



Work and hours amongst mining and energy workers

Australian Coal and Energy Survey First Phase Report



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1. Executive summary

History and background to the project

What does earlier research tell us?

1. While consensus in the existing research literature seems to be growing over the dangers of exceeding a 48-hour working week, there is still uncertainty over the pathways from work to psychological or physiological health. Previous studies have found: associations between the number of work hours and physical illness or symptoms; associations between variable shift ratios and a series of outcomes; effects of shift rotations on exhaustion; and hinted at the importance of employee voice in influencing the health effects of long hours. However, small sample sizes mean few definite conclusions can be drawn from earlier studies.

The Australian Coal and Energy Survey (ACES)

2. The Australian Coal and Energy Survey (ACES) was funded through the Australian Research Council's nationally competitive Linkage Program for research and, under the terms of the program, financed jointly by the Australian Research Council and the CFMEU Mining and Energy Division. It is a longitudinal study (incorporating a second wave in 2013 that will show how things change over time). It features a matched partner design – exploring (where possible) the views of partner-spouse combinations in CFMEU member households. The instrument comprised a detailed 16-page survey for mining and energy workers and a 12-page survey for their partners. The study uses many of the key elements of the Standard Shift Work Index (SSI), the premier research tool in examining the impact of role shift patterns on wellbeing and health, supplementing this with a range of instruments from other studies and several designed specifically for this project.
3. The first wave of the survey was provided to participants over four months to December 2011. Members were randomly chosen to participate from lists provided by each District of the Union. Wave 1 of the two-part ACES survey gathered data from close to 4500 people, comprising 2566 mining and energy workers who were members of the CFMEU in the latter part of 2011, and 1915 partners, of whom most (1725) were matched to specific members. The former represented a response rate of 28 per cent amongst eligible mine and energy workers. Amongst those partners to whom surveys were sent and whose spouses participated, the response rate was 78 per cent. It is necessary to recognise that the research for this project is only partially done, with phase two yet to come. *As a result this report is preliminary in nature.* We thus wish, not only to thank everyone who took part in wave 1, but also to emphasise the importance of everyone's continuing participation in the project into wave 2.

4. To test the validity of the data key questions were compared against data in the Australian Work and Life Index (AWALI) survey. Where ACES and AWALI survey similar or identical questions, the results closely mirror each other; this substantially increases confidence in the findings.
5. A point on terminology: the report sometimes present data on a partner's perception of their own partner who is, of course, a mining and energy worker in the original sample. So to avoid confusion, when referring to married, cohabiting or non-cohabiting couples in which one is a mine and energy worker, the term '*spouse*' is used to refer to the person who is the mine and energy worker and '*partner*' is the term used to describe the other member of the couple. The questionnaires themselves used the term 'partner' for both participants in the couple, but we use 'spouse' here to avoid the confusion of referring to partners' partners.
6. We have interspersed the quantitative findings from this report with quotes from answers given by respondents to ACES to an open-ended question at the end of the survey. Those from members are in red italics, those from their partners in blue small caps.

Industry, employment status, qualifications and income

7. Amongst the coal and energy workers responding to the survey, 86 per cent worked in mining, comprising 80 per cent in coal and 6 per cent in other (mostly metals) mining. A further 9 per cent of respondents were in the electricity generation industry, and 2 per cent were in chemical and other industries.
8. The vast majority (92 per cent) described themselves as being permanent or ongoing staff, with the balance relatively evenly split between fixed term contract (4.5 per cent) and casual (3 per cent). The most common qualifications possessed by respondents were equipment-specific tickets (51 per cent) and Certificate IV (26 per cent). Median earnings were \$2300 per week.

Tenure and security

9. The respondents tended to have been long-term industry workers, with 45 per cent having been in their 'current industry' for at least 20 years, and just 5 per cent having been in the industry for less than 2 years. There was a higher level of job tenure than shown by ABS data for the mining industry (in which only 53 per cent had been with their current employer for at least 3 years). That is not unusual, as union members tend to have longer tenure with their employer than non-members. Labour turnover in mining is amongst the highest of any industry and much higher than would be expected given the level of wages in the industry, so the *ACES dataset will possibly under-represent employees who are dissatisfied with conditions in the industry or other matters and choose to leave the industry, as those early leavers are absent from the study.*

10. We asked respondents to separately estimate their chance of leaving the job or of being sacked in the coming 12 months. Majorities (64 per cent and 59 per cent) rated each probability at zero. However, on the other end of the scale, 7.1 per cent were certain that they would leave their job, and 1.9 per cent were certain they would be sacked, with 12 per cent believing there was a 50 per cent or better chance of being sacked.

Working time stability and rotation

11. While the shift patterns of Australian coal miners in particular are incredibly complex and varied – we found over 70 distinct patterns of shift work amongst our respondents, which are still being analysed – 95 per cent of those who responded to the question on the regularity of their shifts described them as ‘repeating’ as opposed to ‘non-repeating’. Repeating, however, by no means is equivalent to ‘straightforward’. Almost 10 per cent work three or more shifts, while just over 60 per cent work two shifts. Almost three quarters of respondents reported not having every weekend free, with over 10 per cent reporting they had *no* weekends entirely free from their day job.

Preferred and actual hours

12. In ACES, workers were asked ‘including any paid or unpaid overtime, how many hours per week do you work on average in your main job?’ The median mining employee in ACES worked 44 hours per week, and the median full-timer worked 44.5 hours per week.
13. They were then immediately asked ‘If you could choose the number of hours you work each week, and taking into account how that would affect your income, leisure and domestic activities, how many hours a week would you choose to work?’. The majority of mining and energy workers (61 per cent) preferred to work less than forty-one hours per week. The median of preferred hours – that is, the ‘mid point’ – was 40 hours per week. Consistent with AWALI, by far the most common (modal) hours preference in ACES was for a forty-hour working week.
14. Some 50 per cent of employees in ACES were working more hours than they would prefer, even after taking into account how that would affect their income and other activities, while 39 per cent were working the number of hours they would prefer and 11 per cent would prefer to be working more hours. These numbers are not significantly different to those in AWALI. As the respondents we surveyed were those remaining after many workers who were dissatisfied with aspects of the labour conditions had left the industry, the survey was likely to understate the gap between employee preferences and the actual hours worked for those workers who have entered the industry.

Shifts and sleep

15. During work time, employees are experiencing uncharacteristic levels of tiredness that is clearly linked to their shift work. Some 58 per cent of respondents ‘sometimes’, ‘almost always’ or ‘frequently’ experience difficulty

falling asleep between successive night shifts and 62 per cent experienced such difficulties when their shift changed. However, between days off only 34 per cent experienced difficulty sleeping sometimes or more often, and 39 per cent had difficulty sleeping between day shifts.

16. Workers were also asked about the amount of sleep they were 'normally' getting, and asked to rate whether the quantum was 'nowhere near enough', 'could use a lot more' 'could use a bit more' 'getting the right amount' or 'getting plenty'. Between day shifts (18 per cent) and between successive days off (8 per cent), respondents relatively rarely felt they needed 'a lot more' or were getting 'nowhere near enough, but this figure shot up between successive night shifts (42 per cent) and during shift changes (29 per cent).
17. In total 37 per cent of respondents admitted using alcohol to help them sleep, although only 5 per cent admitted using it frequently or almost always to induce sleep.

Shifts, alcohol use and smoking

18. Slightly more mining and energy workers claimed that in the last two years caffeinated drink consumption had gone up (14 per cent) when compared with those who claimed it had gone down (12 per cent), but more workers claimed that their alcohol consumption had gone down (18 per cent) than up (13 per cent respectively). Amongst partners, by contrast, 16 per cent said that their spouse's alcohol consumption had gone up while 12 per cent said it had gone down, and they agreed with their spouses that caffeine consumption had increased just slightly (11 per cent up, 10 per cent down).

Shifts and partner's work

19. We asked partners, "how often do your working hours align with your partner's working hours?" In a little over 10 per cent of cases working hours closely aligned ("almost always"), and in around a third of cases, the working hours of the two were 'rarely' or 'never' in sync. Fifty two per cent of partners worked at least some weekends.

Broad views on shift work

20. We saw a complex set of reactions amongst mining and energy workers to shift work: a clear majority of those willing to volunteer a view were dissatisfied with working hours and shifts; but amongst those working shifts, views were fairly evenly split on whether they wanted to abandon shift work altogether and go back to day jobs; and a majority thought that the advantages of their current arrangements outweighed the disadvantages, taking account of alternatives through other shift patterns.
21. We asked an open-ended question at the end of the survey: "Is there anything else you would like to say about work, your shift patterns or how they relate to your health or personal, family life or community?" Some 554 mining and energy

workers gave responses to the open-ended question, of which 420 concerned working hours, shifts, and related matters. Amongst those 420, we found 315 to be mostly negative remarks, and 89 to be mostly positive remarks, a ratio of slightly more than three negative remarks to each positive remark. A selection of those remarks, both positive and negative, is interspersed throughout this report.

22. Earlier in the ACES questionnaire, after a series of questions asking mining and energy workers to describe the pattern of their specific roster, any requests for increased flexibility, their actual and desired working hours, and related questions, we asked mining and energy workers “Do you feel that overall the advantages of your shift system outweigh the disadvantages?” This appeared to focus respondents’ attention to varying degrees on their specific shift or roster arrangements and evoke comparisons with other rosters they may have experienced. Some 59 per cent of mining and energy workers felt that the advantages of their shift system outweighed the disadvantages, while 22 per cent felt the disadvantages outweighed the advantages. Employees working eight-hour shifts were happier.
23. We then asked, “All other things being equal, would you prefer to give up working shifts and get a day-time job without shifts?” In response, 40 per cent said they would definitely or probably prefer to give up working shifts and get a daytime job without shifts, 19 per cent said maybe, and 41 per cent said probably or definitely not. Amongst those working shifts averaging 12.5 hours or more, preference for giving up shifts was 47 per cent, while those who did not wish to give up shifts comprised 32 per cent.
24. Partners, too, were evenly split on whether they would prefer their spouses to give up working shifts and get a day-time job without shifts. Separately, 20 per cent would like their spouse to get a job elsewhere if it were possible, whereas 58 per cent would not. It is possible that partner disaffection is one part of the explanation for the high labour turnover in the industry, as there is a highly significant correlation ($r=.19$, $p<.001$) between partner disaffection as registered here and their spouse’s reported probability of voluntarily leaving their job within the next year.

Social interactions

25. We showed respondents a list of voluntary organisations and asked them whether they are an active member, an inactive member, or not a member of that type of organization. There was a high degree of non-active memberships. Almost half (46 per cent) of the respondents claimed to get together with relatives and friends not living with them at least once a week, while 16 per cent claimed only to get together with this broader social network once or twice every three months or less.
26. The study also posed questions about the frequency of social contact. Almost half (46 per cent) of mining and energy workers claimed to get together with relatives and friends not living with them at least once a week. Some thirty per cent claimed to get together with their social network just once a month or less

frequently. This figure is higher than the Australian average in 2001 (20 per cent) and in fact also higher than that for those living in 'remote and very remote' regions (22 per cent).

27. ACES also asked all respondents to what degree did they feel satisfied with "feeling part of your community" and with "the amount of free time you have", with scores ranging from 0 (lowest) to 10 (highest). Comparable questions had been asked in a benchmark national study (HILDA), covering people from all walks of life in Australia. In ACES, the mean score on satisfaction with feeling part of the community was lower amongst both mining and energy workers (with a mean of 6.41 on a 0-10 scale) and partners (6.53) than in the national HILDA sample (6.78). The shortfall on satisfaction with free time was even greater amongst mining and energy workers (6.21) and especially partners (6.16) when compared with the national benchmark (6.67).

Personal and family life balance

28. We sought other evidence of social impact by asking whether respondents felt they were getting on better or worse with 'people at home' than two years earlier. Most reported no change, but slightly more mining and energy workers felt they were getting on worse (8.5 per cent) than better (7.6 per cent).

Work-life interference amongst mine & energy workers

29. We compared results for several questions on work-life interference with similar questions that originally appeared in the national AWALI survey. We used four of the five AWALI component questions in ACES, and can compare findings for mining and energy workers with national benchmark data in AWALI taken from 2009. On three of the four items, ACES respondents appeared to have greater work-life interference than the national AWALI sample. Whereas 17 per cent of AWALI respondents said that work interfered 'often' or 'almost always' with their ability to develop or maintain connections and friendship in your community, this response was given by 29 per cent of ACES respondents. Similarly, ACES respondents were more likely than that national AWALI sample to say that work often or always kept them from spending the amount of time they would like with family or friends. ACES respondents were also less likely than the national AWALI sample to say that work rarely or never interfered with their responsibilities or activities outside work.

30. On one matter, however, the pattern was reversed: ACES respondents were less likely than the national AWALI sample to report often feeling rushed or pressed for time. This may be because for ACES respondents, pre-scheduled paid overtime meant expectations of home time availability were shaped in advance.

Partners' perspectives on social impact of work patterns

31. In effect, with time availability predictable but highly restricted, the burden of undertaking household tasks fell to the partner in ACES: amongst female partners in ACES who were working, only 38 per cent were working full-time,

whereas in the Australian labour force as a whole, 54 per cent of female employees work full-time. Amongst the female partners of ACES respondents, 83 per cent said that they undertook the majority of the housework and 14 per cent said that housework was evenly shared. In households with children, similar majorities (81-82 per cent) of female partners indicated that it was they who normally dressed the children before school or stayed at home with children when they were ill.

32. While 64 per cent of mining and energy workers agreed that, after work, they were too tired to do what they wanted to do at home, 59 per cent of partners agreed that after work, their spouse comes home too tired to do some of the things they'd like them to do or need them to do; 21 per cent of mining and energy workers, and 27 per cent of partners, disagreed. Some of this shortfall on energy appeared to be internalised by working partners, amongst whom 49 per cent agreed that after work they, too, were too tired to do what they wanted to do at home – even though a majority of working partners were working part-time.
33. One feature of partner attitudes was anxiety about their spouse while at, or travelling to, work. Some 66 per cent of those for whom the question was applicable 'sometimes or often' felt anxious when their partner was working night shifts, and 69 per cent said that their spouse being away at night sometimes or often made them anxious. Most commonly, 77 per cent sometimes or often felt anxious about their spouse travelling to and from work, including 33 per cent who 'often' felt anxious about this.
34. Noticeable minorities of partners also expressed other concerns. Some 37 per cent agreed that their spouse was often so emotionally drained when they get home from work that it prevents them from contributing to the family (46 per cent disagreed); 29 per cent said that their spouse often brought home problems they have at work; 31 per cent agreed that their spouse's working hours interferes with the partner's own ability to maintain connections and friendships in the community; and 23 per cent agreed that their spouse's work responsibilities affect the partner's own social life more than they should.

Worker say over working conditions

35. All up, 65 per cent of mine and energy workers cited 'higher rates of pay' as one of their reasons for working shifts (i.e. they rated it five or more on the seven-point scale), and 57 per cent cited blocks of leisure time, but only 29 per cent cited 'more convenient for my domestic responsibilities' and 23 per cent said 'bosses aren't around at night'. Nearly half (48 per cent of respondents) indicated 'no choice' as one of the reasons. The high frequency of 'blocks of leisure time' as a reason contrasted with the low satisfaction both mine and energy workers and partners had with their 'amount of free time', as mentioned earlier.

Say over hours, shifts and content

36. ACES confirmed the low level of input of mine and energy workers into their shift arrangements: 61 per cent of mine and energy workers had no say at all in how many hours they worked a week, 70 per cent had no say in the types of shifts they worked, 74 per cent had no say in which shifts they worked on a particular day, and 79 per cent had no say in their starting and finishing times. On when they 'can take time off e.g. for holidays, dentist appointments', respondents showed some greater influence: only 3 per cent of those who answered had no say, a plurality (48 per cent) had 'some' say, 37 per cent had 'quite a lot' and 12 per cent had a 'great deal'. Workers had more say over how they did their work than what they did or when they did it.

Impact of worker say

37. We divided mining and energy workers into three groups measuring their say on hours: those who had no say on all four items on hours and shifts mentioned above; those with a small amount or 'some' say; and those with more say. Those who had no say over any of these aspects of hours and shifts were: more likely to say they had difficulty sleeping between night shifts than other workers; more likely to say that they often felt unsafe working night shifts; more likely to say that their awareness of fatigue amongst their fellow workers often made them feel unsafe; and more likely to say that they felt unsafe travelling to and from work. They were more likely to agree that 'After work, I come home too tired to do some of the things I'd like to do or need to do'. They were more likely to agree that 'I am often so emotionally drained when I get home from work that it prevents me from contributing to my family'.

38. Those who had no say over when they could take time off were considerably more likely to say that they were getting on worse with people at home: 11 per cent said that how well they 'got on with people at home' had gone down over the previous two years, versus 6.5 per cent for whom it had gone up.

Relationship to Work-life interference

39. The mining industry was ranked the second worst on an index measuring the degree of interference between work and family life. One reason may be the divergence between hours preferred and hours worked. Mine and energy workers who wanted to work fewer hours were more likely than others to say that: work 'often' or 'almost always' interferes with responsibilities and activities outside of work; work, often or almost always, stopped them spending the amount of time they would like with their family or friends; and work often or always interfered with their ability to develop or maintain connections and friendship in their community.

40. Overall, while 25 per cent of those working the hours they preferred said they were, often or almost always, rushed and pressed for time, the figure rose to 48 per cent amongst those who wanted to work fewer hours; even more where they also had no say over their hours. The effects were felt not just by mining and

energy workers but also by their partners. Amongst partners of mine and energy workers who would prefer to work fewer hours, over half (52 per cent) often or almost always felt rushed or pressed for time, compared to 43 per cent of workers whose spouses were content with their hours.

Short term illnesses

41. Relatively minor clinical symptoms can serve as indicators of immunosuppression, as the immune system acts to protect the body from organisms like bacteria, viruses, toxins and parasites. We examined a series of eight short-term illnesses and created simple counts of how many out of the eight each respondent reported experiencing over the previous year – as well as analysing illnesses individually.
42. On six of the eight short-term problems we focused on, the incidence steadily rose as respondents' emotional exhaustion from work increased. As a result, the number of short-term illnesses reported by respondents increased as their degree of agreement with that statement on emotional exhaustion increased. Broadly similar patterns were observed with respect to the same illnesses and responses to the statement 'After work, I come home too tired to do some of the things I'd like to do or need to do'.
43. Short-term illnesses were also reported more commonly by employees who were concerned about safety at work.
44. Short-term health problems were reportedly higher amongst workers who said that, all other things being equal, they would probably prefer to give up working shifts and get a day-time job; amongst workers who experienced low satisfaction with their free time; and amongst those who said they slept quite or extremely 'badly' when their shift changed.
45. Worker say was an important factor in self-reported short-term health. Those who had no say over hours reported an average of 1.83 illnesses, compared to 1.59 amongst those who reported 'more' say. 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. After controlling for age, these workers who were both wanting to work fewer hours and had no say over their hours still reported higher probability of abdominal or stomach pain, constipation, diarrhoea and headaches. It has been established that gastro-intestinal problems 'are the most prevalent health complaint associated with shift and night work'. While previous researchers in the sleep and shift work literature have focused on eating habits and circadian disruption in explaining this, our data suggest a causal role associated with employee say could be claimed.

Worker control and sleeping pill use

46. Use of sleeping tablets was higher amongst workers who had no say in their hours. It was also higher, as we might expect, amongst workers who work some night shifts and amongst those with longer average shift lengths.

Psychological health

47. On a simple mental wellbeing scale (based on six indications), mental wellbeing was worse amongst those with no say over hours or shifts, those who wanted to work fewer hours, and particularly those who were in both categories. To illustrate: amongst workers on their preferred hours, 8 per cent reported depression but amongst those who preferred to work fewer hours and had no say over their hours, 15 per cent reported depression.
48. Another proxy for mental wellbeing is the use of certain medications. Workers who wished to reduce their hours were about two fifths more likely to be using anti-depressants than those who were on the hours they preferred. Those who wished to reduce hours and had no say over their hours were three quarters more likely to use anti-depressants. Broadly comparable patterns were observable for use of sleeping tablets and antacids.

Partner short-term illnesses and psychological health

49. Partners also experienced health effects arising from the work of their spouses, although the effects were smaller.. In particular, partner health appeared to be influenced by their perceptions of whether their spouse was able to make an adequate contribution to the household as a result of their work. The stronger was partners' agreement with the statement 'After work, my spouse comes home too tired to do some of the things I'd like them to do or need them to do', the higher was their level of each of: abdominal or stomach pain; constipation; indigestion; grinding teeth; and vomiting.
50. The incidence amongst partners of anxiety, depression and migraines was higher when partners agreed more strongly with the statement 'My spouse is often so emotionally drained when they get home from work that it prevents them from contributing to the family'.

2. History and background to the project

This study arose through two different things. First the CFMEU and their members wanted to gain an insight into the impact of relatively recent changes in mining, as illustrated by this quote from one of our respondents:

I am incredibly delighted to be a part of such a study! It is imperative that more research is done in the areas of shift work to ascertain the health impacts and workplace related dangers of fatigue management. I have experienced working a good roster or working the current bad one. I would be very interested in knowing the results of these studies and actively be a part of changing our workplace culture and educating my co-workers and management to develop working models that benefit us all.

(We have interspersed the quantitative findings from this report with quotes from answers given by respondents to ACES to an open-ended question at the end of the survey. Those from mining and energy workers are in red italics, those from their partners in blue small caps.)

The second reason for the study is recent research such as *Women of the Coal Rushes*,¹ that features the words and memories of 138 people in provincial and rural mining communities, ranging from past and present members of women's auxiliaries and support groups to safety officers, nurses, community workers, victims of sexual harassment and domestic violence, bank workers, retired people, young couples, hospitality managers and activists—in other words, the fabric of Australian mining communities. That project colours in many of the bare statistics relating to the dramatic changes in mining over the last two decades.

