design, private spaces, communication, access to health services, recreational areas, healthy food options)			✓
Accommodation: minimisation or abolition of hotelling / hot bedding		✓	
Accommodation: assess whether accommodation facilities are too highly regulated (lack of control)		✓	
Accommodation: consider placement of accommodation facilities to benefit local communities as well as the mental health of workers (i.e. to increase interaction)		✓	
Accommodation: Provide opportunities/choice for workers to reside in local communities to improve mental health		✓	✓
Activities to improve positive engagement between workers and local communities		✓	
<i>Tertiary Interventions</i>			
The provision of independent mental health support services for FIFO workers			✓
Key staff and workers (and families) receive training in mental health literacy (including suicide prevention, managing mental health problems amongst colleagues and workers)		✓	
Use of peer-based support programs		✓	
Alcohol use: Increased recognition of harmful alcohol use of FIFO workers and its impact on their mental health		✓	
A process for the conduct of mental health evacuations		✓	
Well-developed policies to manage a suicide or suicide attempt		✓	
Better methods for recording the suicides of workers		✓	

The mental health of FIFO workers

Mental health is essential to the well-being of individuals and society; as well as to the productivity of companies. Mental ill-health is a leading cause of lost work days (absenteeism), low performance while at work (presenteeism), worker turnover and early retirement (Birnbaum, Kessler, Kelley, Ben-Hamadi, Joish & Greenberg, 2010). Workplace injuries and illnesses – physical or emotional, are managed by organisations' workplace health and safety (WHS) systems. Yet, for most industries, the workplace processes and practices used to prevent and mitigate physical ailments are far advanced compared to those used to manage mental ill-health.

At the present time, there is no definitive evidence of there being a higher prevalence of mental disorders among Australian FIFO workers in the resources sector. The results of a couple of recent studies, with larger samples (Velandar, Schineanu, Liang & Midford, 2010; Henry, Hamilton, Watson, Macdonald & Sellenger, 2013) suggest a higher prevalence, and while these together illicit concern, their outcomes are hindered by methodological weaknesses - including the failure to control for pre-existing illness and other individual risk factors. Further, they all measure the occurrence of distress symptoms – a measurement that does not necessarily indicate a clinical diagnosis for a mental disorder. However, despite this lack of evidence, it is disquieting that there is further burden for those workers experiencing high to severe levels of distress – that of being isolated and separated from their social supports systems. Other factors, such as fatigue and being 'stuck' in sometimes controlled camp environments (EHSC, 2015) may also worsen their situation. It is this confluence of impacts that is raised as a key concern in the WA EHSC's report into the impact on FIFO work practices on mental health (2015). As well, the workforce's demographic profile, which is primarily 18 to 44 year old males, is known to be more vulnerable to particular mental disorders (e.g. addiction, suicide). On that basis it argues that it is incumbent on the sector to implement strategies that protect FIFO workers from the effects of cumulative impacts that may cause or aggravate psychological injury or harm.

Doing this requires working within current WHS legal frameworks. The Queensland coal mining (1999) and mining and quarrying (1999) WHS legislation is underpinned by principals of risk management and safety management systems. Sites are required to identify, analyse and assess risk, and avoid or remove unacceptable risk of mining hazards. A process more thoroughly explained in associated standards, guidelines and handbooks - ISO 31000:2009 Risk management - Principles and guidelines being the most notable. Risk-based WHS is managed according to the criterion of an "acceptable level of risk". With no absolute definition of an acceptable level of risk, the onerous is on companies to determine their risk tolerance and demonstrate they are conducting their operations so that the risk from their operations is within acceptable limits; and is as low as reasonably achievable. This is achieved using Safety and Health Management Systems (SHMS). Informed by

systems theory SHMSs represent an integrated and all-of-organisation approach to WHS responsibilities and accountabilities, where health and safety is viewed as being affected by all aspects of the design and workings of an organisation. At the foundation of this approach is the notion that workplace incidents, injuries and illnesses are viewed as an indication of a problem in the system, rather than simply human error.

