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Final Sodexo Report

A Literature Review of

Wellness, Wellbeing and Quality of Life Issues

as they impact upon the

Australian Mining Sector


Prepared by

Professor Kerry Carrington and Dr Alison McIntosh

Crime and Justice Research Centre

Queensland University of Technology

June 2013

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Background to this report

Australia's mining boom

Global demand for minerals and energy products has fuelled Australia's recent resources boom and has led to the rapid expansion of mining projects not only in remote locations but increasingly in settled traditionally agricultural rural areas. A fundamental shift has also occurred in the provisioning of skilled and semi-skilled workers. The huge acceleration in industry demand for labour has been accompanied by the entrenchment of workforce arrangements largely dependent on fly-in, fly-out (FIFO) and drive-in, drive-out (DIDO) non-resident workers (NRWs). While NRWs are working away from their homes, they are usually accommodated in work camps or 'villages' for the duration of their work cycle which are normally comprised of many consecutive days of 12-hour day- and night-shifts. The health effects of this form of employment and the accompanying lifestyle is increasingly becoming contentious.¹ Impacts on personal wellness, wellbeing and quality of life essentially remain under-researched and thus misunderstood.

Sodexo in Australia

Sodexo began operations in Australia in 1982, and has since become a leader in providing Quality of Life (QOL) services to businesses across the country.² The 6,000 Australian employees are part of a global Sodexo team of 413,000 people. Sodexo in Australia designs, delivers and manages on-site their QOL services at 320 diverse site locations, including remote sites. Sodexo operates in a range of sectors, including the mining industry. Service plans are tailored to suit the individual needs of organisations.

Sodexo Remote Sites has previously conducted unpublished research among mining workers in Australia. The results highlighted needs and expectations of Australian mining workers. Main insights about workers' requirements were directed towards:

- contacts with closest;
- warm rest time around proper and varied meals;
- additional services to help them better enjoy their life onsite and/or make the most of it;
- organise their transportation;
- promote community living; and
- finding balance between professional and personal life.³

The brief for this current research is aimed at building upon this knowledge.

¹ House of Representatives Standing Committee on Regional Australia (2013)

² Sodexo website (Available at <http://au.sodexo.com/auen/aboutus/aboutusaus%5Caboutusaus.asp>)

³ Sodexo Research Brief

Research brief

Expectations for quality of life and wellness and wellbeing services are increasing dramatically. It's getting costlier and more difficult to retain valuable employees. This is particularly the case in the Australian mining sector. Given the level of interest in ensuring healthy workplaces in Australia, Sodexo has commissioned QUT to conduct a literature review. The objectives as specified by Sodexo are:

Objective 1:

To define the concepts of wellness and wellbeing and quality of life in Australia

Objective 2:

To examine how wellness and wellbeing are developed within organisations in Australia and how they impact on employee and organizational performance. More specifically, to review the literature that could be sourced about:

- challenges of the mining environment;
- the mining lifestyle – implications for health, wellness and daily life;
- personal health and wellness of Australian mining workers;
- factors affecting health in mines and perceived support for health and wellness;
- and
- the impact of employer investment in health on perceptions and behaviour of employees.

Objective 3:

To determine what impact employee wellness and well-being has on the performance of mining workers. More specifically, to review the literature that could be sourced about:

- impact of obesity, alcohol, tobacco use on companies; and
- links between employee engagement and satisfaction and company productivity.

Accordingly this review has attempted to ascertain what factors an organisation should focus on in order to reduce absenteeism and turnover and increase commitment, satisfaction, safety and productivity, with specific reference to the mining industry in Australia.

The structure of the report aligns with the stated objectives in that each of the first three parts address an objective. Part IV summarises prominent issues that have arisen and offers some concluding observations and comments.

Part I: Defining the concepts of wellness, wellbeing and quality of life in Australia

Definitions and conceptualisations

In an Australian context, a variety of definitions of the terms wellness, wellbeing and quality of life (QOL) are generally in accord with internationally recognised understandings. These definitions acknowledge the roles of culture, environment and resources, and the parts they play in the lives of all individuals. Clearly they imply something more encompassing than just objective components to good health in that they go beyond indications of specific biomarkers to incorporate psychosocial components.

Operationalising these terms is, however, another matter and one that requires even more nuanced interpretations for application to the mining industry.

National measurements

Objective measurements using economic indicators such as Gross Domestic Product and other quantitatively measurements including population health, literacy and crime statistics are essentially irrelevant for this review. Some surveys which have provided subjective measurements are more useful. Ones which have tested indicators of personal wellbeing (PW) at a national scale and which have specific relevance to the mining industry have suggested the following:

- Not enough or poor quality sleep has negative impacts on PW.
- Chronic health problems that have required medical treatments – especially one producing severe physical pain or a serious mental illness – negatively affect PW.
- Individuals in established relationships have highest levels of PW; this is the most powerful indicator of positive PW.
- Internet contact with solely ‘virtual’ friends does not alleviating loneliness for those who live alone.
- Regular exercise and physical activity improves feelings of PW.
- Drinking small amounts of alcohol can improve PW; drinking heavily can harm it.
- Smoking cigarettes is associated with low PW.
- Income security is a powerful determinant of PW.
- Job insecurity is damaging to PW.
- Many Australians are living time-poor lives
- Working more than 40 hours a week can harm PW because of work-leisure imbalance.
- PW from the positive aspects of work are not increased when hours of work are 40 per week or more.

- Greater leisure satisfaction is achieved within those groups who work lowest numbers of hours.
- Volunteering and inter-personal relationships are essential elements for PW and a high QOL.

Mining industry subjective measurements

Some insights specific to the mining industry are available from two (2) surveys conducted in Queensland. Although there are recognised deficiencies with the representativeness of the Queensland industry surveys, they are, nevertheless, instructive. Qualitative research addressing wellness, wellbeing and QOL issues for resources sector workers could not be sourced from other states or nationally. Points of specific interest from the two Queensland surveys are summarised below.

- Mining industry workers have lower levels of work-life balance than any other Australian industry group.
- Fewer workers in the mining industry have some say in start and finish times than in any other industry.
- Most mining industry workers are dissatisfied with their working hours and shifts.
- Most mining industry workers have a preference for working no more than 40 hours per week.
- Most mining industry workers experienced difficulties with their sleep patterns.
- Ability to achieve a work-life balance and overall QOL were the most important influences for resident and FIFOs/DIDO mining industry workers deciding their acceptance of work, and hence accommodation, arrangements.

Part II: Development and impact of wellness and wellbeing programs

Workplace wellness programs in Australia

Despite recognition by many Australian-based organisations and industries of the benefits of workplace wellness programs, their introduction has lagged behind some other countries. In Australia, medical costs are less directly the responsibility of employers and also benefits for employers are not readily quantified. Nevertheless, it seems a cultural shift is gradually occurring which may lead to greater contributions of the workplace to wellness and personal wellbeing. Incentives and effective measurements are regarded as key factors; and governments have a major role to play.

Australia's 'Healthy Workers' program

The Healthy Workers program within the National Partnership Agreement for Preventative Health (NPAPH) between the federal and state governments has almost \$300 million budgeted (to June 2018) to support workplace health programs that focus on decreasing rates of overweight and obesity; increasing levels of physical activity and intake of fruit and vegetables; smoking cessation; and reducing harmful levels of

alcohol consumption.

Identified high risk or hard to reach industries and workplaces in the Queensland Healthy Workers strategy include blue collar occupations (e.g. mining industry technicians and trades workers, machinery operators and drivers, labourers); regional areas of predicted high employment growth (as forecast for mining); sedentary workers (again, the industry's machinery operators and drivers are prime examples); and regional, rural and remote workplaces (as for mining). The comparable strategy for Western Australia, the nation's richest resource jurisdiction, does not address issues relevant to this literature review as does the Queensland one.

The importance of non-duplication of existing initiatives in the prioritisation of selected programs within the strategy suggests an industry approach would be viewed more favourably than a plethora of workplace wellness programs and strategies from different organisations.

Health implications and concerns about the lifestyle of mining workers

Choices and/or constraints about working arrangements mean that the mining lifestyle can vary greatly from one individual to the next. Clearly lifestyle is one thing for resident (local) workers who, at the end of each shift, usually go to their home in a town proximate to the worksite and another for those who fly-in, fly-out (FIFO) or drive-in, drive-out (DIDO). What is understood by 'the mining lifestyle' takes account of:

- Long operational hours – 12-hour shifts alternating between day and night within extended work cycles – impact upon the lifestyle of workers and 'frontline' resource sector communities.
- Non-standard workplace arrangements including the use of FIFO/DIDO non-resident workers (NRWs) who, during their extended work cycles, stay in camps which usually accommodate from several hundred to several thousand.
- Separation of NRWs from family and friends and long distance travel to/from the worksite – 'the FIFO lifestyle' – can be among the matters that are unacceptably stressful and tough on good health and wellbeing.
- Conflicts arise from work arrangements spilling into family life.
- The risk or reality of being drawn into the mining culture of heavy drinking, brawling, smoking cigarettes and illegal drug use, especially for NRWs away from home.
- Physical inactivity and obesity, and other forms of risky behaviour resulting in injuries or illnesses (e.g. exposure to HIV, dangerous driving,) are associated with the FIFO lifestyle.
- Conflicts between NRWs and residents of frontline communities.

These aspects of the mining lifestyle have complex and interrelated ramifications for

the health of workers. These were forcefully illustrated in the House of Representatives Standing Committee on Regional Australia inquiry into the effects of FIFO/DIDO workforce arrangements on regional communities. The inquiry identified as serious concerns for these types of mining industry workers the use of alcohol and other drugs; poor diet and physical inactivity; increased sexually transmitted and blood borne infections; mental health issues; fatigue related injury; and an increase in injury related to high-risk behaviour.

The inquiry heard that the FIFO lifestyle was potentially responsible for fatigue and mental health conditions linked with social isolation, depression and violence. Importantly, Recommendation 8 of the report was that:

... the Commonwealth Government commission a comprehensive study into the health effects of fly-in, fly- out/drive-in, drive-out work and lifestyle factors and as a result of this research develop a comprehensive health policy response addressing the needs of fly-in, fly-out/drive-in, drive-out workers.⁴

Whether this and others of the 21 recommendations of the Committee will be adopted remains to be seen.

Major concerns about entrenched substance use and abuse within the FIFO culture with its concomitant impacts on fitness and general health and wellbeing were reiterated in many referenced sources during this current review. Insights about a range of additional issues shaping the FIFO lifestyle were also disclosed for these mining industry workers. These included the behavioural effects of night shift on sleep deprivation and mood swings; disconnections with home-life situations; relationship strains and home conflicts; changes in physical health; and issues with on-site catering and food choices. Crew tensions and work conflicts, roster patterns, and quality in accommodation camp conditions also affected the FIFO/DIDO experience and personal wellbeing.

Clearly managing the sense of loneliness and/or displacement from the family unit is a major issue for FIFOs/DIDOs. In frontline mining towns, NRWs can sometimes represent large, even majority, proportions of local area populations and have become the convenient and readily identified scapegoats for divisions within communities, deflecting attention from equivalent poor conduct of locals. Nevertheless, links between violence, social disorder and drunken men from work camps create a climate of fear and anxiety about safety. For this and other reasons discussed in this report, NRWs are often treated by local residents with suspicion which serves to widen the 'us-them' chasm between locals and FIFOs/DIDOs and further harm the sense of wellbeing of all.

⁴ House of Representatives Standing Committee on Regional Australia (2013: 100)

Workers have expressed reluctance to seek support for psychosocial wellbeing. Barriers include a culture of not discussing problems; embarrassment; fear of loss of employment if problems were admitted; a need for trust in the support person; and the need for assurance of confidentiality.

Notwithstanding identified constraints in measurements of wellness, wellbeing and QOL for Australia and for mining industry workers in particular (as discussed in Part 1), this current report makes linkages between subjective measurements from survey results and aspects of the mining lifestyle with its attendant implications for health, wellness and daily life. Specifically, connections have been made between negative feelings about personal wellbeing and the influences of use of alcohol and tobacco; physical inactivity; long work hours/work cycles; loneliness and separation; and depression and anxiety.

Factors affecting health in the workplace of Australian mining workers

Impacts of obesity, alcohol and tobacco use – key areas of interest nominated in the brief for this project – cannot be considered in isolation because they are interconnected with each other and with a range of other health, wellness and QOL factors. They are closely associated with Australia’s mining culture and the FIFO/DIDO lifestyle. This review shows that they are also intimately connected with the long 12-hour shifts employees are now required to work, extended work cycles which further exacerbates fatigue, and increasingly sedentary work, especially for blue collar workers.

Compared to most other industries, the mining workforce has a high proportion of chronic health problems. These, too, are interrelated with a range of identifiable issues. Some of these – health hazards in daily life, traumatic accidents – have long been associated with work in the mining industry. Others – e.g. workplace stress and mental health, use of prohibited drugs, presenteeism, dangerous social media activities and post traumatic stress disorder – while not necessarily ‘new’ conditions, have emerged as more recent and pressing concerns for workers and employers in this industry.

This review considers, in turn, what the literature has to say about impacts on personal wellbeing of each of these workplace issues. Fatigue, long working hours and the mining culture and lifestyle appear to be at the heart of most conditions.

Employer support for wellness programs

Many organisations recognise there are sound reasons for employers to support health and wellness programs for their employees. These reasons include their effect on reducing absenteeism and presenteeism; containing workers compensation expenses; and enhancing organisation profile which can facilitate recruitment. Workplace wellness programs are also thought to improve employee morale and satisfaction and thus reduce employee turnover, and improve injury and accident rates. These factors

combine to increase productivity – and thus profitability – and provide a competitive advantage for organisations with progressive wellness programs.

Although many organisations support some forms of workplace health promotion initiatives, a major obstacle to the growth and sustainability of programs is the inability to measure their success and thus demonstrate, perhaps at a board level, a return on investment from their implementation. The incentive of reduced health care costs does not carry weight here as in other countries. Without this, there may be insufficient stimulus for the identification of key performance indicators, implementation of meaningful programs, and allowance of sufficient time and monitoring for their return on investment to be assessed.

Other barriers to the adoption of programs within the mining industry vary between people, site cultures, companies, industries and locations. Impediments to employer support of and employee participation in programs have been especially noticed in regional and remote locations. Camp accommodation and catering influences food quality and choices and, for those working long hours and shifts, fatigue and lack of free time discourages physical activity.

Information about a range of health and wellbeing programs were sourced, summarised and analysed. Nine resource sector organisations had programs aimed at Occupational Health and Safety workplace compliance. Only six with lifestyle programs could be sourced; these had been introduced across 11 different worksites. This does not necessarily indicate the level of penetration of lifestyle programs in the mining industry.

Programs which specifically addressed alcohol consumption or drug use were not identified and only one targeted cigarette smoking. Similarly, only two resource sector organisations mentioned programs addressing mental health and/or stress. Reticence in these respects has been attributed to the ‘taboo’ nature of the topics and perceptions that these matters are too difficult to address.

Part III: Impacts of wellness and wellbeing of mining employees

Estimates of productivity costs and days lost

In addition to the specifications defined in the Project Brief for this literature review, the authors were subsequently asked to estimate costs specific to the mining industry.

There is an inherent risk in presenting estimations based on nationally aggregated and in some cases incomplete or inconsistent data. This especially applies for a sector of the economy undergoing rapid change as is the case for the resources sector. For example, number of workers since 2003 has increased by a factor of 1.5 in the five years to 2008 and 2.9 in the decade to 2013.⁵ Nevertheless, estimations of productivity costs for the mining industry (in dollars and/or days lost) have been apportioned for the most

⁵ ABS Cat. No. 6291.0 (February 2013)

recent years for which data could be sourced according to estimates for workforce numbers – mining industry plus mining-allied workers – for the resources sector. These estimates are not to be used without qualifications outlined here about data quality. Specifically, it should be stated that:

All estimations of productivity cost and/or days lost are based on data sourced from publically available national data bases coupled with estimations of the size of the resource sector workforce. Due to inherent distortions introduced by this applied methodology and also to the large number of variable factors which cannot be factored into estimations, the results do not purport to represent actual productivity costs (in dollars and/or days lost) for the industry.

Some of these variable factors include the reality that mental health or stress issues, alcohol consumption and illicit drug abuse, all substantial areas of concern, are essentially taboo topics when it comes to calculation of productivity costs or workplace wellness programs. This is in part due to perceptions that these matters are too difficult to address. Furthermore, drug abuse and stress are still regarded as emergent issues.

An additional difficulty potentially skewing estimates is an industry dominated by blue collar workers; two out of three are Machinery operators and drivers (32.8%), Technicians and trades workers (26.2%) or Labourers (7.1%).⁶ Compared to other workers, blue collar industries have the highest prevalence of obesity, risky alcohol consumption, smoking and physical inactivity⁷ and hence apportioning national costs based solely on workforce numbers may well understate productivity costs for mining. Similarly, the heavy weighting towards a male workforce (around 87% are males) can distort an apportionment of costs.

The following is a summary of estimations of productivity costs arrived at for the mining industry. More information is contained in the identified report subsections.

- Cost of obesity, 2008: \$104.4 million (subsection 2.4.3)
- Cost of sleep disorders, 2010: \$99.2 million (subsection 2.4.4)
- Cost of presenteeism, 2009-10: \$1,023 million, 1.511 million days lost (subsection 2.4.5); 2012: 2.265 million days lost
- Cost of stress-related absenteeism and presenteeism, 2008: \$293.1 million; 695,400 days lost; in 2012: 1.115 million days lost (subsection 2.4.5)
- Successful workers' compensation claim rates for mental stress, 2008-09 to 2010-11: Males 12.2 hours per 100 million hours worked; females 19.6 hours per 100 million hours worked; (0.6% of successful claims) (subsection 2.4.5)

⁶ ABS Cat. No. 6291.0 data cubes (February 2012)

⁷ Queensland Government (2010)

- Days lost through alcohol abuse, 2012: Lower estimate of 711,600 days costing \$249.1 million; upper estimate of 1.962 million days costing \$686.9 million (subsection 2.4.6).
- Cost of alcohol, tobacco and illicit drug abuse, 2004-05: \$694.2 million; 2012: \$2,177.5 million (subsection 2.4.6)

Impacts of obesity and substance (ab)use

With the mining industry's high proportion of overweight and obese workers, obesity is clearly an issue of serious concern. It increases the risk of type 2 diabetes and is linked with other lifestyle issues including, but not limited to, stress and mental health, fatigue, fitness for work, and alcohol consumption.

The impacts on productivity of obesity, alcohol and tobacco use *per se* cannot be isolated. These factors are interrelated with each other and with a range of other health, wellness and QOL issues. They are closely associated with Australia's mining culture and the FIFO/DIDO lifestyle. Suffice to say they directly affect productivity through illness, presenteeism, absenteeism and workforce turnover.

Impacts of worker turnover and replacement

Available data point to high levels of resource sector workforce turnover or replacement demand, especially for NRWs. The probability of job separation (turnover and replacement) in the mining industry is relatively high compared with other industries and substantially higher for NRWs (estimated at least twice the rate of resident workers). Turnover rates in the mining industry are exacerbated by the recognised ageing of its workforce. The average gross replacement rate (those who leave the sector or retire) has been assessed at around 10% a year and is higher for blue- than white-collar workers.

Over the past decade, turnover rates have increased. All sourced results suggest average turnover rates of at least 20% and possibly double that or more for FIFO sites. A turnover rate in excess of 20% is gauged as detrimental to site productivity. It seems most likely, therefore, that productivity costs at many mine sites are exacerbated by employee turnover. These less tangible costs are in addition to recruitment, induction and training costs of replacement employees which could be at least \$500 million annually.

Impacts of presenteeism, stress and illnesses

The cost of presenteeism is estimated to be almost four times the more readily measured but substantial cost of absenteeism in Australia. When a ratio of one mining industry worker to one mining activity related worker is applied (as has been used elsewhere), resource sector workers would have represented, in February 2013, around 6.4% of the Australian workforce. Applying Medibank's estimated average of 6.5 days of lost productivity per worker due to presenteeism equates to around 3.4

million days lost per annum within the resources sector.

Due to recognised lifestyle and workplace challenges in the mining industry, especially for FIFOs/DIDOs, the number of working days of productivity lost per worker through presenteeism would most likely be greater than the average of 6.5 days. Accordingly, speculation that the mining industry's 'share' of the \$34 billion cost of absenteeism could have been at least \$2 billion in 2009-10 does not appear unreasonable.

Mental illness and stress in the workplace is associated with excessive hours and shift work. Indeed, recognition that exceeding a 48-hour working week presents as danger to psychological and physiological health is receiving growing support. Noise, health and safety risks and high workforce turnover are among other types of workplace stressors.

Stress-related workers compensation claims in Australia doubled from 2004 to 2008. On the basis of somewhat dated (2008) estimates, the mining industry in Australia could be experiencing significant costs due to employees experiencing workplace stress. This is estimated to amount to around \$1 billion and 1.7 billion worker days lost per year.

Recent research has shown that mining workers' wellbeing was worse among those with no say over hours or shifts and/or for those who wanted to work fewer hours. Additionally, the study identified use of anti-depressants, sleeping tablets and antacids as a proxy for mental wellbeing. It has also been established that gastro-intestinal problems are the most prevalent health complaint associated with shift and night work. A causal role associated with employees having a say in working arrangements for these types of illnesses has been claimed.

An investigation of cost of workforce turnover, presenteeism, absenteeism and illness to the mining industry is hampered by limitations to accessible material. Nevertheless, lost productivity appears consequential and costly.

Impacts of wellness programs on mining industry employees.

Assessing the impacts – the success or otherwise – of health and wellness programs on mining industry profitability has proved difficult. Only minimal information was available about key performance indicators or how, even if, return on investment was determined. Sourced wellness programs (summarised in Appendix 10) provided only a few clues because impacts were either not indicated or were based on non-quantifiable outcomes such as anecdotal improvements in awareness and motivation; qualitative feedback; employee participation rates; and interest from employees for ongoing participation. Evaluation of impacts by industries other than mining and the extent of their success did not appear to be more sophisticated than for mining.

Sourcing literature which would permit the extent to be gauged to which employees accept and become committed to a continuing involvement in wellness programs has also proved difficult. Our research of Australian programs (Appendix 10) showed that mining organisations referenced responses such as anecdotal improvements in awareness, motivation and health, and reduction in absenteeism and self-reported presenteeism to assess worker acceptance.

Research elsewhere has established that wellness programs are associated with committed workforces and work environments that reflect a priority on health and safety. This means that investments in employee health extend beyond solely health and wellness to the fostering of the perception of the organisation as a 'caring' place to work. Employees reciprocate with greater commitment to their workplace. This strengthens the case for investment in workplace wellness programs due to implications for the development of a committed workforce which, in turn, leads to lower turnover rates and associated direct and indirect costs.

Part IV: Focal factors identified by this review

Employment relationships and workforce arrangements in Australia's resources sector have changed considerably in recent years, especially over the past 10 years or so. These have been strongly influenced by the huge growth in regional and remote mining operations as a result of the resources boom, and the widespread adoption of FIFO/DIDO workforces and contracted workers accommodated in camps.

Part IV distils a raft of circumstances identified by this research which have been powering changes to workforce arrangements. This is accomplished by subjectively weighting three categories of drivers of change: external /whole-of-industry factors; workplace circumstances; and associated lifestyle aspects. Presented in table form, this summary is essentially a framework from which mining site-specific influences can be identified and arguments for appropriate wellness programs constructed.

Assessing influences of these factors, circumstances and aspects on wellness, wellbeing and QOL is, however, complex. This is because of the interconnectivity between causal factors and health conditions. Within mining, fatigue is a root cause as are the long 12-hour shifts, the extended cycles of day/night work, and the increasingly sedentary nature of jobs. For NRWs, becoming embroiled in 'the FIFO lifestyle' presents risks in addition to 'the mining lifestyle' and culture. How can 'lifestyle' changes be effected by wellness programs within extreme constraints imposed by the workplace and workforce 'arrangement'? Clearly more studies are needed in this largely under-researched area if health programs addressing employee wellness and wellbeing and for improving quality of life of workers are to be other than tokenistic.

Part I: Defining the concepts of Wellness, Wellbeing and Quality of Life in Australia

1. Australian indexes and assessments of QOL and wellbeing

1.1 Definitions and conceptualisations

'Wellness' has been defined as 'a complex mix of environmental, occupational, intellectual, emotional, financial, physical, spiritual, cultural and social components'.¹ The concept of wellness may be explained, therefore, as 'a life-long process of moving towards enhancing each of these components in your own life; it is a state of optimal well-being that is oriented toward maximizing an individual's potential'.²

'Wellbeing' is more elusive but the concept has been conceptualised as comprised of three components:

- a cognitive appraisal that one's life was good (life satisfaction);
- experiencing positive levels of pleasant emotions; and
- experiencing relatively low levels of negative moods.³

The World Health Organization (WHO) defines quality of life (QOL) as '[i]ndividuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns'.⁴ This broad ranging concept may be affected in complex ways by physical health; psychological state; level of independence; social relationships; personal beliefs; and their relationship to salient features of their environment.

In an Australian context, a variety of definitions of these terms – often associated with measuring health conditions nationally – acknowledge the roles of culture, environment and resources, and the parts they play in the lives of all individuals. Clearly they imply something more encompassing than just objective components to good health in that they go beyond indications of specific biomarkers to incorporate psychosocial components.

In the latter part of the 1990s, considerable government and academic activity was centred round finding meaningful forms of assessing wellness, wellbeing and QOL. This activity was sparked by interest in finding ways to create a better society through improved national wellbeing and bettering the QOL of individuals. Prior to this, the question of what makes people feel better off – to experience wellness and wellbeing –

¹ NWIA (2011)

² NWIA (2011)

³ Diener (2009)

⁴ WHO (Available at: http://www.who.int/mental_health/media/68.pdf)

had been confined to assessing standards of living: essentially, economic growth was used to gauge policy success. Evaluation of QOL was subsequently expanded through the use of subjective measurements. Before addressing these more useful aspects (as far as this brief is concerned), some brief comments on objective measurements are offered.

1.2 National objective measurements

QOL can be assessed both objectively and subjectively. Historically assessments in Australia have focused on objective measurements. Economic indicators such as Gross Domestic Product and other quantitatively measured indicators including population health, literacy and crime statistics are used. A brief outline of the following four quantitative measurements is presented in Appendix 1 but they are not considered pertinent to this review:

- Social Inclusion in Australia: How Australia is Faring 2012
- Measuring Wellbeing: Frameworks for Australian Social Statistics
- The Genuine Progress Indicator
- The State of the States

1.3 National subjective measurements

Subjective measurements present as an alternative measure of population wellbeing of how Australians feel about life. Two national surveys based on subjective measurements that have relevance to this inquiry – the Australian Work and Life Index (AWALI) and the Australian Unity Wellbeing Index (AUWI) – are discussed in more detail in, respectively, Appendices B1 and B2. Both provide insights into the Australian psyche about a number of contemporary issues associated with wellness and wellbeing and QOL and particularly the way life and work intersect. Especially relevant aspects in the context of this literature review are outlined in the following two subsections.

1.3.1 Australian Unity Wellbeing Index (AUWI)

The Australian Centre on Quality of Life uses the Australian Unity Wellbeing Index (AUWI) to gauge how satisfaction with various aspects of life – both at a personal level and nationally – affect overall life satisfaction of Australians.

The first survey was conducted in April 2001; the most recent undertaken, the 28th, was published in September 2012. In addition to addressing levels of life satisfaction, each survey examines in greater depth a specific topic. Results from ten of these have been addressed for this review due to perceive relevance to employees and organisations operating in Australia's resources sector. These are summarised in Appendix 3, with a brief synopsis presented in Table 1.1.

Table 1.1: Summary of results for selected topics assessed using the AUWI, 2002-12

Topic	Summary of impacts on personal wellbeing (PW)
Impacts of marital status on wellbeing (Weinberg and Cummins 2012)	Those in established relationships have highest levels of PW, followed by those who have never married or are divorced; those going through separation have lowest levels of PW.
Quantity and quality of sleep (Cummins et al. 2012)	<p>Poor quality or limited (too few) hours of sleep can have negative impacts on PW. This highlights the need for comfortable sleeping conditions including undisturbed sleep for sufficient consecutive hours to suit the individual.</p> <p>For persons working 'evening' as opposed to 'day' 12-hour shifts, disturbances (e.g. noise, olfactory) can conflict with conditions for good quality sleep. Arguably interference could be worse for those living in households where 'normal' routines –those associated with child care, school, housework and paid work for others in the household – continue. NRWs in work camps can similarly have their sleep disturbed if accommodation is not sufficiently sound-protected or if behavior of others is not well managed.</p>
Chronic health (Cummins and Schafer 2011)	An illness which has required medical treatments – especially one producing severe physical pain or a serious mental illness – produces below normal levels of PW even when ongoing treatment is no longer deemed necessary. This applies more so to males than females.
Relationships and the Internet (Cummins et al. 2011)	<p>The PW of people who live alone is highly sensitive to low social contact. While their wellbeing is positively linked to internet contact with family and previously known friends, it is not assisted by internet contact with unmet internet friends. Such unmet friends also fail to alleviate loneliness and fail to offer support in times of need.</p> <p>This raises the question of whether NRWs living in accommodation camps might be classified as 'living alone'. The team they work with and the persons they share meals with could be crucial for PW as could the strength, even existence, of a 'home' support network with regular contact easily maintained during the work cycles of rosters.</p>
Physical activity and wellbeing: Links with exercise (Cummins et al. 2008)	People with strong levels of regular exercise and physical activity will benefit from improvement in PW to above normal levels. The converse – i.e. low levels of physical exercise leading to a decrease or 'dip' in PW – is implied.
Physical activity and wellbeing: Links with drinking and smoking (Cummins et al. 2008)	Drinking a small amount of alcohol each day is associated with high PW, especially for males. Drinking may be a coping mechanism for people experiencing stress provided drinking sessions are not 'heavy'. Smoking cigarettes is associated with low PW.

Work, wealth and happiness: Time at work and non-work (Cummins et al. 2007)

Working more than 40 hours a week leads to dissatisfaction with time spent at work and the time available beyond work.

Work, wealth and happiness: Perceptions of wealth and happiness (Cummins et al. 2007)

People tend to overestimate the extent to which variations in income influence their degree of happiness and PW.

Income Security (Cummins et al. 2006)

Income security is one of the most powerful determinants of PW that was found. Employer policies directed to increasing income security would likely raise PW.

Personal relationship (Cummins et al. 2005)

Of all sources of support, the presence or absence of a partner has the most powerful positive effect on PW.

Job security (Cummins et al. 2004)

Worry about losing their job is damaging to PW more so than either worry about getting another job or worry about work-family balance. It's likely that those looking for another job will be functioning poorly at work.

Work status: Hours worked (Cummins et al. 2002)

In summary, the positive aspects of work – the sense of purpose it imbues and the social connectedness it encourages – can be achieved in less time than 40 hours each week. As the number of hours increases from the minimum required to meet these personal needs, no greater sense of purpose will be achieved and more interpersonal contact may start to be aversive. At this point the work becomes routine, tedious, tiring, and ever less enjoyable. The trend for number of work-hours to increase is unlikely to enhance PW.

Work status: Work and leisure satisfaction (Cummins et al. 2002)

Volunteering positively engages people in inter-personal relationships and in meaningful and useful activities, both of which are essential elements for PW and a high QOL. Since most voluntary activities are inherently social, this aspect may be unattractive to some, especially some males. Importantly, the highest levels of leisure satisfaction occur within those groups with the lowest number of work hours. Whatever the reason for this counter-intuitive finding, it was presented as evidence that many people are overly engaged in work to the detriment of their enjoyment of life and PW.

Work status: Distribution of work hours (Cummins et al. 2002)

People working either very long hours (in the sample, mainly home carers) or very short hours (volunteers or part-time paid employment) were doing best in terms of their PW. The people doing least well in this regard were those in paid employment who were working over the 40 hour week.

The synopsis of results presented above for AUWI topics selected for their relevance to the mining industry will be further referenced in Part II of this report by linking them with health and wellbeing problem areas identified for the industry.

1.3.2 Australian Work and Life Index (AWALI)

The Australian Work and Life Index (AWALI) is a national survey of work–life outcomes among working Australians undertaken by the Centre for Work + Life at the University of South Australia. AWALI commenced in 2007; the fifth survey was conducted in 2012. The surveys deal with aspects of work, QOL and wellbeing by measuring how work intersects with other life activities as seen by a randomly selected representative group of working Australians.