The changes saw the mining industry transform from one featuring the shortest standard working hours in 1970 to one now recognised by the Australian Bureau of Statistics as one having the longest hours. In most mines 8-hour days worked five days a week have been replaced for many (but not all) workers by rotating 12-hour shifts which take little or no account of weekends; the use of contractor firms in place of permanent mine employees has increased exponentially; and work organisation has been fundamentally altered.² The transformation of mine working conditions has seen this industry embrace shift work: according to the Australian Bureau of Statistics (ABS), 52 per cent of all mine employees now work shifts – a number that would be higher if office staff were excluded – compared to the accommodation and food services industry, which shows the next highest density of shift work at 44 per cent.³

The changes have gone beyond working hours and shift patterns. Mining companies have largely stopped building mining towns and instead promote long distance commuting (LDC) arrangements, through fly-in-fly-out (FIFO) workforce in more remote mines. Even in mines near existing communities, drive-in-drive-out (DIDO) LDC has become common for a significant part of the workforce. At the same time, major change in communities supporting mines has taken place. Many coal mining town populations fell in the 1990s, and most growth since 2001 has been in the ‘visitor’ populations⁴, workers who now often live in camps on the edge of mining towns or in share accommodation in such towns, where housing prices have soared.

2.1. What does earlier research tell us?

Many mining families are split, mineworkers commonly spending half to three quarters of their time in the camps while their partners and children live several hours drive away, in coastal towns or provincial or capital cities. For other families that can stay together in the mining communities, our early research suggested that shift patterns meant mineworkers have only one or two full weekends free per month. As the majority of mine workers are men, their extended absence has implications for family life as well as their involvement in community activities in both mining-dominated communities and ‘feeder’ communities that house many transient-father mining families.⁵

While there is a large body of research showing that shift work has social and physical implications for both the shift worker and the broader community, the increase in working hours in mining has implications potentially beyond the variability in phases (night or day) in which those hours are being worked. In the western world working hours generally have decreased, though Australia is an uncommon exception to this.⁶ Average actual weekly hours worked per full-time employed Australian rose gradually following the early-1980s, and reached a peak of approximately 41.5 hours in 2000 before dropping off slightly. With international research now beginning to suggest that working beyond 48 hours a week has adverse health and other implications⁷ and European Union labour directives now recognising that figure as a pivot point,⁸ it is notable that the proportion of Australians working over 50 hours increased from 13 per cent in 1978 to an unsustainable peak of 19 per cent around 2000, before again falling off to sit at around 15 per cent in 2010⁹.

While consensus seems to be growing over the dangers of exceeding a 48 hour working week,¹⁰ unpicking the pathways from work to ill health—that is, working out *how* working hours impact on health—is not simple. Part of the problem is that the amount of working hours one works alone appears to be associated with poor lifestyle habits. So, for example, long working hours are associated with behaviours such as smoking and obesity,¹¹ and stimulant intake.¹² However, careful evidence using very large samples has shown direct effects of long working hours, independent of occupational or lifestyle characteristics.¹³ A ‘meta-analysis’ of 21 studies by Sparks and co-workers showed small but statistically significant relationships between work hours and negative health symptoms, with the authors pinpointing the need for further research in areas such as the impact of very long hours and the impact of potential moderating factors such as the working environment, the nature of the job and the level of employee choice.¹⁴

The Sparks study identified a much stronger correlation between psychological health measures and working hours than physiological health measures,¹⁵ in both cases although the absolute effect size was quite small, the significance levels were very high.

The problems associated with long working hours are compounded and complicated by adding shifts to the equation. Shift work has been a consequence and a cause of the industrial revolution, facilitated by the advent of cheap effective lighting -- and in turn enabling high fixed-cost infrastructure, such as manufacturing and mining equipment, to be spread over more work hours. In the 1950s, shift work involved as few as 10 per cent of the population, concentrated in essential services such as health and emergency services, but it has become an elective operational choice of industries such as mining, manufacturing and transport, and, to a more limited degree, retail.

Internationally, shift work rose dramatically in the post war period, and although the growth has plateaued, it continues to rise.¹⁶ Parallel to these changes, the nature of the typical shift worker has changed from being weighted towards emergency-services to a profile that includes non-essential services including manufacturing and mining.¹⁷ While reliable longitudinal data on Australian shift work patterns is absent, the picture in Australia appears to be similar, with mining now the industry with the highest proportion of shift workers.¹⁸

Shifts—either fixed night shifts or rotating shifts—inevitably disrupt sleep, and sleep—both in quantity and quality is reliably associated with good health. As with the impact of

quantity of work hours, the effects of shift work on health are likely to follow one of two pathways—and probably both. Work itself can involve exposure to toxins—including psychological and physical toxins such as exhaustion—which interrupt physiological function, for example through disruption of the circadian rhythm, disrupting the neuroendocrine and immune system.¹⁹

The current shift/roster I'm working creates constant jetlag symptoms. The turn around from days to nights is too short. I've worked at other pits with 5 days on 5 days off style rosters and they were much better for my health and lifestyle. It seems that the body's clock copes better with a longer shift/roster length. My ideal roster would be 7 on, 7 off, this giving your body more time to recover.

Alternatively, it can lead one to adopt lifestyle choices, such as drinking caffeine or eating fast food meals, as was the case in a study of American mineworkers.²⁰ A study by Gordon and colleagues found that variable shift ratios were associated with higher uses of sleeping pills and tranquilisers, alcohol, and damage to social networks, all of which have health consequences.²¹ A third possibility is that shift work may simply exacerbate existing disorders, and there are highly plausible causal routes such an influence might take. There is well-established research showing that dose response to medicines is linked to circadian rhythms (daily activity and sleep patterns)²² and there may be a generalised impact of shift work on immune response,²³ and equally, systematic variation in hormonal status and body temperature over a 24 hour period.²⁴

There are strong associations between raw work hours—independent of night or rotating shifts—and physical illness or symptoms such as hypertension, for example. Compared with those who work less than 40 hours a week, those who work over 40 hours are 17 per cent more likely to report high blood pressure, while those who work in excess of 50 hours were 29 per cent more likely to do so.²⁵ The relationship between the variability in shift patterns and health impacts may be similarly dose-dependent.

Recently left the mine where I was on a 5 day rotating roster, 8.5 hours a day, two weeks of days, two weeks of arvo, two weeks of nights. Not a good family or social roster. Asked pit if I could change over to weekend roster, they said no, so I handed in my resignation. Pit was only 27km from home. Have similar job working 3 night, weekend roster. Stay away from home 3 nights/day but better quality home time with family and my body clock and mood is a lot better

While it is widely acknowledged that some shift systems are likely to have more negative impact than others, studies generally lack standardised measures, although in recent years, a substantial body of work has begun to concentrate around Folkard's Standard Shiftwork Index (SSI),²⁶ a group of measures that are heavily used in the ACES study. In a comprehensive analysis of studies that have used the SSI, Tucker and Knowles²⁷ identified four studies that compared permanent and rotating shifts. Barton²⁸ examined the moderating influence of choice in night shift work, examining the role of personality type and individual circumstances in making that choice. She found that those workers

who chose to work at night adapted better to its rigours, suggesting the importance of employee voice in influencing the health effects of long hours.

In an earlier study, Barton and colleagues²⁹ examined another aspect of control, finding that greater shift work tolerance was associated with greater control over work hours. In a relatively small study of telephone operators on a variety of shift patterns, Nag and Nag³⁰ examined both behavioural and health responses to variability, with rotating shifts associated with greater visual strain. Spelten and colleagues,³¹ working with a population of nurses characterised by two different shift patterns, permanent nights or rotating shifts. They found that nurses on rotating shifts were—despite being younger—regardless of what time of night, less alert than those on permanent night shift, suggesting that rotations had persistent impacts on exhaustion. This study focused on sleep-related issues and work-life conflict.

I have worked for the same coal company for 31 years. I have worked every roster known to man, but 12 hour rotating shifts make you feel more fatigued than all the others. I thought it was just me but looking across the crib room on any shift and you see lots of workers, of all ages trying to catch 40 winks. The time between shifts is not enough to recover fully, shifts may even be better having one month of day work and one of nights. At least you could adjust better.

A National Centre for Health Statistics (US) survey identified a pattern of serious consequences to shift variability but cautioned that a relatively small cell of single-shift participants as a comparator weakened the results.³² However, studies such as this are limited by the fact that they are relatively small.

With coal and energy work thought to contain a high proportion of both shift work and long hours, the CFMEU Mining and Energy Division and the Australian Research Council jointly funded the ACES project to examine what impact the ‘big shift’ in Australian work patterns particular in the coal mining industry is having both at an individual and community level, moving beyond issues of health, to taking a fine-grained look at how the changes are playing out for workers literally at the coal face.

2.2. The Australian Coal and Energy Survey (ACES)

The Australian Coal and Energy Survey (ACES) was funded through the Australian Research Council’s nationally competitive Linkage Program for research and, under the terms of the program, financed jointly by the Australian Research Council and the Mining and Energy Division of the Construction, Forestry, Mining and Energy Union (CFMEU). It is a study of wellbeing in its broadest sense, and working arrangements. It is the largest single such study in the world. It is a *longitudinal* study (that is, it’s not simply a single shot study of workers in the industry today, but will also feature a Wave 2 rollout of the survey to see how things change over time). It features a *matched partner* design, that is, also exploring the views of (where possible) spouses of the CFMEU members sampled in the survey. By surveying both members and their partners, the study authors hope to be able to generate a more three-dimensional view of the way work relates to the whole lives of CFMEU members. The beauty of the ACES study then, by comparison with the earlier studies mentioned in the previous section, is that it allows the questions raised above, and other questions in relation to the impact of working changes in the Australian coal and

energy industry, to be examined in a large study, that uniquely links up workers Australia-wide with their partners in a longitudinal study.

The study makes use of many of the key elements of the Standard Shift Work Index (SSI), the premier research tool in examining the impact of role shift patterns on wellbeing and health. However, the ACES instrument offers a substantial adaption and expansion of the SSI, incorporating more detailed analysis of features unique to Australian conditions (including FIFO, and DIDO) and examines in greater detail the complexity of Australia's multitude of shift patterns. It also additionally examines factors like partner, family, community and broader social group impacts absent in the SSI, and extends the SSI's exploration of the health impacts of working conditions.

The survey instrument comprised a detailed 16-page survey for mining and energy workers and a 12-page survey for their partners. The ACES instrument makes use of: health measures, including but not restricted to those constructed in the widely used General Health Questionnaire (GHQ);³³ shift work and sleep quality questions from the standard shift work index (SSI)³⁴ work-life balance questions from the Australian Work and Life Index (AWALI)³⁵ and elsewhere;³⁶ 'morningness' questions from Adan & Almirall;³⁷ relationship quality using the Revised-Dyadic Adjustment Scale;³⁸ questions on job insecurity, autonomy, child care, alcohol and cigarette consumption and life satisfaction from the Household, Income and Labour Dynamics in Australia (HILDA) survey;³⁹ questions on child behaviour from the Strengths and Difficulties Questionnaire;⁴⁰ social involvement questions from the World Values Survey⁴¹ and HILDA (for example relating to the degree to which people participate in community group activities); and a series of questions designed and tested specifically for this project.

As mentioned, the study is being rolled out in two waves. The first wave of the survey was provided to participants over four months to December 2011. Prior to this, the researchers tested three alternative methods of survey administration in the pilot, and chose for the main survey the method that had the highest response rate in the pilot (with a 50 per cent higher response rate amongst members than the next alternative and double the response rate amongst partners). This method involved then calling members before the survey went out, to explain the survey to them and to obtain their partner's name so that an envelope could also be specifically addressed to their partner. Up to three calls were made to selected members or their partners (whoever answered the phone). Once contact was made, or if contact was not made after three calls, a package containing the surveys and associated information for the member and (where relevant) their partner was sent to the home address. Two rounds of follow-up reminder cards were also sent. Members were randomly chosen to participate from lists provided by each District of the Union. In Districts where no phone numbers were available, a higher sampling probability was applied to offset the lower likelihood of receiving a response, as indicated through the pilot experience. In very small Districts (e.g. Tasmania), the whole membership was sampled. Members in lodges tied to identified contractor firms were also over-sampled, as this represented a small group whose experiences would not be able to be analysed if the number appearing in the final survey was too small. The ACES team is extremely grateful to National, District and Lodge executives and individual members who have directly and indirectly shown their support for this project.⁴²

To test the validity of the data key questions were compared against data in the Australian Work and Life Index (AWALI) survey. AWALI was undertaken annually by the Centre

for Work + Life at the University of South Australia from 2007.⁴³ AWALI surveys a representative, national, stratified random sample of the Australian workforce. Sample sizes were 1435 in 2007, 2831 in 2008 and 2691 in 2009. A request was made to the AWALI project team for unpublished data on hours preferences in the mining industry. In order to achieve a reasonable sample size, data from the three years of AWALI (2007 to 2009) were aggregated to produce a reasonable number of mining respondents (188 for the question on hours and 176 for hours preferences). We discuss the comparisons with AWALI in the section *Preferred and Actual Hours*,⁴⁴ however, it is noteworthy that where ACES and AWALI survey similar or identical questions, the results closely mirror each other, a fact that increases confidence in the findings.

The CFMEU has been nominated as the "principal union" in the mining industry by the Australian Council of Trade Unions and indeed its 22,000 Mining and Energy members represent approximately 60 per cent of the nation's coal mining employees. Using union members as the target population enables a good coverage of the diversity of shift and employment arrangements than company or mine-based studies, and a comparison with industries that often have shift variations, but are not necessarily directly related to coal mining. Wave 1 of the two-part ACES survey gathered data from close to 4500 people, comprising 2566 mining and energy workers who were members of the CFMEU in the latter part of 2011, and 1915 partners, of whom most (1725) are matched to specific members. The former represented a response rate of 28 per cent amongst the mine and energy workers. Amongst those partners to whom surveys were sent and whose spouses participated, the response rate was 78 per cent. Data presented in this report are unweighted.

We also realise that some workers feel insecure in their jobs and that they experience real fear in their association with projects that the company that employs them and pays their bills may find objectionable. Like this woman said:

THIS SURVEY HAS BEEN SUBMITTED VERY LATE - SORRY. JUST SO HAPPENED I RECEIVED A CALL AT NIGHT WITH SOMEONE LOOKING FOR MY HUSBAND ... I FOUND OUT THE CALL WAS REGARDING THESE SURVEYS. AFTER A LENGTHY DISCUSSION, MY HUSBAND REVEALED THE SURVEYS - THEY HAD BEEN HIDDEN FOR AGES IN THE CUPBOARD. AFTER MUCH CONVINCING, HE WOULD ANSWER QUESTIONS IN A SURVEY AS I REMINDED HIM IT WAS/COULD BE FOR HIS BENEFIT. I HAD TO COMPLETE THE SURVEY WITH HIM - THIS WAS THE MOST PAINFUL EXPERIENCE IN OUR 5 YEARS TOGETHER. I THOUGHT I SHOULD MENTION THAT EVEN THOUGH I [AM] ADVISED THE SURVEY IS CONFIDENTIAL, HE WOULDN'T ACCURATELY ANSWER SOME OF THE QUESTIONS, AS HE WAS CONCERNED IT WOULD GET BACK TO THE EMPLOYER.

The occasional sense of fear, but not a reticence about answering, was reflected in some mining and energy workers' quotes, e.g.:

The stand over tactics from some people in management is creeping back into the industry - I'm concerned with the way some of the new starters and young members are being talked to, the way they are threatened with their jobs and the levels of swearing that takes place. I would not want my kids or wife working at my workplace.

Our current work climate, the morale at work is terrible, XXX are not listening to their workers at all. It has a lot to do with management not staying at the same pit for more than 2 years, they rule with a big stick.

Of course, the questionnaires and the findings for individuals are kept completely confidential from the companies (and indeed, for that matter, from the union). As researchers we are very concerned that there existed this level of fear and we stress that all responses are totally anonymous. Still, our examination of the surveys gives us no reason to doubt that the vast majority of them have been completed honestly and correctly.

There were 75 women miners (3 per cent) in our sample. Some 87 per cent of all respondents reported being married or living with a partner, a figure that rose to 90 per cent if we included those in a relationship but living alone. Almost half claimed to have dependents living with them, with 32 per cent claiming to do less than half of the housework, and 16 per cent claiming to do more than half the housework in their household. In presenting the data, we will first present a broad overview of key data, before drilling deeper into the data to examine some of the implications of the findings. Generally speaking, in the text we have reported percentages as integers above 5 per cent but to a single decimal point below that number, unless there is a reason for greater specificity. At the time of writing, a few very late responses had been received and were being entered into the dataset, but it is unlikely these would materially alter any of the quantitative findings.

A point on terminology: the following report sometimes present data on a partner's perception of their own partner who is, of course, a mining and energy worker in the original sample. So to avoid confusion, when referring to married, cohabiting or non-cohabiting couples in which one is a mine and energy worker, the term '*spouse*' is used to refer to the person who is the mine and energy worker and '*partner*' is the term used to describe the other member of the couple. The questionnaires themselves used the term 'partner' for both participants in the couple, but we use 'spouse' here to avoid the confusion of referring to partners' partners.⁴⁵

3. Industry, employment status, qualifications and income

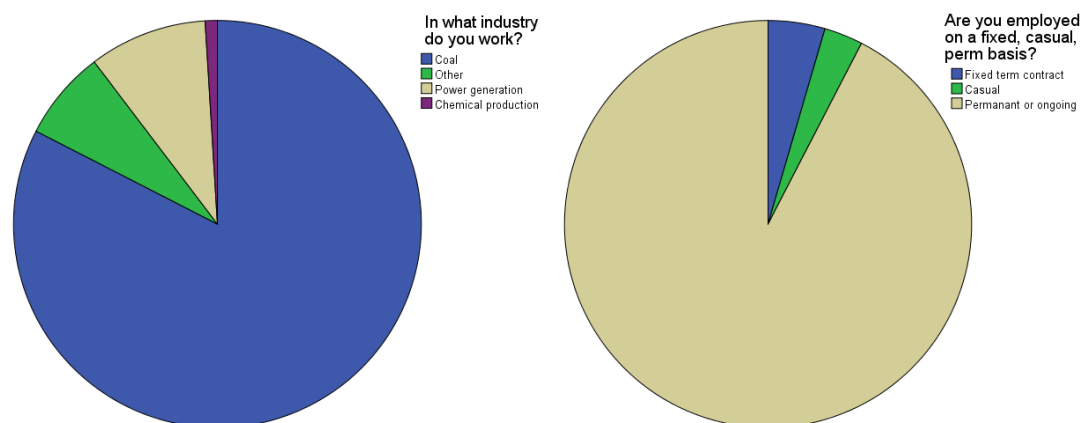
Amongst the coal and energy workers responding to the survey, 86 per cent worked in mining, comprising 80 per cent in coal and 6 per cent in other (mostly metals) mining. A further 9 per cent of respondents were in the electricity generation industry, and 2 per cent were in chemical and other industries. Data were not available for 3 per cent of respondents.

The vast majority (92 per cent) described themselves as being permanent or ongoing staff, with the balance relatively evenly split between fixed term contract (4.5 per cent and casual (3 per cent).

Figure 1 shows the industry split and the breakdown of work conditions amongst those who responded to Wave 1. The most common qualification possessed by those

responding was an equipment-specific ticket (51 per cent), although Certificate IV (26 per cent) and safety certificates (9 per cent) were also mentioned. Over a fifth (22 per cent) had completed high school, and an additional 49 per cent completed high school with some additional training. Around a quarter (26 per cent) had not completed secondary. Just two percent of respondents had a degree or postgraduate degree.

Figure 1 Industry breakdown and employment status of Wave 1 respondents.



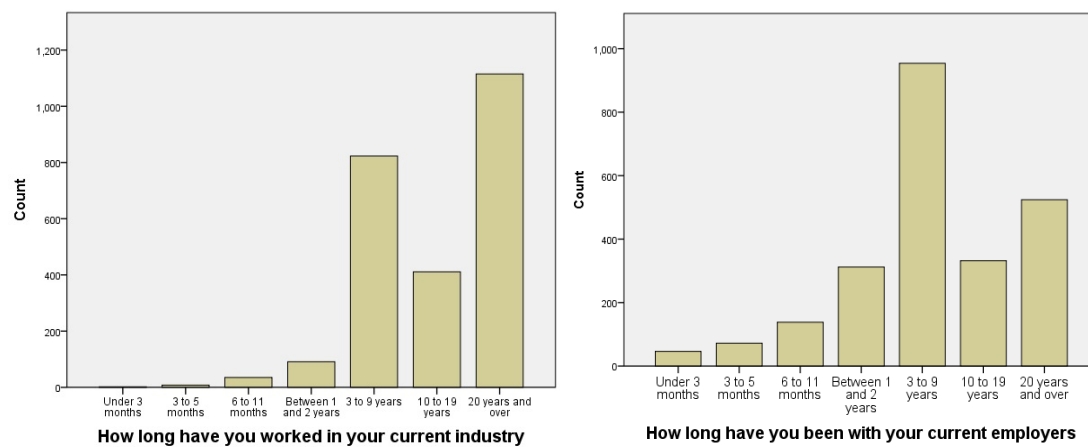
Across the sample, the average (mean) income of mining and energy workers was \$2290 per week. This figure includes those mining and energy workers who work part time. The mode figure of \$2500 represents the most frequent response. Median earnings were \$2300 per week. As would be expected, most ACES respondents (78 per cent each of mining and energy workers and partners) possessed credit cards – higher than usage in the population as a whole (around 58 per cent).⁴⁶ Patterns of repayment of credit cards were broadly similar to the population at large⁴⁷ – 13 per cent of mining and energy workers and 17 per cent of partners reported ‘hardly ever’ or ‘never’ paying off the entire balance each month.

Money can't buy you happiness!

4. Tenure and security

The respondents tended to have been long-term industry workers, with 45 per cent having been in their ‘current industry’ for at least 20 years, and just 5 per cent having been in the industry for *less* than 2 years. The respondents also tend to have high tenure with their current employers, with 76 per cent having been with their current employers for at least 3 years. Twenty two per cent have been with their current employers for over 20 years, and just 11 per cent have been employed by their current employer for less than a year. This was a higher level of job tenure than shown by ABS data for the mining industry (in which only 53 per cent had been with their current employer for at least 3 years). This is not unusual, as union members tend to have longer tenure with their employer than non-members. (See Figure 2 for a breakdown).

Figure 2 How long have you worked in your current industry and current employers?