Risk-based methodologies for managing mining hazards have matured since the introduction of modern WHS regulations – that occurred relatively uniformly across Australian States between 1999 and the early 2000s. Initially focussed on risk assessment techniques such as measuring risks according to likelihood and severity of consequence, best practice methodologies now emphasise the importance of implementing and monitoring effective controls and the identification of critical controls (ICMM, 2015). But as previously suggested, those being used for the management of physical injury and disease are generally advanced compared to those used for the management of psychological harm. In terms of bow-tie analysis, factors such as cumulative exposure effects, long-developing disease periods and individual worker differences must be taken into account when identifying the unwanted event, the causes that precede it, its subsequent consequences and the controls that prevent or mitigate it. Aggregated effects challenge the normally linear approach of bow-tie methodology.

Bow-tie analysis for managing FIFO impacts

As described previously, the reports of the outcomes of the three parliamentary inquiries into the effect of FIFO practices on workers' mental health provide insight into the potential causes and consequences of distress experienced by FIFO workers in the Australian context and best practice strategies used to try to prevent or mitigate them. For example, many of the primary interventions listed in Table 2 represent preventative controls; while the tertiary interventions represent mitigating controls.

In bow-tie analysis the unwanted event is the centre (or knot) of the bow-tie. On the left and right side of the knot are listed the causes and consequences of that event, respectively. The causes and consequences are linked to a series of controls that have the potential to either prevent the event from occurring (preventative controls) or reduce the severity of the consequences (mitigating controls).

A suggested unwanted event for FIFO practices is *worker distress*. Where distress is not suitably mitigated, consequences include increased worker presenteeism, absenteeism, and worker turnover; an increased prevalence of mental problems or disorders, misuse of alcohol and use of illicit drugs; and self-harm. Potential causes or threats commonly discussed in the inquiries include roster design (shift work, length of shift, work start and finish times, length of cycle, commute), fatigue (roster design, amount and quality of sleep, work tasks and environment, sleep disorders

and other health issues), standard of accommodation facilities, availability and reliability of communication technology, workplace culture, bullying, social/community isolation (relationship strain, work/home interference, loneliness), financial pressure, employment volatility, use of alcohol and illicit drugs, rigorous control and supervision while at camp. Preventative controls or strategies to optimise the FIFO experience for employees and their families are provided as summaries in the inquiry reports as well as examples given in the individual formal submissions. For example, the WA and QLD inquiries provide descriptions of preferred accommodation facilities and practices and recreational facilities, and examples of best practice accommodation facilities provided by different mining companies.

The inquiries also provide information about the challenges and opportunities associated with developing strategies to manage FIFO practices. These include identifying interventions that cater for the unique demographic profile of the mining workforce – that are primarily men aged between 18 and 44 years. And the particular mental health risks and vulnerabilities of this group – particularly in terms of suicide and alcohol and drug use. Also catering for differences within the workforce – including construction versus operational groups, workers at different stages of their life (e.g. young singles c.f. parents of dependent children c.f. ‘empty-nesters’), gender differences, indigenous versus non-indigenous workers, contractors versus employees, and workers new to the mining industry and FIFO arrangements. They also make highlight the potential for cumulative effects of risk factors, such as might be experienced by distressed workers who are isolated from their normal social support systems.

Conclusion

FIFO practices are a necessary and appropriate work practice for remote mines and for those in the construction phase of their project. They are also preferred by some workers. Features of FIFO practices have the potential to place demands on workers that may cause them distress. Queensland’s mining WHS legislation requires that sites identify, analyse and assess risk and prevent or mitigate unacceptable risk. It also considers workplace injuries and ill-health indicators of problems within a broader workplace system rather than human error – or weakness. These underpinning values apply to both physical and psychological injury and illness. It is therefore incumbent on the sector to implement strategies that protect workers from any potential negative health effects that might result from working FIFO arrangements. Three parliamentary inquiries have provided guidance on the management of such effects that can be used to inform the development of risk management techniques such as bow-tie analysis to better protect and sustain the mining workforce.

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