The latest survey, AWALI 2012,⁵ offers insights into the ways in which many Australian workers experience conflict or at least constraint with their allocation of time due to intrusion from long hours worked. Importantly, responses are analysed by industry and occupation and the impacts of hours spent in paid work life is gauged.

Results from the AUWI are further expanded upon in Appendix A2.3 by reference to Pocock et al. (2012) who have argued that, in the midst of great wealth, many Australians are living time-poor lives.

1.3.3 Workforce participation and workplace flexibility

A survey of workforce participation and workplace flexibility was undertaken by the ABS in October 2010 in Western Australia.⁶ It provides some insight into employees' personal work preferences and access to flexible working arrangements. Notably, a greater proportion of mining industry workers (14.5%) said that their work-life balance was 'rarely or never balanced' than for any other Australian industry group and less than a third (31.3%), fewer than in any other industry, said their work-life balance was 'always balanced'.

1.3.4 Working Time Arrangements Survey

Information about the working arrangements of employees in their main job, namely start and finish times and shift work, was compiled by the ABS from a November 2009 Working Time Arrangements Survey (conducted throughout Australia as a supplement to the ABS monthly Labour Force Survey).⁷

Fewer workers (30%) in the mining industry had some say in start and finish times than in any other industry. This lack of flexibility was more pronounced for males working in this industry (only 28% had flexibility) than for females (45%).

⁵ Skinner et al. (2012)

⁶ ABS (2011) Cat. No. 6210.5

⁷ ABS (2010) Cat No. 6342.0

Furthermore, the mining industry had the highest proportion of male employees (52%) who usually worked shift work. For women in the mining industry, 24% usually worked shift work, the next highest proportion after 'Health care and social assistance' and 'Accommodation and food services' (both at 32%).

1.3.5 Other National Subjective Measurements

Two other national surveys which deal with subjective measurements – Quality of Life in Australia: An Analysis of Public Perceptions; and The Ipsos Mackay Report – are summaries in Appendix A2.4, in part to affirm that better known ones have not been overlooked.

1.4 Mining industry subjective measurements

Two surveys that provide some subjective measurements of issues which impact upon wellness, wellbeing and QOL of mining industry employees have been sourced. None have targeted the industry nationally. Nevertheless, useful insights are provided; these are summaries in the following two subsections.

1.4.1 The Australian Coal and Energy Survey

A 2012 study of working arrangements and wellbeing by Peetz et al.⁸ examined impacts of the role of shift patterns on wellbeing and health of workers employed in Queensland's coal and energy industry in the latter part of 2011. We have identified that the dataset under-represents the following categories of workers:

- those working industry 'normal' hours of 45 hours per week or more (most surveyed worked less);
- FIFO/DIDO workers;
- contracted workers (92% of those surveyed were permanent or ongoing staff);
- non-union members (only CFMEU members were contacted);
- those new to the industry; and
- potentially dissatisfied employees who have left the industry.

Nevertheless, a clear majority of workers who did respond were dissatisfied with working hours and shifts and experienced difficulties with their sleep patterns. The majority had a preference for working less than 41 hours per week, with a 40 hour working week most commonly preferred. 'All other things being equal', a majority leaned towards giving up shifts.

A summary of results from this preliminary Phase One survey – Phase Two is yet to come – are presented in Appendix A3.1.

⁸ Peetz et al. (2012)

1.4.2 Survey of Queensland workforce accommodation arrangements

A study titled *Workforce Accommodation Arrangements in the Queensland Resources Sector* gathered the views of resources sector employees in that state regarding working and residency arrangements in the minerals and energy sector.⁹ Of completed surveys, 55% were residential workers with the remainder non-resident workers (NRWs).

Based on length of employment, it was apparent that survey respondents were more likely to be employees who were essentially satisfied with their work and accommodation arrangements. Thus respondents are not necessarily representative of workers in the industry and the results need to be digested with this in mind.

Most respondents (64%) indicated they were in preferred accommodation arrangements. They were asked to rate the relative importance of various factors in taking up employment in the resources sector. Ranked similarly as of most importance in deciding to work at the current site were:

- accommodation arrangement (including quality);
- salary;
- career development;
- reputation of employer; and
- work roster.

The most important influencing factors in deciding accommodation arrangements for both residential and non-residential respondents were work-life balance and overall quality of life. For a more informative summary, refer to Appendix A3.2.

1.5 Selected mining industry labour and demographic characteristics

1.5.1 Number of workers in Australia's resources sector

It is impossible to quantify the number of workers directly employed by the resources sector, let alone identify those transient non-resident workers (NRWs) who fly-in, fly-out (FIFO), drive-in, drive-out (DIDO) or use some other method to travel away, mostly to stay in camps for the work cycle of their rosters. Data are not collected about NRWs in any form by the Australian Bureau of Statistics (ABS) or other federal government body. Forecast work numbers are equally elusive.

Mining industry workers as identified by the ABS using the Australian and New Zealand Standard Industrial Classification (ANZSIC) are limited to those directly concerned with resource extraction from operating mines, quarries, or oil and gas wells; some activities which support extraction; and some exploration. It does not include tens of thousands

⁹ URS (2012)

of others directly employed by the resources sector for activities such as surveying, construction of new and expansion projects, transportation, processing, maintenance, and work camp accommodation (management, catering, cleaning, security and so on). These are referred to in this review as 'mining-allied' workers.

The Australian federal government's House of Representatives Standing Committee on Regional Australia which investigated the impacts of FIFO and DIDO workforce arrangements on regional communities were clearly frustrated by this lack of information on workers. It reported that:

A key challenge faced by this inquiry was the lack of nationally consistent data on the scope, effect and cost of FIFO/DIDO work practices. It is very easy to identify problems, but without a real grasp on the figures involved, it is difficult to propose solutions. Many of the Committee's recommendations are aimed at meeting this gap.¹⁰

In fact, the first of the Committee's 21 recommendations in its report, *Cancer of the Bush or Salvation for our Cities? Fly-in, Fly-out and Drive-in, Drive-out Workforce Practices in Regional Australia* which was tabled in the Federal parliament on 13 February 2013, was that:

... the Commonwealth Government fund the Australian Bureau of Statistics to establish a cross-jurisdictional working group to develop and implement a method for the accurate measurement of:

- the extent of fly-in, fly-out/drive-in, drive-out workforce practices in the resource sector; and
- service populations of resource communities.¹¹

For the purpose of this review, we use our estimation of 348,500 workers (including mining-allied workers) in the resources sector in 2012 as the basis for our hypothesis of a range of potential health costs for the mining industry in that year. For earlier years, the ratio applied for mining-allied workers to mining industry workers (the latter as per ABS Cat. No. 6291.0 four-quarterly averages) is 1:3. We also estimate almost two out of three (64.5%; 224,700) of those directly employed by the sector in 2012 were non-resident workers. These figures are based on ABS statistics and also on assumptions informed by our long-term analysis of other public data in this regard. The following table provides rationale for these numbers.

¹⁰ House of Representatives Standing Committee on Regional Australia (2013: 4)

¹¹ House of Representatives Standing Committee on Regional Australia (2013: xix)

Table 1.2: Estimation of Australia's resources sector workforce, 2012

ANZSIC mining industry workers	
Number, 12 months to Feb 2013 (4-quarter average) ¹²	261,400
Mining-allied workers – using ratio of 1:3 industry worker	
Number, 12 months to Feb 2013	87,100
Total industry + allied workers, 2012	348,500
Resources sector non-resident workers (NRWs) – FIFOs, DIDOs, and so on:	
ANZSIC Mining industry workers	
Number, 12 months to Feb 2008 (4-quarter average) ¹³	135,300
Conservatively estimate 50% were NRWs	67,650
Number, 12 months to Feb 2013 (4-quarter average)	261,400
Increase over last 5 years (2008-2013)	126,000
Estimate NRWs 80% of this increase	100,880
Mining industry NRWs Feb 2013	168,530
Mining-allied NRWs – using ratio of 1:3 industry workers¹⁴	56,170
Total industry + allied NRWs, 2012	224,700

The estimate of NRWs to represent a minimum of 50% of industry workers in 2008 is guided by knowledge of the Australian resources sector's increasing reliance on principal contracting companies and third-party contractors for all facets of project development, operation and other directly related services. Indeed, most sectors within the industry have followed the lead set by gold mining companies in the 1980s to favour contract labour and thus use of contractors has risen substantially over the past two decades.¹⁵ Over the boom years since 2008 when number of ANZSIC-identified mining industry workers has risen by 126,000, widely recognised accommodation shortages for potential residents in high-growth mining regions suggests (among other matters) that very high proportions (an estimated 80%) of this growth would be in a non-resident workforce.

For most resource-rich regions of Australia, minimal information on the extent and use of contractors and the type of work they undertake is published. Some data are available, however, for Western Australia (WA) where, in 2008–09, contractors comprised 56% (around 40,000) of mining personnel for that year; they have represented the majority of this sector's workforce for the past decade.¹⁶ Contractors are usually NRWs. Although WA has been the lead state with these workplace arrangements, other jurisdictions have adopted these practices although to what extent is not clear. The use of principal contractors and third-party contractors increases the difficulty of sourcing numbers on workers. Furthermore, some of the contracted

¹² ABS Cat. No. 6291.0

¹³ ABS Cat. No. 6291.0

¹⁴ This slashes the recommended KPMG (2013) ratio of 1:1

¹⁵ NRSET (2010)

¹⁶ DMPWA (2009)

workers do not have an Australian base.

1.5.2 Productivity in the mining industry

Productivity presents as a challenge across the mining sector in Australia. The latest set of ABS data on gross value added (GVA) by hours worked for the industry show that, in every year since 2002, mining has produced less output per hour of labour employed than the previous year. By comparison, all industries combined (including mining) show a steady upwards trend over the decade (Figure 1.1).

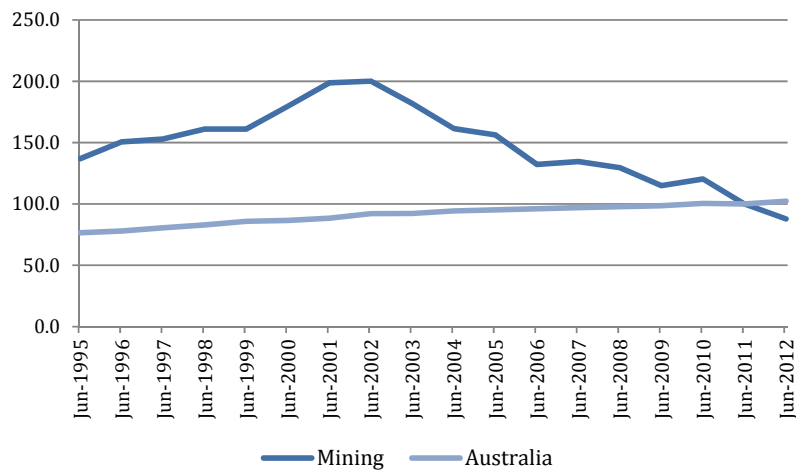


Figure 1.1: Mining industry GVA per hour worked. Australia, 2002-2012

Productivity improvement is challenging for the industry for a number of reasons including:

- Long lead times in achieving returns from capital investment
- The diminishing supply of easily accessible ore
- Infrastructure and supply chain issues
- A wide-ranging skills shortage

Other influences on the downwards productivity trend have been the ballooning in the use of principal contractors and other support services. Key factors within this include:

- Miners employing all resources available, regardless of cost, to exploit high prices via rapid volume growth;
- Skills shortages creating an environment of ever increasing demands from workforces; and
- Continuing trend towards outsourcing parts of the mining value chain.¹⁷

¹⁷ PricewaterhouseCoopers (2013)

As a consequence of these past practices contributing to continuing productivity declines, the fundamental business dynamics of the mining industry are changing. According to a recent PricewaterhouseCoopers (2013) analysis:

No longer can miners focus on expansion at any price – the so called ‘volume frenzy’ – and simply rely on high commodity prices to maintain profitability and deliver shareholder returns.¹⁸

Historically, productivity in iron ore mining (and hence in WA) has performed better than coal mining. Despite this, coal-producing NSW has been the strongest state contributing to labour productivity although Queensland, the biggest producer of coal, has been the poorest.¹⁹

As noted in this section, the mining industry has increasingly relied on embedded contractors and a transient FIFO/DIDO non-resident workforce. Significant cultural and behavioural challenges now exist as mining companies attempt to remove large-scale ‘quick fix’ high cost support services that the industry has rapidly adopted over the last 10 years.²⁰

1.5.3 Other labour and demographic characteristics

Both national and mining industry survey results presented here have emphasised the impact that achieving a satisfactory work-life balance has on wellness, wellbeing and QOL. Mining industry workers particularly, it seems, are under-achieving this balance. Some ABS labour and demographic characteristics for the mining industry in Australia will provide background and enhance appreciation of the material this review. The following figures are presented and commented upon in Appendix 4:

- Employment numbers, February 1985-February 2012
- Full time employment by state, February 2012
- Persons employed full time, hours worked per week, February 1985-February 2012
- Numbers in full employment, by gender, to February 2012
- Full time numbers (000s), by age, February 2012
- Workforce numbers (000s) by occupation, February 2002 to February 2012
- Average number of full-time workers (000s) by occupation, February 2008 to February 2012
- Gender of workers %, Australian industries (ANZSIC classifications), February 2012
- Female workers % by occupation for ‘blue collar’ industries, November 2011.

¹⁸ PricewaterhouseCoopers (2013: 2)

¹⁹ PricewaterhouseCoopers (2013)

²⁰ PricewaterhouseCoopers (2013)

Part II: Examination of how wellness and wellbeing are developed within organisations in Australia and how they impact on employee and organisational performance

2. Development and impact of wellness and wellbeing programs

Part II examines how wellness and wellbeing programs are developed, implemented and assessed in Australia, with particular reference to the resources sector, by considering:

- Issues and enablers for their growth and the status of programs compared with some other countries;
- the National Partnership Agreement on Preventive Health (NPAPH) between the Federal and State Governments which has a core aim (among others) to facilitate 'Healthy Workers' initiatives in support of workplace health programs;
- the mining lifestyle: implications for health, wellness and daily life;
- factors affecting health in the workplace of Australian mining workers; and
- employer support for health and wellness programs.

2.1 Workplace wellness programs in Australia

2.1.1 Evolution of workplace wellness in Australia

The evolution of workplace wellness in Australia from the employer perspective was researched in 2010 by PricewaterhouseCoopers (PwC)¹ on behalf of Medibank Health Solutions. It discussed 'issues and enablers for growth and sustainability' of wellness programs. Observations made about work and the workplace in an Australian context are summarised here as:

- Employment in a fulfilling job can have psychological benefits which flow on to physical benefits.
- Conversely, unemployment, under-employment and stressful working conditions can have adverse impacts on personal health and wellbeing.
- The workplace can affect the physical, mental, economic and social wellbeing of workers.
- The cost of presenteeism – the cost of not fully functioning at work because of medical conditions – is estimated to be almost four times the substantial cost of absenteeism in Australia.
- Improvements to employee health can also be beneficial for employers through improved productivity.

These are important issues which will be returned to later.

¹ PricewaterhouseCoopers (2010)

2.1.2 Australia's comparative status

Despite this recognised knowledge, adoption of workplace wellness programs in Australia has lagged behind some other countries. The following is an outline of apparent reasons and future prospects from the PwC study:

- Medical costs are less directly the responsibility of employers than in other countries.
- A cultural shift, however, is gradually occurring in Australia.
- Aims regarding wellness are emerging between governments and private health insurers (the 'payers' of health care cost in Australia), employers and employees are converging.
- This is generating opportunities for and interest in the role of workplace contribution to wellness and personal wellbeing.
- The benefits for employers are not easily quantified.
- Objectives for wellness programs need to be clearly articulated and measurements put in place before a return on investment for workplace wellness programs can be demonstrated.
- Incentives and effective measurements are regarded as key factors.
- Governments have a role in implementing a range of incentives which encourage employer programs and drive individuals to become involved in them.²

Appendix 5 lists types of organisations which participated in the preparation of this report; only one of 17 represented the resources sector.

2.2 Australia's 'Healthy Workers' program

2.2.1 The National Partnership Agreement on Preventive Health (NPAPH)

The National Partnership Agreement on Preventive Health (NPAPH)³ was announced by the Council of Australian Government on 29 November 2008. On 28 June 2012, the NPAPH was extended by three years to June 2018.

The NPAPH provided \$932.7 million investment by the Australian Government in health prevention over nine years from 2009-10. Its aim is to address the rising prevalence of lifestyle related chronic disease by laying the foundations for healthy behaviours in the daily lives of Australians through identified settings including the workplace.

The establishment of infrastructure required to monitor and evaluate the progress of interventions has been identified as a key feature. This includes the establishment of an

² PricewaterhouseCoopers (2010)

³ Department of Health and Ageing (2012)

Australian National Preventive Health Agency to support the development of evidence and data on the state of preventive health in Australia and the effectiveness of preventative health intervention.

2.2.2 The 'Healthy Worker' initiative

Almost one third (\$294.3 million; 32%) of the total budget from 2009–10 to 2017–18 has been allocated to the 'Healthy Workers' initiative within the NPAPH program to support workplace health programs that focus on:

- decreasing rates of overweight and obesity;
- increasing levels of physical activity and intake of fruit and vegetables;
- smoking cessation; and
- reducing harmful levels of alcohol consumption.

Of this amount, up to \$289.1 million was available to state and territory governments from 1 July 2011 to support health promotion activities in workplaces. The remaining \$5.2 million is to be used by the Commonwealth to develop supportive 'soft infrastructure'. This infrastructure includes the *Joint Statement of Commitment: Promoting Good Health at Work*, a National Healthy Workers Portal and tool kit, and a framework for health promotion programs in workplaces.

One provision within the framework has been for each state and territory to prepare a jurisdictional *Implementation Plan for the Healthy Workers Initiative* based on a standard template. While the state plans have, generally speaking, minimal specific reference to the mining industry *per se*, all adopted the implementation plan template which acknowledged that 'the workforce of mining operations can be physically isolated, largely male and may be drawn from culturally and linguistically diverse backgrounds'.⁴ Each plan goes on to note that, when addressing access and equity, these mining workforce factors should be considered in workplace wellness program design, delivery and evaluation.

Queensland's Healthy Workers strategy, known as the *Workplaces for Wellness Initiative*,⁵ recognises some standout features of the mining industry. The report references research profiling industries and occupational groups at a higher risk in those areas where support is to be focused within NPAPH workplace health programs: i.e. smoking, poor nutrition, physical inactivity and/or harmful alcohol consumption. For instance, compared with other industry groups, Queensland blue collar industries have the highest prevalence of:

- smoking (33.1%);

⁴ See for example New South Wales Government (2010)

⁵ Queensland Government (2010)

- physical inactivity (77.8%);
- overweight or obese measured (64.6%) and self-reported (63.5%) Body Mass Index (BMI); and
- alcohol consumption at increased lifetime risk (35.3%).⁶

In addition, blue collar workers have the second highest prevalence of inadequate fruit and vegetable intake (55.9%). These prevalence estimates of modifiable lifestyle risk factors are also significantly higher than the national employed average.

Specifically, the Healthy Workers strategy states that for the mining industry:

- rates of smoking are higher than for national and state averages;
- lifetime and single occasion risky and high risk alcohol consumption are higher than for national and state averages;
- rates of overweight or obese measurements (BMI and self-reported) are above the national and state average;
- rates of physical activity are lower than the Queensland average; and
- rates of inadequate fruit and vegetable intake are lower than the national and state average and the third lowest of all Queensland industries.

Additional elements of the Queensland plan are summarised in Appendix 6. This appendix also comments on the South Australian Healthy Workers strategies. Although Western Australia has published its strategy, no references specific to mining industry workers or plans targeting this industry could be found in that state's strategy.

2.2.3 Potential for participation from the mining industry?

Identified high risk or hard to reach industries and workplaces in the Queensland Healthy Workers strategy include:

- blue collar occupations (e.g. technicians and trades workers, labourers, machinery operators and drivers), many of which are in the resources sector;
- regional areas of predicted high employment growth [such as through mining];
- sedentary workers [including machinery operators and drivers];
- regional, rural and remote [mining] workplaces; and
- large enterprises across a range of industries (e.g. as found within the resources sector).

Accordingly, it seems that well-considered and structured programs aimed at workplace wellbeing prepared from within the mining industry for its workers could receive favourable consideration for funding within the stated guidelines of the

⁶ Queensland Government (2010)

Queensland Healthy Workers strategy. Other states may follow this lead. The importance of non-duplication of existing initiatives in the prioritisation of selected programs for Queensland suggests an industry approach would be viewed more favourably rather than a plethora of workplace wellness strategies from different organisations.

2.3 The mining lifestyle: Implications for health, wellness and daily life

2.3.1 What is ‘the mining lifestyle’?

Choices about lifestyles means it can vary greatly from one individual to the next but some generalisations of what is understood by the mining lifestyle in Australia will provide background for the following discussion. For all types of jobs within the industry, 12-hour shifts rotating between night and day have become the norm although roster structures vary greatly. Two weeks of work followed by one week of leave often applies for mine site operations; for construction, four-week work cycles are typical. These types of shifts and rosters impact upon the lifestyle of workers and communities as will be expanded upon later.

Clearly lifestyle is one thing for resident (local) workers who, at the end of each shift, usually go to their home in a town proximate to the work site. Conversely, the lifestyle of non-resident workers (NRWs), those who fly-in, fly-out (FIFOs) drive-in, drive-out (DIDOs), bus-in, bus-out (BIBOs), even ship-in, ship-out (SISOs), or use a combination of these methods of travel from their permanent residence (although some don't have one) at the beginning of each work cycle of their rosters and return to at end, is different. Commuting over hundreds, even several thousands, of kilometres sometimes eats into the precious days of workers' leave cycles.

During work cycles, NRWs usually stay in camps – several thousand per camp is not unusual although many are considerably smaller – although hotels, motels and caravan parks are also used. This accommodation is provided by employers for work cycle use alone. Whereas once these camps were found only in remote locations adjacent to a mining or resource lease, increasingly they are in or near long-established towns. NRWs and work camps often become highly contentious within communities at the frontline of resource sector activities, especially where there are clusters of camps.

While some NRWs prosper, others find work and living arrangements, separation from family and friends, and long distance travel among other matters – ‘the FIFO lifestyle’ – unacceptably stressful and tough on good health and wellbeing. Indeed, the industry has acknowledged that around 60-70% of relationships fail.⁷ Moreover, the high turnover rate for NRWs, (30-60%), double that of other employees,⁸ means a sense of belonging within the workplace is difficult to achieve. For those away from home for

⁷ Ranford (2011)

⁸ Kinetic Group (2012); NRSET (2010)

the first time, especially for young single men, these experiences could be affirming. Alternatively, they may be drawn into the mining culture of heavy drinking and the rituals of pub brawling as a way of negotiating their masculine status in the local hierarchy of masculinities.⁹

Populations of transient NRWs are unevenly distributed within resource-active regions and social impacts on the lifestyle of local residents – mining workers as well as others – are greatest where camps are concentrated. Although NRW numbers for a single camp may appear relatively small, cumulative totals for a region can amount to tens of thousands and represent large proportions of the total population (that is, residents plus NRWs). When variable rosters, switches between work and leave cycles and turnover rates are factored in, the number of different individuals continually moving through frontline resource sector communities and their impacts are amplified.

2.3.2 The Windsor Inquiry and FIFO/DIDO workforce arrangements

Serious concerns about health issues for workers, especially NRWs, in addition to those specific to the workplace *per se* have been identified for the mining industry. Notable among sources is the House of Representatives Standing Committee on Regional Australia report on the impacts of FIFO and DIDO workforce arrangements on regional communities and on workers. The Committee's report title *Cancer of the Bush or Salvation for our Cities? Fly-in, Fly-out and Drive-in, Drive-out Workforce Practices in Regional Australia* was tabled in the federal parliament on 13 February 2013.¹⁰ It makes 21 recommendations to government and 12 suggestions to industry on various issues associated with FIFO and DIDO working arrangements. The Committee's chair was Independent MP Tony Windsor and henceforth their inquiry is referred to here as the Windsor Inquiry.

Factors identified by the Windsor Inquiry that impact upon the wellness and wellbeing of FIFO/DIDO workers are summarised here. The Committee was clearly frustrated by the lack of research and data to inform these and other issues and called for greater focus by governments and industry. Indeed, Recommendation 8 of the report was that:

... the Commonwealth Government commission a comprehensive study into the health effects of fly-in, fly- out/drive-in, drive-out work and lifestyle factors and as a result of this research develop a comprehensive health policy response addressing the needs of fly-in, fly-out/drive-in, drive-out workers.¹¹

The inquiry identified the following as serious concerns for FIFO/DIDO workers:

- the use of alcohol and other drugs;

⁹ Carrington, et al. (2010)

¹⁰ House of Representatives Standing Committee on Regional Australia (2013)

¹¹ House of Representatives Standing Committee on Regional Australia (2013: 100)

- poor diet and physical inactivity;
- increased sexually transmitted and blood borne infections;
- mental health issues;
- fatigue related injury; and
- an increase in injury related to high-risk behaviour.¹⁶

Only the first two of these listed impacts – substance abuse, poor diet and physical inactivity – overlap with factors previously identified in this review as impacting on the wellness and wellbeing of mining industry workers. With respect to the use of alcohol and other drugs, the Windsor Inquiry’s report noted that:

Perhaps the most common concern about the wellbeing of FIFO workers raised in the inquiry was the excessive use of alcohol and, increasingly, other substances.¹²

Apparently FIFOs/DIDOs caught up in ‘a culture of binge-drinking and substance abuse’¹³ could not necessarily access continued treatment due to their variable work-leave roster arrangements.

The Windsor Inquiry heard that the FIFO lifestyle was potentially responsible for fatigue, mental health conditions linked with social isolation, depression and violence. These were identified as serious concerns for FIFO/DIDO workers.

Causal factors linked with fatigue were the 12-hour shifts. The inquiry found that DIDO workers driving home for three or more hours after completing the last of their 12-hour shifts of their extended work cycles was leading to high accident and death rates on regional roads. The report warned:

The accident rate in the Bowen Basin is particularly high, and as DIDO workforce arrangements increase throughout southern Queensland and New South Wales, there can be little doubt that a similar trend will develop in new mining areas.¹⁴

DIDO practices also contributed to congestion on regional roads that were built merely to provide a rural link. The Committee’s report highlighted this as one of the areas for corporate action and proposed that mandatory bus-in, bus-out policies be implemented by resource companies.

Depression and anxiety were consistently raised through written submissions and the Committee’s public hearings as serious concerns for the health and wellbeing of FIFOs/DIDOs. Anecdotal evidence suggested that the long working hours and work cycles and the location of accommodation villages or camps influenced the propensity

¹² House of Representatives Standing Committee on Regional Australia (2013: 97)

¹³ House of Representatives Standing Committee on Regional Australia (2013: 97)

¹⁴ House of Representatives Standing Committee on Regional Australia (2013: 56)

of social isolation for these workers.

To help to address these issues, the Committee suggested that industry be more mindful of the placement of work camps. Highlighting this as an area for corporate action, the report urged accommodation providers to work closely with local communities so that balance could be found between offsetting social isolation experienced by FIFO workers and the desires of communities.

Impacts from the rise in injuries related to high-risk behaviour and in sexually transmitted infections were linked in the report to the age and risk profile of FIFO workers: most are male and many are young and single. Despite the lack of data relating to the direct and indirect health impacts of the FIFO/DIDO lifestyle, the Committee indicated that:

... there are health concerns that are likely to be specific to or exacerbated by the FIFO lifestyle that need a targeted health policy focus. Disease as a result of risk-behaviours, alcohol and other substance misuse and depression and anxiety appear to require particular attention.¹⁵

The Terms of Reference of the Windsor Inquiry dictated that its prime consideration was impacts of FIFO/DIDO on regional 'host' communities. Note that it did not specifically consider health and QOL issues for *resident* (as opposed to FIFO/DIDO) mining industry workers in host communities. Nevertheless, the Committee reported that the 12-hour shifts and extended work cycles which are now standard throughout the industry also had negative ramifications for the lifestyle of resident workers and their local communities. These included worker fatigue; erosion of family life; and inability to commit to local activities through participation and volunteering to the clear detriment of the communities.

The Windsor Inquiry also addressed impacts on the health and wellbeing of FIFO/DIDO families including of children with a FIFO/DIDO parent. Given the stated objectives of this literature review, these issues and impacts have not been addressed here.

2.3.3 FIFOs/DIDOs as 'outcasts'

As previously stated in this review, FIFOs/DIDOs can sometimes represent large, even majority, proportions of local area populations.¹⁶ As a group, they exaggerate male dominance and have little or no attachment to workplace communities. They are transients. They are not regulated by informal social controls that traditionally characterise rural communities.¹⁷ Concern about 'stranger' FIFOs/DIDOs is heightened by the greater workforce turnover rate for NRWs, up to double that of resident

¹⁵ House of Representatives Standing Committee on Regional Australia (2013: 100)

¹⁶ Waller (2010); OESR (2012)

¹⁷ Scott et al. (2011)

employees.¹⁸ Hence their existence gives rise to suspicion and concerns.¹⁹

This has manifold consequences for everyday life of workers and residents where the workforce practices associated with NRW have become emblematic of the cultural upheaval, disorder, destruction and loss being experienced by residents and where mining is regarded as the root cause.²⁰ Thus the setting is ripe for the fostering of social divisions and tensions between NRW and resident locals who see themselves as bearing the burdens of the mining boom while most of the benefits go elsewhere.²¹ In such contexts, the deviance of NRW can be exaggerated. This can only serve to widen the 'us-them' chasm between locals and FIFOs/DIDOs and further harm their sense of wellbeing.²²

An influx of NRW means that many shared spaces become highly masculinised places. Violent male-on-male assaults fuelled by excessive alcohol consumption are regarded as normal given the dynamics between locals and NRW. FIFOs/DIDOs are also largely blamed for introducing a cocktail of drugs.²³

The applied adage of 'work hard, play hard' means that pub and nightclub brawls are common.²⁴ Sudden boosts to outsider numbers exacerbate levels of antagonism. Violent altercations are also common in some work camps although privatised security operations usually means that only the most serious offences attract public attention.²⁵

NRW are the convenient and readily identified scapegoats for divisions within communities, deflecting attention from equivalent poor conduct of locals.²⁶ Nevertheless, links between violence, social disorder and drunken men from work camps create a climate of fear and anxiety about safety not only within local communities but also within affected camps. While only a small proportion of workers may be the protagonists, flow-on effects negatively impact upon the health, wellbeing and QOL of many.

As NRW exit and re-enter their source communities, as they move between work-and leave-cycles, they may, over time, become 'outcasts' there also – even within their family and close friendship groups – but this too is essentially an under-researched area.

¹⁸ NRSET (2010); Kinetic Group (2012)

¹⁹ McIntosh (2012)

²⁰ Carrington et al. (2012)

²¹ Carrington and Hogg (2011)

²² Carrington et al. (2011)

²³ Carrington et al. (2010)

²⁴ McIntosh and Carrington (forthcoming)

²⁵ Carrington, Hogg and McIntosh (2011)

²⁶ Carrington and Scott (2008)

2.3.4 Other reports about the mining lifestyle

Other literature supports and enlarges upon aspects of the mining lifestyle. Some are discussed in Appendix 7 and briefly referenced in this subsection.

An article by Goater et al. (2012) provides valuable personal insights into:

- the behavioural effects of night shift – sleep deprivation, mood swings, health and work safety issues;
- disconnections with home-life situations;
- strategies for tackling relationship strain and home conflicts;
- changes in physical health – effects of a sedentary job, and bypassing the gym to socialising at the pub;
- on-site catering and food choices – lack of awareness about readily available educational material; irrespectively, going for taste and speed of service, not nutritional values or ordering a healthy choice;
- alcohol consumption and smoking as part of the mining culture;
- impacts of crew tensions and managing work conflicts;
- impacts of roster patterns on the FIFO experience;
- impacts of varying quality in accommodation camp conditions;
- feelings of isolation and displacement from the family unit; and
- options to consider for social interaction.