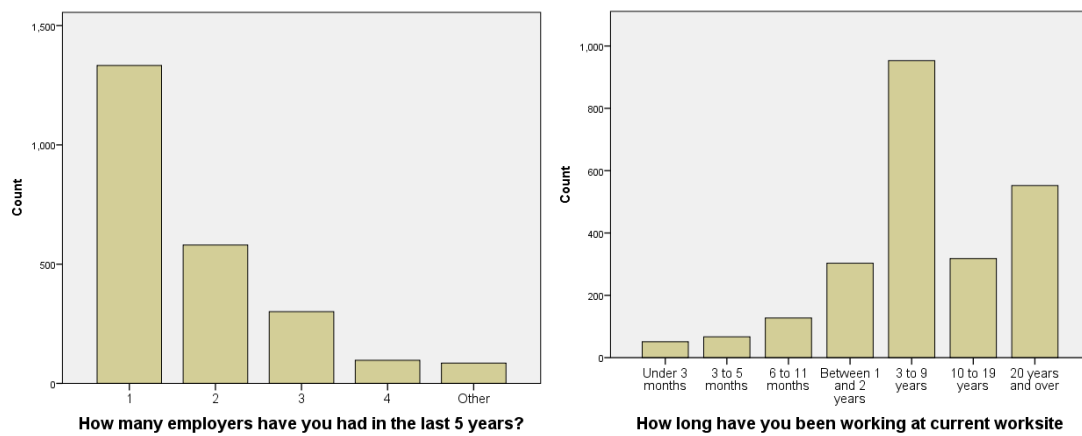


Because of my length of time in coal mining, and related industries, I end up on weekend shifts because I can get job results.

When we asked workers how many *employers* they had had in the last five years, the most common response was ‘one’, with 56 per cent of responses, while 92 per cent had had fewer than three employers. A similar degree of *worksite* stability was found in the sample, with 77 per cent having been at their current worksite for over 3 years, and 23 per cent have remained at a single site for over 20 years (see Figure 3). Yet labour turnover in mining is amongst the highest of any industry,⁴⁸ and much higher than would be expected given the level of wages in the industry.⁴⁹ So the ACES dataset will possibly under-represent employees who are dissatisfied with conditions in the industry or other matters and choose to leave the industry, as many of those early leavers are not available to complete the survey.

If I did not have an understanding wife the 7-day roster system would have wrecked my life! I have been doing it for 22 years now. The money is good but the birthrights you give up, i.e. Christmas, Easter and Fridays at the pub. The start and end of the week, years etc turn you into a drone. If I had a preference for a shift it would be afternoon shift 5 days a week.

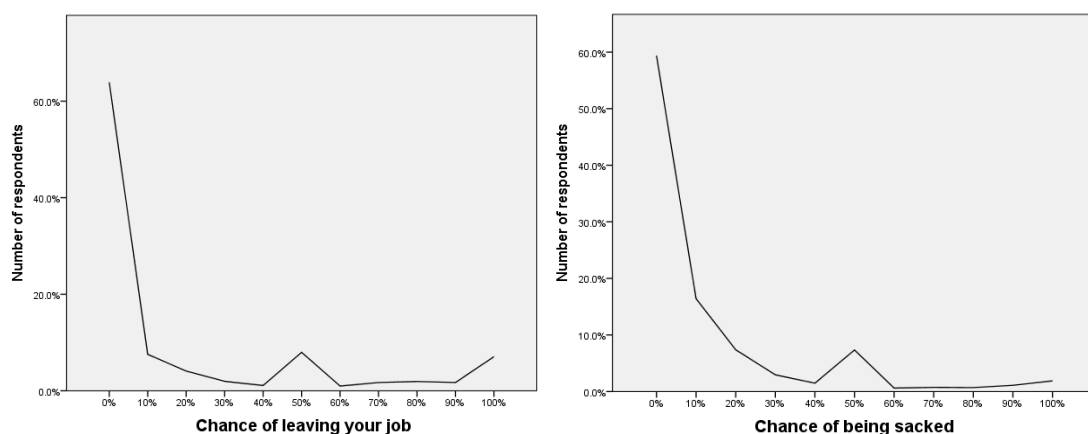
Figure 3 Further indications of tenure—in employers and worksites



We also considered perceptions of job mobility and job insecurity. We asked respondents to separately estimate their chance of leaving the job or of being sacked in the coming 12 months. Majorities (64 per cent and 59 per cent) rated each probability at zero. However, on the other end of the scale, 7.1 per cent were certain that they would leave their job, and 1.9 per cent were *certain* they *would* be sacked.

There was a small peak of respondents at the 50/50 mark for ‘chance of leaving your job, with 8 per cent believing there was an even chance of their turning their back on their current position. Turning specifically to the question of probability of being sacked, 12 per cent believed there was a 50 per cent or better chance of being sacked. Thus around an eighth of workers were feeling highly vulnerable (see Figure 4).

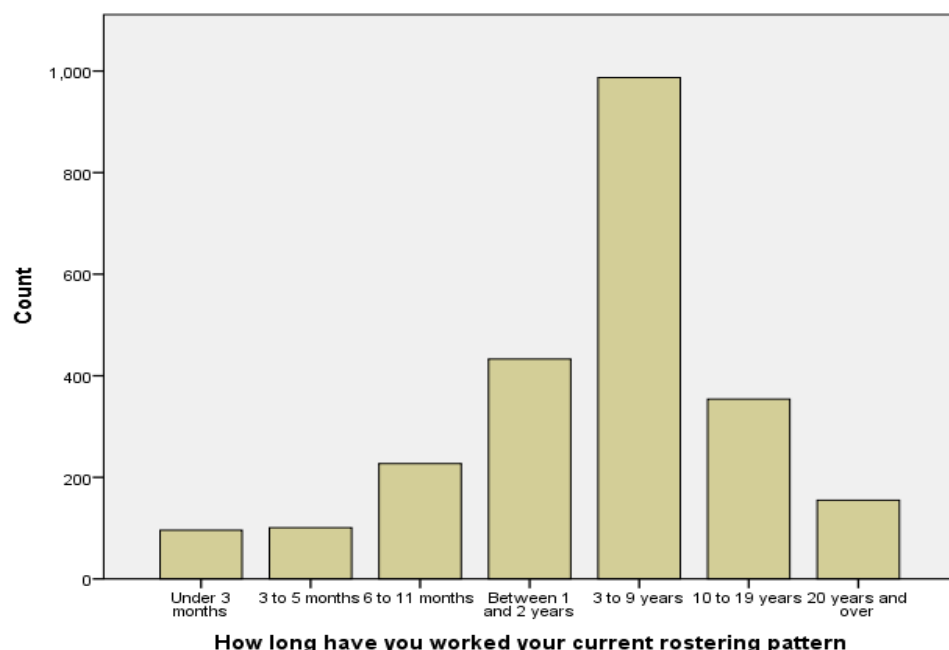
Figure 4 Voluntary or involuntary departure from the industry



The reason I have only \$77.84 in my weekly pay is that my company keeps standing me down ... I need[ed] to raise it up to the union about what's happening with my work and gladly CFMEU help[ed] lodge a complaint to my recent company and without my knowledge the company terminated me. Result for me to look for another job but CFMEU and I have been to a court hearing regarding my case and the next one will be this coming November 24 for unfair dismissal. As of now I don't have a job yet, still hoping to get a job... Being jobless affects my health, family and everything.

Turning to participants' current shift work or roster pattern, stability was again the order of the day. Sixty-four per cent of workers had been working in their current pattern for over three years. The stability was distinctly less pronounced than employer and worksite stability. Forty-two per cent had been on their current pattern for 3 to 9 years, and just 7 per cent had held their current pattern for 20 years or more; 18 per cent had been on their current roster pattern for less than a year; and one in 25 of the workers were still bedding down their current roster pattern, the roster having been introduced in the last three months. The findings underline that while the major players and sites are not changing rapidly, work patterns have been undergoing significant change (compare Figure 5 with Figures 2 and 3).

Figure 5 *How long have you worked in your current roster pattern?*



We work 7/7 equal time rosters, which is great. We have plenty of time for relaxation plus we can choose to live where we would like even interstate. It's good to think that I have the option to move back to Newcastle and not have to leave my present job; my option to FIFO is a good option to have!

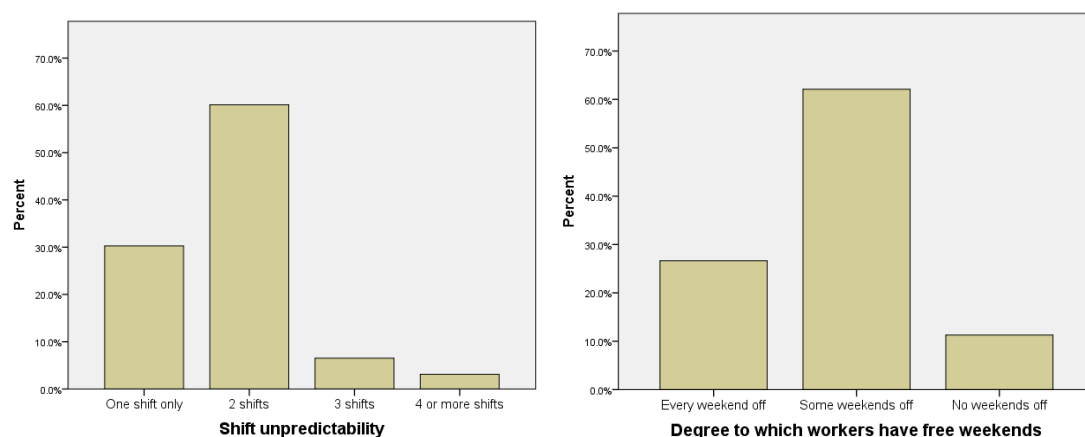
The change in roster hasn't increased production at all. The company saved money because they took money off all of us. We're getting screwed through the coal bonus system the company has come up with.

5. Working time stability and rotation

This study represents the largest study of its type examining sleep patterns and shift work, so it is interesting to dig a little deeper into the sleep patterns of those on shifts. But first of all, although it was clear from some ACES data collected that the shift patterns of Australian coal miners in particular are incredibly complex and varied, 95 per cent of those who responded to the question on the regularity of their shifts described them as ‘repeating’ as opposed to ‘non-repeating’. Repeating, however, by no means is equivalent to ‘straightforward’. Almost 10 per cent work three or more shift, while just over 60 per cent work two shifts. Almost three quarters of respondents reported not to have every weekend free, with over 10 per cent reporting they had no weekends entirely free from their day job (Figure 6 provides further details).

There has been a lot of talk and publicity on shift rosters and lengths. I have worked in the mines for about 30 years and have worked most rosters that are around. I am married with children and I grew up in a mining town (Blackwater). So I am fairly well placed to comment on these matters. While I don't have enough room to write all my observations, I will say that of all the roster patterns I've worked, the longer patterns such as the 7 on 7 off are much more family friendly, especially for people who live away from where they work. The shorter rosters don't allow you quality time, you get home and two days later you are heading back, not giving you time to do things with your family. Longer patterns not only cut your amount of travel time, you can get your jobs done at home, take your children somewhere, and you nearly always get a week off with them on school holidays. I believe this is the way mines should go as it gives a great work/life balance.

Figure 6 *Indicators of working week variability*



Analysis of the exact nature of the shift patterns is still underway, but is a highly time-consuming process, as it emerged that there are literally dozens of shift patterns in place across the mining and energy industry, with some mining and energy workers reporting patterns that repeat in cycles over two months in length. However, to give a flavour of the complexity of the shift work systems in the Australian mining and energy sector, we found over 70 distinct patterns of shift work amongst our respondents, with rotations of up to 70 days. Such a range of responses represents a challenge to those working in the industry to maintain a social life that integrates with the rest of the community *and* their own community. Further details will be provided in subsequent analysis.

Changed jobs in Feb 2011. Previous employer introduced a one-week rotating roster shift cycle, which I wasn't prepared to work. Returned to work with a previous employer of 5 years to go to get a set dayshift roster, which makes it much easier to control my diabetes.

6. Preferred and actual hours

In ACES, workers were asked 'including any paid or unpaid overtime, how many hours per week do you work on average in your main job?' They were then immediately asked 'If you could choose the number of hours you work each week, and taking into account how that would affect your income, leisure and domestic activities, how many hours a week would you choose to work?'. As with AWALI, the ACES data revealed that the majority of mining and energy workers (61 per cent) preferred to work less than forty-one hours per week. The distribution concentrated in the 38-41 hour range, preferred by 31 per cent of respondents. The median of preferred hours – that is, the 'mid point' – was 40 hours per week (as with AWALI). In total, 67 per cent of mining employees preferred to work less than 44 hours per week and only 33 per cent preferred to work 44 hours or more per week. (In AWALI, the figures were 64 per cent and 36 per cent respectively.) Consistent with AWALI, by far the most common (modal) hours preference in ACES was for a forty-hour working week.

We received comments from a partner who has a forty-hour week –

LOVE MY JOB - MY JOB AND MY LIFESTYLE ARE VERY SATISFYING. TO MAINTAIN MY LIFESTYLE I NEED TO WORK THE JOB I DO OR SOMETHING SIMILAR. THERE IS A TRADE OFF - NO WORK NO LIFESTYLE; THIS IS WHY I WORK 40 HOURS A WEEK.

as opposed to a miner who finds -

Rotating roster makes it really hard for me to organise babysitters, so I can return to work. I prefer set shifts so both myself and my children get into regular routine.
If the big companies were not so greedy, nobody would have to work night shift. Pits could close from midnight to 6am.

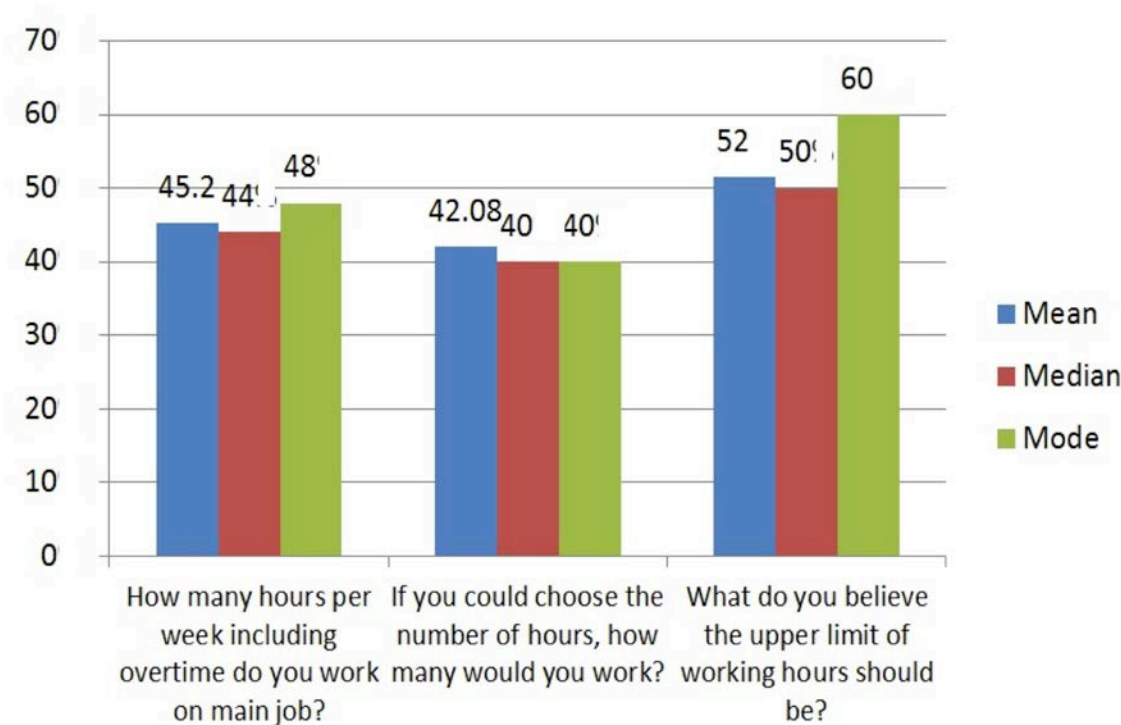
The study also explored the number of hours that employees worked. The median mining employee in ACES worked 44 hours per week, and the median full-timer worked 44.5 hours per week. (These numbers are slightly lower than in AWALI, suggesting that

average hours in unionised coal mining are lower than average hours in the largely non-unionised metals mining sectors.

Long hours take you away from family activities. Weekend 12-hour rosters you don't see your kids grow up, weekend sports etc.

Figure 7 provides a summary of the means (averages), modes (midpoint of responses arranged in series) and medians (most common responses).

Figure 7 Hours mining and energy workers work, want to work, and think work hours should be limited to



Some 50 per cent of employees in ACES were working more hours than they would prefer, even after taking into account how that would affect their income and other activities, while 39 per cent were working the number of hours they would prefer and 11 per cent would prefer to be working more hours. These numbers are not significantly different to those in AWALI. Amongst the 11 per cent who would prefer to be working more hours, the median gap between what they would prefer and what they were working was 12 hours. Amongst the 50 per cent of mining employees who would rather be working fewer hours, the median gap between the hours they are working and the hours they would prefer to work was 8 hours. These data suggest that the idea that current working hours arrangements in the mining industry are driven primarily by changes in employee preferences is not correct.

The 12-hour shift affects the community on many negative planes. I grew up in this industry and I recall family, friends frequently getting together for BBQs, sports, school events. Which still happens, but I notice less and less people at these events. Most families I know go away on days off (often removing kids from school) or cannot get a BBQ with friends happening because of how late we get home, or our friends are on completely different shifts. My wife constantly feels like she "talks" to our friends through text because she doesn't want to risk waking the husband up. We have all the rosters of our friends on the fridge now to check when people are/not available, but I work half the year, get rental allowance and I'm on \$120k so I shouldn't complain.

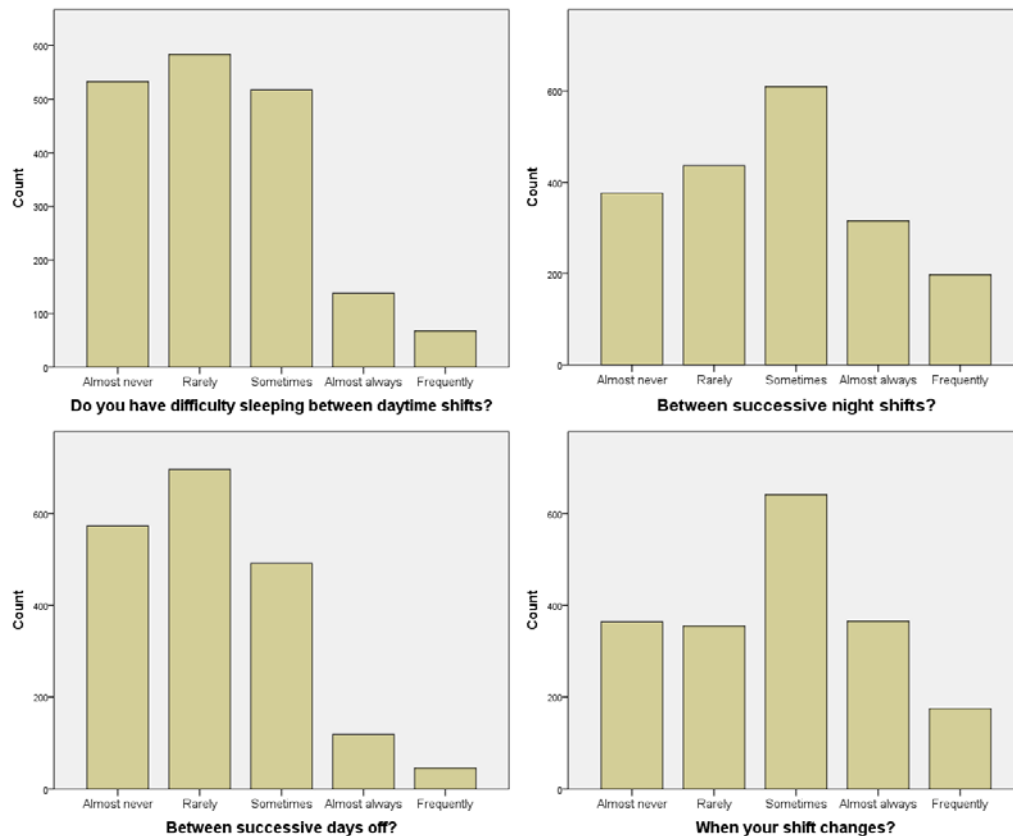
There is, of course, some labour market sorting before these data are collected. That is, the respondents we surveyed were those left over after those who were not satisfied with aspects of the labour hours had left the industry. These data refer to the hours preferences of workers currently employed in the industry at the time of the survey. In earlier qualitative research in coal mining, we spoke to people who had left the industry and would not return due to the length of shifts.⁵⁰ The survey was therefore likely to understate the gap between employee preferences and the actual hours worked for those workers who have entered the industry.

7. Shifts and sleep

Looking at workers' difficulty in falling asleep, when it comes to falling asleep between successive night shifts, 42 per cent almost never or rarely experience difficulty, but 58 per cent 'sometimes', 'almost always' or 'frequently' experience difficulty falling asleep. When it comes to 'home time,' the difficulty falling asleep between successive nights reduces, not surprisingly, with 66 per cent rarely or almost never experiencing such difficulty between days off. In other words, during work time, employees are experiencing uncharacteristic levels of tiredness that is clearly linked to their shift work. Confirmation of this conclusion comes when it comes to day shifts, 61 per cent experience little or no difficulty falling asleep (compared to 42 per cent on night shifts, above). Shift changes present an even greater challenge, with only 38 per cent of respondents saying they experience little difficulty falling asleep between shift changes, while 28 per cent frequently or almost always experience difficulty. Shift changes often mean a 'pyjama day', where a day shift might finish at say 6pm on a Monday and then the next (night) shift begins at 6pm on a Tuesday, "it is a little bit of a lost day", so called, as one of our interviewees said, "because basically some people would never get out of their pyjamas because they would get up in the morning, knock around the house and go back to bed ready to go to work".

Really hate rotating roster. Prefer fixed shifts. Rotating roster leaves me constantly tired and impacts on my moods

Figure 8 Degree to which respondents have difficulty falling asleep during different transitions.



To summarise: 58 per cent ‘sometimes’, ‘almost always’ or ‘frequently’ experience difficulty falling asleep between successive *night shifts* and 62 per cent experienced such difficulties when their *shift changed*, but between days off only 34 per cent experienced difficulty sleeping sometimes or more often, and 39 per cent had difficulty sleeping between day shifts. For further details, see Figure 8.

With changing from day to night all the time, it disrupts sleep patterns, so you don't get quality sleep. I get short sleeps, that when you get up, you still feel fatigued.

