



# **Work and hours amongst mining and energy workers**

**Australian Coal and Energy Survey  
First Phase Report**

Executive  
Summary



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## 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 study of working arrangements and wellbeing in its broadest sense. 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 September 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 employed 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'.