Mining Family Matters, an organisation initially created by a ‘mining wife’ and which offers advice and support to the families of FIFO/DIDO workers, was surveying workers at time of writing. Clearly managing the sense of loneliness or feelings of separation from family is a major issue for FIFOs/DIDOs. Family friendly policies, the ability to easily maintain contact with family and friends, and the quality of accommodation appear to be key factors influencing workers’ continued employment. Results when available should be instructive about issues which are perceived as impacting upon the lifestyle of FIFO/DIDO workers.

Other research has shown that FIFO workers, compared with mining workers who lived locally as residents, report higher levels of sleep disturbance,²⁷ more interference from work in the ability to perform social and domestic activities (such as participating in sport, attending the doctor, looking after children), an increased likelihood of experiencing greater strain on family life,²⁸ increased the risk of marriage breakdown and suicide,²⁹ and can affect psychosocial wellbeing.³⁰

²⁷ Peetz et al. (2012)

²⁸ Keown (2005)

²⁹ Zillman (2012)

³⁰ Torkington et al. (2011)

Workers have expressed reluctance to seek support for psychosocial wellbeing due to a number of barriers.³¹ Instead, trusted friends or colleagues in the mine site workplace are preferred means of support. Moreover, those having these types of problems might not recognise their own stress and thus not seek support.

Expatriate placements including those employed under 457 visas³² are more prone to accidents and injuries in the workplace because they undertake high-risk jobs that native-born people are not inclined to do.³³ Other Occupational Health and Safety issues related to cultural and languages differences and misunderstandings can also arise.³⁴

Several studies³⁵ and reports³⁶ provide recommendations for improving the ability of FIFO/DIDO workers to cope with the lifestyle although whether such recommendations have been implemented has not been reported.

2.3.5 Linking lifestyle impacts with wellness surveys

Here we make some connections between the mining lifestyle and implications for health, wellness and daily life identified in this section of the review with surveyed Australian's concepts of wellness, wellbeing and QOL. Accordingly, we reference Section 1.3 of this review which considered a range of topics monitored using the Australian Unity Wellbeing Index (AUWI). Specifically, where research data are available, linkages are made between relevant topics surveyed by the Australian Centre on Quality of Life during the decade 2002-12 and mining lifestyle issues, namely:

- use of alcohol, other drugs and tobacco;
- physical inactivity;
- long work hours/work cycles;
- loneliness and separation; and
- depression and anxiety.

This analysis (see Table 2.3) is restricted by the nature of the AUWI surveys which purport to represent the majority views of the Australian population and thus have not specifically targeted a population cohort or industry.

³¹ Torkington et al. (2011)

³² Jones (2000)

³³ Ceranic (2012)

³⁴ See, for example, Maddison (2012)

³⁵ Watts (2004); Keown (2005); Gallegos (2006); Behr (2012); Goater et al. (2012)

³⁶ Nott and Keenan (2012); Trivett (2012)

Table 2.3: Mining lifestyle impacts linked with selected AUWI survey topics (2002-12)

<i>Mining worker QOL issues</i>	<i>AUWI topic</i>	<i>Impacts on personal wellbeing (PW)</i>
Use of alcohol, other drugs and tobacco	Physical activity and wellbeing: Links with drinking and smoking	Drinking a small amount of alcohol each day is associated with high PW, especially for males. Drinking may be a coping mechanism for people experiencing stress provided drinking sessions are not 'heavy'. Smoking cigarettes is associated with low wellbeing.
Physical inactivity	Physical activity and wellbeing: Links with exercise	People with strong levels of regular exercise and physical activity will improve PW to above normal levels. The converse – i.e. low levels of physical exercise leading to a decrease or 'dip' in PW – is implied.
Long work hours/cycles	Quantity and quality of sleep	Poor quality or limited (too few) hours of sleep can negatively impact PW. For persons working 'evening' as opposed to 'day' shifts, disturbances (e.g. noise, olfactory) can conflict with conditions for good quality sleep.
	Work, wealth and happiness: Time at work and non-work	Working more than 40 hours a week leads to dissatisfaction with time spent at work and the time available beyond work.
	Work, wealth and happiness: Perceptions of wealth and happiness	People tend to overestimate the extent to which variations in income influence their degree of happiness and PW.
	Work status: Hours worked	The positive aspects of work – the sense of purpose it imbues and the social connectedness it encourages – can be achieved in less than 40 hours each week. As the number of hours increases from the minimum required to meet these personal needs, no greater sense of purpose will be achieved and more interpersonal contact may start to be aversive. At this point the work becomes routine, tedious, tiring, and ever less enjoyable. The trend for number of work-hours to increase is unlikely to enhance PW.
	Work status: Work and leisure satisfaction	The highest levels of leisure satisfaction occur within those groups with the lowest number of work hours. Many people are overly engaged in work to the detriment of their enjoyment of life and PW. Volunteering positively engages people in interpersonal relationships and in meaningful and useful activities, both of which are essential elements for PW and a high QOL. Since most voluntary activities are inherently social, this aspect may be unattractive to some, especially some males.

	Work status: Distribution of work hours	Persons in the group doing least well with respect to PW were those in paid employment who were working over the 40 hour week.
Loneliness and separation	Marital status	Those in established relationships have highest levels of PW; followed by those who have never married or are divorced; those going through separation have lowest levels of PW.
	Relationships and the Internet	PW of people who live alone is highly sensitive to low social contact. ³⁷ PW is positively linked to internet contact with family and previously known friends PW is not assisted by internet contact with unmet internet friends. Such unmet friends also fail to alleviate loneliness and fail to offer support in times of need.
	Personal relationship	Of all sources of support, the presence or absence of a partner has the most powerful positive effect on PW.
Depression and anxiety	Chronic health	An illness which has required medical treatments – especially one producing severe physical pain or a serious mental illness – produces below normal levels of PW even when ongoing treatment is no longer deemed necessary.
	Income Security	Income security is one of the most powerful determinants of PW. Employer policies directed to increasing income security would likely raise PW.
	Job security	Worry about losing their job is damaging to PW more so than either worry about getting another job or worry about work-family balance. Those looking for another job will most likely be functioning poorly at work.

Despite these limitations, some lifestyle factors which can affect individual health and wellbeing are applicable for workers in the mining industry, especially FIFOs/DIDOs. Comments about impacts on personal wellbeing in the table represent a summary of survey results for each identified topic. For greater detail and sources, refer to Section 1.3 of this review.

Whereas this section has explored lifestyle issues for workers employed in the industry, particularly for those who worked under FIFO/DIDO arrangements, the following section considers health and wellbeing issues which can be linked directly with workplace and working conditions in the mining industry.

³⁷ This begs the question as to whether FIFOs/DIDOs accommodated in camps are classified as 'living alone'. The team they work with and those they share meals with outside work shifts could be crucial as could the strength/ existence of a 'home' support network.

2.4 Factors affecting health in the workplace of Australian mining workers

2.4.1 Work and hours in the mining industry

The mining industry has high levels of shift work with more than 80% of employees working some form of shift arrangements.³⁸ Long work rosters with alternating day and night shifts can affect rest and sleep cycles – circadian rhythms – and quality of sleep. Lack of motivation to exercise after a 12-hour work day within a roster with an extended work cycle coupled with poor judgments about nutrition can lead to excessive weight and other health issues.³⁹ Furthermore, results from investigations into shift work in the mining industry in Western Australian and in Queensland have shown that many shift workers have problems balancing work, family and social life.⁴⁰

2.4.2 Chronic health problems

Compared to most other industries, the mining workforce has been identified by researchers working with the industry as having a high (but unquantified) proportion of chronic health problems.⁴¹ Chronic illnesses may be caused through exposure to a range of physical, chemical, biological, ergonomic and psychosocial hazards.⁴² Chronic health problems can be further exacerbated by the recognised ageing of the mining workforce, the regional and remote location of sites, and organisational issues influencing work demands.

The proportion of the workforce experiencing chronic health problems as a result of their employment in the mining industry could not be sourced. Nor is the total cost of chronic disease in Australia known although expenditure statistics confirm that it is expensive.⁴³ Costs for health services for individual chronic conditions in 2004–05 were in excess of \$6.5 billion and, for condition groups that contain chronic diseases (for example, arthritis in the musculoskeletal group), amounted to well over \$13 billion.⁴⁴

Most chronic diseases have complex causality, with multiple factors leading to their onset. They also usually have a long development period, during which there may be no symptom. A prolonged course of illness may also lead to other health complications, associated functional impairment or disability. For these reasons alone, determining the component of a workforce with realised and/or potential chronic health problems is essentially unattainable. The inability to measure is supported by this statement by the AIHW (2012):

³⁸ Department of Natural Resources and Mines (2001); Bofinger and Ham (2002); Peetz et al. (2012)

³⁹ Goater et al. (2012); Nott and Keenan (2012)

⁴⁰ Bofinger and Mahon (2001); ABS (2011) Cat. No. 6210.5

⁴¹ Shannon and Parker (2012)

⁴² Donoghue (2004)

⁴³ AIHW (2012)

⁴⁴ AIHW (2012)

With more emphasis on the prevention of chronic disease and the benefits prevention interventions can bring to both individuals and the community, the ability to measure these will become increasingly important. Currently it is impossible to calculate how much chronic disease costs Australians (both financially and in other ways), and how much money is spent on preventing it.⁴⁵

Because conditions are interactive, usually there is no single solution to developing intervention to prevent or treat them. For example, chronic M/S conditions may involve both biophysical and psychosocial health issues and the condition may be exacerbated by overweight and obesity,⁴⁶ an area of particular concern for mining industry workers.⁴⁷ This industry had the highest proportion (76%) of workers aged 18-64 years classified as overweight or obese.

Risk factors contributing to chronic disease include:

- daily smoking
- physical inactivity
- risky alcohol consumption (for long-term health)
- inadequate consumption of fruit and vegetables, and consumption of whole milk

These behaviours can contribute to the development of biomedical risk factors, such as high blood pressure, obesity and high cholesterol.⁴⁸

Potential improvements which could be accomplished in the health of Australians by risk factor reduction were quantified by the Australian Institute of Health and Welfare for 2007-08 (Table 2.4). In some Australian states, the mining industry has above-average risk factors for most of these categories and thus it would appear that the potential for improvement, especially among males, would be greater than indicated in Table 2.4.

⁴⁵ AIHW (2012: 13)

⁴⁶ Shannon and Parker (2012)

⁴⁷ ABS (2008)

⁴⁸ AIHW (2012)

Table 2.4: Potential improvements in health by risk factor reduction, 2007–08⁴⁹

<i>Risk factor areas</i>	<i>Males</i>	<i>Females</i>
	<i>Proportion^(a) available for improvement</i>	
Smoking (daily and other)	22.2	18.0
Risky alcohol consumption	14.6	11.5
Physical inactivity	57.2	61.2
Poor diet		
Whole milk consumption	54.1	41.5
Vegetable consumption	92.2	89.3
Fruit consumption	55.3	45.3
Excess body weight ^(b)		
Obese	25.0	22.9
Overweight	41.0	30.6
High blood pressure	11.1	12.3

(a) Relates to the proportion of people aged 15 and over for whom improvement is available.

2.4.3 Obesity

In 2008, the overall cost of obesity to Australian governments was estimated to be \$58.2 billion, while the total direct financial cost of obesity for the Australian community was estimated to be \$8.3 billion. The direct estimate includes productivity costs of \$3.6 billion (44%), including short- and long-term employment effects, as well as direct financial costs to the Australian health system of \$2 billion (24%) and carer costs of \$1.9 billion (23%).⁵⁰

In 2008, the mining industry workforce was estimated to represent 2.9% of the workforce.⁵¹ Applying this workforce proportion to the nation's productivity loss through obesity suggests a cost in 2008 to the mining industry of \$104.4 million (Table 2.5). The above-average rates of worker obesity which have been recorded for workers the mining industry together with the large increase in number of workers since 2008 (1.6 times greater in 2012, to 4.5% of the workforce) suggest apportioned productivity costs for the resources sector may be understated and most likely would have increased substantially in the intervening years.

Table 2.5: Productivity cost (in \$ million) of obesity, 2008

<i>Australian workforce, 2008:</i>	<i>\$ million</i>
Productivity cost of obesity ⁵²	3,600.0
<i>Mining industry workforce, 2008: (2.9% of workforce)</i>	
Apportioned cost (assuming 2.9% of workforce or 217,300 persons)	104.4

Thus in a mining industry setting, significant potential for workforce health improvement lies across a range of priority health conditions including those listed above but also including such as:

⁴⁹ AIHW (2012)

⁵⁰ Access Economics (2008), Norton et al. (2011)

⁵¹ Refer to Table 1.2

⁵² Access Economics (2008), Norton et al. (2011)

- musculoskeletal (M/S) injury and disorder;
- sleep disorders and fatigue; and
- mental health.⁵³

2.4.4 Sleep disorders and fatigue

The term ‘fatigue’ describes a number of physical and mental states. In the mining industry, however, fatigue that arises functionally from lack of sleep is a key concern. A range of factors can contribute to fatigue which impacts upon performance levels, including:

- time of day for sleep;
- length of the shift;
- length and structure of the roster work cycle;
- length of the leave cycle;
- history of work; and
- length and timing of break periods.

Other workplace demands may also exaggerate the negative effects of sleep loss. For example, job specific factors include, but are not limited to, poor ambient light conditions where high vigilance levels are required, high-pressure maintenance demands during peak work periods; and/or inadequate breaks within shifts.⁵⁴

Recent Australian research has found that productivity losses and workplace accidents as a result of sleep disorders which result in premature workforce separation and mortality and absenteeism total about \$3.1 billion in 2010.⁵⁵ Apportioning this cost to the mining industry on the basis of its 3.2% share of the workforce in that year (2010) points to productivity costs to the industry of around \$99.2 million (Table 2.6). Of course, this estimate does not allow for the high rates of fatigue and sleep disorders in this industry or the growth by 96,500 in the number of persons estimated to be working in the resources sector over the past two years.

Table 2.6: Productivity cost 9in \$ million) of sleep disorders, 2010

Australian workforce, 2010:	<i>\$ million</i>
Cost of sleep disorders ⁵⁶	3,100.0
Mining industry workforce, 2010:	
Apportioned cost in 2010 (assuming 3.2% of workforce or 252,000 workers)	99.2

⁵³ Shannon and Parker (2012)

⁵⁴ Baker et al. (2002)

⁵⁵ Deloitte Access Economics (2011)

⁵⁶ Deloitte Access Economics (2011)

Sleep disorders also contribute to other diseases and injuries. The proportion of each condition attributable to a sleep disorder is as follows:

- 10.1% of depression
- 5.3% of stroke
- 4.5% of workplace injuries
- 4.3% of motor accidents.⁵⁷

Fatigue is a different issue (the cost of lost productivity could not be sourced for fatigue). Long working-time duration – a trend that began in the 1980s – is a significant problem for part- and full-time workers in Australia.⁵⁸ This trend is concerning given the known relationship between working time and fatigue, and the considerable economic and social costs associated with fatigue.⁵⁹

Increased economic cost can manifest as a result of fatigue-induced inefficiency. In a study of Australian rail car drivers, it was found that highly fatigued drivers used 9% more fuel than rested drivers; this was calculated to represent an approximate extra weekly cost of \$3,512 per fatigued driver.⁶⁰ The high social and safety costs of fatigue have become increasingly apparent. Given the escalating prevalence of long work hours in Australia – in the mining industry in particular – and the serious consequences of the resulting fatigue, it is important to understand the various mechanisms through which fatigue results in impairment.

Sleep loss which occurs during night shift work cycles can be attributed to biological, social and work factors. There are also many other factors that reduce sleep opportunity including changing psychosocial expectations and responsibilities, medical disorders, and seasonal and climactic changes.

Wellness and wellbeing issues associated with fatigue due to long distance commuting by FIFOs/DIDOs, including impacts on productivity, seemingly have not been assessed by the mining industry.

2.4.5 Presenteeism, workplace stress and mental health

The main causes of presenteeism – productivity that is lost when employees come to work but are not fully productive – have been identified as:

- unhealthy lifestyles;
- workers with illnesses going to work;

⁵⁷ Deloitte Access Economics (2011)

⁵⁸ Campbell (2002)

⁵⁹ Safety Institute of Australia (2012)

⁶⁰ Dorrian et al. (2006)

- allergies and asthma; and
- poor work-life balance and high levels of job-related stress.⁶¹

In 2009-10, the total cost of presenteeism to the Australian economy was estimated to be \$34.1 billion (from \$25.7 billion in 2005-06).⁶² On average, 6.5 working days of productivity were lost per employee; this equated to a 2.7% decrease in 2010 GDP.⁶³ If average working days lost is applied to the mining industry, the estimated number of days lost in the same year (2009-10) could have totaled around 1.5 million days (Table 2.7). For 2012, number of days lost could have grown to around 2.3 million due to the increase in the number of workers since 2009-10. The mining industry's share of the total cost of presenteeism in 2009-10, apportioned according to its proportion of the workforce (estimated at 3.0% at that time) could have been around \$1.0 billion (refer to Table 2.7).

Table 2.7: Productivity cost (in \$ million and days lost) of presenteeism, 2009-10, 2012

<i>Australian workforce, 2009-10:</i> ⁶⁴	
Cost of presenteeism	\$34,100 million
Days lost per worker	6.5 days
<i>Mining industry workforce, 2009-10</i>	
Apportioned cost (estimated 3.0% of workforce)	\$1,023 million
Days lost (estimated 232,500 workers ⁶⁵)	1.511 million days
<i>Mining industry workforce, 2012</i>	
Days lost at 6.5 days per worker (estimated 348,500 workers ⁶⁶)	2.265 million days

Workplace stress is one of the main causes of presenteeism and absenteeism. Stress-related workers compensation claims in Australia doubled from 2004 to 2008. Because stress can impact on employee productivity, workplace stress is costing the Australian economy \$14.81 billion a year. Stress-related to presenteeism and absenteeism are directly costing the Australian employers \$10.11 billion a year through 3.2 days per worker are lost each year.⁶⁷ Medibank Private reported that these figures would be even higher if they included the hidden costs associated with re-staffing and re-training that result from high staff turnover caused by stress. These findings are likely to underestimate the overall cost to the economy because mental stress is also known to contribute to a number of other health conditions.⁶⁸

When the mining industry's proportion of the workforce in 2008 (estimated at 2.9% in

⁶¹ Medibank (2011)

⁶² Medibank (2011)

⁶³ Medibank (2011)

⁶⁴ Medibank (2011)

⁶⁵ Refer to Table 1.2

⁶⁶ Refer to Table 1.2

⁶⁷ Medibank Private (2008)

⁶⁸ LaMontagne et al. 2010, Medibank Private (2008)

that year) is applied to the total cost to Australian employers of stress-related presenteeism and absenteeism, this could have costed around \$293.1 million to the industry in 2008. Number of days lost could have totaled around 0.7 millions days and, if the rate of days lost per worker remained constant, could have grown to 1.1 million days by 2012 when the resource sector workforce was estimated to represent 4.5% of the Australian workforce (Table 2.8). An estimation of productivity costs to the mining industry by 2012 in monetary terms cannot be attempted without having an understanding of the increase in national costings since 2008.

Table 2.8: Productivity cost (in \$ million and/or days lost) of stress-related absenteeism and presenteeism, 2008, 2012

Australian workforce, 2008:⁶⁹	
Total cost of stress-related absenteeism and presenteeism	\$10,110 million
Days lost per worker	3.2 days per worker
Mining workforce, 2008:	
Apportioned cost (estimated 2.9% of workforce)	\$293.1 million
Days lost at 3.2 days per worker (for estimated 217,300 workers)	0.695 million days
Mining industry workforce, 2012 (estimated 4.5% of workforce)	
Days lost at 3.2 days per worker (estimated 348,500 workers ⁷⁰)	1.115 million days

Safe Work Australia's first report looking at work-related mental stress was published in April 2013.⁷¹ It recognises that work-related mental stress has become a major concern in workplaces in Australia because of the impact on individual employees and the cost associated with long periods away from work that are typical of these claims. Consequently, mental stress claims are the most expensive form of workers' compensation claims.

More professionals make claims than any other occupation and more claims for work pressure are made than for any other category of mental stress claims. The report cautions, however, that:

... workers' compensation data ... does not include any information on unsuccessful claims, any insight into the number of workers who experience mental stress but choose not to claim workers' compensation or on workers who are not covered by compensation. ... data are skewed towards those workers who are more likely to claim based on their occupation, age, industry of employer, and where they have secure employment.

For the mining industry which is has a majority of blue collar workers, is largely dependent on a contract workforce and also has high turnover rates, this statement points to the reduced likelihood of claims being made by comparison with, for example, professionals with permanent jobs. Additionally:

⁶⁹ Medibank (2008)

⁷⁰ Refer to Table 1.2

⁷¹ Safe Work Australia (2013: ix)

Academic research carried out in Australia has attempted to explore the prevalence of work-related mental stress in Australia. However at this time research based data collection is unable to match the workers' compensation data in terms of regularity, consistency in factors examined and national coverage of the working population. Despite this academic research suggests that workers' compensation claims data underestimate the size of the problem.⁷²

Thus the data cannot fully describe the actual prevalence of work-related mental stress, the extent of those working conditions contributing to mental stress or those most vulnerable to its effects.

Mental stress claims were presented in the Safe Work Australia report as number of claims, percentage and frequency rates by sex and industry for the period 2008-09 to 2010-11 (data are preliminary for 2010-11). Average all-industry rates of successful workers' compensation claims (based on per 100 million hours worked) were 39.4 for males and 81.1 for females. Median time lost for all mental stress claims was 6.1 working weeks (6.2 for males; 6.0 for females). The median direct cost for all mental stress claims was \$12,700 (\$13,400 for males; \$12,300 for females).

The mining industry, with a low 0.6% of successful claims over the period 2008-09 to 2010-11 (although 2% of all serious claims⁷³), had the lowest rate for females (numbering 32 in total over the three years; rate of 19.6) (Table 2.9). For males (numbering 126 in total; rate of 12.2), the only industries with lower rates were Construction (10.8), Agriculture, forestry and fishing (9.5) and Communication services (9.1). Personal and other services recorded the highest rate for both males (238.5) and females (199.2). This was one of only two industries where the frequency rates were higher for males than females; it includes occupations such as police officers; prison officers; guards and security officers; and fire fighters. The Health & community services and Education industries also had the highest number of claims and also high frequency rates. The cost of successful workers' compensation claims was not identified in this report and thus there is no basis on which to apportion costs to the mining industry.

Table 2.9: Successful workers' compensation claim rates for mental stress, 2008-09 to 2010-11⁷⁴

	<i>Males</i>	<i>Females</i>
<i>Australian workforce:</i>		
Median all-industries rate (per 100 million hours worked)	39.4	81.1
<i>Mining workforce:</i>		
Mining industry rate (representing 0.6% of successful claims)	12.2	19.6

Important research led by the Australasian Centre for Rural and Remote Mental Health

⁷² Safe Work Australia (2013: ix)

⁷³ Safe Work Australia (2013) Mining Industry Fact Sheet

⁷⁴ Safe Work Australia (2013)

(ACRRMH) is being conducted in the field with principal contractors in mining, construction and servicing which are operating in remote locations in Western Australia (notably Thiess). Preliminary results have shown that FIFO women cope better at living the split lifestyle than men.⁷⁵ It seems that, for a number of key indicators, women better understand how to minimize the risk of mental health problems associated with the lifestyle, remote work places, and separation from family and friends. Women, however represent only 13% of the mining industry workforce.⁷⁶ Although ACRRMH research to date clearly points to mental health as being problematic and at disturbing levels within the mining industry, published results are not expected until non-company-identifiable and reliable data can be compiled; this may take some years.⁷⁷

The state of a person's mental health affects their physical capacity to act in a safe way and their perception of risk. This relationship between mental health and injury can be self-sustaining in that injury can influence the mental health of an individual.⁷⁸

The issue of mental health is a relatively new frontier in employee safety. Indeed, the understanding of mental health in the mining and resources sector is regarded as embryonic at best. Similarly, the extent to which mental health can affect productivity and profit is not yet fully appreciated.⁷⁹

The Windsor Inquiry identified mental health issues as of serious concern for FIFO/DIDO workers⁸⁰ but resident workers can also suffer. Substance abuse is regarded as one of the most prevalent factors associated with workers and mental health conditions.⁸¹ The increasing use of drugs within the industry can potentially accelerate the prevalence of workers with mental health and stress issues.

2.4.6 Fitness for work, substance abuse and tobacco smoking

The concept of fitness for work extends beyond the absence of illness or injury.⁸² Indeed, drugs, alcohol and fatigue are foremost among workplace safety concerns regarding fitness for work for mining industry employers and employees.⁸³ The Windsor Inquiry and the Committee's recently tabled report⁸⁴ have more recently helped to bring these concerns to prominence. In spite of this, few facts are available.

⁷⁵ ACRRMH (2013)

⁷⁶ ABS Cat. No. 6291.0

⁷⁷ Pers. comm. Dr Jennifer Bowers (2013), Managing Director, ACRRMH

⁷⁸ PricewaterhouseCoopers (2010)

⁷⁹ ACRRMH (n.d.: 2)

⁸⁰ House of Representatives Standing Committee on Regional Australia (2013)

⁸¹ Latimer (2011)

⁸² Parker and Worringham (c.2004)

⁸³ Baker et al. (2002)

⁸⁴ House of Representatives Standing Committee on Regional Australia (2013)

Synthetic cannabis drugs such as Kronic, Spice and K2⁸⁵ have been widely reported as a serious issue at mine sites across Australia where tests have shown nearly one in ten miners as users.⁸⁶ Industries such as mining, where very high disposable incomes are the norm, are being targeted by illicit drug manufacturers.⁸⁷

Tobacco smoking should also present as an issue for the mining industry, not only because of its recognised health hazard status but also because it is associated with low feelings of personal wellbeing.⁸⁸ Surveys have shown rates of tobacco smoking are higher for blue collar workers and for those who work in regional and remote areas.⁸⁹

Both rates of smoking and risky and high risk alcohol consumption have been found to be higher in the mining industry than for national and state averages. The culture of binge drinking and substance abuse has also been linked to lifestyle risks for FIFOs/DIDOs. Workplace testing regimes aimed at detecting use of alcohol or drugs can act as a deterrent although some workplaces have more effective controls than others. Insufficient random or blanket testing can mean that offenders do not get caught. Industry results for detecting substance use by workers or levels of compliance could not be sourced.

In 2001, a conservative (lower) estimate of 2.7 million work days, based on the National Drug Strategy Household Survey results, were attributed as lost through alcohol-related absenteeism.⁹⁰ Another (upper) estimate by the same researchers of 7.4 million work days was also argued.⁹¹ Apparently workers who, infrequently or occasionally, drank at 'risky' and 'high risk' levels accounted for more than half this alcohol-related absenteeism. Presenteeism in the workplace is understood to be around four times the rate of absenteeism (although not specifically known for alcohol-related reductions in on-the-job productivity).⁹² Accordingly, the number of days of lost productivity through presenteeism and absenteeism in 2001 has been estimated to range between 13.4 and 37.0 million days (Table 2.10). As the total Australian workforce in 2001, averaged over four quarters, was 6.57 million, this equates to a lower estimate of 2.04 days lost per employee due to alcohol during that year and an upper estimate of 5.63 days.

Based on current workforce numbers for the mining industry of 348,500 (including mining-allied workers; refer to Table 1.2), this would equate to between 0.7 and 2.0 million days of lost productivity within the industry from absenteeism and

⁸⁵ Duffy (2012)

⁸⁶ Validakis (2012b)

⁸⁷ Gribbin (2013b)

⁸⁸ Cummins et al. (2007)

⁸⁹ DMPWA (c.2009); Queensland Government (2010)

⁹⁰ Pidd et al. (2006)

⁹¹ Collins and Yapsley (2008)

⁹² PricewaterhouseCoopers (2010)

presenteeism through the excessive use of alcohol in 2012. Industry knowledge of worker employment costs would allow this substantial loss in productivity to be costed. For this exercise, a conservative average cost of \$350 per day lost has been used (based on ABS reports from the 2011 Census⁹³). Accordingly, the cost of alcohol absenteeism and presenteeism to the mining industry has been estimated at between \$249.1 million and \$ 686.9 million (refer to Table 2.10). Given that the mining industry is recognised for higher than average levels of risky and high-risk alcohol consumption by workers, these numbers could be significantly understated

Table 2.10: Estimates of productivity cost (in days lost) through alcohol abuse, 2001 (Australia) and 2012 (Mining industry)

	<i>Absenteeism days (000s)</i>	<i>Presenteeism days (000s)</i>	<i>Total days (000s)</i>
<i>Australian workforce, 2001:</i>			
Days lost ⁹⁴			
Lower estimate	2,683	10,732	13,415
Upper estimate	7,400	29,600	37,000
Days lost per worker (workforce of 6.57 million persons ⁹⁵)			
Lower estimate			2.04 days
Upper estimate			5.63 days
<i>Mining workforce, 2012: (with estimated 4.5% of workforce):</i>			
Days lost (for estimated at 348,500 workers ⁹⁶)			
Lower estimate			0.712 million days
Upper estimate			1.963 million days
Estimated cost (at \$350/day ⁹⁷)			<i>\$ million</i>
Lower estimate			249.1
Upper estimate			686.9

However, another analysis points to considerably lower costs. Australian workforce labour costs for 2004-05 were disaggregated by researchers to show values for absenteeism due to use of alcohol, cigarettes, and illicit drug use.⁹⁸ Reduced on-the-job productivity due to abuse of these substances was not included in the researchers' estimates because of lack of data.⁹⁹ Nevertheless, this appears similar to contemporary understanding of 'presenteeism' and an estimate of four times that of absenteeism has been applied here.¹⁰⁰ Thus absenteeism and presenteeism together have been estimated to have cost the nation \$9.4 billion in 2004-05 (refer to Table 2.11).

From these disaggregates and assumptions, the cost of absenteeism and presenteeism

⁹³ ABS (2008, 2013) Cat. No. 4102.0

⁹⁴ Pidd et al. (2006)

⁹⁵ ABS Cat. No. 691.0; 4-quarterly average

⁹⁶ Refer to Table 1.2

⁹⁷ Refer to ABS (2013) Cat. No. 4102.0

⁹⁸ Collins and Lapsley (2008)

⁹⁹ Collins and Lapsley (2008)

¹⁰⁰ PricewaterhouseCoopers (2011)

through tobacco, alcohol and illicit drug abuse to the mining industry in 2004-05, have been attempted. With resource sector workers estimated to represent around 1.9% of the Australian workforce at that time, productivity costs of these types would have been in the vicinity of \$694 million (Table 2.11). In the intervening years, the workforce has grown by a factor of 2.61 and worker costs have also escalated (20% growth has been guestimated for the purpose of this exercise¹⁰¹). Thus by 2013, it could be expected that these types of industry productivity costs could be in the vicinity of \$2.2 billion dollars. This includes alcohol abuse costing \$110 million and is well below the lower estimate of \$249 million given above, based on number of days lost. Clearly providing estimates for the mining industry of the cost of lost productivity through absenteeism and presenteeism based on elusive or conflicting data is challenging. The estimates generated using this data need to be interpreted with caution.

Table 2.11: Estimates of productivity costs (\$ million) due to alcohol, tobacco and illicit drug abuse, 2004-05, 2012

	\$ million	\$ million	\$ million
Australian workforce, 2004-05:			
Cost in absenteeism/presenteeism ¹⁰²			
Alcohol (males 62%)	367.9	1,471.6	1,839.5
Tobacco (males 83%)	779.6	3,118.4	3,898.0
Illicit drugs (males 95%)	733.5	2,934.0	3,667.5
Total costs (males 84%)	1,881.0	7,524.0	9,405.0
Mining workforce, 2004-05:			
Apportioned cost (assuming 1.9% of workforce or 133,900 workers)			
Alcohol			35.1
Tobacco			74.3
Illicit drugs			584.8
Total costs			694.2
Mining workforce, 2012 (assuming 4.5% of workforce)			
Application of increases of 261%/20% in workforce numbers/income, respectively)			
Alcohol			110.0
Tobacco			233.2
Illicit drugs			1834.4
Total costs			2177.5

2.4.7 Other potential health hazards in daily work

The tendency of some mining industry workers to use mobile devices such as iPhones and iPads while driving plant machinery has recently become a mine safety risk.¹⁰³ In fact, engagement in social media activities – checking Facebook and the like – has been reported as being widespread at open-cut coal mines in Queensland.