After going from permanent shifts back to rotating shifts, my body clock never gets used to it. I could only enjoy time off and between shifts on permanent day, arvo or night.

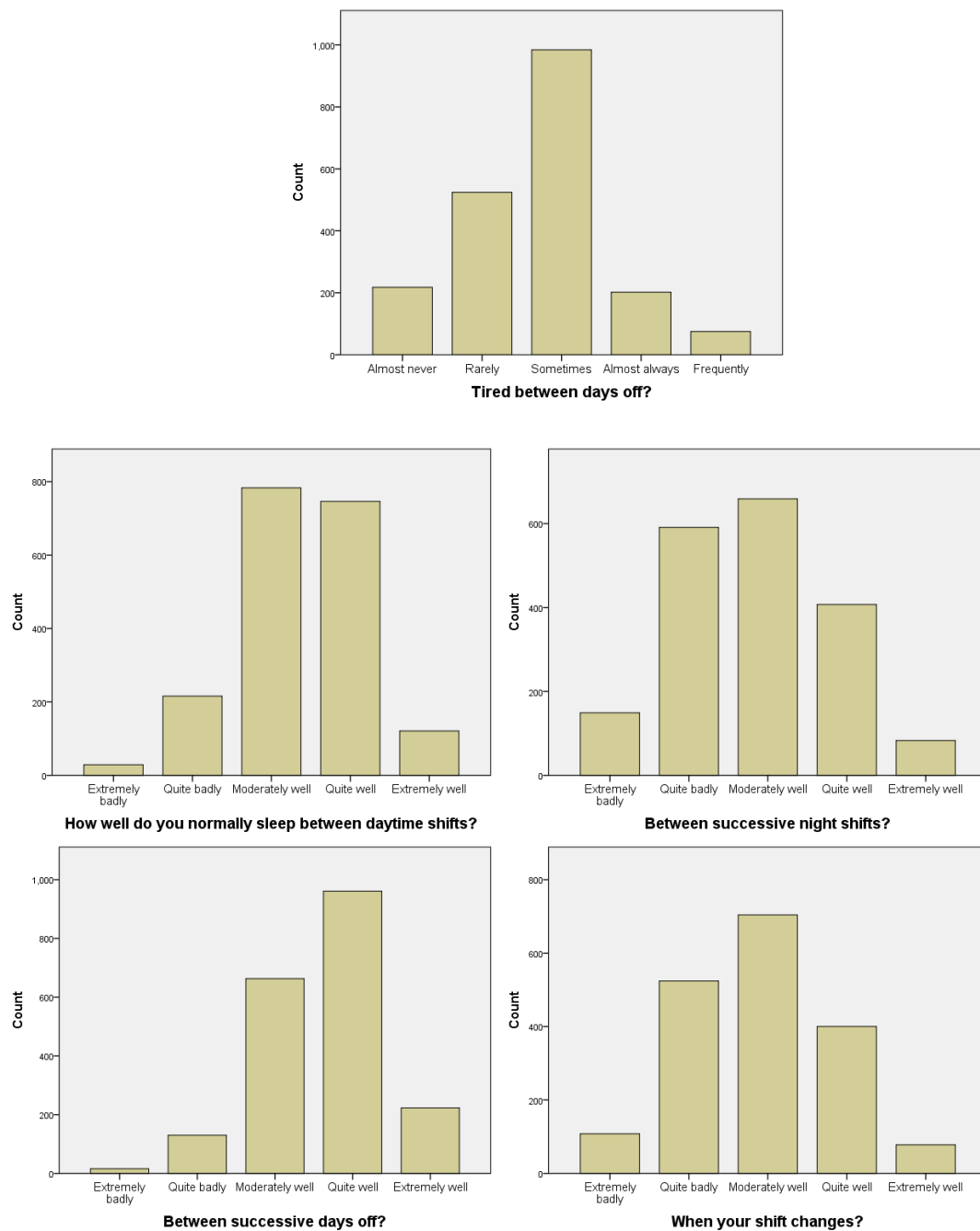
A consequence of this difficulty in falling asleep, naturally enough, is exhaustion, as the quote following indicates.

Work, trying to stay fit after work, travel to work, spending time with wife is very short at night because in need of 8 hours sleep. If I don't get it work is flat out and hard so by Friday I'm exhausted but at least I sleep in my own bed at night now. Lack of sleep all backs up then doing chores, just seems flat out still. Sometimes the weight of everything is too heavy. And the money still just lets us survive for what I do, it's not right. We can't even afford to save for a house.

Combining the “sometimes”, “almost always” and “frequently” responses within a series of questions, we can see that respondents tend to feel less tired between days off (52 per cent ‘sometimes’ or more often feel tired between days off) or between day shifts (63 per cent) compared with between night shifts (88 per cent). Sleep itself follows a similar pattern. Reports of sleeping extremely badly or quite badly were much higher between night shifts (39 per cent) and when shifts changed (35 per cent), than between nights off (7.3 per cent) and between day shifts (13 per cent). The impact on sleep quality thus is extremely clear and the impact of night shifts, in particular, is stark. Figure 9 gives an overview of the results relating to ‘tiredness’.

For me I like the 12.5-hour shifts, it gives me more time at home between shifts. The money is okay and luckily for me I live close to the operation. I'd hate to be travelling a longer distance like a lot of my colleagues, especially after working night shift. I feel they're at a greater risk of falling asleep behind the wheel, putting themselves and others in danger. There has already been a fatality from our operation from this.

Figure 9 Respondents' sleep quality during transitions



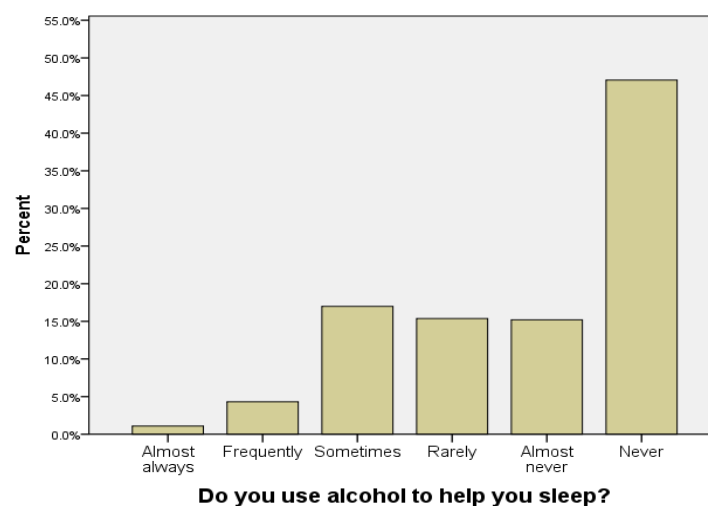
Workers were also asked about the amount of sleep they were 'normally' getting, and asked to rate whether the quantum was 'nowhere near enough', 'could use a lot more' 'could use a bit more' 'getting the right amount' or 'getting plenty'. Between day shifts (18 per cent) and between successive days off (8.3 per cent), respondents relatively rarely felt they needed 'a lot more' or were getting 'nowhere near enough'. This figure rose sharply between successive night shifts (42 per cent) and during shift changes (29 per cent).

I think all mines should be 24/7, NO pyjama days. Start night shift- finish day shift. On a 2 week on 2 week off roster, or alternatively still with even time roster as a week of days and a week off, a week of nights and a week off. I have worked many different rosters, the pyjama day screws with your body clock. Short rosters, i.e. 4 on 4 off or 3 days 3 nights screws with your body clock and when you're at home with friends and family because you are still tired and getting ready to go back when you have only been off a day or two. You don't enjoy the time off and it's difficult to concentrate.

Doing 2x12 hour days then Claytons day, then going to work that night, trying to sleep isn't normal during the day so that 1st night shift is very hard to stay awake. Power naps aren't normal. 2nd night shift is fine, but the next day you have to get up early to try and slot in with normal life. You are feeling tired, it takes 2 days to get over, next thing you're back at work.

ACES explored whether workers were using drugs or alcohol to deal with sleep disruption.. In total 37 per cent admitted using alcohol to help them sleep, although only 5 per cent admitted using it frequently or almost always to induce sleep (see Figure 10).

Figure 10 Use of alcohol to aid sleep.



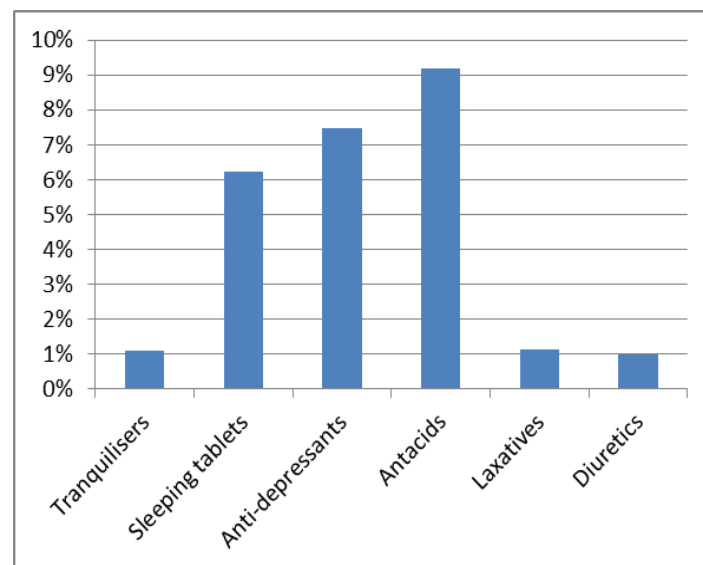
While I love the amount of time off I have with this roster, I need to find other things to do - like sports, hobbies and community work, or self-employment to keep me from drinking too much on my days off. This is a personal thing and will take some discipline to rectify. No big deal, I'm just too comfortable and it's too easy to have a good time all the time (drinking!)!!!

ACES also examined the use of common medications, both prescribed and over-the-counter, amongst the participants. Sleeping tablets were used for prolonged periods by

just 6.2 per cent of respondents, and 1.1 per cent admitted to using tranquillisers regularly (see Figure 11 for an overview).

Working night shift has a negative impact on me as to how I deal with my family. Even though I am conscious of this, it is hard to rectify. The roster I work also affects my driving ability. I have noticed after night shift on a long stretch of road that my response time is quite poor. I am sure my driving ability is a lot worse than if I was affected by any amount of alcohol.

Figure 11 Use of common prescription and non-prescription medications amongst the participants.

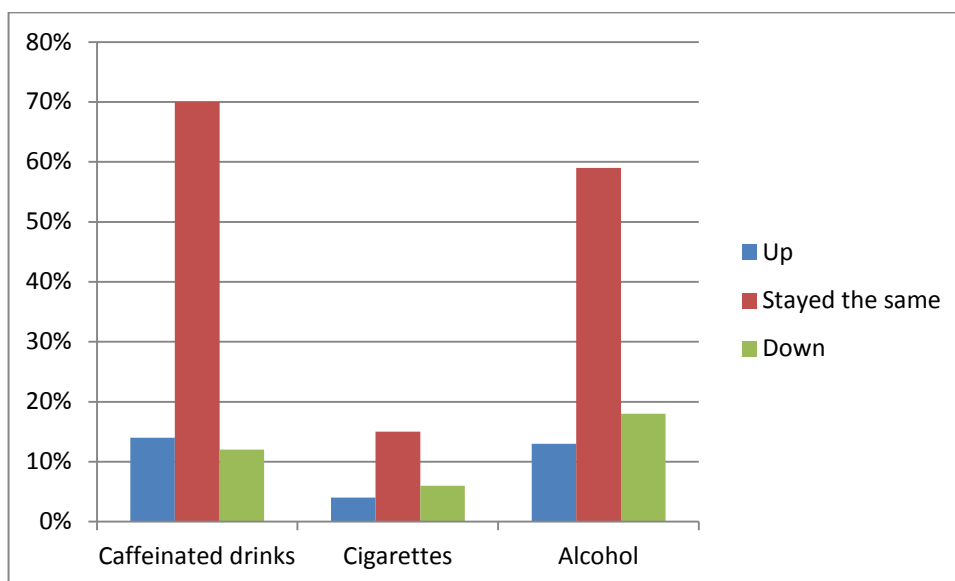


8. Shifts, alcohol use and smoking

Although there is both anecdotal and research evidence that shift work is increasing the intake of caffeinated drinks, alcohol and cigarettes, our study did not generate conclusive evidence on this. Slightly more workers claimed that caffeinated drink consumption had gone up (14 per cent) than down (12 per cent), but more workers claim that alcohol consumption had gone down (18 per cent) than up (13 per cent respectively). There was a similar pattern for cigarette consumption (7 per cent down, 4 per cent up) (see Figure 12 for details). This may be due to the vast majority of our respondents having been in the industry for an extended period of time (our question re change merely probed the last two years) and that any changes caused by the lifestyle may have already been thoroughly entrenched by this stage. Partners had a different perspective on alcohol, being more willing to report that the member's alcohol consumption had gone up (16 per cent said this) than had gone down (12 per cent). Partners were fairly split on their spouse's cigarette consumption (6 per cent said it had gone up, 5 per cent down) and agreed with their spouses that caffeine consumption had increased slightly (11 per cent up, 10 per cent down). Increased alcohol consumption was positively correlated with several illnesses in our sample, with mining and energy workers' perceptions of consumption being better predictors than partner's perceptions of mining and energy workers' illnesses.

In the last 12 months, I changed to weekend work. I now work night shift Saturday, Sunday and Monday, 13 hour shifts plus a shift during the week when required. My health has improved since swapping from Mon-Fri. I have lost 20kg and now no longer require medication daily. Shorter working week is beneficial for both my health and family life.

Figure 12 “Has your use of the following gone up, down or stayed the same over the past two years?”



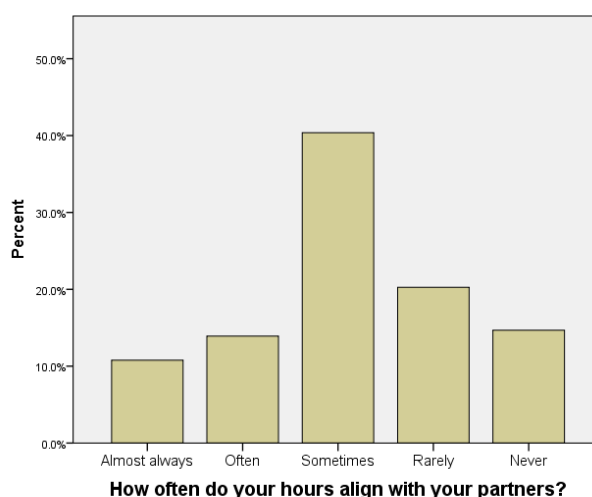
Working in mining has advantages and disadvantages. It's important to try to keep a work-life balance. Fatigue is a big factor, as [is] health. Often I am too tired after 12.5-hour shift to exercise so it's easy to have a problem with weight. We tend to use eating as a fatigue helper. Sitting in a truck for so many hours doesn't help the matter. Also belonging to a hobby group or set adult classes is a problem with changing shifts not being able to turn up every week. But at the end of the day we are paid well to work in an occupation that has the potential if you are not safety conscious could be dangerous

9. Shifts and partner's work

In relation to working hours, another area where ACES allows an analysis of potential social disruption and impact is through an analysis of partners' working patterns. In one key question, we asked, “how often do your working hours align with your partner's working hours?” The results showed that only in a little over 10 per cent of cases were working hours closely aligned (“almost always”), and in around a third of cases, the working hours of the two were ‘rarely’ or ‘never’ in sync (see Figure 13).

Introduction of 12-hour shifts killed small towns, social life and have made family life hard. With the 12-hour shifts came equal time rosters, everyone moved family to coastal areas and commuted to work. With the mining boom and the new workforce that has come with it, see this as normal and I can't see much changing.

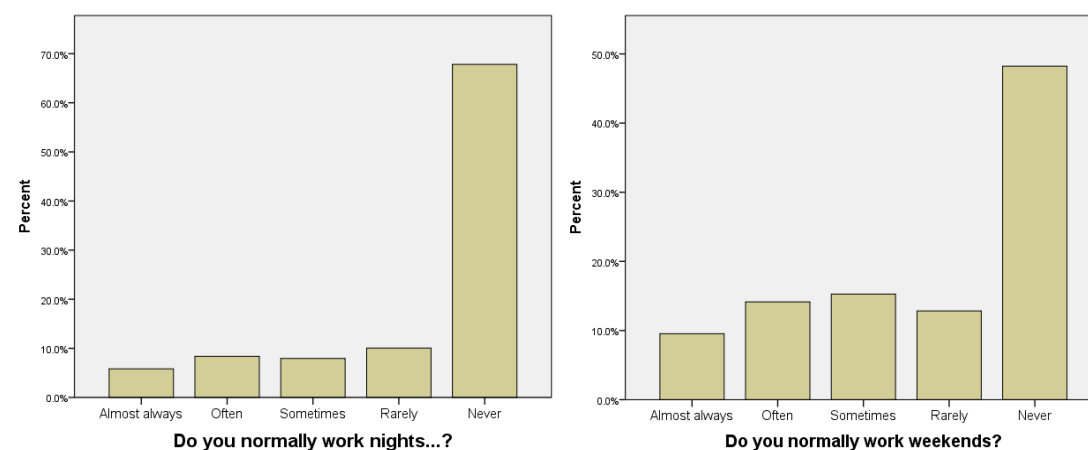
Figure 13 *The degree of alignment between mining and energy workers' and partners' hours.*



ACES also asked mining and energy workers' partners about the frequency with which *they* worked nights or weekends, with Figure 14 giving an overview. Note that a surprisingly large proportion of them (15 per cent) report frequently ("often" or "almost always") working nights and 4 per cent report doing so at least occasionally. Furthermore, 38 per cent are working occasional weekends. In total, 52 per cent of employed partners worked at least some weekends. Not surprisingly, the majority of partners working were not working in times that synchronise with their spouses.

I would like to have every weekend off to be with my girl. Working night shift is no real drama for me, but not much time with my girl really gets me down.

Figure 14 *Work-hours and disruption of CFMEU partners*



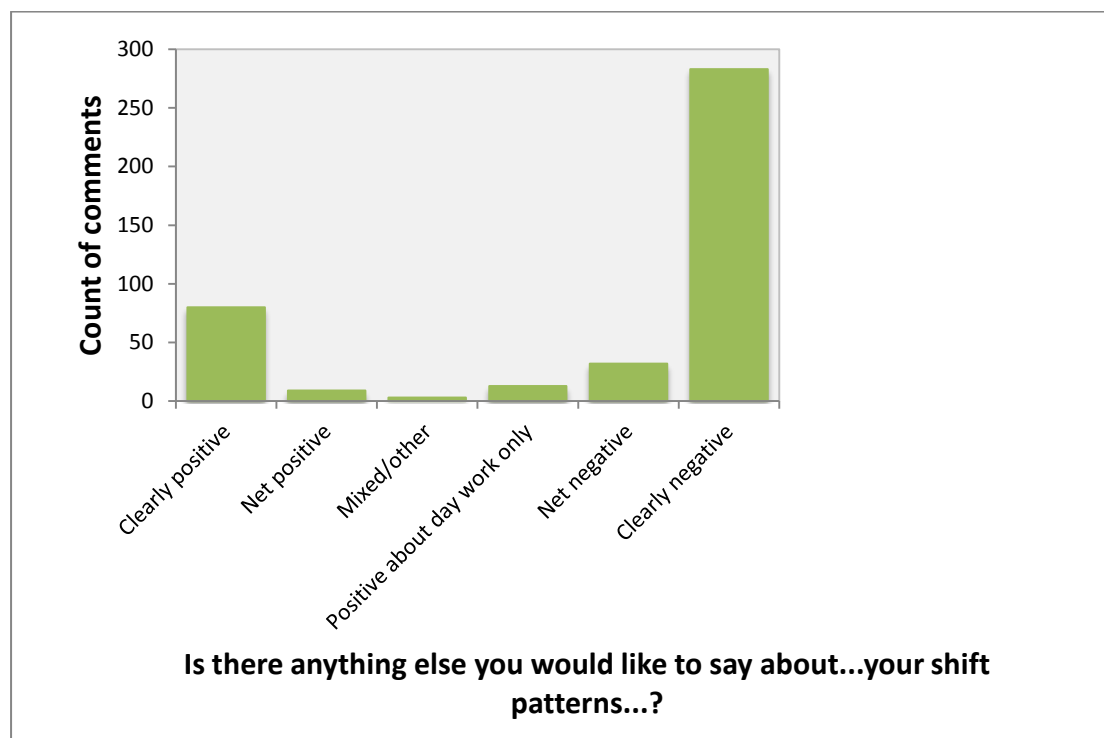
NIGHT SHIFT IN SUCH LONG STINTS HAS HAD A HUGE EFFECT ON MY PARTNER. I GUESS DAY SHIFTS OF 12 HOURS SHOULD ALSO BE INCLUDED. HE HAS AGED CONSIDERABLY IN THE PAST 2 YEARS AND ON DAYS OFF HE IS STILL OCCUPIED WITH WORK ISSUES. LIFE EXPECTANCY WOULD SURELY DECREASE WITH CONTINUAL LONG AND MIXED HOURS.

10. Broad views on shift work

After a series of questions aimed at detailing the pattern of their specific roster, any requests for increased flexibility, their actual and desired working hours, and related questions, we asked mining and energy workers “Do you feel that overall the advantages of your shift system outweigh the disadvantages?” We then asked them, “All other things being equal, would you prefer to give up working shifts and get a day-time job without shifts?”. We also asked an open-ended question at the end of the survey: “Is there anything else you would like to say about work, your shift patterns or how they relate to your health or personal, family life or community?”

Some 554 mining and energy workers gave responses to the open-ended question, of which 420 concerned working hours, shifts, and related matters. Amongst those 420, we found 315 to be mostly negative remarks, and 89 to be mostly positive remarks, a ratio of slightly more than three negative remarks to each positive remark (Figure 15). A selection of those remarks, both positive and negative, is interspersed throughout this report.

Figure 15 *Categorisation of Mining and energy workers’ open ended comments on working hours, shifts and related topics*



12 hour shifts and FIFO is destroying families and communities. Sporting bodies are suffering. Community segregation with camps, businesses are suffering. It is leading to people lowering their principles and morals. Make a buck and get out attitude is running rife. It is splitting locals and travellers. Company favours travellers over locals and play them off against each other. By offering travellers more perks and favours than their local counterparts.

Be happy working 35 hour week, or 18 days a month day and afternoon shifts, or permanent night shift. Extended or 12.5 hour shifts have a detrimental effect on fatigue, family and social life. Money is good, but impacts on your life generally. Working broken 12.5 hour shifts does not allow your body clock to adjust properly.

The closed-choice questions mentioned above produced two different responses, both appearing to focus respondents' attention to varying degrees on their specific shift or roster arrangements and evoke comparisons with other rosters they may have experienced. Some 59 per cent of mining and energy workers felt that the advantages of their shift system outweighed the disadvantages (27 per cent "definitely", 32 per cent "probably"), while 22 per cent felt the disadvantages outweighed the advantages (6 per cent "definitely", 15 per cent "probably") (Figure 16). Employees working eight hour shifts were happier: 35 per cent of those working an unweighted average of eight hours per shift said the advantages "definitely" outweighed the disadvantages, compared to 22 per cent of those working an average 12.5 hours or more (and just 10 per cent of the small number (N=31) of those working 13 or more hour shifts).

I enjoy my work and especially my life/work balance

When asked the second question, 40 per cent said they would definitely or probably prefer to give up working shifts and get a daytime job without shifts, 19 per cent said maybe, and 41 per cent said probably or definitely not (Figure 17). Amongst those working shifts averaging 12.5 hours or more, preference for giving up shifts was 47 per cent, while those who probably or definitely did not wish to give up shifts was 32 per cent.

Most of [my] family and friends are about 750 kilometres away. It's a long drive to be happy. If I could get a job paying the same amount I would be back in a flash.

In sum, these three sets of findings suggest a complex set of reactions amongst mining and energy workers: a clear majority of those willing to volunteer a view in open-ended comments were dissatisfied with working hours and shifts; but amongst those working shifts, views were fairly evenly split on whether they wanted to abandon shift work altogether and go back to day jobs, and a majority thought that the advantages of their current arrangements outweighed the disadvantages, taking account of alternatives through other shift patterns.

Figure 16 Mining and energy workers' view of advantages and disadvantages of current shifts

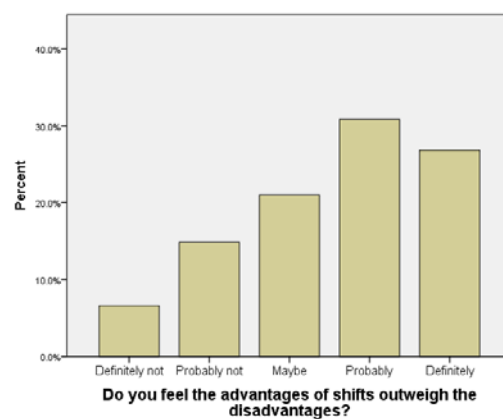
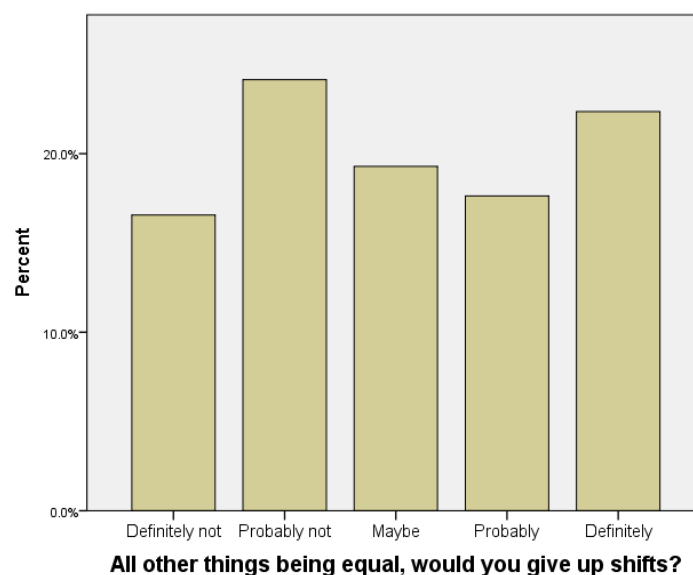


Figure 17 Member's preference regarding giving up shift work and getting a day-time job without shifts



I enjoy the mining industry as I have never had a job that has given me and my family the financial freedom that mining offered to me

ACES also examined partners' view of their spouses' working hours with some similar questions. Partners, too, were evenly split on whether they would prefer their spouses to give up working shifts and get a day-time job without shifts, with 41 per cent of those replying saying definitely or probably, 17 per cent maybe and 42 per cent saying probably or definitely not. They were similarly more likely to consider that currently the advantages of their spouse's working hours outweighed the disadvantages (by a margin of

63 per cent to 18 per cent). However, as with the mining and energy workers, many partners' open ended comments reflected unhappiness with the rotating long shift system.

SHIFT WORK IS OFTEN HARD ON MY PARTNER WHEN OVERTIME IS INVOLVED. THE LONG 12-HOUR SHIFTS SOMETIMES 7 DAYS IN A ROW IS TOO MUCH. LEADS TO ONE VERY GRUMPY, OLD MAN!

Overall, 20 per cent would like their spouse to get a job elsewhere if it were possible, whereas 58 per cent would not. It is possible that partner disaffection is one part of the explanation for the high labour turnover in the industry, as there is a strong, significant correlation ($r=.19$, $p<.001$) between partner disaffection as registered here and their spouse's reported probability of voluntarily leaving their job within the next year. (Where partners strongly agreed that they would rather their spouse got a job elsewhere, only 45 per cent of their spouses thought there was no chance they would quit their job in the next year, but where partners strongly wanted them to stay in the job, some 74 per cent of spouses were certain they would be in the same job in a year's time.)

HAVE BEEN MARRIED 20 YEARS. FOR 18 OF THESE YEARS MY HUSBAND HAS BEEN A SHIFT WORKER. IT WAS DIFFICULT WHEN THE CHILDREN WERE YOUNGER. THEY WOULDN'T KNOW SOMETIMES IF HE WAS AT WORK OR IF HE WAS ASLEEP. I SUFFERED SEVERE MORNING SICKNESS DURING PREGNANCY AND SPENT TIME IN HOSPITAL. WE WERE VERY LUCKY TO HAVE MEMBERS TO CALL ON, SO THAT MY HUSBAND DID NOT HAVE TO HAVE TOO MANY SICK DAYS. HAVE HAD TO GO TO SOCIAL EVENTS BY MYSELF. HAVE GOTTEN USED TO IT. HATE WHEN HE WORKS ON CHRISTMAS DAY. HE HAS NOT BEEN ABLE TO THROW HIMSELF INTO THE COMMUNITY THINGS BECAUSE OF SHIFTS. PROBABLY WILL WHEN HE RETIRES.

SHOULD BE AN OPTION FOR THOSE WITH FAMILIES TO DO PERMANENT DAY WORK ON SAME PAY AS EVERYONE ELSE.

11. Social interactions

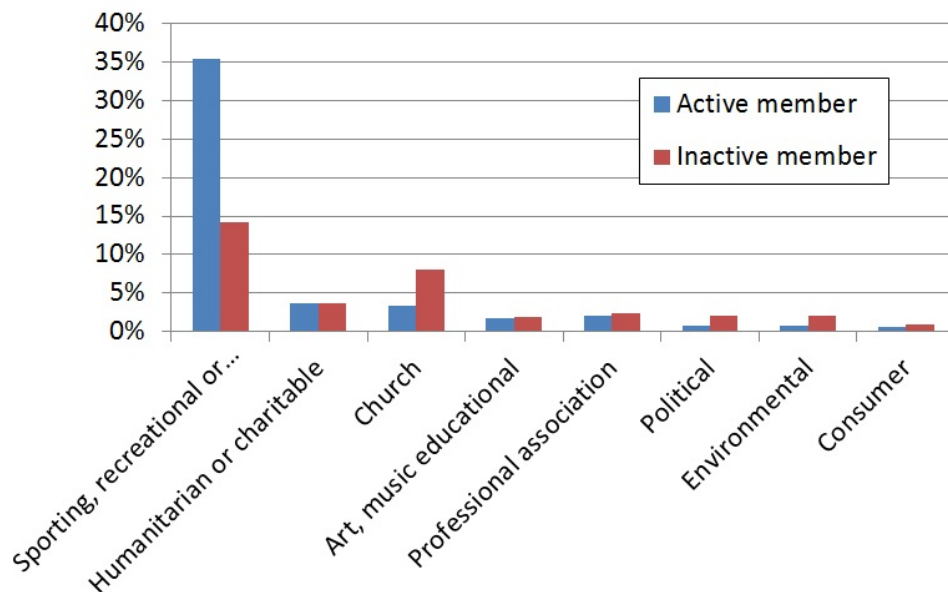
We showed respondents a list of voluntary organisations and asked them whether they are an active member, an inactive member, or not a member of that type of organization. Of those who responded to the question, 38 per cent claimed to be an active member of a sporting or other hobby-related club, 4.1 per cent of a charitable or humanitarian organisation, 3.8 per cent active member of a church, 2.4 per cent of a professional body, 2.1 per cent of an art, music or educational body, 0.8 per cent of a political organisation or party, or environmental group, 0.7 per cent of a consumer organisation and 7.5 per cent of another community-based organisation.

I firmly believe that the influx of both short term contracted employees, who do not reside in the town but go home on RDOs, and the advent of the 12-hour shifts has sounded the death knell for recreational activities in town. If there is something on in town on your days off it means you get to socialise only with those who are on the same crew as you - what joy! (Sarcasm!) All family celebrations have to be planned well in advance as we are all on different crews so leave has to be taken to attend.

Having been on day work permanently for the last 4 years it probably hasn't much to do with your survey. I would like to say that my previous shift patterns affected my ability to form communities and I am slowly only now starting to establish these ties.

Figure 18 shows that there was also a high degree of non-active memberships, indicating that respondents have let their engagement with organisations lapse.

Figure 18 Respondents membership of various community groups, active and inactive



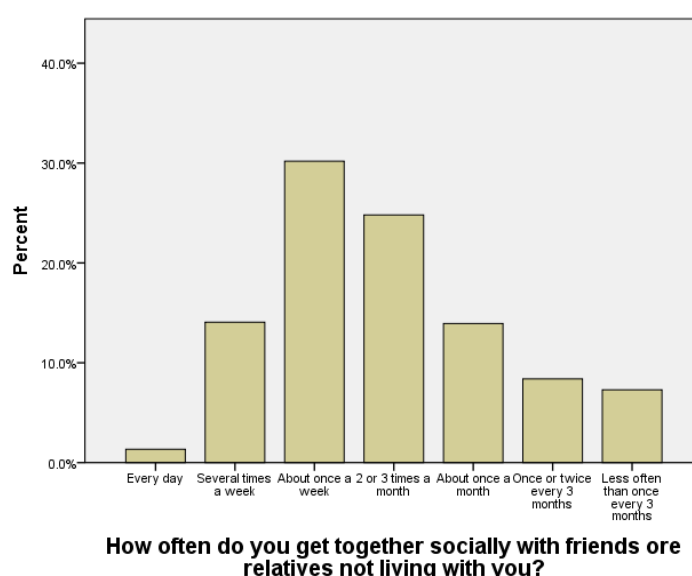
The study also posed questions about the frequency with which CFMEU members get together socially with friends and relatives (see Figure 19) as well as other questions relating to social contact.

I THINK IT'S RIDICULOUS THAT THE MINE IS ONLY CLOSED OVER CHRISTMAS FOR 24 HOURS. XXX CAN AFFORD TO CLOSE FOR LONGER. THIS YEAR MY HUSBAND HAS TO GO IN FOR ONE NIGHT SHIFT. NOT GOOD FOR FATIGUE.

Almost half (46 per cent) of the respondents claimed to get together with relatives and friends not living with them at least once a week, while a surprisingly high 16 per cent claimed only to get together with this broader social network once or twice every three months or less. Thirty per cent claimed to get together with their social network just once a month or less frequently. This figure is higher than the Australian average in 2001 (20 per cent) and significantly higher than the figure even for those living in 'remote and very remote' regions (22 per cent).⁵¹

IF YOU ARE RELYING ON YOUR PARTNER TO PROVIDE CHILDCARE IT AFFECTS THE POSITIONS YOU CAN CHOOSE FOR EMPLOYMENT DUE TO THE ROTATING ROSTER. IF YOU ARE LUCKY ENOUGH TO SECURE EMPLOYMENT AROUND YOUR PARTNER'S ROSTER IT MEANS YOU ARE NEVER BOTH HOME WITH THE CHILDREN AS A FAMILY. IT'S DIFFICULT TO GET CHILDREN TO SPORTS EVENTS BY THE TIME THE PARTNER GETS HOME FROM DAY WORK AT 8PM IT'S HARD TO COORDINATE MEAL TIME. DIFFICULT WITH SMALLER CHILDREN WHEN PARTNER IS SLEEPING THROUGH THE DAY AND THEY CAN'T HAVE FRIENDS AROUND. SOCIAL EVENTS OFTEN FALL ON WEEKENDS THAT THE PARTNER IS ROSTERED ON, SO SOMETIMES YOU GO ALONE OR DON'T GO AT ALL. PARTNER COMES HOME DRAINED AND SHORT TEMPERED; HAVE TO SAVE DISCUSSION ISSUES FOR NIGHTS OFF WORK. SOMETIMES WE CAN GO DAYS WITHOUT ACTUALLY SEEING EACH OTHER.

Figure 19 Frequency of social interactions



ACES also asked a question of the degree to which both mining and energy workers and partners were “feeling part of your community”, with 42 per cent scoring at the midpoint of satisfaction or below, almost exactly the same score as those who were satisfied with the amount of free time they had.

These two questions, both scored in ranges from 0 to 10, replicated questions asked in the national HILDA study, covering people from all walks of life in Australia. In a study based on the 2006 wave of HILDA the mean satisfaction amongst Australians of how much they felt part of their community was 6.78, including 6.71 amongst males and 6.84 amongst females.⁵² In ACES, the mean score on this question was lower amongst both mining and energy workers (6.41) and partners (6.53). It was especially low amongst female mining and energy workers (5.82), but there were no differences between male and female partners.

On the question of how satisfied respondents were with ‘the amount of free time you have’, the HILDA average in 2006 was 6.67, with slightly higher satisfaction amongst

men (6.73) than women (6.62). In ACES, satisfaction with free time was again lower both amongst mining and energy workers (6.21) and especially partners (6.16).

AS A NEW PERSON TO THE SECTOR AND COMMUNITY, MY MAIN CONCERN IS FOR WOMEN WHO LEAVE THEIR PREVIOUS LIVES BEHIND TO JOIN THEIR HUSBANDS. WE SACRIFICE A LOT AND IT IS A HUGE UPHEAVAL. I LEFT MY COMMUNITY, MY FAMILY AND FRIENDS, PETS, HOME TO COME TO SINGLETON. I FEEL ISOLATED, BORED, DEPRESSED AND WANT TO GO BACK HOME TO NEW ZEALAND. I FEEL THAT THE MINES SHOULD HAVE DROP-IN-CENTRES FOR WIVES AND PARTNERS WHO COME INTO THESE AREAS SO THAT THEY CAN SUPPORT EACH OTHER, SOCIALISE, FIND OUT INFORMATION ABOUT AMENITIES, DOCTORS AND OTHER SERVICES AVAILABLE TO THEM. ALSO, THINGS LIKE YOGA, MEDITATION, BOOK EXCHANGE ART CLASSES COULD ALL BE SPONSORED BY THE INDUSTRY.

12. Personal and family life balance

We sought other evidence of social impacts by asking whether respondents felt they were getting on better or worse with ‘people at home’ than two years earlier. Most reported no change, but slightly more mining and energy workers felt they were getting on worse (8.5 per cent) than better (7.6 per cent).

We also asked a number of questions that directly tapped the issue of work-life balance. Some allowed for responses on a seven-point Likert scale ranging from ‘strongly agree’ to ‘strongly disagree’, while some allowed for five discrete categories of responses from ‘never’ to ‘almost always’. Figure 20 provides an overview of some key findings.

12.1. Work-life interference amongst mine & energy workers

Asked if their work interfered with responsibilities or activities outside work, for 23 per cent of respondents, work interfered with their non-work life, ‘often’ or ‘almost always’. The most common response (40 per cent) was ‘sometimes’, with 14 per cent saying ‘never’, and the remaining 23 per cent saying ‘rarely’.

ALTHOUGH IT IS UNLIKELY THAT THIS WOULD EVER HAPPEN, I WOULD LIKE TO SEE THE RETURN OF 8-HOUR SHIFTS TO THE MINING SECTOR. AS THIS IS WHEN TRUE BALANCE IS ACHIEVED IN ONE'S WORK, SOCIAL AND COMMUNITY LIFE AND FAMILY OF COURSE.

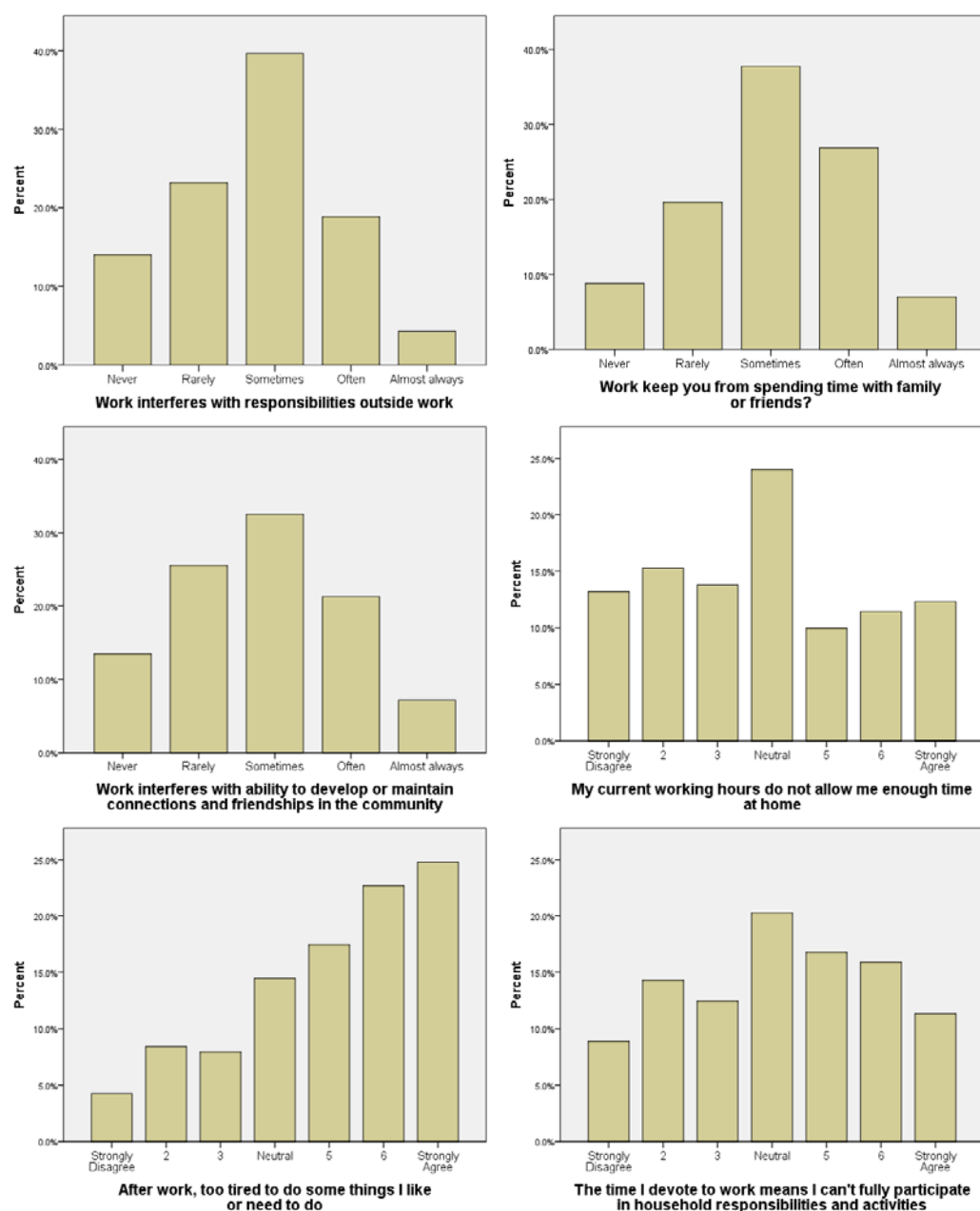
Asked specifically about time balance, the most common response to the question of whether respondents felt that their work hours did not allow them enough time at home was a neutral one. Slightly more leant towards having enough time at home (42 per cent) than not having enough time at home (33 per cent).

When it came to tiredness on its own, however, the results were quite different, with most respondents agreeing that after work they were too tired to do what they wanted to do at home (64 per cent), compared with 21 per cent disagreeing.

In response to a question asking whether time spent at work prevented respondents from engaging equally in household responsibilities, 44 per cent agreed, and 36 per cent disagreed.

Asked how much work interfered with their ability to maintain or develop connections and friendships in their community, 29 per cent said ‘often’ or ‘almost always’, 33 per cent said ‘sometimes’, while 25 per cent said ‘rarely’ and 14 per cent ‘never’. On the question of whether work prevented them from spending time with family and friends, the result was slightly more negative, with 34 per cent saying it did this ‘often’ or ‘always’, while 38 per cent said it did so ‘sometimes’ and 28 per cent ‘rarely’ or ‘never’. See Figure 20.