Mining industry workers are subjected to a variety of potential health hazards in their normal daily work. Some effects are often not visible and, in some cases, the hazard is

¹⁰¹ ABS (2013) Cat. No. 4102.0

¹⁰² Collins and Lapsley (2008)

¹⁰³ Herber (2013)

not clearly understood and is difficult to measure.¹⁰⁴ If not managed effectively, work-related injuries and disease can occur. Some health hazards encountered in mining not discussed so far are:

- industrial deafness;
- musculoskeletal disorders;
- dermatitis;
- asbestosis and occupational cancers;
- noise;
- whole body vibration;
- ultra-violet sunlight exposure;
- dust;
- working on uneven ground;
- manual handling;
- workplace design including access and egress;
- heat/thermal stress; and
- polymeric chemicals.¹⁰⁵

Fatal and severe traumatic injuries continue to occur in mining. These often have profound impacts on morale.¹⁰⁶ Post-traumatic stress disorders sometimes develop in witnesses, colleagues and managers, the effects of which might not be realised until many years after the event. Managers and workmates often feel personally responsible for the injuries of others, even in the absence of negligence, and face the ordeal of government inquiries and legal proceedings.

This section has presented a synopsis of many workplace issues relevant to both employers and employees who are concerned with addressing worker wellness. These factors are dealt with more fully in Appendix 8. We now explore the extent to which Australian employers and those in the mining industry in particular support health and wellbeing programs.

2.5 Employer support for wellness programs

2.5.1 Potential benefits to industry/employer

The workplace has been identified as one of the most important settings where health promotion can occur due to the potential for efficiencies, success and sustainability.¹⁰⁷ A healthy workforce has been shown to be more productive, have reduced levels of absenteeism and presenteeism, and provide significant cost benefits.¹⁰⁸

¹⁰⁴ Department of Natural Resources and Mines (Queensland) (2012)

¹⁰⁵ Donoghue (2004)

¹⁰⁶ Williamson and Feyer (2000)

¹⁰⁷ Department of Health and Ageing (2012)

¹⁰⁸ Shannon and Parker (2012)

In addition to these potential economic benefits to the employer, those that support workplace health promotion initiatives demonstrate to their workers and the wider community that they value their employees.¹⁰⁹ Moreover, within the Western Australian private sector (as opposed to public), implementation of workplace wellness programs is thought to have:

- improved employee recruitment/attraction;
- improved employee morale and satisfaction;
- reduced turnover rates; and
- improved injury and accident rates.¹¹⁰

Positive influences of such programs on hospital costs, health claims and life insurance cost has been found through research elsewhere.¹¹¹ While these are not necessarily direct costs to employers in Australia as they are in many overseas countries, they would, nevertheless, impact upon containment of workers compensation expenses for organisations. Accordingly, organisations which are known to have healthy positive work environments and wellness initiatives reap identifiable benefits. Thus there are sound reasons for employers to support health and wellness programs for their employees.

Wellness initiatives have become the expectation of many employees.¹¹² Until this view becomes widely acknowledged by employers through the adopted and implemented of programs aimed at retention and motivation of staff, preferred workplaces may be distinguished within a competitive labour market. In other words innovative organisations within the industry may be able to take advantage of this distinction.

Employer perceptions about Occupational Health and Safety (OHS) practices through health and wellness programs and the breadth of such practices in Australia are briefly addressed in Appendix A9.1. Although it appears most organisations genuinely support some forms of worksite health promotion initiatives, there are factors which discourage growth and sustainability of wellness programs in Australia. For example, if objectives are not clearly articulated and measurements put in place, a return on investment for workplace wellness programs cannot be demonstrated. This alone can be a major obstacle as will now be discussed.

2.5.2 Penetration, aims and strategies of workplace wellness programs

PricewaterhouseCoopers (2010) reported health assessment and intervention

¹⁰⁹ Shannon and Parker (2012)

¹¹⁰ Hooper and Bull (2009: 26)

¹¹¹ Mearns et al. (2010)

¹¹² PricewaterhouseCoopers (2010)

programs were in place in 2010 for 1,500 corporate and government employers and around 400,000 employees (3.6% of the workforce).¹¹³ The sustainability of these programs depends on demonstrating a return on investment (ROI) at an organisational level. This presents challenges for employers and highlights a need for:

- A clear and coherent strategic approach. Many programs have developed organically rather than to address identified business and health needs to meet certain objectives. How success would be measured is largely not articulated.
- Effective measurement. A major challenge is how to measure. Movements away from baseline indicators of absenteeism, presenteeism and population risk status are difficult to measure and interpret. Additionally, linking changes in health outcomes to business performance can be problematic for employers. Long lead times add another layer of complexity.

Identifying key performance indicators (KPIs) which can be used to reliably and effectively measure improvements in worker health, participation rates and performance appears to be a substantial barrier in Australia. If processes were developed, ROI for workplace wellness programs could be assessed.

PwC argue that quantifying correlations between wellness initiatives and key leading indicators would be not only informative but also possible. The incentive of reduced health care costs does not carry weight here as in other countries because medical costs are less directly the responsibility of employers. Perhaps without this factor there has been insufficient stimulus for some organisations, industries or the nation as a whole to identify KPIs, implement programs, and allow sufficient time and monitoring for their impact on ROI to be assessed.

Key aims of Australian workplace wellness programs have been directed towards:

- Building of social capital by encouraging participation in group activities (preferably as face-to-face interactions).
- Influencing individual health behaviours and attitudes through tailored programs to raise awareness and involvement.
- Providing equity of access to programs across the country rather than just in urban centres.¹¹⁴

In pursuing these aims, strategies adopted by organisations have considered:

- Designing programs to be user specific and culturally appropriate.

¹¹³ PricewaterhouseCoopers (2010)

¹¹⁴ PricewaterhouseCoopers (2010)

- Delivering programs through multiple modalities (including face-to-face, telephone and online support).
- Seeking employee feedback (such as through surveys and suggestion boxes).
- Ensuring/developing trust about confidentiality by service providers so workers are not exposed to possible discrimination.
- Expending efforts to provide trustworthy, secure and appropriate modes of delivery (such as a supported and safe environment for discussion of mental health issues).¹¹⁵

Education and increasing awareness about healthy lifestyles have been identified as effective strategies for engaging individuals in their own health.¹¹⁶ Notwithstanding this, delivery methods and a holistic site-based approach need to be appropriately tailored to the workplace and employer commitment to the programs supported at all levels of the organisation.¹¹⁷ Otherwise, these types of messages may well miss their mark.

Employer innovation has been highlighted as key to keeping employees interested and involved in wellness program participation.¹¹⁸ Furthermore, offering incentives to employees is regarded as important. Notwithstanding these realisations, it seems few employers have explored the use of incentives to encourage participation despite evidence from overseas of the effectiveness of this approach.

Some guidelines which have been offered for the delivery of wellness programs are outlined in Appendix A9.2.

2.5.3 Obstacles to workplace wellness programs

The establishment of procedures to monitor and evaluate the progress of health and wellness intervention programs has been identified as a significant feature for the widespread implementation of these types of programs.¹¹⁹ Unfortunately, lack of reliable and accurate health information means that workplace health and wellness programs are inadequately evaluated. This makes cost-benefit analyses of programs through measurement of KPIs and ROI difficult if not impossible. Hence benefits for employers are not easily quantified. Without 'proof of the pudding', employers may be reluctant to expend other than tokenistic resources in this direction.

Health status and performance measurements of employees achieved through pre-employment and periodic assessment of workers have been suggested for the

¹¹⁵ PricewaterhouseCoopers (2010)

¹¹⁶ Shannon and Parker (2012); Sparrow (2006)

¹¹⁷ Goater et al. (2012), Shannon and Parker (2012)

¹¹⁸ PricewaterhouseCoopers (2010)

¹¹⁹ Department of Health and Ageing (2012)

industry.¹²⁰ For this to be truly effective (given the high turnover rates within the industry), widespread adoption and consistency in data within and between mining industry employer organisations would need to be maintained. This strategy could facilitate an industry-wide study of health and wellness factors and contribute towards causations of ill-health and workplace health and safety implications and their economic impact.

Some researchers claim that a focus on communication methods and health literacy is essential if a workplace goal is to enhance workforce health.¹²¹ This is because these factors are associated with the acquisition of knowledge and the way people think, feel and act in relation to their health or that of others. Evaluating communication methods about health issues in the workplace requires carefully designed, evidence based procedures. Appropriate identification of health literacy indicators requires specialised knowledge coupled with an understanding of the mining industry context. Worker unawareness of readily available literature about nutrition provided by the employer serves to illustrate these matters.¹²²

Changes in attitudes about responsibilities for health in the workplace might also need to be cultivated. In 2005, the University of Western Australia conducted an analysis of workplace health promotion programs in that state's workplaces.¹²³ In this survey, barriers to implementing health programs in the workplace were identified as:

- low employee participation rates;
- concerns over works compensation or insurance risks; and
- costs involved in running these programs.¹²⁴

Various obstacles which have impeded successful implementation of worksite wellness programs in the US and achievement of goals for workplace wellness and health there are identified in Appendix A9.3. Both the physical and psychosocial environments need to be addressed to encourage engagement within programs.¹²⁵ Some factors that warrant consideration in these respects are mentioned in Appendix A9.4.

Barriers to adoption of programs within the mining industry have been found to vary between people, site cultures, companies, industries and locations.¹²⁶ Impediments to employer support of and employee participation in programs have been especially noticed in regional and remote locations, in camp accommodation and catering, and for those working long hours and shifts. Similarly, common issues that have been raised by

¹²⁰ Goater et al. (2012)

¹²¹ Shannon and Parker (2012); Sparrow (2006)

¹²² Goater et al. (2012)

¹²³ Hooper and Bull (2009)

¹²⁴ Hooper and Bull (2009: 26)

¹²⁵ Sparrow (2006)

¹²⁶ Sparrow (2006)

workers which hinder to their involvement include fatigue; lack of time for physical activity; limited healthy food choices within the camp setting; and lack of fresh, affordable, and/or good quality food.¹²⁷

2.5.4 Analysing mining industry wellness programs

Can generalisations about the aims and strategies of Australian wellness programs identified in the literature be applied to the mining industry? Through interrogation of websites, we have sourced information about a range of health and wellbeing programs that have been implemented in Australia. For the mining industry, we were able to source only 25 programs in total; for other industries, we have accessed, for loosely comparative purposes, 16 programs. Summaries of these programs are provided in Table A10.17, Appendix 10, for these headings:

- organisation name;
- type of program;
- focus areas of program;
- program impact; and
- ongoing/future plans

This table also indicates whether the program appeared to be aimed at wellness and QOL issues or specifically at OHS for compliance or improvement. For the mining industry, a total of 14 were lifestyle programs and 11 were workplace programs (see Table 2.12). Although nine different organisations had implemented workplace programs, we could source only six with lifestyle programs; these had been introduced across 11 different worksites. This exploration and analysis does not necessarily indicate the level of penetration of lifestyle programs in the mining industry.

Table 2.12: Numbers of mining industry lifestyle and workplace programs

	<i>Number of programs</i>	<i>Number of worksites</i>	<i>Number of organisations</i>
Mining industry:			
Lifestyle programs	14	11	6
Workplace programs	11	9	9
All programs	25	18	12
Other industries:			
Lifestyle programs	16	16	16

Lifestyle (health and wellbeing) programs implemented by mining organisations were of the following types:

1. Fatigue management (arguably a workplace program instead)
2. Health assessments and monitoring – tracking fitness levels

¹²⁷ Sparrow (2006)

3. Health assessments and personal fitness
4. Hygiene management and monitoring
5. Nutrition and exercise – white and blue collar workers
6. Optimisation of the FIFO lifestyle – for workers and their families
7. Overall health and fitness –fatigue, musculoskeletal disorders, diabetes, heart disease, influenza, obesity, nutrition and occupational illnesses
8. QOL improvements – various health, fitness and education programs
9. Recovery process of injured workers – emotional aspects; improving QOL of retired workers
10. Risk management - individual health coaching, physical activity, nutrition
11. Risk management – inform lifestyle choices
12. Risk management and illnesses – sedentary lifestyles, poor diet, stress, smoking, obesity, mental health
13. Risk management and presenteeism – for workers and their families
14. Worker health and reduced absenteeism.

While workplace compliance programs also address worker health, we gauged them as being directed more towards management of physical injuries to the exclusion of psychosocial issues and improving QOL. These programs addressed:

1. Hydration issues
2. Hearing conservation
3. Improving site safety behaviour
4. Injury management
5. Management of musculoskeletal disorders
6. Managing the harmful diesel particular matter
7. Preventative strategies for ergonomic / manual handling issues
8. Noise exposure for workers
9. New starters' injuries
10. Sprains and strains prevention
11. Hydrocarbon loss of containment events.

By comparison, all programs for organisations linked to industries other than mining were classified as lifestyle ones. Mostly these appeared to be metropolitan based large organisations (government, corporate and utility-provisioning) and thus implementation of programs arguably would be easier to manage than for mining organisations with a dispersed workforce in regional and remote areas. Types of issues most commonly addressed by these lifestyle programs were targeting physical activity, nutrition, smoking and mental health.

We have presented ample evidence that workforce arrangements and the workplace

can affect the physical, mental, economic and social wellbeing of workers.¹²⁸ This analysis of ‘case studies’ illustrates that lifestyle and workplace programs aimed at addressing these aspects vary greatly within and between industries. Employment in a fulfilling job can have psychological benefits which flow on to physical benefits. Conversely, unemployment, under-employment and stressful working conditions can have adverse impacts on personal health and wellbeing. Results from surveys, ongoing at the time of writing, by Mining Family Matters into FIFO worker lifestyle issues¹²⁹ and by the Australian Centre for Rural and Remote Mental Health which is investigating the mental health of workers¹³⁰ may provide further insights into ways to better manage lifestyle and workplace issues for workers, especially FIFOs/DIDOs.

In our wide-ranging analysis of Australian wellness programs, we could not identify programs within the mining industry which specifically addressed alcohol consumption or drug use and only one mentioned targeting cigarette smoking. Although this does not necessarily mean that these occupational hazards associated with the mining culture and lifestyle were off the radar, the industry has received criticism for not having these types of treatment programs in place.

Similarly, we found mention of only two resource sector organisations with programs addressing mental health and/or stress¹³¹ although one provider of such programs advertised three principal contractors to the industry as clients.¹³² Very few workplace initiatives in Australia or internationally have addressed alcohol consumption, mental health or stress issues. Reticence in these respects has been attributed elsewhere to the ‘taboo’ nature of the topics and perceptions that these matters are too difficult to address.¹³³

The next section examines some perceived impacts of wellness programs on mining industry employees although measurements, it seems, have been largely elusive.

¹²⁸ PricewaterhouseCoopers (2010)

¹²⁹ Consan Consulting (2013)

¹³⁰ Delandraftt (2013)

¹³¹ PricewaterhouseCoopers (2010); Xstrata Coal Bulga (n.d.)

¹³² Assureprograms at http://www.assureprograms.com.au/assure/value_and_roi.php

¹³³ Hooper and Bull (2009: 41)

Part III: Determination of what impacts employee wellness and wellbeing has on the performance of mining workers

3. Impacts of wellness and wellbeing of mining employees

Many Australian employers, including those in the mining industry, provide wellness and wellbeing programs in support of their workers (for example, see Table A10.17). Employers who have these programs in place clearly recognise that improvements to their employees' health can also be beneficial for their organisations through improved productivity.

Part III assesses the available evidence about impacts of wellness and wellbeing programs on the performance of mining industry workers. It then looks at indications of employee acceptance of these programs by examining links between employee engagement and satisfaction and company productivity.

3.1 Impacts of obesity and substance use and abuse

This brief has specifically asked for a review of impacts of obesity, alcohol and tobacco use on the performance of mining industry workers might be assessed.

Obesity as a lifestyle issue for mining industry workers has been reviewed in Part II. With its high proportion of workers – especially blue collar ones – classified as overweight or obese, clearly this is an issue of serious concern. Obesity also increases the risk of type 2 diabetes and is linked with other mining industry lifestyle issues including, but not limited to, stress and mental health, fatigue, fitness for work, and alcohol consumption. The literature about (ab)use of alcohol (also drugs) and tobacco in the mining industry was also reviewed in Part II. Rates of smoking and risky alcohol consumption are recognised as higher in this industry than for the national average.

There is no definitive data set to determine the impacts of obesity, alcohol and tobacco use *per se* on the productivity of organisations. These issues are interconnected with each other and with a range of other health, wellness and QOL factors. They are closely associated with Australia's mining culture and the FIFO/DIDO lifestyle. Suffice to say they directly affect productivity through illness, presenteeism, absenteeism and workforce turnover. These are impacts about which the literature does provide some clues, even some measurements, with respect to employee engagement and satisfaction and employer productivity, and to which we now turn.

3.2 Impacts of worker turnover and replacement

Only limited or dated data are available concerning the resources sector workforce turnover (the replacement of people who leave their current job for another in the same sector) or replacement demand (referring to those who leave the sector

altogether or retire). Data that are available point to high levels, especially for non-resident workers (NRWs), as referral to the following sources show.

A survey conducted by the National Resources Sector Employment Taskforce (NRSET) showed annual turnover rates varying substantially, from 40-90% in 2009 but most commonly 5-20%.¹ In the preceding year, 20-30% turnover was most commonly reported.

Turnover rates in the mining industry are exacerbated by the recognised ageing of its workforce. A NRSET trend analysis for major occupations in the resources sector pointed to an average gross replacement rate (those who leave the sector or retire) of around 10% a year. Professionals – white collar workers – had a lower rate which implies a higher rate for blue collar workers. Refer to Appendix A11.1 for additional summary information from the NRSET report.

The Kinetic Group's 2012 *Annual Workforce Report of the Resources Industry in Queensland* indicated that:

- Annual turnover was 17% overall excluding contractors and 24.4% including contractors.
- Of all separating employees, 18.4% left within the first 12 months of employment at an estimated cost of \$30 million to the industry.
- Turnover rate for long term employers (with over five years' service) was 16.5%; this raises potential issues of experience loss and recruitment churn.
- The turnover burden to industry was estimated at \$140 million annually for direct costs of recruitment, induction and training.
- Turnover for non-resident workers, at 61.5%, was more than double that of other employees.

If the costs to the Queensland industry are extrapolated to the national industry and the same turnover rates applied, then (based on ABS May 2012 labour workforce statistics) the turnover burden would be around \$500 million annually for the direct costs of recruitment, induction and training alone. This does not account for indirect costs associated with managing loss of skills, productivity and experience.

The Kinetic Group's report is further instructive about:

- the FIFO/DIDO workforce and forecasts for the future;
- replacements (retirees and those exiting the industry); and
- the age(ing) of industry workforce and new recruits.

¹ NRSET (2010)

Refer to Appendix A11.3 for additional summary information from the Kinetic Group's report.

A 2003 study² found that turnover rates for workers directly employed by mining companies ranged from 10% to 28%, with an average of 21%. If contractors had been included in the analysis, then the turnover rate would have been greater. Other more dated turnover survey results are outlined in Appendix 11.3.

All results suggest turnover rates of at least 20% and rising. Turnover rate in excess of 20% are considered to be detrimental to site productivity. It seems most likely, therefore, that productivity costs at many mine sites are damaged due to employee turnover. These less tangible costs are in addition to recruitment, induction and training costs of replacement employees.

3.3 Impacts of illnesses

3.3.1 Presenteeism, mental illness and stress

The cost of presenteeism – the cost of not fully functioning at work because of medical conditions – is estimated to be almost four times the more readily measured but substantial cost of absenteeism in Australia.³ The cost of presenteeism to the Australian economy in 2009-10 was estimated to have cost:

- \$34.1 billion (from \$25.7 billion in 2005-06); and
- on average, 6.5 working days of lost productivity per employee annually.⁴

Stress-related workers compensation claims in Australia doubled from 2004 to 2008. Excessive work hours, noise, health and safety risks and high workforce turnover – arguably issues associated with working in the mining industry – are among those factors given as examples of types of workplace stressors.⁵ Because stress can impact on employee productivity:

- workplace stress cost the Australian economy \$14.81 billion in 2008;
- 3.2 days per worker are lost each year through workplace stress.⁶

A majority of mining⁷ and mining activities-related workers⁸ are thought to be NRWs

² Beach et al. (2003)

³ PricewaterhouseCoopers (2010)

⁴ Medibank (2011)

⁵ Medibank Private (2008)

⁶ Medibank Private (2008)

⁷ Extraction work from operating mines, some support activities and exploration are counted under the ANZSIC mining industry classification

⁸ Workers for construction; surveying; transportation; processing; out-sourced plant maintenance work; camp operations including management, catering and security; and so on

with the potential for attendant lifestyle challenges and, arguably, a greater propensity for negatively affecting productivity through presenteeism and mental illnesses and stress. Table 3.13 summarises estimates of lost productivity through presenteeism and mental illnesses and stress within the Australian resources sector. Refer to Appendix A12.1 for additional discussion.

Table 3.13: Estimates of lost productivity through presenteeism and mental illnesses/ stress within the Australian resources sector

<i>Australia's resources sector</i>		<i>Presenteeism</i>	<i>Mental illness and stress</i>
Persons employed in the mining industry ⁹	261,400		
Including mining activities-related workers ¹⁰	348,500		
Share of the Australian workforce	4.3%		
Lost productivity per worker ¹¹		6.5 days	3.2 days
Days lost per annum (in millions)		c. 2.3 m days	c. 1.1 m days
Mining industry estimated share of cost		\$1.5 billion ¹²	\$0.6 billion ¹³

As noted elsewhere, mental illness and stress in the workplace is associated with excessive hours and shift work. Indeed, recognition that exceeding a 48-hour working week presents as danger to psychological and physiological health is receiving growing support.¹⁴ A recent study of workers in the Queensland mining industry found that wellbeing was worse among those with:

- no say over hours or shifts;
- those who wanted to work fewer hours; and
- particularly those who were in both categories.¹⁵

Additionally, the study found that use of anti-depressants, sleeping tablets and antacids were identified as a proxy for mental wellbeing.

3.3.2 'Minor' illnesses of workers in Queensland's mining industry

A measurement of the impact of long shifts and minimal or no control over hours worked was attempted in a recent study of mining and energy workers in the Queensland resources sector. Refer to Appendix A12.2 for additional summary information. The research pointed to:

- Number of self-reported minor short-term illnesses increased as levels of emotional exhaustion increased; for workers having no say over hours worked;

⁹ ABS Cat. No. 6291.0

¹⁰ Refer to Table 1.2

¹¹ Medibank (2011)

¹² For 2009-10; Medibank (2011)

¹³ For 2008; Medibank Private (2008)

¹⁴ Peetz et al. (2012)

¹⁵ Peetz et al. (2012)

- and for those who wanted to work fewer hours.
- Short-term illnesses were also reported more commonly by employees who would prefer a day-time job or were concerned about safety at work.¹⁶

Gastro-intestinal problems are the most prevalent health complaint associated with shift and night work.¹⁷ This research claims a causal role associated with employees having a say in working arrangements for these types of illnesses. Productivity can be severely impacted at a worksite when workers flying in for their extended work-cycle – or, less so, if an entire shift – succumbs to a contagious illness such as gastro-enteritis.

An investigation of cost of workforce turnover, presenteeism, absenteeism and illness to the mining industry is hampered by limitations to accessible material. Nevertheless, lost productivity appears consequential and costly and could justify the investment by employers in counteracting wellness programs. The following section considers the impact of such programs on mining industry workers.

3.4 Impacts of wellness programs on mining industry employees.

3.4.1 Limits to available material

There is, unfortunately, limited research in Australia (and elsewhere) of the cost to employers of employee health and wellbeing. This limits the degree to which measurements or estimates of impacts upon productivity of wellness programs can be offered and the effects or extent of employee engagement in them can be indicated.

Part of the reason for this lack of research is that surveying and/or interviewing workers, management and executives in the mining industry presents a range of difficulties. Nevertheless, unless longitudinal studies over a number of years are undertaken which permit comparative measurements of the effectiveness of wellness programs to be attempted, quantifying impacts of programs on performance of the mining workforce and worker acceptance of them will remain elusive.

3.4.2 (Lack of) measurement by KPIs and ROI

As already noted, assessing the impact – the success or otherwise – of health and wellness programs on mining industry profitability has proved difficult. Only minimal information was available about KPIs or how, even if, ROI was determined. Examples from websites for mining organisations, government or industry reports, and providers of services were accessed for the following (for more information, refer to Appendix 10):

¹⁶ Peetz et al. (2012)

¹⁷ Peetz et al. (2012)

- Program impact was a measurement of movements in body mass index, blood pressure, cholesterol, absenteeism and injury rates at one mine site.
- Fitness levels were tracked at one mine site through follow-up assessments.
- ROI was operationalised at one mine site as a reduction in risk status (number of workers carrying risk factors) that was associated with increased productivity (self-reported presenteeism).
- KPIs (not identified) were measured at another mine site and results monitored
- Workers compensation experience was assessed at one mine site.
- One-off results from a weight-loss challenge were measured at one mine site.

Mostly, however, impacts were either not indicated or were based on:

- anecdotal improvements in awareness and motivation;
- qualitative feedback (including in surveys);
- employee participation rates including mandatory attendance at seminars and educational event; and
- interest from employees for ongoing participation.

Two organisations indicated that success in earlier programs resulted in their ongoing extension into other parts of the company but, in the main, intentions for furthering wellness programs were unstated. Evaluation of impacts by industries other than mining and the extent of their success did not appear to be more sophisticated than for mining.

3.4.3 Employee acceptance of wellness programs

Difficulties have also been experienced with gauging the extent to which employees accept and become committed to a continuing involvement in wellness programs. Our research of wellness programs in Australia (summarised in Appendix 10) showed that mining organisations assessed worker acceptance based on a range of factors including:

- anecdotal improvements in awareness and motivation for embracing nutrition and exercise programs;
- reduction in self-reported presenteeism;
- individual results from weight loss challenges;
- high participation rates in programs offered;
- anecdotal improvements in health; and
- reduced absenteeism.

Despite these shortcomings, there appears to be little doubt that wellness programs can have wide-ranging consequences for the benefit of both employees and employers as the following illustrates.

3.4.4 Links between employee engagement and company productivity

Research in the UK has established that wellness programs are associated with committed workforces and work environments that reflect a priority on health and safety.¹⁸ Specifically, Mearns et al.'s (2010) research has found that health investment practices – wellness programs – are positively related to:

- safety compliance;
- worksite commitment;
- health climate; and
- safety climate through the priority the organisation places on general employee wellbeing.

This means that investments in employee health extend beyond solely health and wellness to the fostering of the perception of the organisation as a 'caring' place to work. Employees reciprocate to this perceived concern for their wellbeing with greater commitment to their workplace. Higher workplace commitment was found in organisations with higher levels of investments in wellness programs and practices.

These results point to an increased safety climate and reduced turnover being achievable through an increased focus on workforce health and wellbeing. This is because higher levels of commitment ensue from a workforce (perceived to be) treated with consideration and concern for their wellbeing. While establishing an entrenched safety environment was important for safety compliance and reduced injuries and illnesses, investment in health was more important for worksite commitment.¹⁹ This strengthens the business case for investment in workplace health initiatives and wellness programs due to implications for the development of a committed workforce which, in turn, leads to lower turnover rates.

¹⁸ Mearns et al. (2012)

¹⁹ Mearns et al. (2012)

Part IV: Summary of issues and focal factors to be considered in the mining industry

4. Focal factors to be addressed in the mining industry

4.1 Changing workforce arrangements in the resources sector

Employment relationships and workforce arrangements in Australia's resources sector have changed considerably in recent years, especially over the past 10 years or so. These changes have been strongly influenced by the huge growth in regional and remote mining operations as a result of the resources boom, and the widespread adoption of FIFO/DIDO workforces and contracted workers accommodated in camps. Change has also been characterised by an increasing proportion of workers employed in less secure but more flexible forms of employment. The health effects on employees of these workplace changes and associated lifestyle transformations, especially for FIFOs/DIDOs, are becoming increasingly contentious even though they are largely under-researched and thus misunderstood.¹

This review of the literature about wellness, wellbeing and QOL issues and programs with relevance to employers and employees in the mining industry has attempted to ascertain factors an organisation should focus on in order to reduce absenteeism and turnover and increase commitment, satisfaction, safety and productivity. Many issues have been identified as influencing these factors, some more so than others, but most are interconnected with multiple others and hence cannot be addressed in isolation.

4.2 Influences of drivers of change

A number of prominent features clearly influence mining industry workers' health in Australia. For some, the drivers are global 'external' or whole-of-industry forces; for others, 'internal' organisational and workplace/worksite arrangements are the main determinants; in some instances, lifestyle choices and constraints, whether at home or in accommodation camps, can be forceful. Often, though, there are overlaps between the different types of drivers.

The following Table 4.14 illustrates this by identifying a range of changing workforce arrangements for mining industry workers and then nominating adjudged levels of influences from (a) external/whole-of-industry factors, (b) internal workplace conditions and/or (c) lifestyle drivers of change. An indication of the extent to which each type of driver has influence, compared with others, on an issues has been attempted by using a 'dot' scale where no dots implies nil or minimal influence and three suggest very strong influence. This approach has facilitated the extent of differing influences to be distilled.

¹ House of Representatives Standing Committee on Regional Australia (2013)

Table 4.14: Influences of drivers of change in workforce arrangements in the mining industry, Australia

Changing arrangements and workforce circumstances²	Drivers of change		
	External/ industry	Work- place	Life- style
Massive increases in employee numbers – a tripling over the past decade alone	...		
Almost two-thirds are blue-collar workers with greater risk factors than others	...		
Long operational hours – 12-hour shifts in extended work cycles – have become the norm
Workers experience fatigue due to shift work and the structure of rosters
Switching between day- and night-shifts affect a worker’s circadian rhythm and ability to stay healthy
Associated increased employer demands for non-standard workplace arrangements	
Arrangements for travel to/from work (especially for NRWs) can directly and indirectly affect health	
Leisure time for NRWs during leave cycles can be reduced by shift work and travel arrangements	
Increased flexibility to allow for adjustment in production demands	
Intensifying organisation demands	
For NRWs, isolation, disorientation from home and friends
For NRWs, stress about what’s happening at home, such as not being able to help with problems
Conflicts arising from work spilling into family life	
These conflicts have been associated with sickness leave and poor physical and mental health in workers	
Elevated psychosocial workloads lead to many employees facing mental rather than physical demands	
At the same time, the working environment is becoming less physically active	
The global financial crisis has contributed to declining mental health due to greater job uncertainty	...		
The detrimental effects of perceived job insecurity (injury, sickness, absence, poor sleep, psychological distress ...)	
The threat of downsizing has also been associated with stress, sickness absence, musculoskeletal pain and injury.	
Other factors causing job dissatisfactions can add to stress and poor productivity through presenteeism	
Personal wellbeing directly and indirectly impacts upon injury.	
Obesity and physical inactivity are associated with increased workplace injury	
Other risk factors (alcohol, tobacco, illegal drug use) are also associated with increased workplace injury

² Loosely based on PricewaterhouseCoopers (2010) but largely informed by this current literature review

Heavy drinking and other substance abuse, especially during the work cycle	.	..	...
Most workers are in regional/remote areas which also increased the likelihood of higher levels of risk indicators	...	...	...
Quality of camp accommodation for FIFOs/DIDOs varies considerably, can promote poor nutrition/eating habits	.	...	...
The presence of chronic conditions also complicates and slows rehabilitation and recovery from injury.		...	...
The state of a person's mental health affects their physical capacity to act in a safe way		...	...
Other forms of risky behaviour (e.g. exposure to HIV; dangerous driving) are associated with the FIFO lifestyle.		..	...
Importantly, this relationship between mental health and injury is bi-directional		...	...
A high level of workplace stress is a costly burden for employers (both directly and indirectly)	...	...	...

4.3 Focal factors to be addressed

Table 4.14 presents a comprehensive list of issues and influences as drivers of change and culture in the mining industry in Australia. The strength of the drivers upon each 'circumstance' will most likely vary from one worksite, one regional/remote location, one state, one organisation, to the next. Therefore, the table is essentially a framework from which site-specific influences can be identified and arguments for appropriate wellness programs constructed.