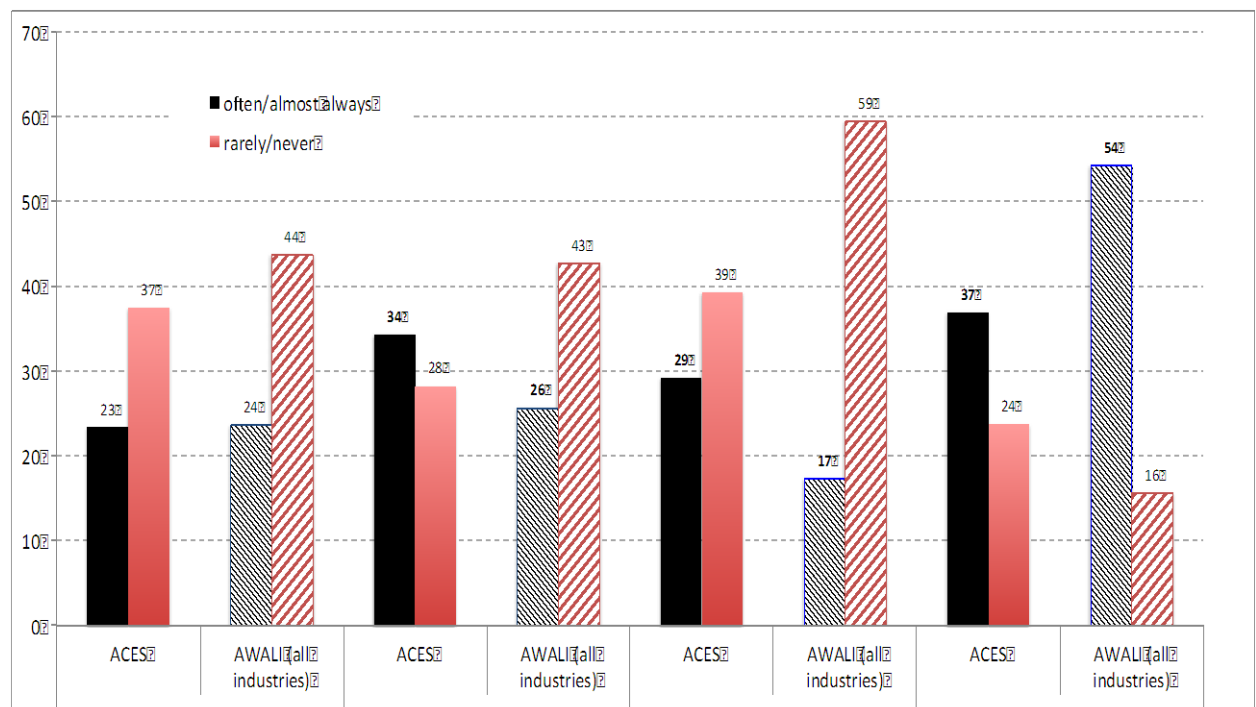
Figure 20 *Key questions on work-life balance*



... is the worst company I have ever dealt with. They chew up the employees and rob us of our dignity along with robbing this country's natural wealth. Their goal is the world's first remotely operated mining operation and they are half way there. How's that for jobs for the future! No workers, no union. They are equal to the Nazi party. Brain washed Australian managers wreaking havoc on this country and its people. Long live the CFMEU!

Figure 21 compares results for four of the above questions with similar questions that originally appeared in the national Australian Work And Life Index (AWALI) survey, mentioned earlier as conducted by the Centre for Work + Life at the University of South Australia. We used four of the five AWALI component questions in ACES, and can compare findings for mining and energy workers with national benchmark data in AWALI taken from 2009.

Figure 21 Work-life interference in ACES 2011 and AWALI 2009



Interestingly, on three of the four items, ACES respondents appeared to have greater work-life interference than the national AWALI sample. In particular, whereas 17 per cent of AWALI respondents said that work interfered 'often' or 'almost always' with their ability to develop or maintain connections and friendship in your community, this response was given, as mentioned, by 29 per cent of ACES respondents, while the proportions who said that this happened 'rarely' or 'never' was 20 percentage points lower amongst ACES respondents than in the national AWALI sample. Similarly, ACES respondents were more likely than the national AWALI sample to say that work often or always kept them from spending the amount of time you would like with family or friends, and considerably less likely to say that this happened rarely or never. ACES respondents were also less likely than the national AWALI sample to say that work rarely

or never interfered with their responsibilities or activities outside work.

On one matter, however, the pattern was reversed: ACES respondents were less likely than the national AWALI sample to report often feeling rushed or pressed for time. This probably reflects the fact that many of the AWALI respondents who felt this were working unpaid overtime and/or bringing work home with them, which was in turn putting constant and somewhat unpredictable pressure on their remaining time at home, whereas for ACES respondents, pre-scheduled paid overtime meant that expectations of time availability at home were shaped in advance. We explore this in the next section.

12.2. Partners' perspectives on social impact of work patterns

In effect, with time availability predictable but highly restricted, the burden of undertaking household tasks fell to the partner in ACES: amongst female partners in ACES who were working, only 38 per cent were working full-time, whereas in the Australian labour force as a whole, 54 per cent of female employees work full-time.⁵³ Amongst the female partners of ACES respondents, 83 per cent said that they undertook the majority of the housework and 14 per cent that housework was evenly shared. In households with children, similar majorities (81-82 per cent) of female partners indicated that it was they who normally dressed the children before school or stayed at home with children when they were ill.

Figure 22 provides an overview of responses to a range of questions that tap into partners' perceptions on spousal availability. Asked if their spouse's working hours allow their spouse enough time at home, 25 per cent disagreed, 57 per cent agreed, with the balance neutral. A larger minority (31 per cent) agreed that their spouse's working hours interfered with their ability to maintain connections and friendships in the community, with 48 per cent disagreeing. Thirty two per cent disagreed that their spouses seemed relaxed at home (versus 49 per cent who agreed that they were); and 27 per cent felt their spouse was too tired to do things around the home (versus 42 per cent who felt they were not too tired).

IT WAS ALL EXTREMELY HARD WHEN MY KIDS WERE YOUNG. NOW THEY ARE FIVE AND SIX AND MY HUSBAND EARNS ENOUGH THAT I CAN AFFORD A BABYSITTER ETC SO THAT I CAN GO OUT AND SOCIALISE WITH FRIENDS ETC, AND NOT FEEL GUILTY BECAUSE MY BOYS ARE OLD ENOUGH TO ENJOY THAT. OUR LIFE IS REALLY WELL BALANCED AND WE HAVE MONEY TO SPEND - I CAN'T COMPLAIN.

MY PARTNER'S SHIFT WORK IS DEFINITELY HARD FOR EVERYONE AT HOME, ESPECIALLY HAVING A THREE YEAR OLD AND NEWBORN. IT'S GREAT TO HAVE A SUPPORTIVE WORKPLACE AND UNION. I FEEL CONFIDENT THAT MY HUSBAND IS WELL REPRESENTED. IDEALLY I WOULD LIKE MY PARTNER TO BE ON DAY WORK, BUT WITH THAT COMES A PAY CUT.

Curiously, partners were slightly less likely to complain about their spouse's tiredness than were the mining and energy workers themselves. While, as mentioned, 64 per cent of mining and energy workers agreed that after work they were too tired to do what they wanted to do at home, only 59 per cent of partners agreed that after work, their spouse comes home too tired to do some of the things they'd like them to do or need them to do; 21

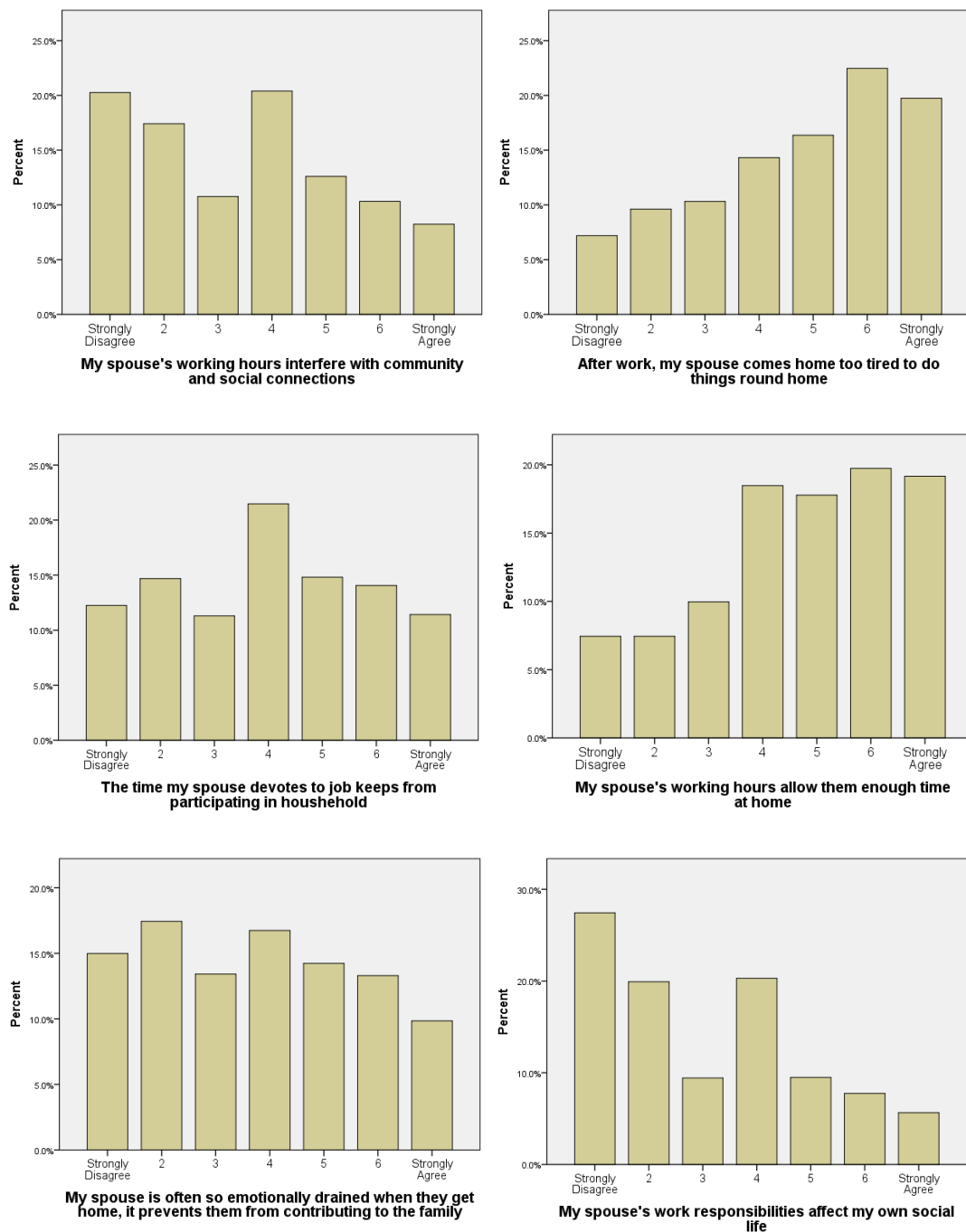
per cent of mining and energy workers, and 27 per cent of partners, disagreed. Some of this was in turn internalised by working partners, amongst whom 49 per cent agreed that after work they, too, were too tired to do what they wanted to do at home (31 per cent disagreed) – even though most were working part-time. Only 24 per cent of partners felt that their own working hours did not allow them enough time at home; 57 per cent disagreed.

One feature of partner attitudes was anxiety about their spouse while at, or travelling to, work. Some 66 per cent of those for whom the question was applicable ‘sometimes or often’ felt anxious when their partner was working night shifts (including 24 per cent who said ‘often’), and 69 per cent said that their spouse being away at night sometimes or often made them anxious (including 21 per cent ‘often’). Most commonly, 77 per cent sometimes or often felt anxious about their spouse travelling to and from work, including 33 per cent who ‘often’ felt anxious about this.

Substantial minorities of partners also expressed other concerns. Some 37 per cent agreed that their spouse was often so emotionally drained when they get home from work that it prevents them from contributing to the family (46 per cent disagreed); 29 per cent said that their spouse often brings home problems they have at work; 31 per cent agreed that their spouse’s working hours interferes with the partner’s own ability to maintain connections and friendships in the community; and 23 per cent agreed that their spouse’s work responsibilities affect the partner’s own social life more than they should.

I WISHED MY HUSBAND DIDN'T HAVE TO CHANGE ROSTERS. IT HAS AFFECTED US A LOT WITH OUR GRANDCHILDREN AND OUR SOCIAL EVENTS. IT HAS ALSO AFFECTED OUR COMMUNITY, WHICH IS VERY SMALL WITH PEOPLE NOT ABLE TO WATCH FOOTBALL AND NETBALL TEAMS DUE TO THEIR WORK COMMITMENTS. WE CAN'T DO THE THINGS WE WERE ABLE TO DO BEFORE THE ROSTER CHANGES. I REALLY DON'T LIKE THE WAY EMPLOYERS CAN CHANGE PEOPLE'S LIVES WHEN THEY FEEL LIKE IT. CHANGE THEIR LIFESTYLE AND SEE IF THEY LIKE IT. I HATE THEM!

Figure 22 Partners' perception of how mining and energy workers' work effects their behaviour/capacity at home



WITH THE NEW ROSTER THAT HAS BEEN FORCED ON US... IT HAS A GREAT IMPACT ON OUR LIVES AS NOW MY HUSBAND WILL BE WORKING LONGER HOURS, ESPECIALLY ON THE WEEKENDS, WHICH WE DON'T LIKE AT ALL. IT MEANS LESS TIME WITH OUR ADULT CHILDREN, OUR GRANDSON AND EXTENDED FAMILY AND FRIENDS; LOSING THE FREEDOM TO DO SPORTS AND HOBBIES THAT PREVIOUS WE COULD DO TOGETHER. AS I SUFFER WITH DEPRESSION, THE CHANGE IN MY HUSBAND'S ROSTER IS OF A GREAT CONCERN AS HE WILL BE AWAY MORE, AND I KNOW THAT HE WILL WORRY ABOUT WHAT EFFECT THIS WILL HAVE ON ME, BUT THIS ALSO PUTS MORE STRESS ON HIM. SO ALL IN ALL THE SHIFT CHANGES INTERFERE WITH OUR LIVES.

WORKING SHIFT WORK ALTHOUGH ALLOWING FLEXIBILITY, IF THE ROSTER HAS BEEN COMPLETED, IT IS DIFFICULT TO REARRANGE IF SOMETHING UNEXPECTED OCCURS.

13. Worker say over working conditions

To date the mining industry provides relatively little say for employees in choosing their hours of work or rosters. Some of the respondents in our qualitative research told us how they had been able to swap shifts to meet their personal needs (for example, to enable a husband and wife to work the same shifts), and this was borne out in ACES. But overall, employee input was minimal. Some told us how their social lives had been transformed because they were no longer on the same shift patterns as their friends (or even husbands) and could not socialise or go away with them. This was confirmed in some ACES responses: amongst partners in ACES who said that their working hours rarely or never aligned with their spouse's, 39 per cent agreed that their partner's working hours interfered with their ability to maintain connections and friendships in the community; this was the case for amongst only 24 per cent of those whose hours almost always aligned with their spouses'.

Company has more control over you as you are on a personal contract. Performance pay - we all used to be paid the same, now the company has split us up by paying one person on shift 1% more than the other. Wage freeze for staff and shift allowance reduced 47.5% where the wages through their union are able to roll a larger per cent into their base rate, which increases their super contribution. The staff shift allowance went from a percentage figure to a \$ figure and if it was to fall below 45% it would be topped up. Unions seem to have less input to individual contracts.

Respondents were asked to indicate on a seven-point scale the extent to which various possible reasons were motivations for their working shifts. Possible responses ranged from 'not a reason for me' to 'very much a reason for me'. The most common 'very much a reason for me' response was 'higher rates of pay', given by 36 per cent of mine and energy workers. Almost as common was the response 'there was no choice', given by 34 per cent. A third principal response, given by 27 per cent of mine and energy workers, was 'blocks of leisure time'. Much less common were two other options, 'more convenient for my domestic responsibilities' (13 per cent) and 'bosses aren't around at night' (9 per cent).

Have been underground for twenty-eight years. Lucky enough to have had approx fifteen years on day shift and never had to work rotating shifts. Majority of people only work shifts because they have to get the job and money. Did somewhat enjoy certain shifts, not night shift.

All up, 65 per cent of mine and energy workers gave pay as one of their reasons (i.e. they rated it five or more on the seven-point scale) for working shifts, and 57 per cent gave blocks of leisure time, but only 29 per cent gave 'more convenient for my domestic

responsibilities’ and 23 per cent said ‘bosses aren’t around at night’. Nearly half (48 per cent of respondents) indicated ‘no choice’ as one of the reasons. The high frequency of ‘blocks of leisure time’ as a reason contrasted with the low satisfaction both mine and energy workers and parts had with their ‘amount of free time’ mentioned earlier.

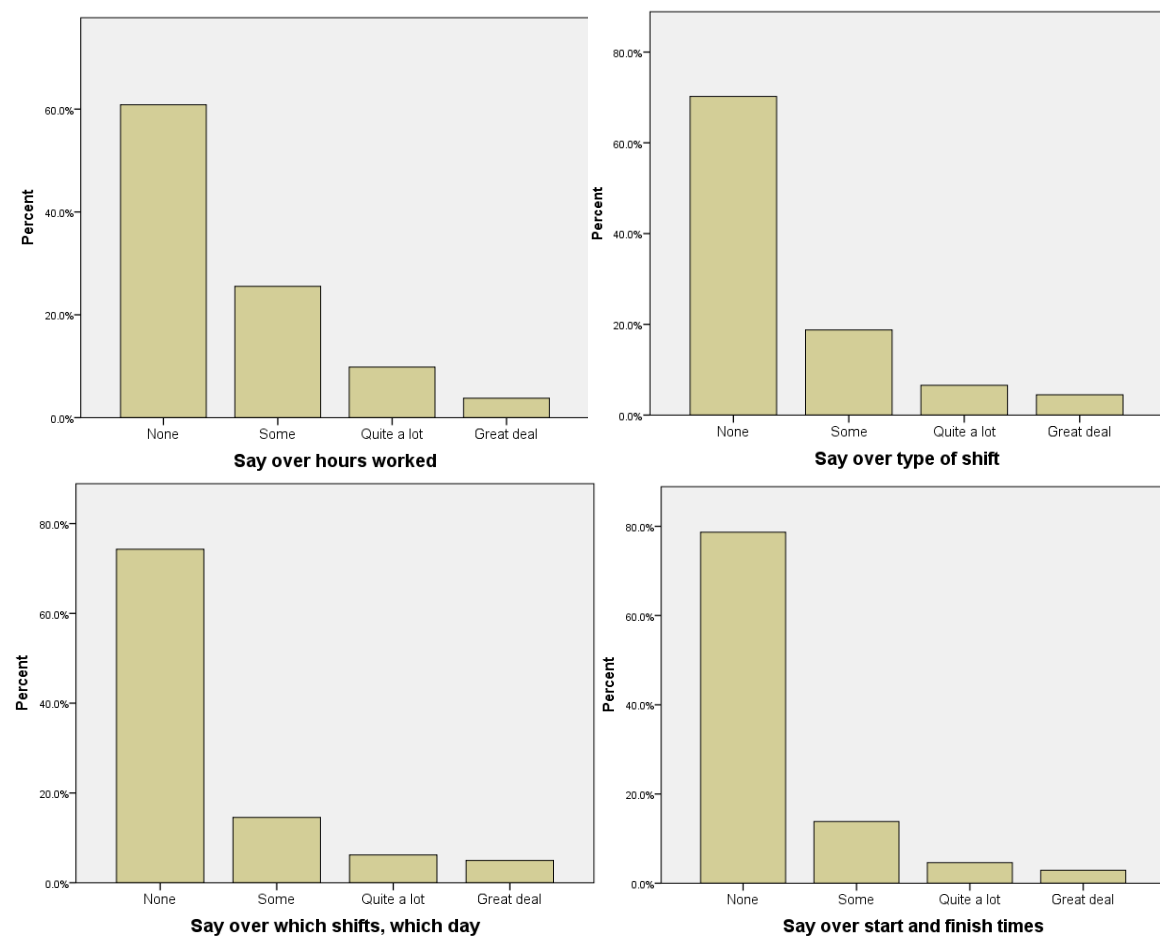
13.1. Say over hours, shifts and content

ACES confirmed the low level of input of mine and energy workers into their shift arrangements: 61 per cent of mine and energy workers had no say at all in how many hours they worked a week, 70 per cent had no say in the types of shifts they worked (e.g. night, 8 hour or 12 hour etc.), 74 per cent had no say in which shifts they worked on a particular day, and 79 per cent had no say in their starting and finishing times. These four items were each measured on four point scales ranging from ‘none’ through ‘some’ and ‘quite a lot’ to ‘a great deal’. These figures confirm that workers in mining and energy have very low rates of say in their hours and shifts, compared to other industries (see Figure 23).

I think more opportunity should be given to the workforce to allow them to decide what shifts they work. There are many workers out there that prefer to work weekends or nights, or both, rather than the standard 4 panel 12 hour roster. Why should I have to work so many weekends when there is someone out there that is willing to work them? This would allow me to have a better social life and better relationship with my fiancée, while giving the other workers what he/she wants at the same time. I also think 12 hour night shifts should be outlawed unless workers are given a 1 hour crib break. Corporate greed at its best!

To provide a comparison point for one of these findings, an earlier survey of 15 organisations across diverse industries and size bands in Queensland found that only 3 per cent of workers outside mining reported having no say over how many hours they worked per week and only 31 per cent reported having no say over their start and finish times.⁵⁴ (That earlier survey included one mining organization which, significantly, had the lowest rates of employee say of any organization in the survey.)

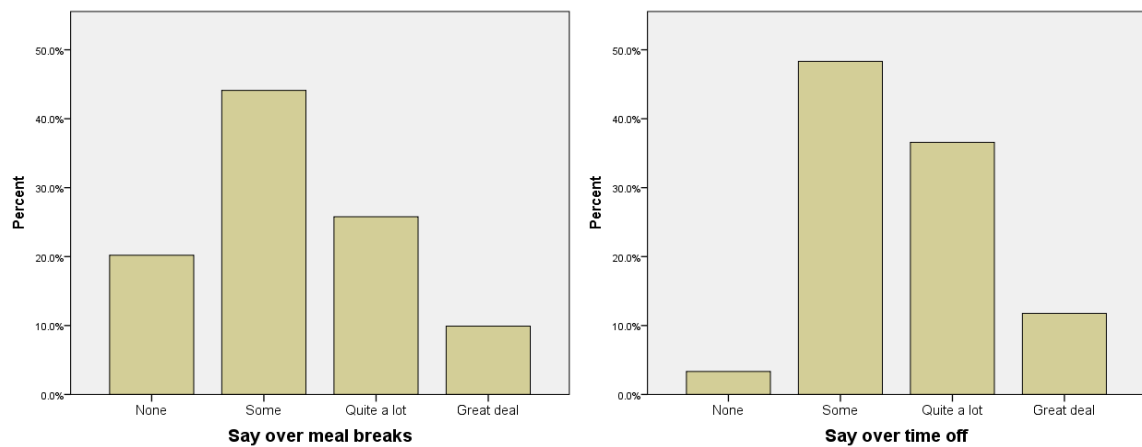
Figure 23 Respondents sense of control over aspects of their work



ACES also asked how much say mining and energy workers had over when they ‘can take time off e.g. for holidays, dentist appointments’. Here respondents showed some greater levels of influence: only 3 per cent of those who answered had no say, a plurality (48 per cent) had ‘some’ say, 37 per cent had ‘quite a lot’ and 12 per cent had a ‘great deal’. The study also looked at say over meal breaks, again showing a similar pattern of response. These results are displayed in Figure 24.

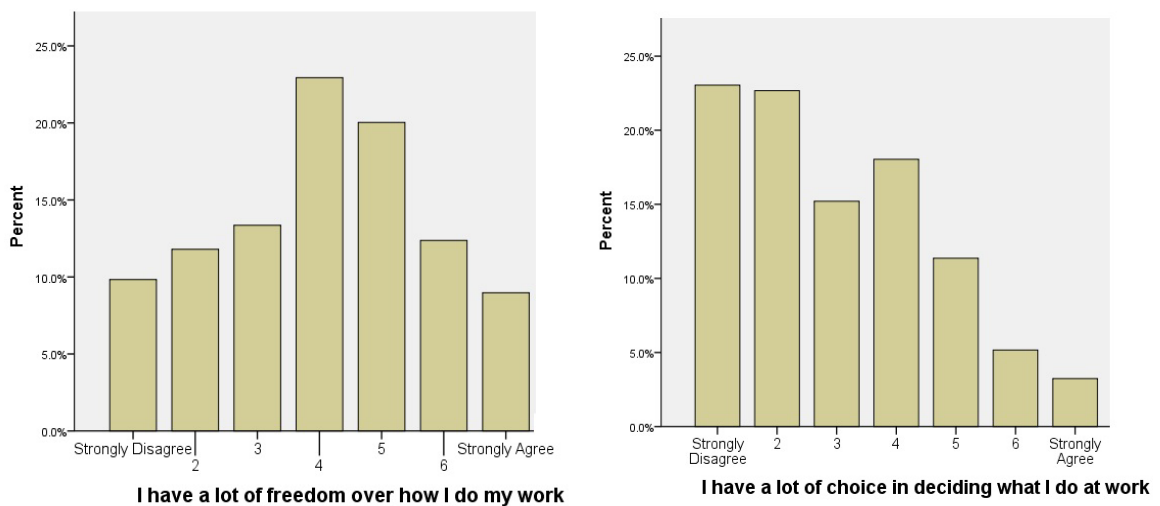
I spend a lot of time working, right up until 2006 away from family and kids. And then a company did us for about \$400,000, which put me where I am now. So trying to do the right thing, work hard and retir[ing] early to spend time with kids has cost me. That is the reason why you will notice the hate of night and weekend work, which I had no control of.

Figure 24 *Perceived say over meal breaks and time off*



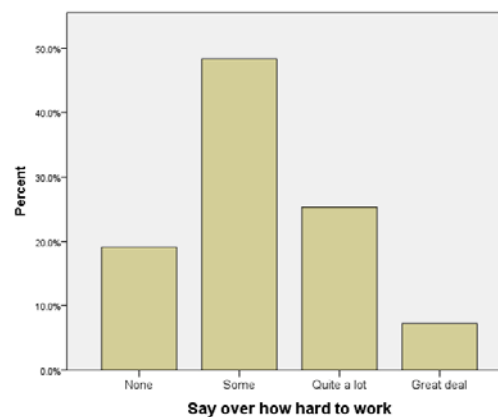
The ACES study also examined the degree of say that workers experienced in relation to the content of their work. Workers had more say over how they did their work than what they did: using a seven point scale ranging from strongly disagree to strongly agree, respondents showed much greater agreement with the statement “I have a lot of freedom to decide how I do my work” than with another statement “I have a lot of choice in deciding what I do at work” (see Figure 25).

Figure 25 *Respondents sense of control over content of their work*



The issue of control over work intensity was also examined, with respondents asked to judge how much control they had over how hard they had to work on a four-point scale. Figure 26 captures the trend of the findings, with almost half of those respondent (48 per cent) saying they had some control, and 19 per cent claiming they had no control whatsoever.

Figure 26 Respondents sense of control over work intensity.



13.2. Impact of worker say

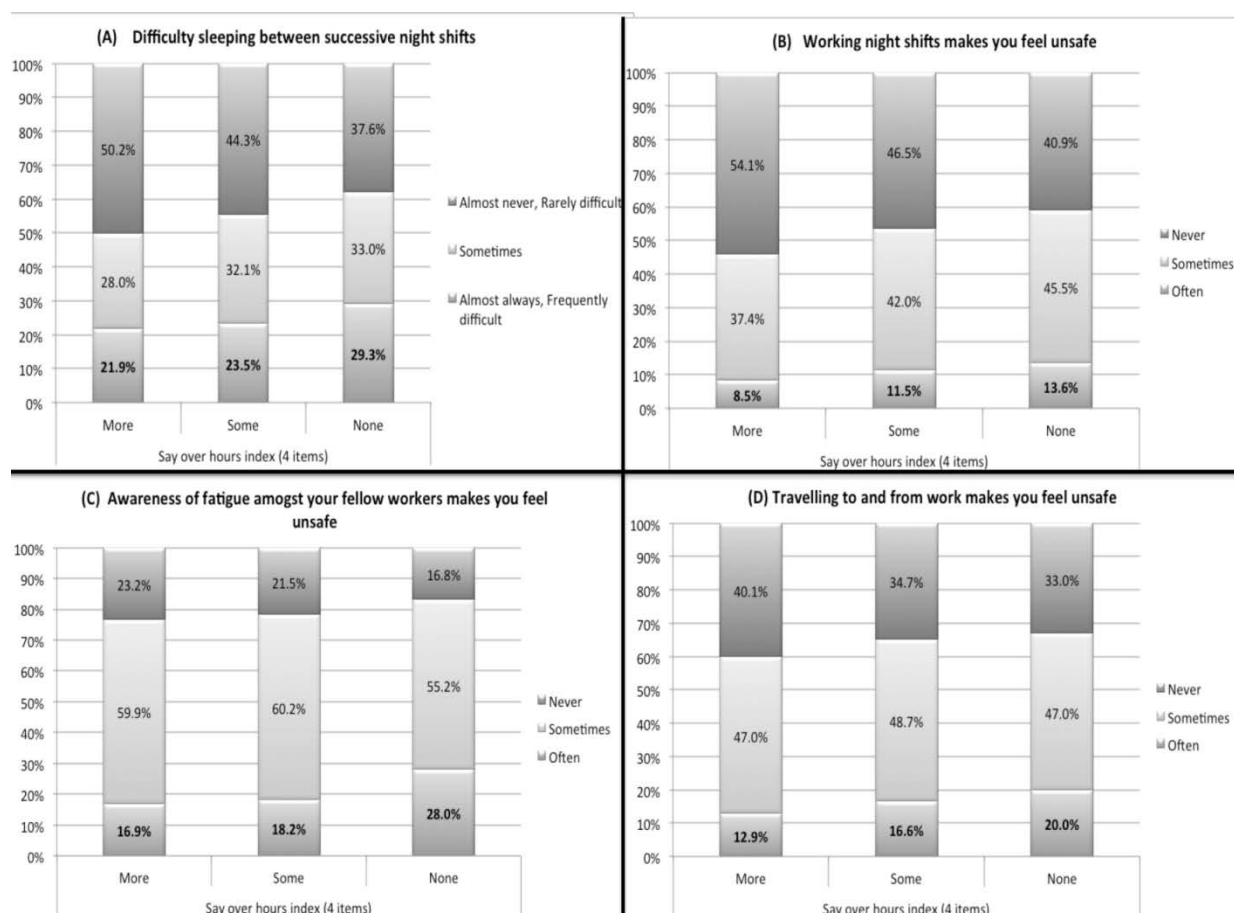
In order to examine the impact of sense of control, a mini index of ‘say over hours’ index (with good reliability of $\alpha=.85$) was constructed using the four items shown in Figure 27). After recoding into a three-point scale, those who had no say on all four items were given a score of 1 (‘none’). They accounted for slightly more than half the sample. Those who reported ‘some’ say in either one or two items, and none on the rest (or ‘quite a lot’ on one item and ‘none’ on the other three) were given a score of 2 (‘some’). They accounted for slightly more than a quarter of the sample. Those who reported ‘some’ say on three or more items (or ‘quite a lot’ on one and ‘some’ or better on another) were given a score of 3 (‘more’). They accounted for slightly less than a quarter of the sample.

A lot of companies preach safety, be aware, don't use or do if machine or job is deemed unsafe, but never (deep down) seem receptive to reported safety incidents (machine stood down, too much dust on roads etc.) when under pressure to cut coal.

The 35 hour 5 panel 7 day roster I work is the best balanced for work and living. The only issue we have is the lack of staff, thus resulting in an excessive amount of overtime required to maintain a minimum (and unsafe) manning level.

Lack of employee ability to prevent excessive and hence unreasonable hours in turn created problems for employees in terms of their wellbeing and family relationships. This is illustrated in the four panels of Figure 30. Those who had no say over any of these aspects of hours and shifts were more likely to say they had difficulty sleeping between night shifts (29 per cent) than other workers (22-23 per cent) (Panel A of Figure 27). They were more likely than other workers to say that they often felt unsafe working night shifts (Panel B). They were more likely than other workers to say that their awareness of fatigue amongst their fellow workers often made them feel unsafe (Panel C). They were also more likely than others to say that they felt unsafe travelling to and from work (Panel D).

Figure 27 Impact of lack of employee say over hours (no say, 'some' say and 'more' say)



Workplace has no designated post nightshift quick-sleep facility prior to driving home if fatigued.

Injuries appear to increase after midnight, as does the severity, which appears linked to work group fatigue.

Workers who had no say over their hours or shifts were *more* likely to agree that 'After work, I come home too tired to do some of the things I'd like to do or need to do' (70 per cent) than were those with 'some' (64 per cent) or 'more' (55 per cent) say over hours. They were more likely to agree that 'I am often so emotionally drained when I get home from work that it prevents me from contributing to my family' (44 per cent) than were those with 'some' (34 per cent) or 'more' (29 per cent) say over hours.

Those who had no say over when they could take time off were considerably more likely to say that they were getting on worse with people at home: 11 per cent said that how well they 'got on with people at home' had gone down over the previous two years, versus 6.5 per cent for whom it had gone up. By comparison, amongst those who had a 'great deal'

of say over when they could take time off, only 3 per cent were getting on worse with people at home and 10 per cent were getting on better.

THE HOURS TO WHICH HE WORKS IS SOMETIMES GOOD, BUT THERE ARE LOTS OF BAD THINGS. POOR DIET IS TERRIBLE, OFTEN EATING RUBBISH TO AND FROM WORK. HE HAS GAINED LOADS OF WEIGHT. HIS SELF-ESTEEM HAS DIMINISHED AND HE IS OFTEN GRUMPY AND NASTY WITH ME. HE REGULARLY ARGUES ABOUT MOST THINGS, ESPECIALLY MONEY. HE ALWAYS DOES OVERTIME - WE ARE ALWAYS STRUGGLING TO GET AHEAD, EVEN ON HIS GREAT SALARY. HIS JOB DOES HOWEVER MAKE US FEEL SECURE AND FINANCIALLY IS REALLY GOOD.

WITH MY PARTNER WORKING NIGHT SHIFT, I HAVE NOTICED A LOT OF CHANGES IN OUR LIVES. HE IS CONSTANTLY TIRED AND THEREFORE MORE SELFISH IN HIS NEEDS AND AVAILABILITY TO DO ANYTHING WITH OR FOR THE FAMILY. THIS LEADS TO DISAGREEMENTS AND GENERAL UNHAPPINESS IN OUR LIVES. I HAVE ALSO NOTICED CHANGES IN HIS HEALTH OVER THE PAST 3 YEARS SINCE HE STARTED NIGHT SHIFT.

13.3. Relationship to Work-life interference

The AWALI project showed that, when all industries are ranked on an index measuring the degree of interference between work and family life, the mining industry is ranked the second worst.⁵⁵ (This AWALI index is constructed from responses to five questions concerning whether: work interferes with activities outside work; work interferes with enough time with family or friends; work interferes with community connections; respondents feel rushed or pressed for time; and respondents feel satisfied with their work life balance. One reason for mining's poor ranking on work-life interference is the divergence between hours preferred and hours worked. The AWALI index is scored from zero (best possible fit between work and life) to 100 (worst possible fit). Nationally, male workers who are working more hours than they would prefer have an index score 35 per cent higher (i.e. 35 per cent worse) than male workers who are working at or near their preferred hours. For female workers, the impact is 46 per cent. According to the AWALI researchers, this finding has important implications, as 'measures which help workers find a better fit between actual and preferred hours will result in lower work-life conflict'.⁵⁶

Worked in mining all my life, grew up and schooled in Mt Isa, nine years with the mines out there, definitely felt like part of the community...Work, sporting, social, all important parts of of community lifestyle. Myself, a big believer of keeping the families together. Takes a community to bring up a child...Now 46, I find shift work easier to work; I am not needing as much sleep. The issues between my wife and I are near nil. I think a lot of them were contributed to the fact that shift work interfered with the social life whilst going through that younger age. That is, being a part of social events, bringing kids up, sleep patterns affected/moods. If I filled this out ten years ago, answers would be different.

So it was that those ACES respondents who would prefer to be working fewer hours scored poorly on the component questions in the AWALI index mentioned above. For example, 29 per cent of mine and energy workers who preferred fewer hours said that work 'often' or 'almost always' interferes with responsibilities and activities outside of

work, almost double the 15 per cent portion amongst those who preferred their current number of hours. The figure rose to 33 per cent amongst those who wanted fewer hours and had no say over their hours. Mine and energy workers who wanted to work fewer hours were more likely to say that work, often or almost always, stopped them spending the amount of time they would like with their family or friends, and that it often or always interfered with their ability to develop or maintain connections and friendship in their community

More money, less hours!

Overall, while 25 per cent of those working the hours they preferred said they were, often or almost always, rushed and pressed for time, the figure rose to 48 per cent amongst those who wanted to work fewer hours; 53 per cent of those who wanted to work fewer hours and had no say over their hours said that they often felt rushed or pressed for time.

The effects were felt not just by mine and energy workers but also by their partners. Amongst partners of mine and energy workers who would prefer to work fewer hours, over half (52 per cent) often or almost always felt rushed or pressed for time, compared to 43 per cent of workers whose spouses were content with their hours.

Working the rotating roster is not family friendly like the company states. Family and friends find it hard to remember when you have days off and are very reluctant to call or drop in for fear of waking you if trying to sleep for nights. Rotating roster has no set day off each week, making family commitments very difficult, that is children's sport, day-care etc

MY PARTNER'S WORK AFFECTS THE WHOLE FAMILY. WE WORRY CONSTANTLY WHEN HE TRAVELS TO AND FROM WORK WHEN HE IS TIRED AND ALTHOUGH IT'S GETTING BETTER THERE'S BULLYING AT WORK BY SUPERVISORS AND IT'S NASTY AND NEEDLESS.

Table 1 shows this and other relationships. Partners of workers who wanted to work fewer hours were more likely than other partners to agree that their spouse was often so emotionally drained when they get home from work that it prevented them from contributing to the family, that after work, their spouse came home too tired to do some of the things they'd like them or need them to do, that their spouse's working hours interfered with their own ability to maintain connections and friendships in the community, and to disagree that their spouse seemed relaxed most of the time at home. Broadly similar patterns emerged when comparing the partners of mine and energy workers who had no say, versus those with some say, over their working hours.

Table 1 Relationship between preferences-hours worked discrepancy amongst mining and energy workers and their partners' views on various issues

Partner views:	agreement amongst partners whose spouse preferred to work <i>fewer</i> hours	agreement amongst partners whose spouse preferred to work <i>same number</i> of hours
Often or almost always feel rushed or pressed for time	52	43
My spouse is often so emotionally drained when they get home from work that it prevents them from contributing to the family	44	28
After work, my spouse comes home too tired to do some of the things I'd like them or need them to do	64	52
My spouse's working hours interferes with my ability to maintain connections and friendships in the community	36	25
Disagree that: my spouse seems relaxed most of the time at home	40	25
Spouse working night shifts make you anxious – often	28	19
Would prefer your spouse gave up working shifts and got day time job	50	32

N= 780 (prefer fewer hours), 596 (prefer same hours).

Note: The term 'partner' used in the questionnaire has been replaced by 'spouse' in this table, to maintain consistency with our naming convention. All differences statistically significant at 5 per cent level or higher.

In a t-test applied to a scale measuring how happy partners were with their relationship, it was shown that partners of workers who had no say over their hours were less happy with their relationship than those whose spouses had some say over their hours.

Night shift is a risk both in terms of health and increased risk of an accident at work or driving to and from work.

THE CHANCE TO WORK HERE BELONGS TO MY HUSBAND. HE ENJOYS THE WORK AND I DOUBT I COULD DRAG HIM AWAY. HE DOESN'T LIKE WORKING NIGHTS BUT HE COPES WITH THEM. HE RELAXES WHEN HE NEEDS TO DO SO, AND HAS TIME TO DO BUSINESS WHEN HE NEEDS ON HIS DAYS OFF. WHEN HE STARTED NIGHT SHIFTS HE HAD PROBLEMS WITH DERMATITIS BUT THAT SEEMS TO BE BETTER IN THE 3.5 YEARS HE HAS BEEN ON THESE SHIFTS. I AM HAPPY BECAUSE MY WORK ALLOWS ME TO TAKE TWO DAYS OFF EVERY MONTH TO SPEND LONG WEEKENDS TOGETHER.

14. Short term illnesses

We gave respondents a long list of health problems and asked them to indicate which of these they had experienced in the last twelve months, regardless of whether or not they considered the illness or injury to be now cured or under control. We adapted a checklist of health related questions from the Southern Methodist University Health Questionnaire (SMU-HQ), a heavily cited 63-item symptom and illness questionnaire measure.⁵⁷ Our checklist modifies the SMU-HQ in a number of significant aspects. It divides and presents illnesses in a number of discrete categories (short term problems, longer term problems, chronic illnesses, major illness, workplace injuries, reproductive issues and other problems). Unlike the SMU-HQ, the questionnaire did not include anorexia/bulimia, sore throat, colitis, haemorrhoids, severe acne, breast cancer (as a separate category), kidney or urinary tract problems, mononucleosis, gall bladder problems, eye problems, serious dental problems, pregnancy, appendicitis, paralysis and obesity (which is measured elsewhere in the study). However, unlike the SMU-HQ, it *did* include anxiety, ‘other psychological problems’, heart attack, significant coronary heart disease, stroke, epilepsy or other seizures, high blood sugar, low blood sugar, fracture of the spinal column (as a separate category), dislocation of limbs, open wounds, serious open wounds (involving a foreign body), bruising or minor crushing, sprain/strain, welder’s flash, dermatitis, repetitive strain injury, reaction to toxic chemicals, herpes, irregular menstrual cycles, spontaneous abortion, impotence and lack of interest in sex. The additions recognise the spread of diseases that have been tentatively or significantly linked with shift work or long working hours. Like the SMU-HQ, our checklist includes a section for “any other significant health problems.” In terms of the relatively minor and short-term problems identified in this study, the SMU-HQ is identical in coverage, and is the focus of the following analysis.

Rostered shift impedes my ability and motivations to stay fit and healthy through gym participation and sport activities due to fatigue after work. Shorter shifts would improve attendance at gym and ability to attend family matters after work.

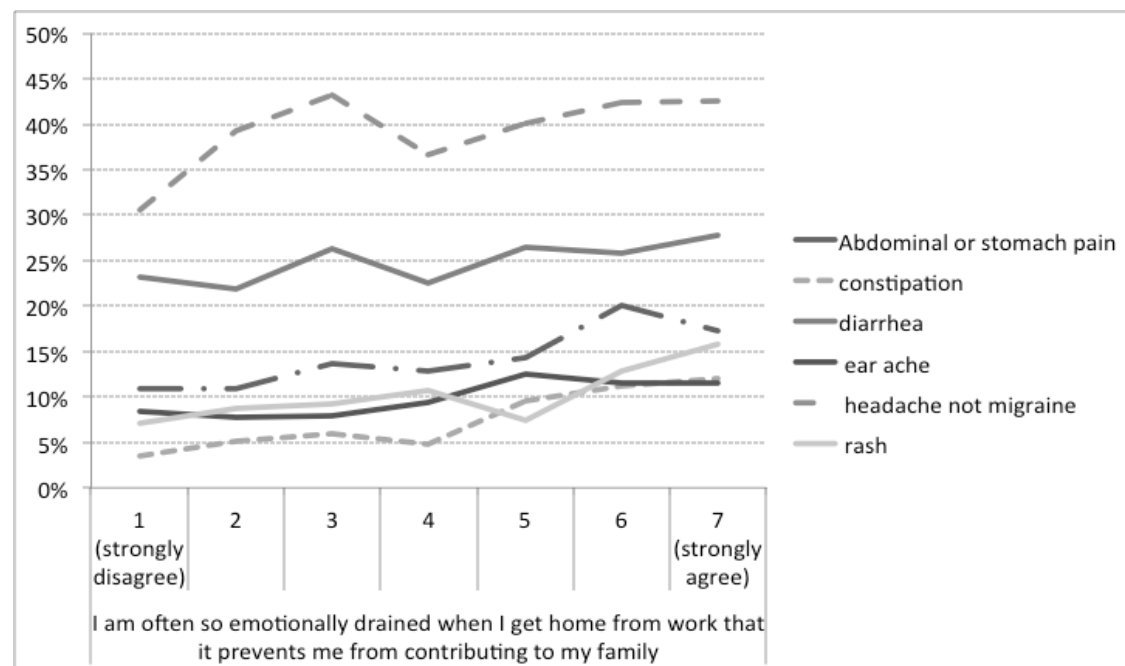
Our focus is on a group of eight classed under a heading “short term problems”. The immune system acts to protect the body from organisms like bacteria, viruses, toxins and parasites,⁵⁸ and relatively minor clinical symptoms can thus serve as indicators of immunosuppression.⁵⁹ The symptoms included in our group of eight comprised: abdominal or stomach pain; cold or flu; constipation; diarrhoea; ear ache; fainting; ‘headache (not migraine)’; and rash. We created an index of short-term illnesses – a simple count of how many out of the eight each respondent reported experiencing over the previous year – as well as analysing illnesses individually.