Assessing the influence or strength of the different impacts of workforce circumstances and arrangements upon wellness, wellbeing and QOL is, however, complex. This is largely because of the interconnectivity between causal factors and conditions. Fatigue is a root cause as are the long 12-hour shifts, the extended cycles of day/night work, and the increasingly sedentary nature of jobs, especially for blue collar workers. For non-resident workers, feelings of isolation and other elements of 'the FIFO lifestyle' present risks in addition to 'the mining lifestyle' and its culture of heavy drinking, smoking and other substance uses. How can lifestyle changes be effected by wellness programs within the extreme constraints imposed by workplace and workforce 'arrangement'?

This current research has illustrated that there are serious concerns about the health of mining industry employees, especially those who are FIFOs/DIDOs. Strategies outlined under the federal and state governments' National Partnership Agreement for Preventative Health favour an industry-wide approach to 'Healthy Workers' programs. Clearly more studies are needed in this largely under-researched area if health programs addressing employee wellness and wellbeing and for improving quality of life of workers are to be other than tokenistic.

Appendices

Appendix 1: Objective measurements

This appendix summarises four frameworks for measuring quantitative indicators which have been used in Australia in the pursuit of quality of life assessment.

A1.1 Social Inclusion in Australia: How Australia is Faring 2012

The Australian Social Inclusion Board was formed in May 2008 to advise the Federal Government on social inclusion in Australia. Their reports present a statistical view (measured using a compendium of headline indicators) of the nature and extent of disadvantage and social inclusion in Australia as a way of reviewing Australia's progress.

The latest and second report in 2012 indicated few significant changes since the first edition was published two years previously.¹ Three out of four Australians (75%) reported they were satisfied with their life as a whole, higher than the OECD average of 63%.

The report also discussed variations in other indicators adjudged as representative of QOL and wellbeing including rates of:

- employment, long-term unemployment, persistent family joblessness (improvements);
- children in jobless families (14% of all children under 15 years; fourth highest among OECD nations);
- proportions of the population within specified age-ranges with secondary and tertiary qualifications (increasing);
- income inequality (steadily increasing);
- housing availability (easing for low-income group);
- repeat homelessness (improving);
- self-reported health (with 85% 'good', this is higher than the OECD of 68%);
- multiple and entrenched disadvantages (too high); and
- life expectancy (high and increasing).

These indicators are for Australia as a whole and as such have minimal meaning that can be assumed or attributed to employee or organisational performance in the resources sector. Hence they are deemed essentially irrelevant for this review.

A1.2 Measuring Wellbeing: Frameworks for Australian Social Statistics

¹ Australian Social Inclusion Board (2012)

Since 2002, the Australian Bureau of Statistics (ABS) has published selected statistics about society, the economy and the environment to provide insights into national progress. These factors addressing national performance are brought together as Measures of Australia's Progress (MAP). This research, based on about 15 headline indicators and a range of background indicators, is confined to objective indicators. MAP reports are of limited relevance for this review.

A1.3 The Genuine Progress Indicator

The Australia Institute introduced the Genuine Progress Indicator (GPI) in 1997. The composite GPI was constructed using a range of economic, social and environmental indicators to measure change in the nation's wellbeing that was more comprehensive than GDP. The GPI for Australia has not been updated since 2000.

A1.4 The State of the States

The State of the States was an annual report published by the Evatt Foundation for 14 years, from 1994. Using key indicators under the headings of social, environmental and economic, it aimed to measure the performance of each state government and to draw attention to policies at the sub-national level.

The series was concluded in 2007 because the Foundation believed that:

its main objectives had been met: the international financial credit rating agencies have been discredited world-wide, and now no Australian government would ever consider running for re-election without presenting policies that address the triple bottom line of social, economic and environmental objectives.²

² Evatt Foundation, online

Appendix 2: Subjective measurements

A2.1 Australian Unity Wellbeing Index

The Australian Centre on Quality of Life uses the Australian Unity Wellbeing Index (AUWI) to monitor the wellbeing of Australians' satisfaction with various aspects of their lives and overall life satisfaction in Australia. Accordingly it comprises two numbers: the Personal Wellbeing Index and the National Wellbeing Index. The latter will not be further referenced in this review.

The first survey was conducted in April 2001; the most recent undertaken, the 28th, was published in September 2012. Each survey involves a telephone interview with a new sample of 2,000 Australians selected to represent the geographic distribution of the national population. A standard set of demographic questions and other survey-specific questions are also asked. Additionally, each survey examines in greater depth a specific topic. Some topics are of relevance in this review due to their links with the concepts of wellness and wellbeing and QOL for Australians working in the resources sector. These topics are presented under the following report headlines:

- Impacts of marriage on wellbeing (Nov 12)
- Quantity and quality of sleep (Apr 12)
- Chronic health (Sep 11)
- Relationships and the internet (Apr 11)
- Physical activity and wellbeing (Aug 08)
- Work, wealth and happiness (Apr 07)
- Income security (May 06)
- Personal relationships (Sep 05)
- Job security (Oct 04)
- Work and leisure (Sep 02)

These topics have been selected having in mind that contemporary workforce arrangements for the resources sector are largely dependent on fly-in, fly-out (FIFO), drive-in, drive-out (DIDO) and other forms of non-resident workers (NRWs) who mostly stay in accommodation camps during the work cycle of rosters. They spend more time 'away' than 'at home'; that is, more time living away from their households, families and communities than embedded within them. Thus consideration of an expanded range of lifestyle issues additional to those traditionally associated with employee workplace wellness and employer organisational influences seems essential for the mining environment.

Summarised results for each selected special topic are now presented in the chronological sequence in which the surveys were conducted, beginning with the most recent on marital status.

A2.1.1 Impacts of marital status on wellbeing¹

- Married people (even if not for the first time) exhibit the highest personal wellbeing (PW), followed by those in de facto relationships
- The lowest PW is reported by separated people, those who are coming to terms with the dissolution of their marriage
- The wellbeing of divorced people is no different from people who have never been married. A divorce may signify some resolution to their marital problems, and a longer time for adaptation
- Remarried people report significantly higher wellbeing than those who are never married, separated or divorced. This suggests that the best way to recover from the drop in wellbeing experienced through separation or divorce is to re-marry
- The wellbeing of widows falls just below the normal range
- The wellbeing of married people varies only slightly over the course of their marriage and is almost always at the top of, or above, the normal range for PW

In summary, those in established relationships have highest levels of PW, followed by those who have never married or are divorced; those going through separation have lowest levels of PW.

A2.1.2 Quantity and quality of sleep²

- There appears to be a relationship between average hours of sleep and PW, such that PW increases with increasing hours of sleep. This is true until 10 hours of sleep, at which point PW falls below the normal range.
- PW is most adversely affected for people who sleep four hours or less in a 24-hour period
- Under challenging sleep conditions, PW for females is less affected than for males
- In general, the longer it takes to fall asleep, the lower is PW.
- PW scores are highest for people who sleep through the night without waking or who wake just once
- Those who report (remembered) bad dreams or nightmares have lower PW although still in the normal range.
- Most with remembered bad dreams have them only rarely. People who report that they have bad dreams once a week or more, however, often have PW below the normal range.

In summary, poor quality or limited (too few) hours of sleep can have negative impacts

¹ Weinberg and Cummins (2012)

² Cummins et al. (2012)

on PW. This highlights the need for comfortable sleeping conditions including undisturbed sleep for sufficient consecutive hours to suit the individual.

For persons working 'evening' as opposed to 'day' 12-hour shifts, disturbances (e.g. noise, olfactory) can conflict with conditions for good quality sleep. Arguably interference could be worse for those living in households where 'normal' routines – those associated with child care, school, housework and paid work for others in the household – continue. NRWs in work camps can similarly have their sleep disturbed if accommodation is not sufficiently sound-protected or if behavior of others is not well managed.

A2.1.3 Chronic health³

- Persons who have *ever* had to visit a doctor on a regular basis have PW below normal range.
- Persons with a serious psychological condition that causes them to visit a doctor on a regular basis have PW that is lower than for people who have had a serious medical condition or injury.
- The wellbeing of male is lower than that of females, whether due to a serious medical condition, an injury, or a psychological condition.
- Indications are that many people do not fully adapt to their medical condition or injury.
- PW falls below the normal range with a general physical pain rating at or below a self assessment of 'three out of ten'. That makes this type of pain the most powerful negative influence on PW.

In summary, an illness which has required medical treatments – especially one producing severe physical pain or a serious mental illness – produces below normal levels of PW even when ongoing treatment is no longer deemed necessary. This applies more so to males than females.

A2.1.4 Relationships and the Internet⁴

- Males who do not use the internet have below-normal PW. This does not apply to females unless they do not have internet access to family.
- The PW of people under 76 years is lower if they do not use the internet.
- The PW of people who live alone is highly sensitive to low social contact.
- The PW of those who have lost touch with their family is extremely low.
- Personal contact is more powerful as a source of support than internet contact.
- The weakest form of support comes from unmet internet friends.
- As income rises, support from a partner rises but support falls from other family

³ Cummins and Schafer (2011)

⁴ Cummins et al. (2011)

and all internet groups. This suggested increasing nuclear-family self-sufficiency as income rises.

- There is a strong level of negative association between loneliness and PW.

In summary, the PW of people who live alone is highly sensitive to low social contact. While their wellbeing is positively linked to internet contact with family and previously known friends, it is not assisted by internet contact with unmet internet friends. Such unmet friends also fail to alleviate loneliness and fail to offer support in times of need.

This raises the question of whether NRWs living in accommodation camps might be classified as 'living alone'. The team they work with and the persons they share meals with could be crucial for PW as could the strength, even existence, of a 'home' support network with regular contact easily maintained during the work cycles of rosters.

A2.1.5 Physical activity and wellbeing: Links with exercise⁵

- Strong activity is associated with above normal PW. Whether the activity causes high wellbeing or high wellbeing causes strong activity is uncertain.
- Exercising for three days each week was associated with the maximum benefit for PW. Exercising more frequently conferred no additional benefit.
- The normal dip in PW for people in the middle age range does not occur for those who exercise six or seven times each week.
- Involvement with groups, of itself, is weakly associated with higher PW. It is the exercise component, undertaken either with or without a group, which is strongly associated with high wellbeing.

In summary, people with strong levels of regular exercise and physical activity will benefit from improvement in PW to above normal levels. The converse – i.e. low levels of physical exercise leading to a decrease or 'dip' in PW – is implied.

A2.1.6 Physical activity and wellbeing: Links with drinking and smoking⁶

- People are more likely to drink every day if they are males and on high incomes. Males who drink every day have above normal PW. Females who drink everyday have normal level PW.
- Not drinking alcohol during the ages of 36-65 years disadvantages PW. The reason for this is uncertain but could possibly be linked to coping. Middle age can be a stressful period of life due to managing families, work and mortgages. Perhaps the consumption of alcohol during this time is an important coping strategy for many people.
- Not drinking alcohol disadvantages the PW of people who are divorced or who

⁵ Cummins et al. (2008)

⁶ Cummins et al. (2008)

are sole parents.

- There is no systematic change in male PW as the number of drinks per session exceeds three. Female PW falls at more than three per session.
- The PW of the married group surveyed decreased with more than three drinks per session. One explanation was that the heavy drinking was associated with a dysfunctional relationship.
- Current smokers have lower PW. This was more likely associated with socio-economic status since people living in difficult circumstances are more likely to smoke.

In summary, drinking a small amount of alcohol each day is associated with high PW, especially for males. Drinking may be a coping mechanism for people experiencing stress provided drinking sessions are not 'heavy'. Smoking cigarettes is associated with low PW.

A2.1.7 Work, wealth and happiness: Time at work and non-work⁷

- Females have higher satisfaction with work than males.
- Satisfaction with amount of time available away from work is also higher for females.
- Both genders express less satisfaction with the time available away from work when they have children. The impact is greater for males than for females.
- Satisfaction with the amount of time available away from work decreases when people spend more than 30 hours at work. It then falls again when people spend more than 50 hours at work.
- Satisfaction with amount of time spent at work decreases for females once the number of work hours exceeds 40. For males this does not occur until the number of work hours exceeds 45.
- Work satisfaction significantly increases after 56 years. This may reflect a real choice of work/non-work, a decision to keep working because they like their job, and the general rise in subjective wellbeing that occurs after this age.

In summary, working more than 40 hours a week leads to dissatisfaction with time spent at work and the time available beyond work.

A2.1.8 Work, wealth and happiness: Perceptions of wealth and happiness⁸

- Projected happiness does not vary with income.
- People with low incomes overestimate the power of doubling their income to increase their happiness.
- Females rate their projected happiness with double income as higher than do

⁷ Cummins et al. (2007)

⁸ Cummins et al. (2007)

males.

- Single parents and people who are divorced show the largest disparity between actual and projected happiness of all groups. This is realistic given the power of money to increase their actual happiness.
- People who have separated show a low disparity between actual and projected happiness. They seem to recognise that the major deficit in their lives is not so much the lack of money but the absence of a good partner.
- People grossly overestimate the power of halving their income to decrease their happiness. This varies little between the demographic groups.
- How strongly people agree with either 'you like to own as many possessions as you can possibly afford' or 'you admire people who have more money than you do' has minimal systematic effect on PW.

In summary, people tend to overestimate the extent to which variations in income influence their degree of happiness and PW.

A2.1.9 Income Security⁹

- Even small degrees of income uncertainty are associated with reduced PW.
- The people most severely affected are those who have an income certainty self-assessed as less than 'six out of ten'.
- Living with a partner buffers the effects of income uncertainty but everyone is adversely affected when the level of income certainty drops below six.
- The distress people feel in relation to income uncertainty reduces PW more powerfully than does strong physical pain.
- The PW of males who do not earn money is more adversely affected than it is for females.
- Not earning money severely affects the PW of people who are separated. This probably reflects their uncertain financial future.

In summary, income security is one of the most powerful determinants of PW that was found. Employer policies directed to increasing income security would likely raise PW.

A2.1.10 Personal relationship¹⁰

- The strongest source of personal support is from a partner. Support from a partner takes time to mature before remaining stable and high.
- Low levels of support from all sources are worse for PW than no support at all.
- Under conditions of low support, the three sources that also provide the strongest support when they are operating well (partner, general friends, and

⁹ Cummins et al. (2006)

¹⁰ Cummins et al. (2005)

- professionals) are the most damaging to PW.
- People who have never married have fewer sources of support than people who have a partner. Moreover, the sources that they do have yield less support than they do for people who are married.
 - Male PW is much less influenced by the degree of social support than is the PW of females.
 - The support that people gain from 'professionals' (as distinct from 'work friends') increases markedly with age. This exemplifies the increasing importance of good professional relationships for older people.
 - In situations where personal involvement is discretionary (no partner), males experience lower levels of support than females.
 - Low support from any one source predicts low support from all other sources.
 - For people who have separated, the only source of support that impacts significantly on their PW is partner support. Thus, people who are separated remain highly dependent on their partner (current or past) to maintain their wellbeing.

In summary, of all sources of support, the presence or absence of a partner has the most powerful positive effect on PW.

A2.1.11 Job security¹¹

- Worry about losing their job is damaging to PW more so than either worry about getting another job or worry about work-family balance.
- PW cannot be measured through health. Even though full-time retired and volunteers have lower than normal health satisfaction, their PW was above the 'normal' range.
- People who were full-time employed and yet looking for work have lower than normal PW. It is likely that these people will be functioning poorly in their job.

In summary, worry about losing their job is damaging to PW more so than either worry about getting another job or worry about work-family balance. It's likely that those looking for another job will be functioning poorly at work.

A2.1.12 Work status: Hours worked¹²

The five work categories were: paid employment, family and household care, voluntary work, study and no work. All of the work status groups had levels of PW within the normative range.

- Work hours had little impact on overall PW but those working 20 hours or less

¹¹ Cummins et al. (2004)

¹² Cummins et al. (2002)

and over 60 hours (in the sample, mostly home carers) showed higher satisfaction with work, and those working 41-60 hours less satisfaction with work hours.

- Longer work hours also impacted on satisfaction with leisure, especially leisure time.
- Those aged 26-55 were much less satisfied with work and leisure than both younger and older people, probably reflecting the work and family pressures experienced by this age group.

In summary, the positive aspects of work – the sense of purpose it imbues and the social connectedness it encourages – can be achieved in less time than 40 hours each week. As the number of hours increases from the minimum required to meet these personal needs, no greater sense of purpose will be achieved and more interpersonal contact may start to be aversive. At this point the work becomes routine, tedious, tiring, and ever less enjoyable. The trend for number of work-hours to increase is unlikely to enhance PW.

A2.1.13 Work status: Work and leisure satisfaction¹³

- Volunteers stood out from other workers in having the highest levels of PW. Mostly aged over 55, more likely to be female, and worked for 20 hours or less a week, they enjoyed high levels of satisfaction with their lives, work and leisure, health, sense of community connection and religion or spirituality.
- People who work 41-60 hours each week had relatively low levels of PW.
- If people would prefer to work less than a regular 40 hour week, and they are being required to work even longer hours due to financial or work-place circumstances, their PW is likely to suffer.
- The highest levels of leisure satisfaction occurred within those groups with the lowest number of work hours.
- Many people are overly engaged in their work to the detriment of their enjoyment of life.

In summary, volunteering positively engages people in inter-personal relationships and in meaningful and useful activities, both of which are essential elements for PW and a high QOL. Since most voluntary activities are inherently social, this aspect may be unattractive to some, especially some males. Importantly, the highest levels of leisure satisfaction occur within those groups with the lowest number of work hours. Whatever the reason for this counter-intuitive finding, it was presented as evidence that many people are overly engaged in work to the detriment of their enjoyment of life and PW.

¹³ Cummins et al. (2002)

A2.1.14 Work status: Distribution of work hours¹⁴

- People working just over the 40-hour week are the least satisfied with the number of hours they work.
- The longer hours that people work, the less satisfied they are with the amount of time they have for their leisure. This trend stops at 41-60 hours since there is no difference between this group and people working 61+ hours.
- There is little evidence that people working more than 60 hours each week are suffering in terms of their PW. Note, however, that most of these in the survey were home carers. None of the major indicators had them as different from the other work groups and the only decrement was in the quantity and quality of their leisure time. This, however, is compensated by them having greater satisfaction than at least some of the lower work-hour groups in terms of satisfaction with their job, their health, and their religion/spirituality. Overall, this group seems to be putting a huge effort into their (home carer) work and getting suitably rewarded.
- People doing least well on several measures of PW are those working 41-60 hours, and 83% of this group was in paid employment. It seems likely that many people in this group are working over the 40 hour week for additional money or work-place requirements, rather than through choice.
- People working from 1-20 hours each week have the highest levels of personal wellbeing.
- People working from 41-60 hours per week have the lowest levels of wellbeing. Most are in paid employment and aged 36-55 years.
- People working 61+ hours per week have normative levels of personal wellbeing. They were predominantly females aged 26-45 years caring for their family, and have very high levels of satisfaction with their personal relationships.

In summary, people working either very long hours (in the sample, mainly home carers) or very short hours (volunteers or part-time paid employment) were doing best in terms of their PW. The people doing least well in this regard were those in paid employment who were working over the 40 hour week.

The synopsis of results presented above for AUWI topics selected for their relevance to the mining industry will be further referenced in Part II of this report by linking them with health and wellbeing problem areas identified for the industry.

¹⁴ Cummins et al. (2002)

A2.2 Australian Work and Life Index

A2.2.1 'The Big Squeeze'

The AWALI is a national survey of work-life outcomes among working Australians undertaken by the Centre for Work + Life at the University of South Australia. This was the fifth AWALI survey with previous ones carried out in the four consecutive years 2007-10. The AWALI surveys measure how work intersects with other life activities as seen by a randomly selected representative group of working Australians: 2,887 for the 2012 survey.¹

This section summarises selected results from AWALI 2012. It deals with aspects of work, QOL and wellbeing and thus is pertinent to this review. Titled *The Big Squeeze: Work, Life and Care in 2012*,² this publication offers insights into the ways in which many Australian workers experience conflict or at least constraint with their allocation of time due to intrusion from (too many) long hours worked.

A2.2.2 Work-life interference and outcomes for the mining industry

Widespread work-life interference has remained persistent since the first survey with little positive change in Australians' work-life outcomes, on average, over the five year timeframe.³ Particular groups have been shown to be consistently more affected. Importantly for this review:

- Workers in the mining industry have the worst work-life outcomes, probably reflecting their long average working hours.
- On average, work-life interference worsens as hours of work lengthen; it's much worse for men and women working 45+ hours per week.
- Managers and professionals have worse work-life interferences than other occupations.

Moreover:

- long hours and a poor fit between actual and preferred working hours are both associated with the worse work-life outcomes; and
- most of those who work long hours would prefer not to.

A2.2.3 Job overload and work intensification

Many surveyed workers experienced job overload and high levels of work intensification. Jobs that overload workers and create time pressures are not good for health as they increase the likelihood of stress, burnout and poor physical health, and

¹ Skinner et al. (2012)

² Skinner et al. (2012)

³ Skinner et al. (2012)

negatively affect relationships with family and partners.⁴ AWALI 2012 measures of work intensification – work pressures, frequency of working at high speed, and tight deadlines and work overload – affected 30-40% of the workforce ‘often’.

These perceived rates of work intensification for Australians are higher than measured in Europe using similar measures.⁵ Higher rates of work intensification on all of the measures mentioned above are associated with worse work-life interaction.

A2.2.4 Working (too many) long hours

Many men (more so than women) work long hours, most of them reluctantly, and experience high levels of work-life interference. Their levels of work-life interference have remained essentially stable over the past five years. In AWALI 2012:

- 28.0% of surveyed men worked long hours (48+ hours a week) (9.7% of women); and
- there was little indication that these long hours were worked by choice.

AWALI 2012 showed that most Australian workers feel that they gave sufficient or too much time to paid work. This is especially the case for men and women working full-time, and those working longer hours in particular. Since 2007, AWALI surveys have consistently revealed strong preferences for shorter hours among many working Australians. Indeed:

- most men working long hours (72.0% cent) would prefer to work at least half a day less; and
- fathers are the group most likely to prefer to work at least half a day less: half say they would like to do so.

Work-life interference at high levels was not only among those working long hours, or more than they would like, but also those who did not get flexibility when they request it. As in previous years, most workers working long hours want to work less (taking account of the effect on their pay packets) but many appear to have difficulty reducing their hours.⁶

AWALI 2012 included data on size of firms. Workers in larger firms had higher work-life interference than those in smaller firms.

The results from ALAWI 2012 and earlier surveys were drawn upon by Pocock et al. (2012) in their recent book to which we now return.

⁴ Skinner et al. (2012)

⁵ Skinner et al. (2012)

⁶ Skinner et al. (2012)

A2.3 Australian workers living with a ticking ‘time bomb’?

The following section expands upon some concepts and findings published in *Time Bomb: Work, Rest and Play in Australia Today*.⁷ The authors, Barbara Pocock, Natalie Skinner and Phillipa Williams, warn that many Australians are living a ‘time bomb’ as they juggle jobs, home commitments and community life. It expands upon research by the University of South Australia’s Centre for Work + Life and fleshes out the AWALI surveys reviewed above. In so doing, it argues that, in the midst of great wealth, many Australians are living time-poor lives.

A2.3.1 Impacts on QOL and workplace abilities

Pocock et al.’s research has led them to exhort that the ‘big squeeze’ on the important personal resource of time affects not only people’s QOL and wellbeing in the workplaces, in households and in communities but also their ability as workers to increase skills and qualifications. This time bomb can, they suggest, be diffused by acknowledging and counting the costs incurred, weighing up work and its larger effects and consciously deciding what is enough work, decent work, and a more ‘balanced’ life.

A good job is also one that fits with our lives so that we have time for rest and recovery (including sleep), which are necessary for our health, safety and productivity.⁸

The QOL argument is used to pay attention to conflicts that arise between work and other life activities. Work is important but Pocock et al. (2012) contend that Australian workers think that there are also other things to be experienced, enjoyed, attended to and achieved in life. General support for this argument can be found in the AWALI 2012 survey⁹ where one third of Australians said they would like to work fewer hours, even if it means less money. Furthermore, one in seven mining industry workers who responded to the WA ABS survey mentioned in subsections 1.2.5 – a higher proportion than in any other industry – said their work-life activity was rarely or never balanced and for over half of the remainder, work-life interference meant that balance was only achieved ‘sometimes’.¹⁰

A2.3.2 Unhealthy working situations and patterns

Identified standouts in Australian workplaces for creating unhealthy working situations/ patterns include:

- the nature of work demands (essentially, workplace flexibility); together with
- level (lack) of control workers have; and

⁷ Pocock et al. (2012)

⁸ Pocock et al. (2012: 46)

⁹ Skinner et al. (2012)

¹⁰ ABS (2011) Cat. No. 6201.5

- the supportiveness of the work culture.¹¹

Pocock et al. contend that work, in itself, is not always a social good. If what happens in the workplace causes workers to become fatigued and over-worked, there can be implications for social wellbeing. This can become magnified if the stretched workers live in communities where others are similarly stretched. At the same time, households and communities can shape what happens at work, the outcomes for workers, workplaces and the fortunes of employers¹² and thus problems experienced at home can be reflected as negativities in the workplace.

A2.3.3 Stressors from diverse working and commuting patterns

What used to be the ‘standard’ working week in Australia of nine to five, Monday to Friday, has given way to extremely diverse working patterns. This applies especially within the resources sector where 12-hour shifts within extended rosters have become the norm. Moreover, patterns of travel to and from work can be time ‘wasted’ in commuting.¹³ For those employed as fly-in, fly-out workers, complex long-distance travel patterns over hundreds, often several thousands, of kilometers, involving car/bus as well as air travel can often eat into precious days off within limited leave cycles.

In an effort to reduce travel time, large numbers of non-resident workers and their families relocate to cities (e.g. Perth, Brisbane and Mackay) or smaller centres. While this type of mobility can be associated with better work opportunities and positive change, it can also introduce other stressor such as the need to establish new community relationships, often in the absence of extended family support.¹⁴

A2.3.4 Factors shaping outcomes from work

Income from work is important to individuals and their immediate families and many take pleasure, identity and skills from their jobs. However, a number of other factors shape outcomes from work and affect what Australian workers ‘take home’ from work. These include:

- hours and flexibility of working time;
- characteristics of the job;
- the workplace and its cultures and norms;
- the industries within which people work; and
- the conditions and regulations of the larger labour market.¹⁵

¹¹ Pocock et al. (2012: 52)

¹² Pocock et al. (2012: 13)

¹³ Pocock et al. (2012: 13)

¹⁴ Pocock et al. (2012)

¹⁵ Pocock et al. (2012: 16)

For workplaces, households and communities to be resilient in Australia, people need to be more adaptable so that they that can navigate changes and defuse feelings of time poverty. Moreover, the promotion of equality of opportunities over people's life-cycles leads to higher levels of individual and social wellbeing:

While we experience social or community exclusion individually, living in unequal societies affects all: it gets under the individual and social 'skin', shaping a society's health, economy, safety and mobility as well as its sustainability.¹⁶

Pocock et al. maintain that a well-functioning socio-ecological system of work, family and community would have:

... strong, healthy and inclusive communities; productive workplaces with low levels of turnover, absenteeism, injury and illness, high levels of worker wellbeing, satisfaction and engagement' and high levels of family wellbeing, coherence and support (for infants, children, teenagers, and adults).¹⁷

A2.3.5 Important matters affecting quality of work

The ability to control how the different domains of this socio-ecological system fit together on terms that allow a preferred mix of jobs family and community relations is not available to many. Thus if people can feel good about their job, it can compensate for imperfect balance. One of the major factors influencing this is the quality of work including job security, demands and fairness.¹⁸ Other aspects of the workplace identified as important include:

- the nature of supervision;
- workplace culture;
- the extent of flexibility;
- the ability to change working time and place;
- the predictability of working time; and
- the hours of work.

Consequences of overwork can include high health and productivity costs. These are often hidden from public view but are privately experienced and privately and publically paid for.¹⁹

Pocock et al. discuss the importance of work, care, rest and play theoretically and also as these aspects have been found to impact upon Australian workers though results

¹⁶ Pocock et al. (2012: 17)

¹⁷ Pocock et al. (2012: 22)

¹⁸ Pocock et al. (2012: 28)

¹⁹ Pocock et al. (2012: 27)

from the AWALI surveys. They remind us that the Australian workers' campaign for an eight-hour day was based on equal hours of labour, recreation and rest. This principal, although largely unachievable in contemporary Australia, has, they maintain, been backed by psychological research. Furthermore, according to effort-recovery theory:

... people have a fundamental psychological need to rest and recover after exertion. This applies not only to physical effort, but to mental effort as well. Our bodies and minds need a break after a period of work, regardless of whether we work in an office, factory, construction site or classroom. Failure to rest and recover can create a negative feedback loop, in which we become increasingly exhausted and fatigued, trying to push ourselves to work without being fully rested and refreshed.²⁰

A2.3.6 How much work is too much?

We will return to these themes later on but, in the meantime, this introduced the question of how much work is too much?

In Australia, the National Employment Standards establish 38 hours as the maximum weekly hours plus 'reasonable' requests to work longer hours. What is 'reasonable'? The International Labour Organisation (ILO) defines 48+ hours as 'very long' and the European Parliament's Working Time Directive places an upper limit on weekly working hours of 48 hours for workers in the European Union, including overtime. For the purposes of statistical collection, the ABS defines 50+ hours as 'very long'.²¹

Pocock et al. (2012) acknowledge that the complexities and nuances of real life mean that it is not possible to identify an absolute and universal benchmark of long work hours beyond which health, safety and wellbeing is severely compromised for everybody. Rather, the effect of hours worked on health and other outcomes depends on a range of contexts including:

- the demands of the job;
- when the hours are worked (day or evening/night);
- whether working long hours extends over a few days, weeks, months or longer;
- where and what 'home' is to workers; and
- demands on them during time off.

A2.3.7 Potential impacts from working long hours

The following summary of some potential impacts from working long hours²² may be of relevance to an industry sector which is concerned about wellness and wellbeing of employees. In general, working long hours (irrespective of definition):

²⁰ Pocock et al. (2012: 30)

²¹ Pocock et al. (2012: 31)

²² Pocock et al. (2012: 31-32)

- increases the risk of a range of mental health issues (e.g. burnout, stress, depression);
- are deterrents to physical health (e.g. cardiovascular disease, cancer, work-related injuries, sleep problems, immune and gastrointestinal disorders);
- affect the quality of close relationships with partners, children, family and our wider social circle;
- influence the likelihood of workers to smoke, consume more alcohol, exercise less, and have unhealthy weight gain; and
- regularly working overtime of more than five hours a week Increases the risk of mortality (particularly for women).

A2.3.8 Health and productivity impacts from work-life conflict

Pocock et al. point to a recent study in the Netherlands²³ which found that work-to-family conflict was related to both higher cholesterol and body mass index. Of additional relevance, more positive work-family balance was found to be related to improved health outcomes including weight loss and lower cholesterol levels, as well as improved workplace outcomes such as lower absenteeism.²⁴

There are also disadvantages for employers linked with employees working long hours. These include:

- increased absenteeism and lower productivity; and
- less satisfied and committed workers; which leads to
- workers being more likely to leave their jobs; and
- negative impacts on fatigue and sleepiness which can translate as accidents at work and travelling to and from work.²⁵

Importantly, Australian and international studies have shown that, regardless of the length of work hours, if they do not fit with a person's working time preferences, the risk of stress and burnout, poor physical health, family wellbeing and decreased satisfaction with one's job and life in general can be amplified.²⁶

A2.4 Other national subjective measurements

A2.4.1 Quality of Life in Australia: An analysis of public perceptions

A 1999 Newspoll survey gauging public perceptions of 1200 adult Australians found that 75% of Australians rated 'being able to spend more time with your family and friends' as very important in improving their personal QOL, while 66% rated 'having

²³ Pocock et al. (2012: 46)

²⁴ Van Steenbergen and Ellemers (2009) in Pocock et al. (2012)

²⁵ Pocock et al. (2012: 42, 47)

²⁶ Pocock et al. (2012: 33, 47)

less stress and pressure in your life' as very important. Only 38% rated as very important 'having more money to buy things'.