I feel the roster we currently work is very bad for my health and wellbeing, a pyjama day in between day and night is a complete waste of time and leads to very bad sleep patterns. Even time rosters are what I will be looking for in the future.

Figure 28 shows the link between feelings of emotional exhaustion from work and self-reported short-term illnesses. On six of the eight short-term problems listed above, the

incidence steadily rises as respondents' emotional exhaustion from work increases. As a result, the number of short-term illnesses reported by respondents increased as their degree of agreement with that statement on emotional exhaustion increased. Broadly similar patterns were observed with respect to the same illnesses and responses to the statement 'After work, I come home too tired to do some of the things I'd like to do or need to do'.

Figure 28 *Emotional exhaustion from work and individual short-term illnesses*

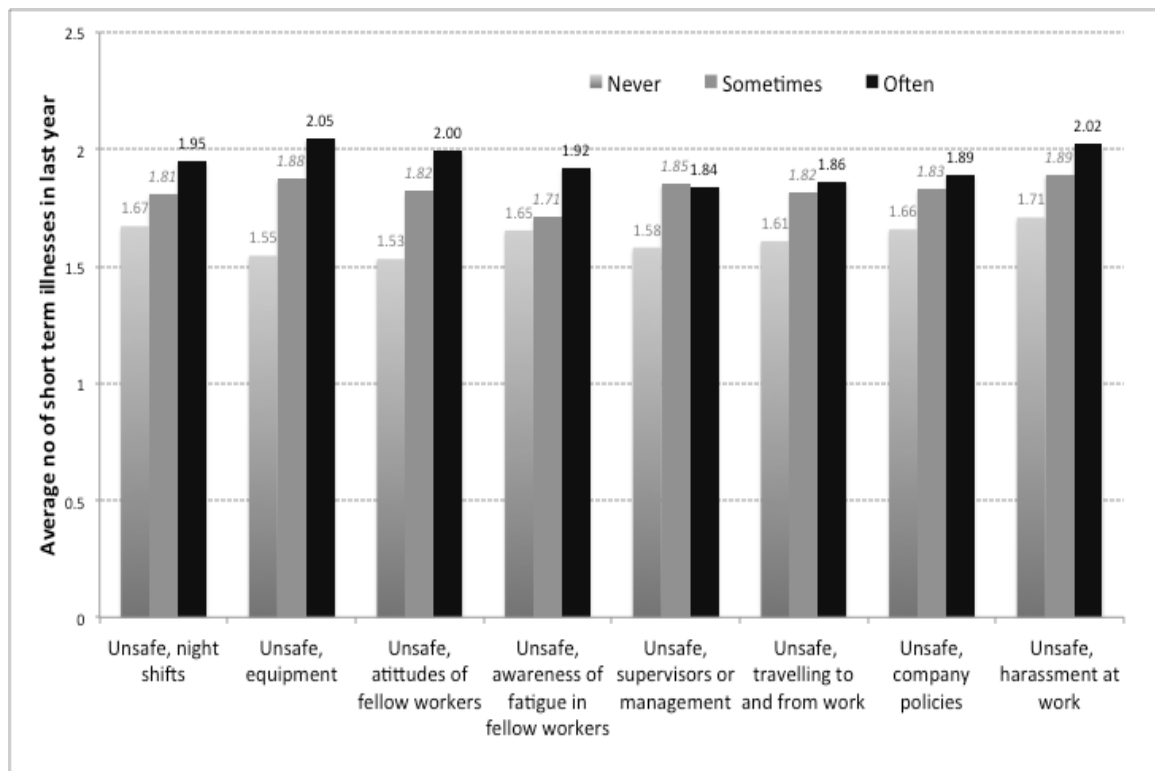


I did rotating shifts, and thought it was no good for my sleep pattern and I had a brain seizure, now I am on medication. The brain seizure was diagnosed by a neurologist as from sleep deprivation. Fixed roster shifts are much better. A lot of the men at my mine still on the rotating roster are tired all the time, falling asleep on day shift at lunch time.

Short-term illnesses were also reported more commonly by employees who were concerned about safety at work. As discussed earlier, we asked about various matters that may have made respondents feel unsafe and to what extent this was so: in total, seven matters related to work, one to travel to and from work, and one to the communities in which they lived. Respondents could answer that each item 'never', 'sometimes' or 'often' made them feel unsafe. Figure 29 shows how responses to eight of those items affect the number of short-term illnesses reported by mining and energy workers. In each case, those who often felt unsafe as a result of a particular item reported, on average, more short-term illnesses than those who 'never' felt unsafe. For example, amongst those who 'never' reported feeling unsafe as a result of their 'awareness of fatigue amongst [their] fellow workers', the average number of short-term illnesses was 1.53; amongst those who 'often' felt unsafe for that reason, the average number of short-term illnesses was 2.00. More than two illnesses on average were reported by people who 'often' felt unsafe as a result of harassment at work, and of unsafe equipment.

I believe 12hr 40min shifts are dangerous, especially for night shift, in the mining sector for fatigue purposes and should be outlawed. The only reason we do these shifts is because of production. Keep the machines working etc. I see people pushing themselves through these shifts in an unsafe manner

Figure 29 Number of self-reported short-term illnesses per employee by perceptions of safety.



Short-term health problems were reportedly higher amongst workers who said that, all other things being equal, they would probably prefer to give up working shifts and get a day-time job (an average of 1.86 self-reported short term illnesses) than amongst those who would probably not prefer to get a day-time job (1.62 illnesses). They were higher amongst workers who expressed low satisfaction with their free time, as measured by a 0 to 10 scale measuring responses to the question ‘how satisfied are you with the amount of free time you have). Those scoring 0 to 3 (dissatisfied with amount of free time) self-reported an average of 1.95 short-term illnesses, compared to 1.58 illnesses for those scoring 7 to 10 (satisfied). Self-reported short-term health problems were also higher amongst those who said they slept quite or extremely ‘badly’ when their shift changed (1.96 illnesses) than amongst those who slept quite or extremely ‘well’ (1.51 illnesses).

In the qualitative comments in ACES, some respondents claimed health issues were associated with camps, as per the following quote:

Camp life is unbearable but what else am I to do, it's the only option. Food is a big concern, not enough variety and last week our water was unfit for human consumption, the smell and the taste everybody complained, I suffered from a stomach bug that is ongoing, been for ultrasound and xray today, all clear. The rooms are too small!

Worker say was an important factor in self-reported short-term health. Those who had no say over hours reported an average of 1.83 illnesses, compared to 1.59 amongst those who reported 'more' say. Workers who wanted to work fewer hours reported an average of 1.85 short-term illnesses, compared to 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. They were particularly more likely than other workers to report high rates of headaches and each type of gastro-intestinal problem. As age might also be expected to influence illness, we ran an ordinary least squares (OLS) regression that predicted the number of short term illnesses and controlled for age (in linear form); we found wanting to work fewer hours, and having no say over their hours, remained separately significant in predicting short-term illnesses. That is, those three factors still shaped illness even after accounting for age. We also ran separate logistic regression equations predicting the incidence of individual illnesses against age and whether respondents were both wanting to work fewer hours and had no say over their hours. After controlling for age, these workers who were both wanting to work fewer hours and had no say over their hours still reported higher probability of abdominal or stomach pain, constipation, diarrhoea and headaches. It has been established that gastro-intestinal problems 'are the most prevalent health complaint associated with shift and night work'.⁶⁰ While previous researchers have focused on eating habits and circadian disruption in explaining this,⁶¹ our data suggest a role for employee say in understanding the causal chain.

Concerns over crew members not getting enough sleep, falling asleep in machines and having accidents as well as the moods, which influence job security.

I don't understand how anyone can be allowed to work 12 hour rotating shifts. How can mining companies push safety so hard and pretend it's a priority then allow fatigued workers on the road. How can companies preach health and safety and then force workers to work 12-hour rosters with pyjama days etc. How can our government preach "stop, revive survive" and then allow them to get away with it. I have enough trouble working 10-hour shifts.

14.1. *Worker control and sleeping pill use*

Use of sleeping tablets was higher amongst workers who had no say in their hours. It was also higher, as we might expect, amongst workers who work some night shifts and amongst those with longer average shift lengths. These patterns are shown in Table 2. Table 3 shows the reported use of the three classes of medications specifically in relation to preferences for hours. Note the sharp increase in use of medications for those who would prefer to work fewer hours.

Table 2 *Use of sleeping tablets by say in hours, shift length and night shift*

		Sleeping tablets
Say index - 4 items - 3 categories	1 (none)	9.0 per cent
	2 (some)	3.5%
	3 (more)	4.8%
Average shift length (3 categories)	up to 11 hours	4.2%
	12 - 12.5 hours	7.1%
	13 hours and over	13.0%
Works on night shift	no	4.0%
	yes	7.2%

14.2. *Psychological health*

Amongst the health issues within the preceding 12 months that we asked respondents to report on, there was a series of nine items under the heading ‘other problems’, which included six items directly related to mental wellbeing (anxiety; depression; other psychological problems; blackouts; grinding of teeth or TMJ; migraines) and three gastro-

intestinal issues sometimes seen as linked to mental wellbeing (indigestion; ulcer or other gastric disorders; and vomiting). We constructed a dichotomous measure of self-reported mental wellbeing based on the first six items, scoring it as ‘good’ if respondents answered ‘no’ to all six items, ‘not good’ if they answered ‘yes’ to one or more. Separately, we asked respondents a series of twelve questions from the Goldberg’s GHQ designed to as a convenient screen to measure non-psychotic psychiatric distress in adults.⁶²

We found that 21 per cent of respondents with ‘some’ or ‘more’ say on the say in hours scale were rated as ‘not good’ on the simple mental wellbeing measure, but this figure rose to 27 per cent amongst those with no say over hours or shifts. Amongst those who were happy with their hours, only 19 per cent were rated ‘not good’ on mental wellbeing, but 28 per cent of those who wanted less hours were ‘not good’. Amongst those who both wanted to work fewer hours and had no say on their hours or shifts, the incidence of ‘not good’ mental wellbeing rose to 32 per cent. To illustrate with respect to specific illnesses, amongst workers on their preferred hours 8 per cent reported anxiety, 8 per cent reported depression and 5 per cent reported migraines. But amongst those who preferred to work fewer hours, 11 per cent reported anxiety, 13 per cent reported depression and 7 per cent reported migraines. And amongst those who preferred to work fewer hours and had no say over their hours, 12 per cent reported anxiety, 15 per cent reported depression and 8 per cent reported migraines.

On Goldberg’s scale, we rated anyone who in net terms gave negative responses on at least half the twelve items as having a ‘net negative’ score. Amongst workers who were content with the number of hours they worked, 5 per cent had a ‘net negative’ score. But amongst those who wanted to work fewer hours, the number doubled to 10 per cent. Amongst those who wanted fewer hours and had no say, 11 per cent had a ‘net negative’ depression scale score.

Table 3 Use of medications by hours preferences

	Sleeping tablets	Anti-depressants	Antacids
Want no substantial change in hours	4.1%	6.0%	7.5%
Want to reduce hours by at least 1 hour per week	8.0%	8.7%	11.4%
Want to reduce hours by at least 1 hour per week <i>and</i> have no say on hours	11.3%	10.6%	12.6%

Another proxy for mental wellbeing is the use of certain medications. Table 3 shows that workers who wished to reduce their hours were about two fifths more likely to be using anti-depressants than those who were on the hours they preferred. Those who wished to reduce hours and had no say over their hours were three quarters more likely to use anti-depressants. Use of sleeping tablets was almost twice as high amongst those who wished to reduce their hours than those who were content with their hours. Use of antacids was

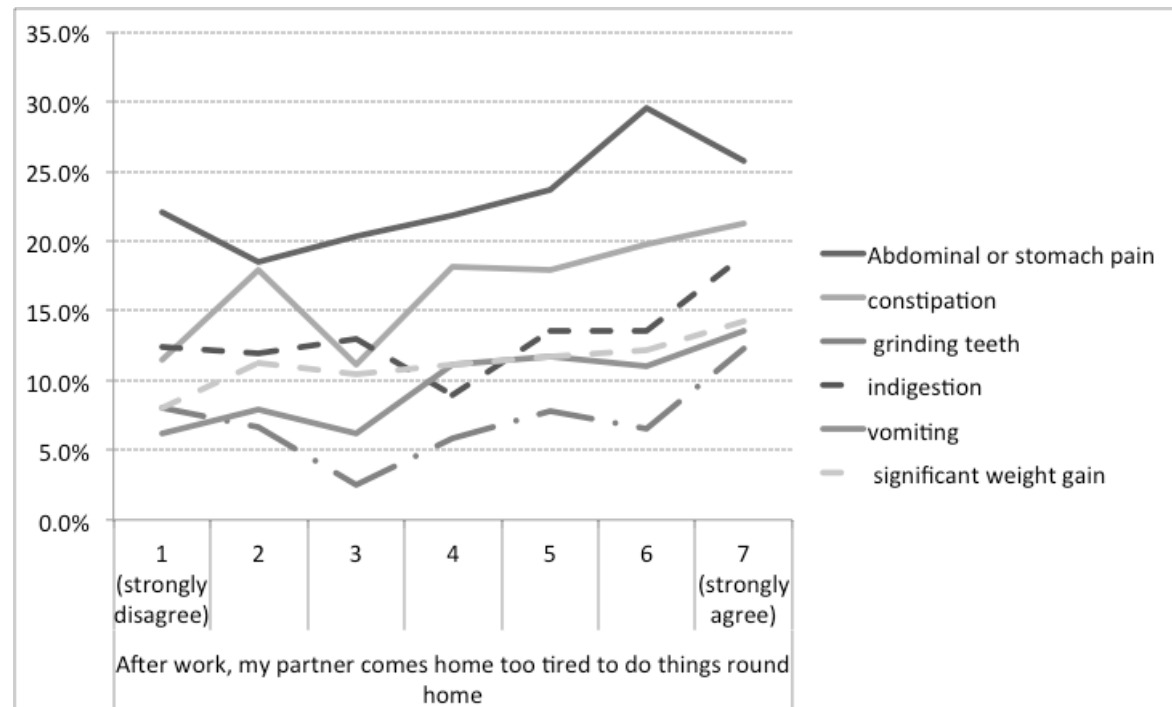
one and a half times as high. In both cases use was even higher where workers wanted fewer hours *and* had no say over hours.

Recently terminated from employment. Had friends turn against me. Had a second hand surgery from an injury sustained two years ago. Back on anti-depressants. My life has taken a 180 turn for the worse. The CFMEU has been very supportive.

15. Partner short-term illnesses and psychological health

Partners also experienced health effects arising from the work of their spouses, although the effects were smaller and presumably less direct. In particular, partner health appeared to be influenced by their perceptions of whether their spouse was able to make an adequate contribution to the household as a result of their work. This was observable in those areas of health commonly linked to psychological wellbeing either as direct or physiological conditions. Figure 30 below shows the relationship between partner responses to the statement ‘After work, my spouse comes home too tired to do some of the things I’d like them to do or need them to do’ and a series of physiological conditions. We see that the stronger was partners’ agreement with this statement, the higher was their level of each of: abdominal or stomach pain; constipation; indigestion; grinding teeth; vomiting; and perhaps significant weight loss (the last being a significant correlation at the 10 per cent level, the others at the 5 per cent level or better). (See Figure 31).

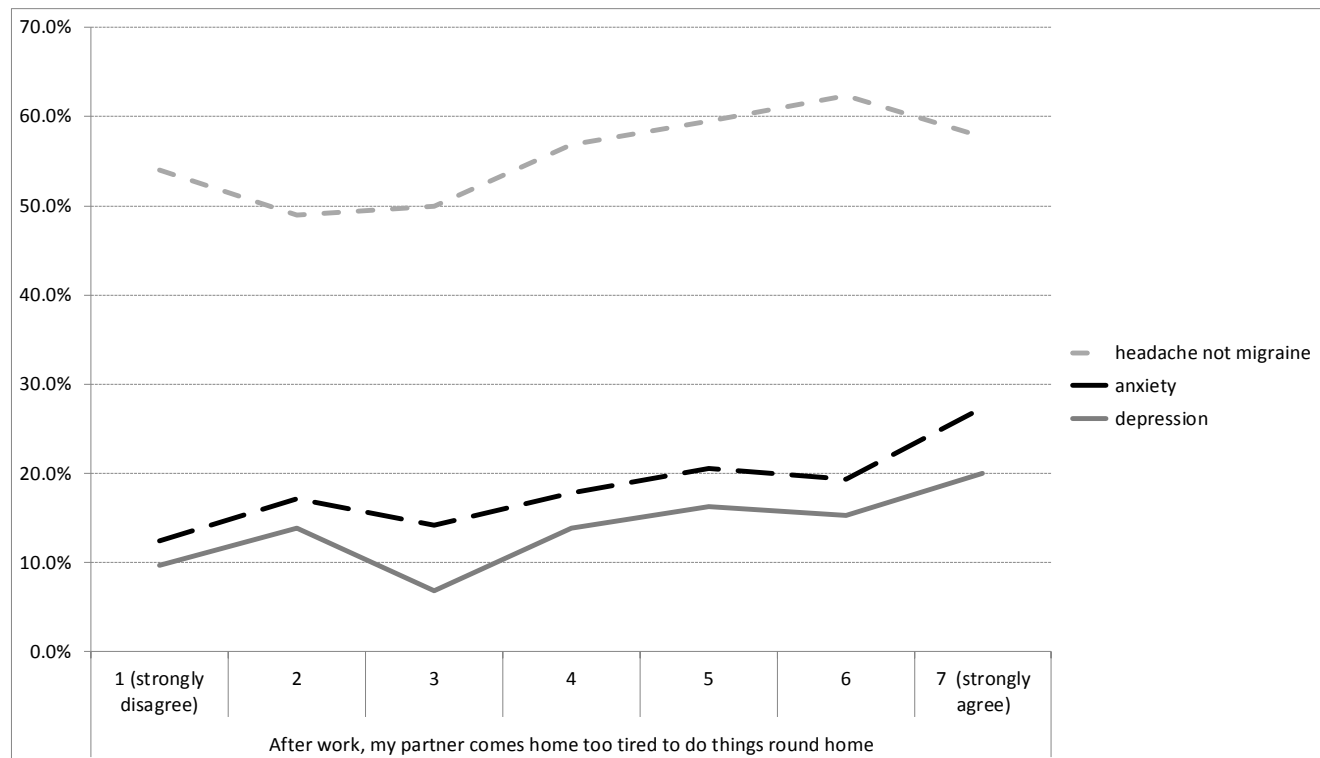
Figure 30 *Selected partner illnesses and partner attitude to tiredness of their spouse*



Partners’ self-reported anxiety and depression increased even more strongly as agreement with this statement on partner tiredness increased. This is shown in Figure 31, along with accompanying increases in incidence of headaches (migraines, not shown, also increased). Stronger relationships again existed between, on the one hand, the incidence amongst

partners of anxiety, depression and migraines and, on the other hand, increasing partner agreement with the statement ‘My spouse is often so emotionally drained when they get home from work that it prevents them from contributing to the family’.

Figure 31 *Partner anxiety, depression and headaches and attitude to tiredness of their spouse*



Sick of being treated like a machine or just a number on employer's computer database. People don't get treated like people anymore, we are too replaceable. Employers are getting more demanding every year and more off shore orientated. The Australian way is no longer, it is now asking more and do in a mate. There is no loyalty or trusted mateship anymore. Too many skills are easy to get these days by internet and training groups, no more experience is necessary it's up to what colour card you have and how many.

16. Conclusions and future directions

This report represents the early findings of what will prove to be a substantial series of outcomes. The study is currently being written up into a number of papers for expert audiences so the results presented in this report are very much preliminary findings. The task of analysing these data and a consideration of the full implications of the findings will take some years. Several important aspects of the results have still to be coded, including a significant amount of qualitative data arising from open-ended questions, as

well as analyses relating to the detail of mining and energy workers' complex shift work patterns. Shift work patterns are one of the central drivers of this study. Wave 2 of the study, while in some senses a smaller mirror image of the Wave 1 study presented in this report, will mark a significant increase in the power of the ACES survey. This will then become a longitudinal study, that is, able to examine the same population at two different time points, enabling us to make more definitive conclusions about causation.

We do not summarise the findings here – the executive summary provides a comprehensive overview. But we note that this study highlights many aspects of mining and energy work that are subject to substantial change, including rapidly advancing hours and unpredictable shift patterns. The study reinforces evidence that variable shift patterns, and in particular night shift, are causing sleep disruption, which has significant health and safety implications. There also appear to be significant linkages between this variability and sleep disruption, on the one hand, and physical health; these links can be more accurately teased out when this project progresses into Wave 2. For those workers who clearly want and are unable to attain fewer hours of work, there appears to be significant impacts on depression, and a greater use of sleeping tablets, antacids and anti-depressants.

It is already clear that the jobs that mining and energy workers are involved in are also characterised by something with significant physical and psychological health implications: lack of control. Changes in the mining and energy sector have been underpinned, and reinforced, by a shift in power from labour to capital. Most employees now have very little say over their hours and shift arrangements – for half, they have no say at all. Despite the high level of exits from the industry as workers find the working arrangements too difficult, half of the mining and energy workers who remain in the industry would prefer to be working fewer hours than they are working, even after taking account of the impact on their income, leisure and domestic activities.

This lack of control, combined with tiredness, is not simply making mining and energy workers feel unsafe: it is having negative health consequences, including affecting psychological health. Workers with no say over their hours and shifts have more difficulty sleeping and are more likely to feel unsafe at work or on their way to or from work. They are more likely to feel too tired and too emotionally drained to do things they need to do at home. The low level of say and high level of preference for working shorter hours means that mining employees record a high level of disjuncture and interference between work and life. Furthermore, the lack of say over basic work-life decisions is having a flow-on effect on partners of mining and energy workers, who often confirm that their spouses are indeed too tired or emotionally drained to function properly in the household, and which in turn has other adverse effects on partners.

Our thanks to everyone who participated so generously in our survey. We hope that everyone who participated in this first phase will be able to do so again in phase two. In the meantime, we leave you with this expression of faith:

Thank you for the opportunity to participate in this survey! I hope and believe it could be life changing for Australian families.

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