Instead of narrowly focusing on material progress, Australians were seeking a better balance between economic welfare, social equity and environmental sustainability. Qualitative surveys were explaining a growing tension between values and lifestyle which was heightened by 'the promotion of a fast-paced, high-pressure, hyper-consumer lifestyle'²⁷ on which economic performance depended

A2.4.2 The Ipsos Mackay Report

Discussion about concepts of wellness and wellbeing and QOL in Australia might appear incomplete without at least passing reference to social commentator and psychologist Hugh Mackay. Mackay is recognized as a pioneer of social research and the use of focus groups in Australia to explore what drives Australians and is of concern and importance to them. His influence extends to the government, education and corporate sectors. In addition to *The Ipsos Mackay Report* quarterly research series (previously *The Mackay Report*), he is the author of a number of books which deal with Australians' thoughts and opinions but none are further referenced for this review. The book list consists of:

- What Makes Us Tick? (2010)
- Advance Australia ... Where? (2007)
- Turning Point (1999)
- Generations: Baby Boomers, their Parents & their Children (1997)
- *Reinventing Australia* (1993) drew on 60 individual reports

Mackay has argued that Australia has plenty to be disappointed about in terms of QOL and wellbeing. He has highlighted the mood of disengagement by the population, the rise of unbridled materialism, and the ways in which levels of debt that can't be sustained have been embraced.

²⁷ Eckersley (1999: ix)

Appendix 3: Mining Industry Subjective Measurements

A3.1 The Australian Coal and Energy Survey

Phase One of this longitudinal study of working arrangements and wellbeing¹ examined the impact of the role of shift patterns on wellbeing and health of 2566 workers (and 1915 partners) who were members of the Construction, Forestry, Mining and Energy Union (CFMEU) and employed in Queensland's coal and energy industry in the latter part of 2011.

Peetz et al. reported that results when compared against parallel data sourced from the AWALI survey closely mirrored those findings. We caution that care be taken with interpretation of results, however, due to our identified bias in the sample. For instance, the report (unless otherwise identified) states that:

- Respondents were mostly long-term industry workers; 45% had worked in the industry for at least 20 years.
- Only 130 (5%) of respondents had worked in the industry for less than two years at the time of the survey.
- The numbers employed in coal mining alone grew by a massive 24,300 (65%) in the two years immediately before the survey.²
- Importantly, the survey was limited to members of the industry union (the CFMEU).
- Only about 60% of coal mining employees are members of the union.
- 92% of those surveyed were permanent or ongoing staff (i.e. not contracted workers).
- Most FIFO/DIDO workers are now contracted.³

In summary, the dataset under-represents potentially dissatisfied employees who have left the industry and also FIFO/DIDO workers. Furthermore, workers new to the industry (many of whom would be FIFOs/DIDOs) were particularly under-represented.

Also notable is that most resource sector employees (around 60% according to recent ABS data⁴) now work more than 45 hours per week and yet the median hours worked by survey respondents, at 44.5 hours, was less than this. This further begs the question of industry representativeness of the survey respondents. This is not a criticism of methodology but rather an illustration of the difficulties in accessing mining industry employees for this type of research.

¹ Peetz et al. (2012)

² ABS Cat. No. 6291.0

³ Carrington et al. (2011)

⁴ ABS Cat. No. 6291.0

The authors caution that their report is preliminary in nature as Phase Two is yet to come. Nevertheless, worker responses reported to questions about preferred and actual hours indicated that:

- The majority of workers (61%) preferred to work less than 41 hours per week.
- The most common preference was for a 40 hour working week.
- Some 50% were working more hours than they would prefer, even after taking into account the effect that a reduction in hours worked would have on income.
- The survey was likely to understate the gap between employee preference and the actual hours worked for those who have entered the industry.

With reference to shifts and sleep:

- During work cycles, workers were experiencing uncharacteristic levels of tiredness clearly linked to their shift work.
- 58% experienced difficulties falling asleep between successive night shifts and 42% felt they needed 'a lot more' sleep or were getting 'nowhere near enough'.
- 62% experienced difficulties when their shift changed.
- During shift changes, 29% said they needed a great deal more sleep.
- 39% had difficulty sleeping between day shifts but only 18% felt the need for a lot more sleep.
- During leave cycles, only 34% experienced difficulties sleeping with 8% wanting a lot more sleep.
- 37% of respondents admitted using alcohol to help them sleep.

In summary, a clear majority was dissatisfied with working hours and shifts and experienced difficulties with their sleep patterns.

Among those working shifts, there were complex reactions about whether they wanted to abandon shift work altogether and go back to day jobs. Less than one in three of those working 12.5 hours or more per shift did not wish to give up shift work. On balance, however, a majority thought that the advantages of their current arrangements outweighed the disadvantages. Nevertheless, 'all other things being equal', a majority leaned towards giving up shifts. These outcomes would reflect the bias in the survey to represent attitudes of 'survivor' populations of this workforce.

A3.2 Survey of Queensland workforce accommodation arrangements

A study titled *Workforce Accommodation Arrangements in the Queensland Resources Sector* which was commissioned by the Queensland Resources Council (QRC) in August 2011 gathered the views of resources sector employees regarding working and

residency arrangements in the minerals and energy sector.⁵ The study was largely dependent on distributed survey forms to gather data from within the Bowen Basin (coal mining), the Surat Basin (coal seam gas) and the North West Minerals Province (centred round Mt Isa).

Of 2,250 completed surveys, 55% (1,241) were residential workers with the remainder (1,009) non-resident workers (NRWs). Minimal difference was reported in demography and family characteristics (85% were in a relationship; 46% did not have dependent children) or the time spent in the resource sector between residential respondents and those who were NRWs.

Greater than 60% of both residential and non-residential respondents had been in the sector for five years or more. In the five years from the beginning of 2012 (when the surveys were returned), mining industry employment in Queensland had grown by 27,100 or 76%.⁶ Clearly, therefore, survey respondents were more likely to be employees who were essentially satisfied with their work and accommodation arrangements. Indeed, most respondents (64%) did indicate they were in preferred accommodation arrangements. Thus respondents are not necessarily representative of workers in the industry and the results need to be digested with this in mind. The voice of those who choose to exit the industry due to dissatisfaction is, of course, difficult to capture.

Most of the anticipated growth in Queensland – an almost doubling in operating employment from 2011 to 2020 – is expected to be in coal mining from the Bowen and Galilee Basins. Expanding workforces in these and other regions, especially in Western Australia, and the concomitant additional strain on already struggling accommodation, services and infrastructure may add to the difficulty in attracting workers to these locations and the disturbances to frontline local communities.

The survey results for respondents showed that:

- The accommodation arrangement was important or very important in employment decision making to 82% of residential workers and 70% of non-residential workers.
- Around 60% of NRWs were accommodated in camps close to their worksites.
- 40% of residential and non-residential respondents were in their preferred accommodation arrangements and had taken the job because their preferred arrangements were available. The implication is that if preferred arrangements were not available, they would not choose to work in the resources sector.
- 20% of NRW respondents wanted to change to residential status; being able to

⁵ URS (2012)

⁶ ABS Cat. No. 6921.0

- make the change was important for them.
- 15% of NRW respondents stated they were in non-preferred accommodation arrangements.
- 61% of non-residential respondents rated their accommodation as good or excellent.
- 19% of non-residential respondents rated their accommodation as poor or very poor.

Respondents were asked to rate the relative importance of various factors in taking up employment in the resources sector. Ranked similarly as of most importance in deciding to work at the current site were:

- accommodation arrangement;
- salary;
- career development;
- reputation of employer; and
- work roster.

These survey findings were supported by the views expressed in 14 interviews with HR personnel who were responsible for recruitment and employee management. Views on accommodation arrangements and issues that might influence recruitment decisions were also sought. The most important influencing factors in deciding accommodation arrangements for both residential and non-residential respondents were:

- work-life balance; and
- overall quality of life.

Both residential and non-residential respondents also ranked the following highly, although the former group placed more emphasis on them:

- quality of accommodation;
- suits family arrangement; and
- allows involvement in family life.

Demand for employees in the resources sector is outstripping supply. Employees, especially those new to the sector, are becoming more discriminating in their choices of employer and employment conditions.

Appendix 4: Selected mining industry labour and demographic characteristics

Due to the emphasis given to the influence that hours worked has on wellness, wellbeing and QOL in both Skinner et al. (2012) and Pocock et al. (2012), a brief analysis of some ABS labour and demographic characteristics which have relevance in this review are presented in Appendix F. Figures have been created using statistics available in ABS labour force databases.

There has been dramatic growth in employment in the Australian mining industry since around the mid-2000s. Most of this growth is in full-time employment (Figure A4.1). Part time employees represent only about 3% of the total mining workforce identified within the ANZSIC industry classifications.¹ The classification for mining exclude workers directed employed for resources sector activities such as surveying, construction, transportation, processing, maintenance, work camp accommodation, catering, cleaning and security.

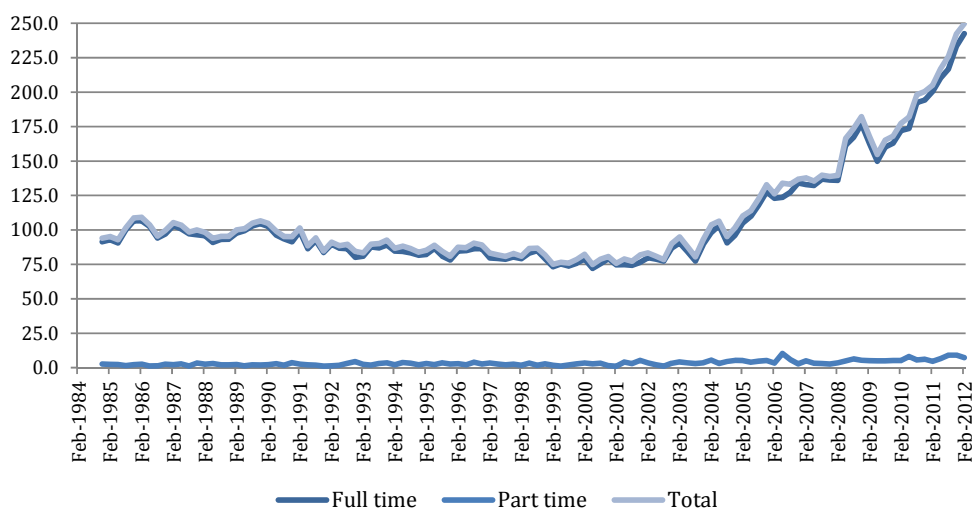


Figure A4.1: Mining industry employment numbers, Australia, Feb 1985-Feb 2012

Source: After ABS Cat. No. 6291.0

Specifically, full-time employment has grown by over 80% in the five years from February 2007 (132,900 workers) to February 2012 (242,500 workers). Latest available ABS data for February 2013 show a further increase to 259,600 persons.²

Most employment growth over the past five years has been in Western Australia and Queensland. Figure A4.2 shows the dominance of these two states, Western Australia in particular. Growth has also been strong in New South Wales.

¹ ABS Cat No. 6291.0

² ABS Cat No. 6291.0

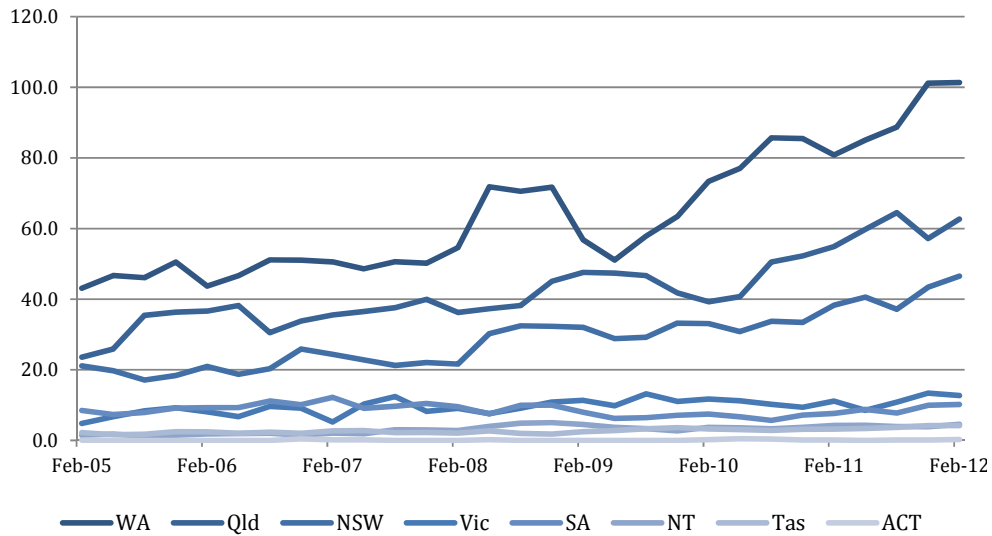


Figure A4.2: Australian mining industry, full time employment by state, Feb 2012

Source: Source: After ABS Cat. No. 6291.0

From 1985 to 2012, the proportion of mining industry employees working a ‘standard’ week of 30-39 hours (or less) has declined from 50% of the industry’s workforce to 30% (Figure A4.3). During the same period, the proportion working 50 hours or more has risen from 20% to 53%. Indeed, by November 2012, 70% of the mining industry workforce worked 40 hour or more per week. This upward trend in number of hours worked has become emphasised over the years since 2005.

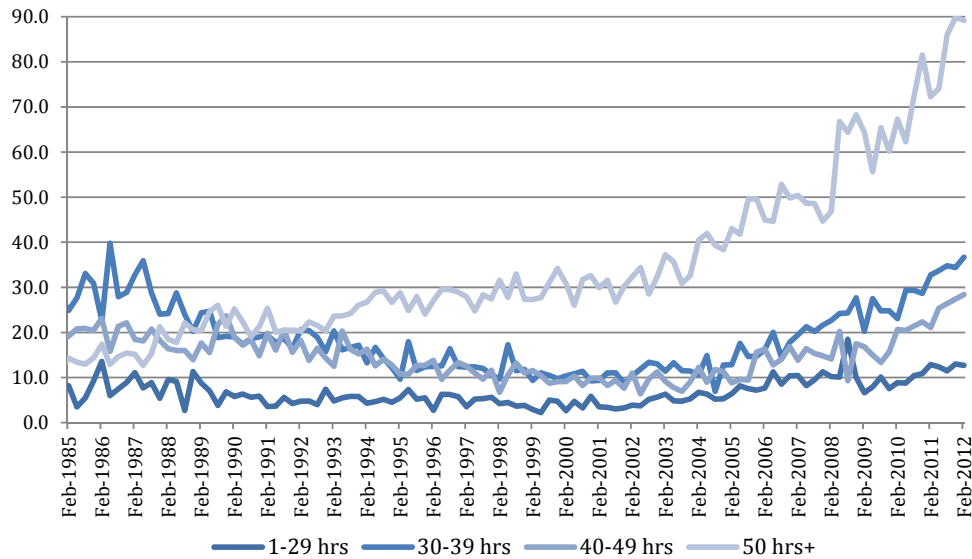


Figure A4.3: Mining industry persons employed full time, hours worked per week, Australia, Feb 1985-Feb 2012

Source: After ABS Cat. No. 6291.0

Although the number of females in the industry has risen in recent years, it remains dominated by males (Figure A4.4). In February 2012, 85% of full-time employees were males.

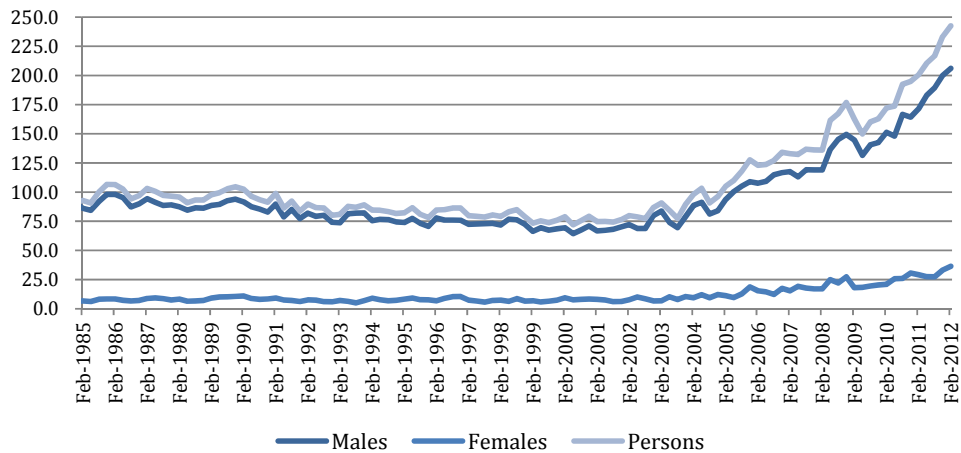


Figure A4.4: Mining industry numbers, full employment, Australia, to Feb 2012

Source: After ABS (2102, Cat. No. 6291.0)

Ageing of the mining workforce has been cited as one reason for the comparatively high levels of workforce turnover³ and also of chronic health problems by comparison with other industries.⁴ A large majority of workers (at least 85%) are males. Figure A4.5 shows that around 26,000 (11.2%) of males are aged 55 years or more.

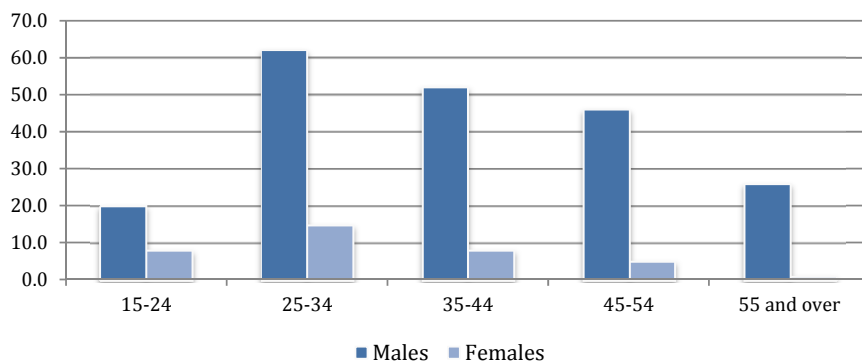


Figure A4.5: Mining industry full time numbers (000s), by age, Australia, Feb 2012

Source: After ABS (2102, Cat. No. 6291.0)

Figure A4.6 shows mining industry workforce numbers by occupation for the ten years to February 2012. Australia-wide, most workers were either Machinery Operators and

³ Beach et al. (2003); Kinetic Group (2012); NRSET (2010)

⁴ Shannon and Parker (2012)

Drivers or Technicians and Trade Workers. Numbers in these 'blue collar' occupations have risen considerably since the mid-2000s.

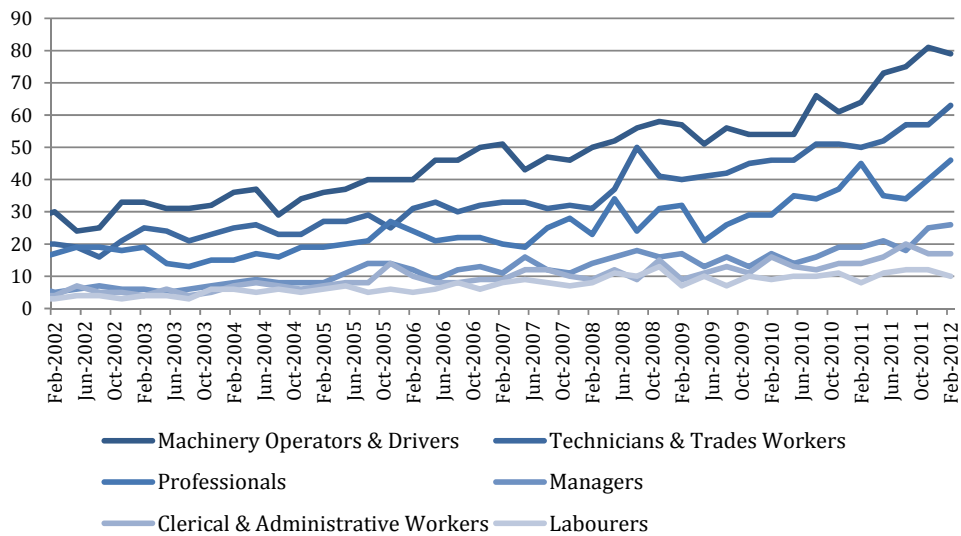


Figure A4.6: Mining industry workforce numbers (000s) by occupation, Australia, Feb 2002 to Feb 2012

Source: After ABS Cat. No. 6291.0

While there has been an increase over recent years in the number of mining industry employees in all occupations, the upward trend has been more magnified for the dominant blue collar occupations than for the traditional white collar professions as shown in Figure A4.7.

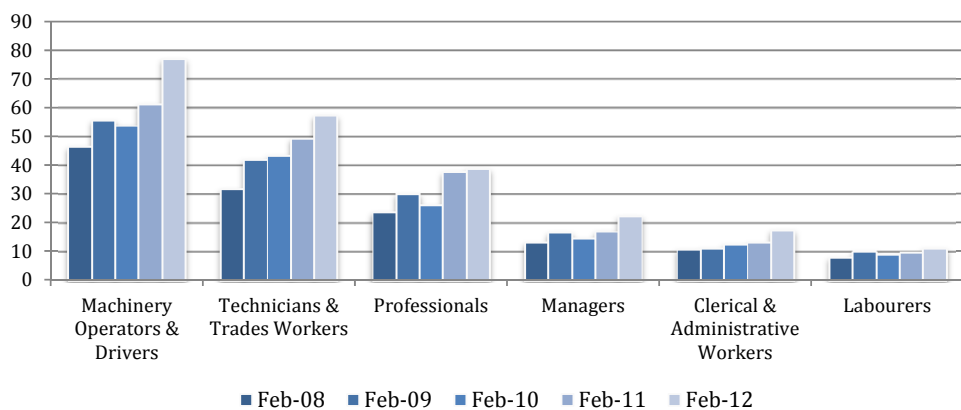


Figure A4.7: Average number of full-time mining industry workers (000s) by occupation, Australia, Feb 2008 to Feb 2012

Source: After ABS Cat. No. 6291.0

The mining industry is dominated by males more so than other industries with the exception of the construction industry (Figure A4.8). The proportion of construction workers directly employed by the resources sector has, over recent years, been

assessed as high owing to the resources boom and the rush to develop new or expand existing minerals and energy projects. Numbers cannot, however, be identified.

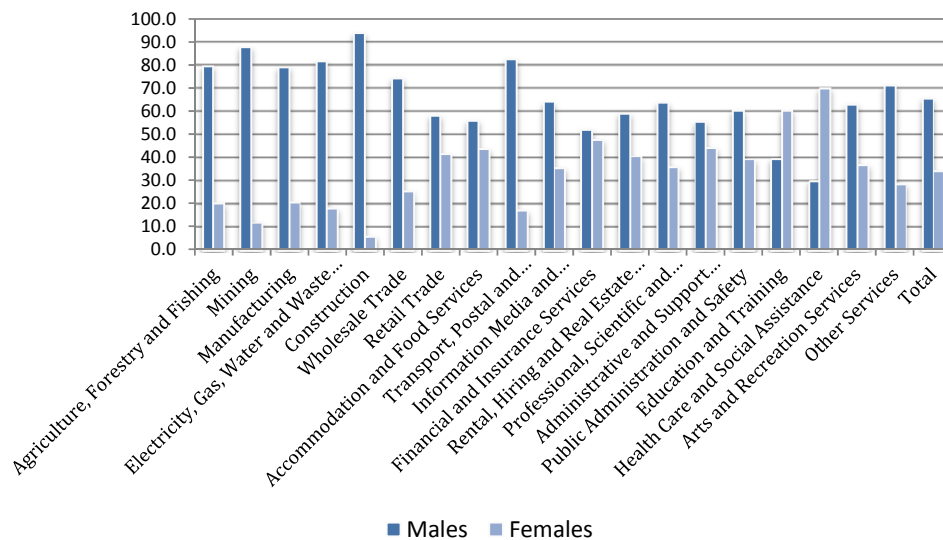


Figure A4.8: Gender of workers %, Australian industries (ANZSIC classifications), Feb 2012

Source: After ABS Cat. No. 6291.0

Industries with traditionally large proportions of males are also those with large numbers of blue collar workers. Figure A4.9 illustrates the representation of female workers in the main occupations for mining compared with other selected 'blue collar' industries with large numbers of male workers. With the exception of Clerical and Administration Workers, female workers in the mining industry are comparatively low.

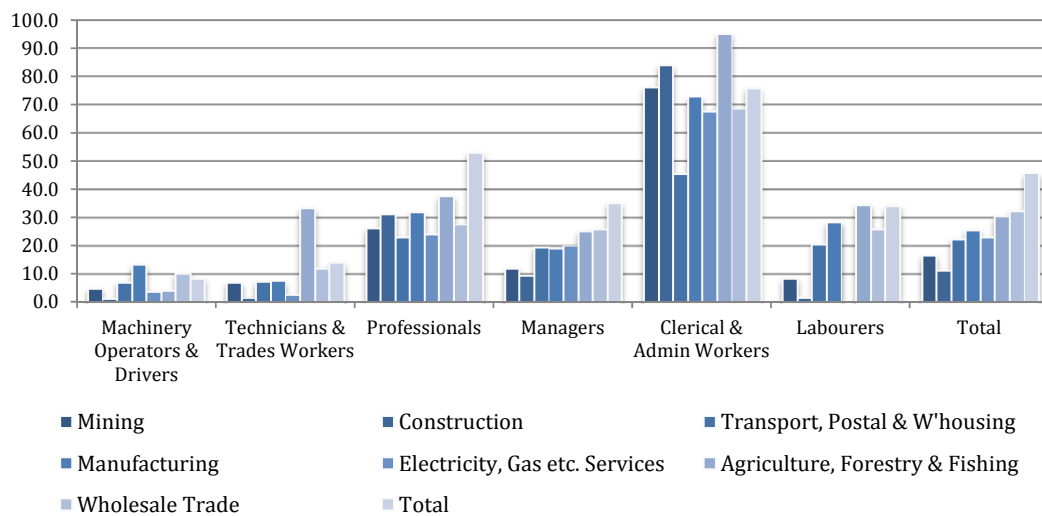


Figure A4.9: Female workers % by occupation for 'blue collar' industries, Nov 2011

Source: After ABS Cat. No. 6291.0

Appendix 5: Participating organisations in PwC report

In the preparation of its 2010 report on the evolution of workplace wellness in Australia, PricewaterhouseCoopers (PwC) consulted with 17 participating organisations into the current state of workplace wellness in Australia. Table A5.15 lists the diverse types of organisations; only one – Rio Tinto – was representative of the mining/resources sector. Many tended towards having metro-centric or ‘white collar’ types of operations and thus were at odds with the resources sector with its activity base in regional/remote locations and where most jobs are ‘blue collar’. Nevertheless, the report is instructive and supportive of other findings.¹

Table A5.15: Types of participating organisations in the PwC (2010) survey, by industry²

Academic Research	1
Business Council	1
Chamber of Commerce	2
Construction	1
Consumer Products	1
Financial Services	4
Industry Group	1
Information Technology	1
Mining /Resources	1
Pharmaceutical	2
Statutory Authority	1
Telecommunications	2

Some human resources representatives of the participating companies took the view that wellness initiatives, rather than being a differentiator, have become the expectation of many potential employees. Until this view becomes widely adopted and implemented, however, programs aimed at retention and motivation of staff can distinguish preferred employers within a competitive labour market such as that experienced in the mining industry.

¹ See, for example, DMPWA (c. 2009); Queensland Government (2010)

² PricewaterhouseCoopers (2010)

Appendix 6: State 'Healthy Workers' strategy

A6.1 Queensland's Healthy Workers strategy and mining industry challenges

This state's plan includes a mix of targeted strategies and a range of centralised support tools for workplace wellness with specific references to this industry. The report references research profiling industries and occupational groups at a higher risk in those areas where support is to be focused within NPAPH workplace health programs: i.e. smoking, poor nutrition, physical inactivity and/or harmful alcohol consumption.

A6.1.1 Blue collar occupations

The Queensland Healthy Workers strategy notes that identified high risk or hard-to-reach industries and workplaces included blue collar occupations in the mining industry: i.e. technicians and trades workers, labourers, machinery operators and drivers. Hence these become targeted workers.

Compared with other industry groups, Queensland blue collar industries have the highest prevalence of:

- smoking (33.1%);
- physical inactivity (77.8%);
- overweight or obese measured (64.6%) and self-reported (63.5%) Body Mass Index (BMI); and
- alcohol consumption at increased lifetime risk (35.3%).¹

In addition, blue collar workers have the second highest prevalence of inadequate fruit and vegetable intake (55.9%). These prevalence estimates of modifiable lifestyle risk factors are also significantly higher than the national employed average.

Specifically, the Healthy Workers strategy states that for the mining industry:

- rates of smoking are higher than for national and state averages;
- lifetime and single occasion risky and high risk alcohol consumption are higher than for national and state averages;
- rates of overweight or obese measurements (BMI and self-reported) are above the national and state average;
- rates of physical activity are lower than the Queensland average; and
- rates of inadequate fruit and vegetable intake are lower than the national and state average and the third lowest of all Queensland industries.

These findings have been supported elsewhere. For example, significant variations in

¹ Queensland Government (2010)

the health behaviours of professionals (generally higher qualified workers) compared to non-professionals (blue collar workers such as machinery operators and drivers) were observed in the PwC report.² It also recounted that, overall, blue collar workers tend to exhibit poorer health behaviours and experience greater risk factors than both professionals (white collar workers) and the general population. The summary of results from the 2007 Victorian Population Health Survey³ (Table A6.16) illustrate this.

Table A6.16: Comparative health behaviours and risk factors, Victoria, 2007⁴

<i>Victorian population</i>	<i>Professionals</i>	<i>Non-professionals</i>	<i>State-wide</i>
Risky or high-risk drinkers – short-term harm	47.7	52.2	
Current smokers	13.5	24.6	19.9
Daily fruit intake lower than recommended levels	50.1	40.0	45.7
Self-reported excellent/very good health	53.9	42.7	
Psychological distress – moderate levels	20.0	27.0	

Identified higher health risks for blue collar workers is especially relevant for the mining industry as illustrated in Appendix D by the high proportion of machinery operators and technicians and trade workers.

A6.1.2 Regional and remote workers

The report notes, furthermore, that prevalence of modifiable lifestyle risk factors for workers outside Brisbane are consistently higher than for workers from this capital city. In particular, workers outside Brisbane had higher levels of:

- smoking (Brisbane: 20.6%; balance of state: 27.9%);
- physical inactivity (Brisbane: 73.8%; balance of state: 75.9%);
- overweight or obese measured BMI (Brisbane: 55.5%; balance of state: 60.3%); and
- alcohol consumption at increased lifetime risk (Brisbane: 23.5%; balance of state: 27.6%).

Higher levels of almost all risk indicators (obesity, physical activity, smoking, consumption of alcohol, cholesterol) point to higher risk of cardiovascular disease, Type 2 diabetes and chronic kidney disease in regional and remote areas.

Mining industry workers are mostly employed in regional and remote areas. Moreover, identified high-risk industries and areas in the state include regional areas of predicted high employment growth. Notably, continued and new resource exploration and mining

² PricewaterhouseCoopers (2010)

³ Department of Human Services (Victoria) (2008)

⁴ Department of Human Services (Victoria) (2008)

are anticipated as drivers of large employment growth in this state. Estimates of workforce numbers are difficult to quantify and vary but a range of reports that we have sourced show that:

- November 2012 workforce statistics for the mining industry indicate 73,400 persons, approximately 4.4% of the Queensland workforce, were employed full-time within the mining industry for operational activities;^{5, 6}
- in May 2012, the need for 39,600 *additional* operating workers in Queensland by 2020 was forecast by the industry;⁷
- In November 2012, developers were committed to 22 new or expansion resources projects in Queensland valued at \$78.4 billion;⁸ and
- Numerous other projects are in the pipeline, currently undergoing feasibility studies or awaiting final investment decisions.⁹

A6.1.3 Sedentary workers

Irrespective of an individual's level of physical activity, there is emerging evidence suggesting that sedentary behaviours may be an independent risk factor for chronic diseases such as Type 2 diabetes.¹⁰ This emerging evidence has implications for workplaces with a large proportion of their workforce in essentially sedentary roles. This classification can apply to both white (e.g. office) and blue (e.g. machinery operators and drivers) collar workers in the mining industry.

A6.1.4 Delivery ideas

Targeted implementation of workplace wellness initiatives (workplace-based health promotion programs) in the Queensland Healthy Workers plan¹¹ will include:

- encouragement for settings to implement holistic workplace health promotion to reduce chronic disease lifestyle risk factors facilitated through *Workplaces for Wellness* support workers and matched funding support schemes;
- targeted delivery of evidence-based workplace wellness initiatives such as *Pit Stop Men's Health Program* and the *Sustainable Farm Families Program*;
- facilitated access to workplace specific health support services (e.g. *Workplace Quit Smoking Program*); and

⁵ ABS Cat. No. 6261.0

⁶ Note these statistics excludes many tens of thousands of workers estimated for other regional resource sector activities such as surveying, construction, transportation, processing, maintenance, work camp accommodation, catering, cleaning and security.

⁷ URS (2012)

⁸ BREE (2012)

⁹ BREE (2012)

¹⁰ Queensland Government (2010)

¹¹ Queensland Government (2010)

- equitable access to workplace-based health promotion support tools and resources (e.g. *Workplaces for Wellness* webportal, *Workplaces for Wellness* recognition scheme, *10,000 Steps Workplaces* program and *Get Healthy Information and Coaching Service*).

A6.1.5 Envisaged outcomes

The activity of adapting, implementing and evaluating best-practice workplace-based programs and policies with targeted industries, workplaces and employee groups aims to build the capacity of employers to improve their workers' health and wellbeing and to encourage these workers to make healthy lifestyle choices.

The Queensland Healthy Workers plan envisaged that short-term outcomes would include:

- engagement with key industry, workplaces and employee groups to increase readiness for sustained commitment to workplace wellness;
- implementation of best-practice workplace wellness initiatives in a range of hard-to-reach and high-risk workplaces; and
- increased *Workplaces for Wellness* webportal usage and recognition scheme participation by workplaces.

Other specific short-term outcomes for workers may include:

- increased understanding and identification of risk factors for lifestyle-related chronic diseases;
- increased access to health information, support services and evidence-based workplace wellness initiative; and
- increased awareness of physical activity opportunities within the workplace and community, smoking and harmful alcohol consumption cessation support services, and healthy eating recommendations.

The plan envisaged that medium-term outcomes would include:

- an increased number of Queensland workplaces valuing and addressing workplace wellness through supportive policy, cultural and physical environments;
- enhanced linkages between health services and workplaces; and
- increased healthy lifestyle awareness, knowledge, skills for Queensland workers within key industries.

Medium-term outcomes may also include increased positive healthy lifestyle behaviour change by individual workers resulting in reduced smoking prevalence and harmful

alcohol consumption, and increased fruit and vegetable consumption and physical activity levels.

Envisaged long-term outcomes would include:

- an increase in sustainable individual worker healthy lifestyle behaviours;
- a reduced risk of workers developing lifestyle-related chronic disease; and
- workplaces with sustainable investment in evidence-based workplace health promotion programs, strategies and policies.

A6.1.6 Strategy rationale

The rationale for Queensland's Healthy Workers strategy was based on:

- national and international evidence pointing to workplaces as a highly effective setting for promoting health and wellbeing and preventing chronic disease;
- best practice health promotion advocating the effectiveness of targeted workplace health promotion initiatives that consider the specific needs, differences and challenges of worker groups; and
- the Queensland Government also prioritising collective efforts in order to achieve the greatest gains in worker health outcomes.

The key process used to determine priority worker groups was assessment of emerging evidence that identifies:

- specific workplace groups with a greater prevalence of chronic disease risk factors ;
- hard-to-reach workers/workplaces; and
- industries and sectors employing large proportions of the workforce.

Additional considerations included workplace groups with high proportions of the workforce comprising of broader priority population groups such as those from low socio-economic backgrounds, people from culturally and linguistically diverse backgrounds and Aboriginal and Torres Strait Islanders.

A6.1.7 Prioritising workplace wellness programs

The Queensland Strategy identified five core principles to help guide the prioritisation of effort and selection of workplace wellness programs and policies including:

- evidence of effectiveness;
- cost effectiveness;
- the potential for significant health gain within the short to medium timeframe;

- conduciveness to a partnership/shared responsibility approach; and
- non-duplication of existing initiatives.

A suite of evidence-based workplace wellness initiatives have been identified for expansion, further development and/or implementation with the selected priority workgroups.

A6.2 Other state Healthy Workers strategies

The **South Australian** *Implementation Plan for Healthy Workers Initiative*¹² additionally pointed out that mining industry workers have increased risk to their health from alcohol consumption at the following levels:

- 66.2% risky (national average 47.2%; South Australian average 48.6%);
- 59.2% high risk (national average 32.7%; South Australian 32.1%); and
- 38.1% increased lifetime risk (national average 23.8%; South Australian 20.7%).

Although **Western Australia** has published its strategy, no references specific to mining industry workers or plans targeting this industry could be found in the 88-page document titled *Western Australian Health Promotion Strategic Framework 2012-2016: Working Together to Promote Health and Prevent Chronic Disease and Injury in our Communities*.¹³

¹² South Australian Government (2010)

¹³ Department of Health (Western Australia) (2012)

Appendix 7: Reviewing the mining lifestyle

This appendix presents material sourced in addition to that presented in Section 2.4 of the main report.

A7.1 Wellbeing of FIFOs: Referencing a personal reflection

This section draws upon the experiences of one person during two and a half years of employment as a contracted FIFO machinery operator at different mine sites, under different shift conditions and across different operating crews.¹ Presented at the Eighth AUSIMM Open Pit Conference in Perth in September 2012, this paper appears unique in the insights it offers into the lifestyle of one individual.

Although the viewpoint presented is a personal account, the experiences are also explored from an epistemological perspective and thus the article manages to impartially discuss, based on these first-hand accounts, issues that may be encountered by FIFO/DIDO initiates who are perhaps unprepared for the demands of this type of work and its lifestyle. Because of the potential for bias in the existing, albeit limited, literature which essentially represents attitudes of ‘survivor’ FIFO/DIDO populations,² this account importantly adds balance and informs potential workers, their employers and the industry.

The article provides valuable personal insights into:

- the behavioural effects of night shift – sleep deprivation, mood swings, health and work safety issues;
- disconnections with home-life situations;
- strategies for tackling relationship strain and home conflicts (not all of which worked for Rick and his wife);
- changes in physical health – effects of a sedentary job, and bypassing the gym to socialising at the pub;
- on-site catering and food choices – lack of awareness about readily available educational material; irrespectively, going for taste and speed of service, not nutritional values or ordering a healthy choice;
- alcohol consumption and smoking as part of the mining culture;
- impacts of crew tensions and managing work conflicts;
- impacts of roster patterns on the FIFO experience;
- impacts of varying quality in accommodation camp conditions;
- feelings of isolation and displacement from the family unit; and
- options to consider for social interaction.

¹ Goater et al. (2012)

² Arnold (1995)

Clearly Rick and his wife experienced a range of issues directly attributed to his FIFO work and lifestyle. In 18 months, Rick's weight escalated from 85kg to 110kg. For Rick:

... group exercise or gym after a 12.5 hour shift is like offering another hour of work after a long, mentally fatiguing day. Thus, the use of these services is subject to worker fatigue. Instead of exercise, Rick, like many others, looks forward to sitting down and socialising at the end of the day at the pub.³

For his wife, major concerns revolved around the entrenched drinking and smoking FIFO culture, with its concomitant impacts on his fitness and general health and wellbeing.

The authors concluded by making a number of observations and recommendations. These are summarised as follows:

- Appropriate information should be provided to workers on outcomes of scientific research into the plausible impacts of FIFO/DIDO work on health, wellbeing and lifestyle. Such information should be appropriately delivered and include the limitations and uncertainty of current research in this area.
- The resilience of NRWs and their families could be strengthened by providing an information pack. Social media could be used to promote communication between family and friends and to monitor the 'heartbeat' of workforce health and wellbeing.
- Rosters and day-night shifts should be constructed so that an acceptable work-life balance can be achieved.
- On-site gyms are unlikely to promote worker health in the absence of a holistic site-based approach to health promotion that is tailored to the variety of rosters, shift cycles, job roles, and individual needs of NRWs.
- Extend the concept of 'fit for work' beyond the physical actions required for job roles or tasks by incorporating consideration of food and lifestyle choices that may negatively influence worker health or the ability to sustain the FIFO/DIDO lifestyle.
- Overcome barriers to research on health and wellbeing of workers by making pre-employment and periodic health assessments consistent within, and between, mining companies and the data available to independent researchers.⁴

Parallels may be drawn between the issues faced by Rick and his wife and those raised by Mining Family Matters, an organisation initially created by a 'mining wife' and which offers advice and support to the families of FIFO/DIDO workers, to which we now turn.

³ Goater et al. (2012: 35)

⁴ Goater et al. (2012: 38-39)

A7.2 What matters to FIFO/DIDO members of Mining Family Matters?

In January 2013, Mining Family Matters teamed up with Foxtel for Business to promote a survey on the impacts of separation and isolation on families and workforce retention.⁵ The survey was ongoing at time of writing and hence no results are available. Nevertheless, many of the questions asked are instructive about issues which are perceived as impacting upon the lifestyle of FIFO/DIDO workers. For example, the survey asks workers to indicate their level of agreement with the following statements as to the impact of FIFO/DIDO:

- I feel a sense of separation and loneliness most of the time.
- I miss the regular family activities.
- I have adapted well to the FIFO/DIDO arrangements.
- The relationship with my family is strained because I am away so much.
- My family and I have worked successfully at managing the FIFO/DIDO arrangements.
- The sense of separation and loneliness is so great it will impact on my decision to stay working under FIFO/DIDO arrangements.
- The sense of separation and loneliness impacts on my ability to work productively.

Additionally, the survey asks workers to indicate their level of agreement with the following statements about the things that trigger a sense of separation and loneliness when away from your family:

- Being alone at night.
- Lack of contact with family and friends.
- Lack of access to entertainment options I have at home.
- Not having the daily routines that I have at home.
- Lack of access to recreation options I have at home.
- Missing family routines.
- Not knowing what happens in my home area (local community).

Clearly managing the sense of loneliness or feelings of separation from family is a major issue for FIFOs/DIDOs. Family friendly policies, the ability to easily maintain contact with family and friends, and the quality of accommodation may be key factors influencing workers' continued employment. Survey results may be worthy of accessing though Mining Family Matters when they become available.

A7.3 Other research and reports

Other research has shown that, compared with mining workers who lived locally as

⁵ Consan Consulting (2013: online)

residents, FIFO workers report higher levels of sleep disturbance,⁶ more interference from work in the ability to perform social and domestic activities (such as participating in sport, attending the doctor, looking after children) and an increased likelihood of experiencing greater strain on family life.⁷

According to some reports, the FIFO lifestyle puts significant pressure on the family life of workers and increases the risk of marriage breakdown and suicide.⁸ Although it seems many employers are offering options for confidential counselling for employees and are putting in place some strategies to address the nuances of managing a FIFO workforce, workers may be slow in their acceptance and use of these services.

A research project exploring how FIFO/DIDO lifestyle affected the psychosocial wellbeing of mining industry workers⁹ found that awareness of support in the workplace (such as Employee Assistance Programs) varied and use of such services was generally bypassed. Instead administration staff and nurses or medics (general practitioners) were called on for support although some expressed uncertainty about the role of nurses and medics in providing help regarding mental health issues. Instead, trusted friends or colleagues in the mine site workplace were considered a preferred means of support.

Expatriate placements including those employed under 457 visas are also common in mining but only limited research into the associated psychosocial hazards could be located.¹⁰ International research shows migrant workers are more prone to accidents and injuries in the workplace because they undertake high-risk jobs that native-born people are not inclined to do.¹¹ Other Occupational Health and Safety issues related to cultural and languages differences and misunderstandings can also arise.¹²

Workers surveyed for a project based in a Queensland coal mining area often expressed reluctance to seek support for psychosocial wellbeing with the following barriers identified:

- culture of not discussing problems;
- embarrassment;
- fear of loss of employment if problems were admitted;
- a need for trust in the support person; and
- the need for assurance of confidentiality.¹³

⁶ Peetz et al. (2012)

⁷ Keown (2005)

⁸ Zillman (2012)

⁹ Torkington et al. (2011)

¹⁰ Jones (2000)

¹¹ Ceranic (2012)

¹² See, for example, Maddison (2012)

¹³ Torkington et al. (2011)

Moreover, Torkington et al. (2011) observed that those having problems might not recognise their own stress and thus not seek support. Australian males are classically portrayed as exceptionally proud, stoic, self-reliant men of fortitude who see asking for help as a sign of weakness. This resoluteness to self-reliance often means that troubling issues tend to remain internalized.¹⁴

Several other studies¹⁵ and reports¹⁶ provide recommendations for improving the ability of FIFO/DIDO workers to cope with the lifestyle although whether such recommendations have been implemented has not been reported.

¹⁴ Carrington et al. (forthcoming)

¹⁵ Watts (2004); Keown (2005); Gallegos (2006); Behr (2012)

¹⁶ Nott and Keenan (2012); Trivett (2012)

Appendix 8: Factors and arrangements in the workplace

This appendix elaborates upon factors in the workplace which have the potential to affect the health of Australian mining industry workers, synopses of which have been presented in Section 2.5.

A8.1 Work and hours in the mining industry

The mining industry has high levels of shift work with more than 80% of employees working some form of shift arrangements.¹ Long work rosters with alternating day and night shifts can affect rest and sleep cycles – circadian rhythms – and quality of sleep. Lack of motivation to exercise after a 12-hour work day within a roster with an extended work cycle coupled with poor judgments about nutrition can lead to excessive weight and other health issues.² Furthermore, results from investigations into shift work in the mining industry in Western Australian and in Queensland have shown that many shift workers have problems balancing work, family and social life.³

The 12-hour shifts and long work cycles have largely come about because of industry emphasis on labour and capital utilisation. The coal industry in particular experienced a cost-price squeeze on profitability during the 1990s.⁴ The federal government's Productivity Commission inquiry during 2007 into productivity in the mining industry noted that:

... working hours grew strongly in the 1980s and 1990s and by 1997 mining recorded both the longest hours profile of any industry and the most rapid increase in weekly hours (Heiler and Pickersgill 201, p. 23). The introduction of 12-hour shifts was a key factor ...⁵

Moreover, extended shifts were better suited to FIFO/DIDO arrangements as it was not efficient to have workers travelling long distances to work 'normal' rosters within what used to be 'standard' eight-hour shifts. Although the originally stated intention in a number of mining industries was for these working arrangements to apply solely to mines operating in remote locations adjacent to a mining or resource lease, within a few short years, 12-hour shifts became the industry standard across all types of mine sites (refer to Figure 1.3).

A8.2 Chronic health problems

Compared to most other industries, the mining workforce has a high proportion of

¹ Department of Natural Resources and Mines (2001); Bofinger and Ham (2002); Peetz et al. (2012)

² Nott and Keenan (2012)

³ Bofinger and Mahon (2001); ABS (2011) Cat. No. 6210.5

⁴ Topp et al. (2008)

⁵ Topp et al. (2008)

chronic health problems.⁶ Parameters outlined in the Queensland Healthy Worker strategy for identified high risk or hard to reach industries and workplaces support this assertion (refer to subsection 2.3.1).⁷ Chronic health problems can be further exacerbated by:

- the ageing of the workforce;
- regional and remote location of sites; and
- organisational issues influencing work demands.

Raising awareness among the workforce of health issues is being promoted by governments and by some organisations as an important strategy for addressing chronic health problems. In a mining industry setting, significant potential for workforce health improvement lies across a range of priority health conditions such as:

- cardiovascular disease;
- musculoskeletal (M/S) injury and disorder;
- obesity;
- sleep disorders;
- fatigue; and
- mental health.⁸

All conditions listed in this section are interactive suggesting that there is no single solution to developing intervention to prevent or treat them. For example, chronic M/S conditions may involve both biophysical and psychosocial health issues and the condition may be exacerbated by overweight and obesity.⁹

A8.3 Obesity

An ABS publication based on the 2004-05 National Health Survey highlights the potential of excess body weight to be a health concern for mining industry workers.¹⁰ This industry had the highest proportion (76%) of workers aged 18-64 years classified as overweight or obese. This increases the risk of type 2 diabetes for employees in the industry.¹¹ If left undiagnosed, diabetes can affect vision and cause lethargy with direct implications for safety and production.

Moreover, the occupation with the highest proportion of overweight or obese adults aged 18-64 years was production and transport workers (63%). Our analysis of

⁶ Shannon and Parker (2012)

⁷ Queensland Government (2010); ABS (2011) Cat. No. 6210.5

⁸ Shannon and Parker (2012)

⁹ Shannon and Parker (2012)

¹⁰ ABS (2011) Cat. No. 4710.0

¹¹ Trute (2013)

February 2012 ABS data showed that a majority (at least 59%) of persons in the mining industry were employed in production processes: 33% as machinery operators and drivers and 26% as technicians and trade workers.¹² This further triggers alarm bells about the propensity for obesity in this industry.

A8.4 Workplace stress and mental health

Workplace stress, one of the main causes of presenteeism and absenteeism, has been defined by the World Health Organisation as:

... the response people may experience when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.¹³

It has been described as 'an emotional experience associated with nervousness, tension and strain, brought about by factors related to work'.¹⁴

According to Medibank Private, stress-related workers compensation claims doubled from 2004 to 2008. Excessive work hours, noise, health and safety risks and high workforce turnover – arguably issues associated with working in the mining industry – are among those factors given as examples of types of workplace stressors.¹⁵ Because stress can impact on employee productivity:

- workplace stress is costing the Australian economy \$14.81 billion a year;
- stress-related to presenteeism and absenteeism are directly costing the Australian employers \$10.11 billion a year; and
- 3.2 days per worker are lost each year through workplace stress.¹⁶

Conceivably, then, the mining industry is experiencing significant costs due to employees experiencing workplace stress.

As previously noted, work-life conflicts have been associated with stress leave and poor physical and mental health in workers. Elevated psychosocial workloads can also lead to many employees facing mental and emotional demands. The state of a person's mental health affects their physical capacity to act in a safe way and their perception of risk. This relationship between mental health and injury can be self-sustaining in that injury can influence the mental health of an individual.¹⁷

¹² ABS Cat. No. 6291.0 data cube

¹³ WHO (2007: online)

¹⁴ Kalia (2002)

¹⁵ Medibank Private (2008)

¹⁶ Medibank Private (2008)

¹⁷ PricewaterhouseCoopers (2010)

The issue of mental health is a relatively new frontier in employee safety. Indeed, the Australasian Centre for Rural and Remote Mental Health (ACRRMH) believes that:

The understanding of mental health in the mining and resources sector is embryonic at best. Similarly, the extent to which mental health can affect productivity and profit is not yet fully appreciated.¹⁸

Wellbeing and lifestyle surveys have been conducted by the ACRRMH during 2012 and 2013 with the support of a number of mining industry organisations.¹⁹ Results are imminent and should help to raise awareness about mental health of workers. ACRRMH have flagged that results show differences in workers' mental health based on:

- organisational attitudes and policies;
- whether crews operate underground, above ground or in construction; and
- shifts and rosters.²⁰

Although results may present challenges for the industry, they may also permit workplace and lifestyle policies and environments to be developed to better manage and support employees.

The Windsor Inquiry identified mental health issues as of serious concern for FIFO/DIDO workers²¹ but resident workers can also suffer. Substance abuse is regarded as one of the most prevalent factors associated with workers and mental health conditions.²² The increasing use of drugs within the industry can potentially accelerate the prevalence of workers with mental health and stress issues.

In our wide-ranging analysis of Australian wellness programs (refer to subsection 2.6.7), we found mention of only two resource sector organisations with programs addressing mental health and / or stress²³ although one provider of such programs advertised as clients three principal contractors to the industry.²⁴ Reticence in this respect has been attributed elsewhere to the 'taboo' nature of the topic and perceptions that these matters are too difficult to address.²⁵

A8.5 Substance abuse

Allegations about substance abuse in the mining workforce, particularly of alcohol and drugs, with serious consequences for health and wellbeing has received limited

¹⁸ ACRRMH (n.d.: 2)

¹⁹ Delandrafft (2013)

²⁰ Delandrafft (2013)

²¹ House of Representatives Standing Committee on Regional Australia (2013)

²² Latimer (2011)

²³ PricewaterhouseCoopers (2010); Xstrata Coal Bulga (n.d.)

²⁴ Assureprograms at http://www.assureprograms.com.au/assure/value_and_roi.php

²⁵ Hooper and Bull (2009: 41)

attention by industry or academics, although see the works of Carrington and her team previously referenced in this current review. The hundreds of submissions to and public hearings for the Windsor Inquiry and the Committee's recently tabled report²⁶ have more recently helped to bring these legitimate concerns to prominence. In spite of this, few facts are available and the industry appears reticent to publicly acknowledge or discuss the extent of the problem. Nevertheless, the media has recently begun to pursue this aspect of the dark side of the mining industry. For example, ABC Radio National broadcast a series of three reports during March 2013.²⁷ A report on the Mining Family Matters website canvases some of the complexities and realities of drug use and alcohol abuse in the industry.²⁸

We have previously noted (subsection 2.3.1) that, for the mining industry in Queensland, both rates of smoking and risky and high risk alcohol consumption are higher than for national and state averages. The culture of binge drinking and substance abuse has also been raised with reference to, specifically, lifestyle risks for FIFOs/DIDOs. This does not mean that resident workers are untarnished – or, indeed, that all, even most, mining industry workers drink too much alcohol or use illegal drugs. Substance abuse does, however, remain the 'elephant in the room' when it comes to discussing health and safety issues despite this being one of the most prevalent factors affecting workers with mental health conditions²⁹ and fitness for work (see subsection 2.5.8 below).

In our analysis of wellness programs in the Australian mining sector (refer to subsection 2.6.7), we were unable to find any systematic reviews dealing with alcohol or drug intervention programs in the workplace. The lack of findings to support the implementation of such initiatives as part of a workplace health promotion program is consistent with findings in other reports reviewed for this current study. A large two-year national workplace health initiative in the United Kingdom³⁰ reported very few initiatives were implemented to address alcohol consumption, mental health or stress issues for the following potential reasons:

These health issues were viewed by the project co-ordinators and the workplace management as 'more sensitive' and '*taboo*' topics, and they were perceived as too difficult to address. The evaluation report concluded that a lack of experience and knowledge amongst the project coordinators largely explained their reluctance to incorporate more initiatives in these areas.³¹

It seems, therefore, that there are few examples of industry in Australia or elsewhere

²⁶ House of Representatives Standing Committee on Regional Australia (2013)

²⁷ Gribbin (2013a, 2013b, 2013c)

²⁸ Martin (n.d.)

²⁹ Latimer (2011)

³⁰ Identified in Hooper and Bull (2009)

³¹ Hooper and Bull (2009: 41)

meaningfully dealing with substance abuse as health and wellness issues for their workers.

Workplace testing regimes aimed at detecting use of alcohol or drugs and thereby assisting with health and safety issues on site can act as a deterrent although some workplaces have more effective controls than others. Although some mine sites have zero tolerance to drugs and alcohol, insufficient random or blanket testing can mean that offenders do not get caught.

With the support of the industry, stricter regulations and more advanced testing procedures on synthetic drugs were signalled in 2012 so that resources companies could crack down on their use in mines.³² Cannabinoids like Kronic have been widely reported as a serious issue at mine sites across Australia where tests have apparently showed that nearly one in ten miners used Kronic.³³ However, a new cannabinoids known as 'Venom', allegedly favoured by mine workers, was being marketed in Western Australia by the end of 2012.³⁴ In Queensland, synthetic cannabis drugs such as Spice and K2 (also sold as Bliss, Black Mamba, Bombay Blue, Blaze, Genie, Zohai, JWH -018, -073, -250, Yucatan Fire, Skunk and Moon Rocks³⁵) are among the better known brands that are available. According to the Queensland Police Drug Squad, industries such as mining, where very high disposable incomes are the norm, are being targeted by illicit drug manufacturers.³⁶

A8.6 Tobacco smoking

Tobacco smoking should also present as an issue for the mining industry, not only because of its recognised health hazard status but also because it is associated with low feelings of personal wellbeing.³⁷

We have previously noted that rates of tobacco smoking are higher in Queensland for blue collar workers and for those who work away from the capital city. Similarly high results have been measured for workers in the mining industry in Western Australia. Until recently, mine workers were subjected to statutory initial and periodic health (Minehealth) assessments.

Minehealth results from the late 2000s showed that the smoking rate was 35.5% for males and 32.6% for females. A reduction in smoking rates was observed, however, in mining employees who had more than one Minehealth assessment. Nevertheless, smoking rates persisted at around 27% for both genders by the third assessment. Blue

³² Duffy (2012)

³³ Validakis (2012b)

³⁴ Validakis (2012a)

³⁵ The Partnership at Drugfree.org (online at <http://www.drugfree.org/drug-guide/k2-spice>)

³⁶ Gribbin (2013b)

³⁷ Cummins et al. (2007)

collar workers in the industry (36.7% for males' first assessment and 29.4% for female baseline results) were more likely than white collar workers to smoke at rates exceeding the national average of 17.5%.³⁸

Objectives of Minehealth assessments carried out by the state's Department of Mines and Petroleum (DMPWA) were to:

- assess the health status of all mining industry employees on a regular basis;
- analyse collected data to detect adverse health effects at the earliest opportunity;
- enable appropriate and timely corrective actions to be taken in order to safeguard and the health and wellbeing of mining industry employees; and
- provide data for future epidemiological studies.³⁹

In January 2013, the DMPWA announced, without warning, the cessation of the Minehealth assessments with effect from the next day. The DMPWA stated that two comprehensive epidemiological studies of the database conducted in 2010 and 2012 had shown that these assessments neither prevented nor detected ill health at an early stage.⁴⁰ The Minehealth surveillance program had been regarded by others as a valuable risk management employer tool for the mining industry.⁴¹ Its demise is unfortunate and, indeed, untimely given government initiatives under the NPAPH scheme.

In recognition of tobacco smoking as a significant health risk factor for chronic disease, legislation prohibits Australian workers from smoking within workplace buildings. For safety reasons, the Queensland Coal Mining Safety and Health Act makes it illegal for underground mine workers to light a cigarette while working underground, with those prosecuted for infringement subject to severe penalties. In most states, legislation is also progressively being introduced to severely limit the exposure of workers to environmental tobacco smoke in their workplace (such as in hotels, clubs and *al fresco* food areas). This does not always mean, however, that the law is enforced. The FIFO worker, Rick (whose experiences we first discussed in subsection 2.4.3) revealed that, in his workplace:

The hardest part of quitting smoking is being surrounded by other smokers. While smoking has always been banned in all machines, some people have continued to smoke in them, which have caused a lot of complaints from those who are non-smokers.⁴²

³⁸ DMPWA (c.2009)

³⁹ DMPWA (c.2009)

⁴⁰ DMPWA (2013)

⁴¹ Kinetic Health (2013)

⁴² Goater et al. (2012: 36)

One initiative to deal with this was the potential to make the whole mine pit non-smoking. At the time, smoking was restricted to the pit where the operational managing company has jurisdiction. Smoking restrictions in other areas frequented by miners who smoke, such as outside the wet mess⁴³ at the end of the day, could be implemented. As Goater et al. (2012) pointed out:

The current choice that miners have to make between socialising and being exposed to passive smoke is considered by some not to be in the best interests of the workforce.⁴⁴

Rates of smoking in Australia are steadily decreasing over time.⁴⁵ Nevertheless, people living on outer regional and remote areas are more likely to be daily smokers than people living in other parts of the country.⁴⁶ Moreover, smoking has long been part of the mine culture as has become worker fatigue due to shift work and long hours to which we now turn.

A8.7 Fatigue

The term 'fatigue' describes a number of physical and mental states. For example, physical fatigue can arise from exertion or exposure to heat. Mental fatigue can arise from periods of high mental activity. In the mining industry, however, fatigue that arises functionally from lack of sleep is a key concern and, accordingly, is addressed separately here.

Fatigue causes a reduction in alertness and performance skills. Hours-of-work involving long shifts and/or night work within extended work cycles can significantly limit the opportunity for sleep and recovery in each 24-hour period. This is because shiftwork disrupts the body clock which is programmed for activity during the day and sleep at night.⁴⁷ Thus a range of factors can contribute to fatigue which impacts upon performance levels. These include:

- time of day for sleep;
- length of the shift;
- length and structure of the roster work cycle;
- length of the leave cycle;
- history of work; and
- length and timing of break periods.

Other workplace demands may also exaggerate the negative effects of sleep loss. For example, job specific factors include but are not limited to:

⁴³ Work camp canteen selling alcohol

⁴⁴ Goater et al. (2012: 36)

⁴⁵ ABS (2011) Cat. No. 4841.0

⁴⁶ ABS (2011) Cat. No. 4841.0

⁴⁷ Baker et al. (2002)

- poor ambient light conditions where high vigilance levels are required;
- high-pressure maintenance demands during peak work periods; and/or
- inadequate breaks within shifts.⁴⁸

We have previously referenced research⁴⁹ which has indicated that shift workers obtain significantly less sleep than non-shift workers and the quality of that sleep is also significantly reduced. Sleep loss during night work typically equates to one to three hours per day.⁵⁰ This sleep loss can be attributed to biological, social and work factors. There are also many other factors that reduce sleep opportunity including:

- changing psychosocial expectations and responsibilities;
- medical disorders; and
- seasonal and climactic changes.

Research has also found that the effects on cognitive psychomotor performance of 10-26 hours of sustained wakefulness are similar to the effects of moderate alcohol consumption. Importantly, researchers have demonstrated that one night of sleep deprivation produces performance impairment greater than the currently acceptable level of blood alcohol concentrations for non-commercial driving.⁵¹

A 2000 study into working time arrangements in the Australian mining industry with particular reference to occupational health and safety was conducted in recognition that:

The effects of extended shifts on workers' exposure to ambient factors, such as noise, dust, heat, vibration and chemical agents appear to be largely unknown or, if they are known, heavily under-reported. The attendant issues of fatigue and long distance commuting have health, safety and social implications that warrant further study; not to mention the impact of fatigue on productivity.⁵²

Our review of the literature suggests that not much has changed since this study was conducted. Wellness and wellbeing issues associated with fatigue, especially 'FIFO fatigue', are still waiting to be addressed by the mining industry.

A8.8 Fitness for work

Fitness for work has been defined as:

⁴⁸ Baker et al. (2002)

⁴⁹ For example, Peetz et al. (2012)

⁵⁰ Baker et al. (2002)

⁵¹ Baker et al. (2002)

⁵² Heiler et al. (2000)

... the capacity of an individual to perform their job safely and competently. Fitness for duty policies are introduced in workplaces to enforce the duty of care of both the employer and employee. Provision of a safe work environment, which includes ensuring that all workers are capable, is the responsibility of both the employer and individual employees.⁵³

If a worker is found to have medical problems or impairments related to drugs, alcohol or fatigue, that person is considered unfit for work. This means that the concept of fitness for work extends beyond the absence of illness or injury.⁵⁴ Indeed, drugs, alcohol and fatigue are foremost among workplace safety concerns regarding fitness for work for mining industry employers and employees.⁵⁵

In New South Wales, Queensland and Western Australia, legislation provides for specific obligations relating to fitness for work. These provisions generally oblige a mine operator to develop and implement a fitness for work program which includes measures to eliminate or control risks relating to fitness for work, namely, the consumption of drugs and alcohol, fatigue and medical assessments.⁵⁶

While mine operators should ensure that drug and alcohol testing regimes form part of the safety management system at the mine, Mining Safety Law in Australia states that:

... this should be done in consultation with the workforce and workforce representatives to avoid disputes and ensure that an appropriate testing regime can be effectively implemented.⁵⁷

Alcohol and drug use is targeted in fitness for work policies because these substances are well known to impair the capacity of an employee to perform their job safely and effectively. Where substances affect performance, both the employee and their colleagues are placed at increased risk.

Fitness for work policies generally incorporate a testing protocol for either the presence of prohibited substances in bodily fluids, or the performance impairment associated with the use of prohibited substances and/or fatigue. Many organisations already have in place policies aimed at detecting alcohol and drug use or guidelines prohibiting their use without necessarily identifying them as 'fitness for work' policies. Not all are effective in detection or as deterrents.

A8.9 Presenteeism

⁵³ Baker et al. (2002)

⁵⁴ Parker and Worringham (c.2004)

⁵⁵ Baker et al. (2002)

⁵⁶ Poteri (2012)

⁵⁷ Poteri (2012)

Medibank⁵⁸ defines presenteeism as:

The productivity that is lost when employees come to work but, as a consequence of illness or other medical conditions, are not fully productive. Employees who work when ill are more prone to injury and, if contagious, increase the risk of passing on an illness to other employees.

Medibank has categorised the main causes of presenteeism as:

- unhealthy lifestyles;
- workers with illnesses going to work;
- allergies and asthma; and
- poor work-life balance and high levels of job-related stress.

Medibank (formerly Medibank Private) has been assessing the current state of presenteeism since 2007. Its most recent report estimated that:

- in 2009/10, the total cost of presenteeism to the Australian economy was estimated to be \$34.1 billion (from \$25.7 billion in 2005-06);
- on average, 6.5 working days of productivity are lost per employee annually as a result of presenteeism; and
- presenteeism equated to a 2.7% decrease in 2010 GDP.⁵⁹

The cost of presenteeism for the mining industry has not been estimated but some of the main causes (such as unhealthy lifestyles and poor work-life balance) have previously been identified as problematic for workers within this industry.

A8.10 Engagement in social (media) activities

A sense of connectedness, of belonging to a crew, a team, a mine site, an organisation, a community, even to an industry can be hard to achieve when many work tasks – for instance, plant and machinery operation – are solitary in nature and may be performed in a geographically remote environment.⁶⁰ Even crib meals during a shift are conducted with crew members which means there is limited opportunity to interact with others.

Engaging and connecting can be even more difficult for FIFOs/DIDOs accommodated in work camps. As a group, they have little or no attachment to workplace communities and activities; nor are they regulated by informal social controls that traditionally characterise rural communities. Hence their existence often gives rise to suspicion and concerns.⁶¹

⁵⁸ Medibank (2011)

⁵⁹ Medibank (2011)

⁶⁰ Nott and Keenan (2012)

⁶¹ McIntosh (2012)

These factors together with NRW's separation from family and friends may add to the tendency of mining industry workers to engage in social media activities. Use of mobile devices while operating vehicles or other mobile plant has recently been reported as a mine safety risk.⁶²

Several serious or high potential, narrowly avoided incidents directly caused by workers using mobile technology were apparently being investigated in Queensland in early 2013. Use of mobile devices such as iPhones and iPads and interaction on social media has been reported as being widespread at open-cut coal mines in that state. The allegations are that some workers have been checking sites like Facebook while driving bulldozers, graders, dump trucks and excavators. This could become a significant safety concern given increasing levels of engagement in social media activities size and the size and gross weights of equipment moving around on mine site.

A8.11 Potential health hazards in daily work

Due to the inherent nature of the work, mining industry workers, especially those who work underground, are subject to a number of potential health hazards in their normal daily work. The consequences of continual exposure to health hazards may be progressive and not realised until it is too late. The effects are often not visible and, in some cases, the hazard is not clearly understood and is difficult to measure.⁶³

If health hazards are not managed effectively, work-related injuries and disease can occur. Some health hazards encountered in mining not discussed so far are:

- industrial deafness;
- musculoskeletal disorders;
- dermatitis;
- asbestosis and occupational cancers;
- noise;
- whole body vibration;
- ultra-violet sunlight exposure;
- dust;
- working on uneven ground;
- manual handling;
- workplace design including access and egress;
- heat/thermal stress; and
- polymeric chemicals.⁶⁴

⁶² Herber (2013)

⁶³ Department of Natural Resources and Mines (Queensland) (2012)

⁶⁴ Donoghue (2004)

A8.12 Fatal and severe traumatic injuries and PTSD

Fatigue in relation to shift work in the mining industry has been subject to considerable investigation and has been discussed elsewhere in this current review. Moreover, sleep deficits which are sometimes experienced in locations with extremely hot weather conditions have been shown to cause impairments of cognitive and motor performance among drivers from other industries.⁶⁵ Fatigue, sleep deprivation and other health and wellbeing factors that can impinge upon performance in the workplace need constant surveillance and appropriate monitoring strategies and initiatives so that accidents and injuries might be averted.

Unfortunately, fatal and severe traumatic injuries continue to occur in mining. These often have profound impacts on morale.⁶⁶ Post-traumatic stress disorders sometimes develop in witnesses, colleagues and managers. The effects might not be realised until many years after the event. Managers and workmates often feel personally responsible for the injuries of others, even in the absence of negligence, and face the ordeal of government inquiries and legal proceedings.

⁶⁵ Baker et al. (2003)

⁶⁶ Williamson and Feyer (2000)

Appendix 9:

A9.1 Occupational Health and Safety practices in Australia

Occupational Health and Safety (OHS) in Australia is presented by Safe Work Australia as a key issue for not only Australian employers but also for workers and the wider community.¹ OHS legislation is aimed at ensuring employers have legal obligations and responsibilities to take all reasonable steps to protect employee health, safety and welfare at work by providing and maintaining a working environment that is safe for employees and without risk to health.² Although it appears most organisations genuinely support some forms of worksite health promotion initiatives, unions, employees and governments have, in the past, expressed concerns that employers may seek to improve productivity and workplace moral through the delivery of health promotion at the expense of basic OHS issues.³ Safe Work Australia which supports the National OHS Strategy 2002-2012 has put paid to this by declaring that:

A good OHS practice not only provides a safer working environment but improves worker morale and productivity. By pursuing good OHS practices businesses face fewer workplace injuries and benefit from higher employee retention rates and enhanced corporate image. This reduces the costs associated with production delays, recruiting new staff and replacing equipment, and avoids the resulting uncertainty and workload pressure placed on co-workers. Businesses that strive to improve their OHS performance create safer workplaces. This benefits not only employers and employees but also their families, their communities and the Australian economy.⁴

A9.2 Guidelines for the delivery of wellness programs

An Australian company delivering wellness programs and services within the local mining industry has stated that, from their experience, programs which provide the greatest levels of success for employers are:

- constructed around an organisation's specific health needs;
- address apparent barriers to change;
- are relevant to the participant; and
- provide regular follow-up and measurement of health indicators.⁵

Other guidelines to organisations include:

- Success is optimised by conducting the program in a supportive environment.

¹ Safe Work Australia (2009)

² Gaukroger and Kenney (2003)

³ Bellingham (1991)

⁴ Safe Work Australia (2009: 3)

⁵ Scanes (n.d.)

- Without management support, a wellness program is likely to gain little exposure and, in turn, low participation.
- Involving employees is particularly important in the developmental stage of the program.
- Ensure the program is relevant to an organisation's needs.
- Consider opportunities for employees to be physically active in the workplace.
- Consider the facilities that are available for employees to be active within the confines of the work camp and in the community.
- Ensure a good range of healthy food choices at work and in camp accommodation.
- Consider promotional materials to encourage health food choice.
- Assist the community to access healthier food.⁶

A9.3 Impediments to workplace wellness programs in the US

In the United States, the 2004 National Worksite Health Promotion Survey⁷ reported various obstacles impeded successful implementation of worksite wellness programs and achievement of goals for workplace wellness and health. The five main ones were:

- lack of employee interest (for 63.5%);
- insufficient staff resources (50.1%);
- inadequate funding (48.2%) which was responsible for ...
- failure to engage high-risk employees (48%); and
- the inability to elicit the support of upper management (38%).

Reasons employees in this US survey avoided workplace wellness programs and health promotion included:

- they cost money;
- the programs were offered at inconvenient times;
- the purpose for the program was not clearly explained;
- childcare was not provided;
- commute issues were not provided for by the program;
- the benefits to the company and how these directly affect the employees was not explained;
- lower level management could not convey the advantages of the program to the employees under their authority;
- employees were angry and distrustful of the employer;

⁶ Scanes (n.d.)

⁷ Linnan et al. (2008)

- wellness and health programs were pushed up the priority list ahead of unhealthy daily work conditions; and
- employees felt forced to relinquish control over their own health risks to the company resulting in a perceived violation of their rights.

A9.4 Physical and psychosocial environment considerations

Addressing both the physical and psychosocial environment is important. Physical environmental factors refer to:

- the worksite's ergonomic capabilities and systems;
- catering facilities;
- access to health care professionals and specialists; and
- health and fitness services such as gymnasiums and organised sport.⁸

If the basics in exercise equipment facilities are not available, this not only gives people one more excuse not to be active but also supports the assumption that their employer does not care enough about them to provide these facilities. Organisations that do provide such facilities improve their public image by demonstrating a concern for the welfare of their employees and, in turn, this has a flow on effect of improved staff recruitment and retention.⁹

The psychosocial environment relates to social and psychological factors such as:

- a supportive management network;
- encouragement and acknowledgment of the employee's ideas and issues; and
- a sense of appreciation through pay reviews, incentive schemes and employee benefits.¹⁰

Other environmental factors that are thought to increase engagement within a program include:

- The use of positive images of men in marketing materials and suitable reading materials.
- Using presenters that have extensive experience working with males from blue collar industries.
- Using premises that are easily accessible, with easy car parking. Men generally have a low tolerance level and will give up if accessing the program venue is too hard.

⁸ Sparrow (2006)

⁹ Sparrow (2006)

¹⁰ Sparrow (2006)

- Provide services outside normal working hours. Men who work long working hours find it difficult to access health programs, and it is easier for men to access programs on weekends or during evenings.
- Minimise power differences between the program presenter and participants.

Appendix 10: Wellness Programs in Australia

Table A10.17: Case studies of organisations operating in Australia

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Resource sector organisations					
Alcoa World Alumina Australia¹	'Road to Silence' program	Expansion of its Hearing Conservation Program	Significant reductions in workplace occupational noise exposure		1
Argyle Diamonds²	Thermal stress program to improve worker awareness of hydration issues	Multidimensional program included physiological monitoring, environmental monitoring, refrigeration/ventilation controls; and training.	Highly successful; the number of clinically dehydrated personnel decreasing from a peak of 14% in November 2010 to 0.3% in March 2011		1
Barminco³	Diesel Emissions Management Program	A range of new work practices and technologies based on the most recent science regarding emissions monitoring and treatment.	Barminco believes it has gone significantly beyond just regulations compliance for managing the extremely harmful fine diesel particular matter		1
Barrick Gold⁴	Health and Wellbeing Program	'White' and 'blue collar' workers targeted Health assessments and risk management strategy	Anecdotal improvements in awareness and motivation for embracing nutrition and exercise programs	Success of initial 6 month program resulted in the program being extended to an ongoing basis	2

* 1 = Workplace program; 2 = Lifestyle program

¹ CMEWA (2013)

² CMEWA (2013)

³ CMEWA (2013)

⁴ Corporate Bodies International (c. 2011a)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Resource sector organisations (continued)					
BHP Iron Ore ⁵	Identify aspirations and needs of FIFOs	Consult FIFO employees and their families to identify the services and programs that their employees and their families seek to enable them to optimise their FIFO lifestyle.			2
Boral ⁶	BWell Program	Onsite health assessments, quarterly educational seminars and other resources for employees and their families	Measurement framework uses workers compensation experience, mandatory attendance at seminars and educational event, and ROI. ROI is operationalised as: A reduction in risk status (no. of workers carrying risk factors) that is associated with increased productivity (self-reported presenteeism)		2
Chevron Australia ⁷	Sprains and Strains Prevention Program	Targeting the prevention of musculoskeletal disorders on employees in the office and site environments	Resistance training improved the strength of muscles, tendons, ligaments and bones- elements essential in reducing individuals' personal risk of a sprain or strain.		1
Rio Tinto ⁸	Screening, assessing and managing a range of health risks and illnesses	Sedentary lifestyles, poor diet, stress, smoking, obesity, mental health	Measurement of core performance indicators and monitoring (results not indicated)	Initially three business units were piloting the strategy over two years to measure impacts	2

* 1 = Workplace program; 2 = Lifestyle program

⁵ Creating Communities Pty Ltd (2012)

⁶ Boral (2002)

⁷ CMEWA (2013)

⁸ PricewaterhouseCoopers (2010)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Resource sector organisations (continued)					
Rio Tinto Coal Australia⁹	Achieve Health Program	Delivers programs such as skin cancer checks, health assessments, personal fitness and wellbeing plans for employees	>1100 employee participants in 2011 from Bengalla, Mount Thorley Warkworth, Kestrel Mine, Hail Creek Mine and Brisbane Corporate office	Program continuing to be embedded across all sites	2
	Fatigue Management Framework	To reduce the risk of fatigue-related incidents occurring	Implemented in 2012		2
	Ergoanalyst Program	Preventative strategies for ergonomic / manual handling issues	Implemented at all sites in January 2012	Ongoing	1
	Noise Reduction Strategy Action Plan	Noise reduction exposure for workers	Aim is to meet 16% noise exposure reduction, from 2008 baseline, by 2013	Continuing implementation	1
	Medgate	To consistently manage hygiene information	Implemented of Hygiene and Medical modules at all sites in January 2012		2
	Site Safety Acceleration Program	To improve safety behaviour	Introduced at Mount Thorley Warkworth – with promise	To be implemented at Clermont Mine in 2012	1
Rio Tinto Kestrel Coal¹⁰	Achieve Health Program (2010 launch) for employees and their families	Risk management strategy (including individual health coaching), physical activity, nutrition	Success seemingly gauged on levels of participation and individual results from the weight loss challenge >70% initial sign up Highest participation rates of all Rio Tinto sites in 2010	Viewed as a solid platform from which to expand the program	2

* 1 = Workplace program; 2 = Lifestyle program

⁹ Rio Tinto Coal Australia (2012)

¹⁰ Corporate Bodies International (c. 2011b)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Resource sector organisations (continued)					
Santos ¹¹	Health and Wellbeing Standard	Emphasis on health risk prevention strategies encourages employees to self-manage and make informed choices about their lifestyles			2
WesTrac ¹²	New Starter Safety Mentors	Trial program to assign each new starter to an experienced safety mentor.	Resulted in a steep reduction in injuries in new starters and a new-found sense of responsibility for the mentors.		1
Woodside Energy Ltd ¹³	Loss of Containment (LOC) Reduction Program	Unified organisational approach to incident analysis, standardised reporting, improvement planning, and workforce training and engagement	Over the last three years, sustainable reduction in hydrocarbon LOC events have been achieved across its operating facilities.		1
Xstrata Coal Blakefield South u/g mine, NSW ¹⁴	Health improvement – 16-week health challenge		18% improvement in BMI 17% improvement in blood pressure 9% reduction in cholesterol Some improvements in absenteeism Injury rate ‘tracking well’		2
Xstrata Coal Bulga Coal Complex (surface & u/g), NSW ¹⁵	SafeCoal program: encourage health, fitness, wellbeing of employees and contractors	Fatigue, musculoskeletal disorders, diabetes, heart disease, influenza, obesity, nutrition and occupational illnesses			2

* 1 = Workplace program; 2 = Lifestyle program

¹¹ Santos (n.d.)

¹² CMEWA (2013)

¹³ CMEWA (2013)

¹⁴ Healthy mine workers leads to less injuries (2012)

¹⁵ Xstrata Coal Bulga (n.d.)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Resource sector organisations (continued)					
	Sustaining People Program	Voluntary health assessments, access to gym facilities, education sessions	Tracking fitness through follow-up assessments.		2
	Stress Management Program	Injury management and subsidised treatments such as massage and osteopathic therapy			1
Xstrata Coal Tahmoor ¹⁶	Ergonomics and Communication Program	Musculoskeletal disorders	Pilot program		1
Xstrata Coal, Mangoola ¹⁷	Health and Wellness Program	Improve employee quality of life through various health, fitness and education programs			2
Xstrata Copper ¹⁸	Wesley Research Institute Medical Research Program - \$0.9 million in funding	Assisting injured workers through various emotional aspects of their recovery process; and improving the ongoing quality of life for mine workers after they retire			2

* 1 = Workplace program; 2 = Lifestyle program

¹⁶ Department of Trade & Investment, Mine Safety (New South Wales) (2012)

¹⁷ Xstrata Coal (2011)

¹⁸ The Wesley Research Institute (2012)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Non-resource sector organisations					
ACT Government Health ¹⁹	My Health Staff Health and Wellbeing Program	Reducing the risk of chronic disease (by surveying nutrition, physical activity, alcohol consumption, healthy weight, smoking and mental health)	Evaluation has been incorporated but no results to date (early stages of program)		2
ActewAGL ²⁰	ACTive Health and Wellness Program (2006)	Evaluate absenteeism, presenteesim, sick leave and injury rates, staff costs and scope for improvement Assess effects on staff of smoking, poor food choices, lack of physical activity ... Assess staff interest in personal health status Assess corporate desire to provide benefits			2
Department of Water (WA) ²¹	Health and Lifestyle program (2007)	Regular seminars; quarterly health initiatives; workplace health expos and coordinated events; one-on-one consultations in the workplace; staff encouraged to adopt health behaviours; nutritional advice and support for healthy eating; 'Climb to the Top' stair climbing challenge; 'Virtual race around Australia'; Annual voluntary health checks	Positive qualitative feedback from employees including: An opportunity for meeting and socialising with work colleagues; Good incentives and motivation to 'get back to exercise'; Perceptions of good impact on morale; More alert and healthy workers being more productive; Improved employee perceptions of management concerns for employees.		2

* 1 = Workplace program; 2 = Lifestyle program

¹⁹ ACT Government (2012)

²⁰ ActewAGL (2012)

²¹ Hooper and Bull (2009)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Non-resource sector organisations (continued)					
Department of Consumer and Employment Protection (WA)²²	'Work Safe Work Well' pilot wellness program	A range of wellness initiatives including: Lunchtime fitness classes, meditation session Healthy heart checks	A 'comprehensive evaluation' indicated that a large proportion of the pilot centre's workforce (WestCentre) had participated and there was considerable interest for ongoing participation. '... employers educate, encourage, and enable staff to lead healthier, active lifestyles.'		2
Department of Police and Emergency Management (DPEM)²³ (Tasmanian Police)	Exertime Program (2010) Soup Program	Improve healthy eating habits and physical activity levels	Measured decreases in blood pressure, cholesterol and triglycerides Reduction in number of musculoskeletal complaints and work-related soreness Reported increases in physical and mental health		2
King & Wood Mallesons²⁴ (law firm)	Relax, revive, refresh	Raising awareness through seminars Health checks and screening Gym membership and onsite classes	Anecdotally, improved staff engagement and retention		2

²² Hooper and Bull (2009)

²³ DPEM (Tasmania) (n.d.)

²⁴ King & Wood Mallesons (2012)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Non-resource sector organisations (continued)					
Non-resource sector organisations (continued)		Physical activity, participating in community events, mental health awareness, promoting interpersonal relationships, various health promotion activities/sessions	Monitoring of trends in hours worked, absenteeism, work satisfaction shows improvements in all areas		2
NAB²⁵	Mental health awareness program	Improving wellbeing of individuals and productivity among people and workplace			2
Ramsay Health Care²⁶	A workplace health program (2002 onwards)	Nutrition, smoking, exercise, health promotion, volunteer programs	Data collected on staff turnover, absenteeism and lost time through injury show improvements in all areas		2
St George Bank²⁷	A wellness program	Linked to driving employee engagement and hence positive effects on performance	Online surveys, staff feedback and participation rates were being used to measure the program's impact		2
Sydney Water²⁸	A workplace health program	Exercise, smoking, general health promotion	Staff turnover (employees < one year's service) declined from 18% in 2007-08 to fewer than 9% in 2008-09 Absenteeism declined from 7.2 days of sick leave in 2005-06 to 5.9 days in 2008-09		2

²⁵ PricewaterhouseCoopers (2010)

²⁶ Ramsay Health Care (n.d.)

²⁷ PricewaterhouseCoopers (2010)

²⁸ Sydney Water (n.d.)

<i>Organisation name</i>	<i>Types of programs</i>	<i>Focus areas of wellness program/s</i>	<i>Program impact/ performance indicators (return on investment)</i>	<i>Ongoing/future plans</i>	<i>*</i>
Non-resource sector organisations (continued)					
Synergetic ²⁹ (software co.)	A workplace health program	Promotes physical activity	Nothing measured; positive employee feedback		2
Unilever Australia ³⁰	Ignite U Program	Physical health (through nutrient and exercise components) and mental health	Individuals are assessed after an initial 6 months in the program		2
Unisys Australia ³¹	Living Well @ Unisys (2007 launch)	Targeted hydration, physical activity, nutrition and strength & resilience (stress management)	Employees improved their health and wellbeing by an average of 5.7% Included 11% improvement in stress 8.8% improvement in risk behaviour 4.2% improvement in nutrition ROI of \$4.13: 1 in reduced absenteeism; \$17.5: 1 in reduced presenteeism		2
Urban Contractors (civil works) ³²	A health and wellbeing program	Team leadership, goal setting and personal development	Difficult to measure as no baseline data and this approach has always been part of the culture		2
Vodophone ³³	vWell101	Personal health coaching for employees with high health risks	Overall health/wellbeing improved by 18% (lowest component was improvement in job satisfaction measured at 1.7%); self reported work effectiveness improved by 5.7%; absence reduced by 0.4 days per employee (from 10.8 days); ROI was calculated at \$8.111: 1 (incl GST)		2

* 1 = Workplace program; 2 = Lifestyle program

²⁹ Synergetic (n.d.)

³⁰ Health Care Australia Online (2010)

³¹ Springboard Health and Performance (n.d.)

³² Urban Contractors (2012)

³³ Springboard Health and Performance (n.d.)

Appendix 11: Reports dealing with worker turnover and replacement

A11.1 National Resources Sector Employment Taskforce (NRSET)

The federal government-appointed National Resources Sector Employment Taskforce (NRSET) commented in their 2010 final report that the probability of job separation (turnover and replacement) in the mining industry was relatively high compared with other industries and, based on anecdotal advice received in submissions, turnover for NRWs was higher than for other workers.

A survey conducted by the NRSET asked companies questions about their annual turnover rates over the three years 2007-09. Table A11.18 is a summary of responses from 20 companies.

Table A11.18: Reported employee turnover, 2007-09¹

<i>Year</i>	<i>Range of reported turnover</i>	<i>Most commonly reported annual turnover</i>
2007	0-40%	5-20%
2008	1-85%	20-30%
2009 ²	40-90%	5-20%

Clearly sector turnover rates vary substantially. One large resources company advised the Taskforce that turnover for its FIFO workers was double that of other employees, up to 30% a year.

Turnover rates in the mining industry are exacerbated by the recognised ageing of its workforce. In its submission to the NRSET, the federal government Department of Education, Employment and Workplace Relations estimated 7% of the 2010 workforce would retire from the mining, oil and gas sectors over the five years to 2015 and 6% over the next ten years.³ In total, around 16,000 were expected to retire by 2015, including 2,700 professionals. A NRSET trend analysis for major occupations in the resources sector pointed to an average gross replacement rate (those who leave the sector or retire) of around 10% a year. Professionals – white collar workers – had a lower rate which implies a higher rate for blue collar workers.

A11.2 Kinetic Group's report on the Queensland mining industry

Arguably a more informative source, albeit for Queensland alone, is the Kinetic Group's 2012 *Annual Workforce Report of the Resources Industry*. This provides an analysis of surveyed workforce data from individuals representing 56% of that state's mining industry workforce during 2010-11.⁴ The results are from 35,371 workers who

¹ NRSET (2010)

² The 2009 values for 'range' and 'most commonly reported' were reversed in the NRSET report to what is shown here; those values appeared improbable.

³ NRSET (2010)

⁴ Kinetic Group (2012)

responded to the survey. Most (69%) were current employees as at July 2011; 17% had left their place of employment during 2010-11; and 14% were newly recruited during 2010-11.

The Kinetic Group's analysis of survey results indicated the following for turnover (including those leaving the industry and retirements and thus meaning separation) and retention in Queensland's mining industry:

- Annual turnover was 17% overall excluding contractors and 24.4% including contractors.
- Of all separating employees, 18.4% left within the first 12 months of employment; estimated cost to industry was \$30 million.
- Turnover rate for long term employers (with over five years' service) was 16.5%; this raises potential issues of experience loss and recruitment churn.
- The turnover burden to industry was estimated at \$140 million annually for direct costs of recruitment, induction and training.
- Turnover for non-resident workers, at 61.5%, was more than double that of other employees.

If the costs to the Queensland industry are extrapolated to the national industry and the same turnover rates applied, then (based on ABS May 2012 labour workforce statistics) the turnover burden would be around \$500 million annually for the direct costs of recruitment, induction and training alone. This does not account for indirect costs associated with managing loss of skills, productivity and experience.

With regard to NRWs, the report noted that:

- Almost one third of 'current' employees lived more than 300km from their place of work. They separated at twice the rate of those who lived closer.
- Forecasts suggest that NRWs will increase by up to 5,000 by 2014.
- Any additional mining workforce could comprise up to 75% NRWs, with some mines opting for a 100% non-resident workforce.

On replacements (retirees and those exiting the industry):

- An estimated 10,095 employees were expected to leave the industry over the five years to 2015. This represents 21.4% of all separating employees in the industry.
- This means that 18.2% of employment numbers will need to be replaced with employees new to the industry who will require education and training.
- Workforce replacements are contributing significantly to industry costs.

On age and new recruits:

- The industry workforce is ageing, and new entrants to the industry are older than the existing workforce.
- Almost one third of new recruits are 50 years or older.
- 22% of employees are aged over 50 years with 3.2% over 60 years and retirement-eligible.

The report further pointed out that:

- High staff turnover is a major risk to the industry's future growth.
- High staff turnover represents a significant tangible cost to organisations in terms of recruitment, induction and training costs.
- There are also less tangible costs associated with managing loss of skills, productivity and experience.

A11.3 Other (dated) turnover survey results

A 2003 report on *Workforce Turnover in FIFO Mining Operations in Australia* by Beach et al.⁵ presented findings from a study of workforce turnover in a sample of *remote* mining operations in Australia. In this study, 'turnover' referred to any employee movement that created a vacancy on site. The study did not include contractors as turnover among this cohort of workers – most likely higher than for others – was not regularly monitored, possibly due in part to the difficulty in tracking such movements.

The study found that there was substantial variation in turnover rates between and within FIFO mine sites (as was also suggested in the 2010 NRSET report). Rates ranged from 10% to 28%, with an average of 21%. This outcome was slightly greater than the 2012 Kinetic Group survey results of 17% for Queensland but below the 24.4% when contracted workers were included. It is likely that, if contractors had been included in the Beach et al. (2003) analysis, the turnover rate would have been greater.

A 2002 survey of the Western Australian minerals industry by the Mining Occupational Safety and Health Advisory Board found that the average length of service at mines was 5.1 years which indicates an average annual turnover rate at the time of 19.6% in that state's mines.⁶

It seems, therefore, that all results suggest turnover rates of at least 20% but up to 60% and more than double the averages for other industries. Over the past decade, turnover rates have seemingly increased. Beach et al. (2003) commented that there was general consensus among mine managers that a turnover rate in excess of 20% was detrimental to site productivity. It seems most likely, therefore, that productivity costs

⁵ Beach et al. (2003)

⁶ Beach et al. (2003)

at many mine sites are damaged due to employee turnover. These less tangible costs are in addition to recruitment, induction and training costs of replacement employees.

Appendix 12: Impacts of illnesses

A12.1 Presenteeism

The cost of presenteeism – the cost of not fully functioning at work because of medical conditions – is estimated to be almost four times the more readily measured but substantial cost of absenteeism in Australia.¹

Medibank's report on the cost of presenteeism to the Australian economy in 2009-10 are summarised as:

- the total cost was \$34.1 billion (from \$25.7 billion in 2005-06);
- on average, 6.5 working days of productivity were lost per employee annually as a result of presenteeism; and
- presenteeism equated to a 2.7% decrease in 2010 GDP.²

Presenteeism for the mining industry has not been separately costed. Estimating the mining industry's contribution cannot simply be achieved by apportionment based on number of workers. In the first instance, numbers directly employed cannot be determined from published data. Although employment in mining doubled over the last five years (to 259,200 full-time workers), this represented only 3.2% of the Australian workforce.³ These statistics, however, need further clarification. Only extraction work from operating mines, some support activities and exploration are counted under the ANZSIC mining industry classification. Workers for construction, surveying, transportation, processing, out-sourced plant maintenance and work camp operations including management, catering and security are not included.⁴

If a ratio of one mining industry worker to one mining activity related worker is used – as was recently applied by KPMG⁵ – then resource sector workers would represent around 6.5% of the total Australian workforce. Applying the average 6.5 days of lost productivity per worker due to presenteeism equates to around 3.4 million days lost per annum within the resources sector.

Secondly, some of the main causes (such as unhealthy lifestyles and poor work-life balance) are recognised as being especially problematic for workers within the industry. A large majority of mining activity related workers are thought to be NRWs with the potential for attendant lifestyle challenges and, arguably, a greater propensity for negatively affecting productivity through presenteeism. Consequently, the number of working days of productivity lost per worker could be greater than the average of 6.5

¹ PricewaterhouseCoopers (2010)

² Medibank (2011)

³ ABS Cat. No. 6192.0

⁴ McIntosh (2012)

⁵ KPMG (2013)

days. Moreover, speculation that the mining industry's 'share' of the \$34 billion cost of presenteeism could have been at least \$2 billion in 2009-10 appears reasonable.

A12.2 Mental illness and stress

Stress-related workers compensation claims in Australia doubled from 2004 to 2008. Excessive work hours, noise, health and safety risks and high workforce turnover – arguably issues associated with working in the mining industry – are among those factors given as examples of types of workplace stressors.⁶ Because stress can impact on employee productivity:

- workplace stress is costing the Australian economy \$14.81 billion a year;
- stress-related to presenteeism and absenteeism are directly costing the Australian employers \$10.11 billion a year; and
- 3.2 days per worker are lost each year through workplace stress.⁷

On the basis of the somewhat dated estimates given above, the mining industry in Australia could be expected to be experiencing significant costs due to employees experiencing workplace stress. Using the assumptions outlined above, this could amount to around 1.7 billion worker days lost per year and an estimated cost (in 2008 dollars) of about \$1 billion.

As noted above and elsewhere in this current review, mental illness and stress in the workplace is associated with excessive hours and shift work. Indeed, recognition that exceeding a 48-hour working week presents as danger to psychological and physiological health is receiving growing support.⁸ A recent study of workers in the Queensland mining industry found that wellbeing was worse among those with:

- no say over hours or shifts;
- those who wanted to work fewer hours; and
- particularly those who were in both categories.⁹

Additionally, the study found that use of anti-depressants, sleeping tablets and antacids were identified as a proxy for mental wellbeing.

A12.3 'Minor' illnesses of workers in Queensland's mining industry

A recent study by Peetz et al. (2012) which addressed the influence of hours worked and shift patterns on mining and energy workers in the Queensland resources sector (summarised in Part I, subsection 1.2.3) is returned to here. This refers to Wave 1 of a

⁶ Medibank Private (2008)

⁷ Medibank Private (2008)

⁸ Peetz et al. (2012)

⁹ Peetz et al. (2012)

proposed longitudinal study. Results from Wave 2 could be expected to make a further contribution towards causations of ill-health and workplace health and safety implications.

For the mining industry in Queensland, a measurement of the impact of long shifts and minimal or no control over hours worked has been attempted in this recent research by Peetz et al. (2012). Looking at minor short-term illnesses such as headaches, flu and abdominal pain:

- Number of minor short-term illnesses reported by respondents increased as their perceived levels of emotional exhaustion increased.
- Short-term illnesses were also reported more commonly by employees who were concerned about safety at work.
- Short-term health problems were reported higher among workers who would prefer, all other things being equal, to give up working shifts and get a day-time job.
- Those who reported having no say over their hours reported an average of 1.83 illnesses, 1.15 times more than the average of 1.59 among those who reported having greater say.
- Workers who wanted to work fewer hours reported an average of 1.85 short-term illnesses, 1.14 times more than the 1.61 amongst those who were content with the number of hours they were working.
- Amongst those who wanted to work fewer hours and claimed no say over their hours, the average number of short-term illnesses was as high as 1.98.¹⁰
- Number of short-term illnesses reported by respondents increased as their perceived levels of emotional exhaustion increased.

It has been established that gastro-intestinal problems are the most prevalent health complaint associated with shift and night work.¹¹ This research claims a causal role associated with employees having a say in working arrangements for these types of illnesses.

Based on these findings, costs of minor illnesses could be estimated by organisations with reference to their HR summary records of absenteeism through illness and their workforce arrangements for employees.

¹⁰ Peetz et al. (2012)

¹¹ Peetz et al. (2012)

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