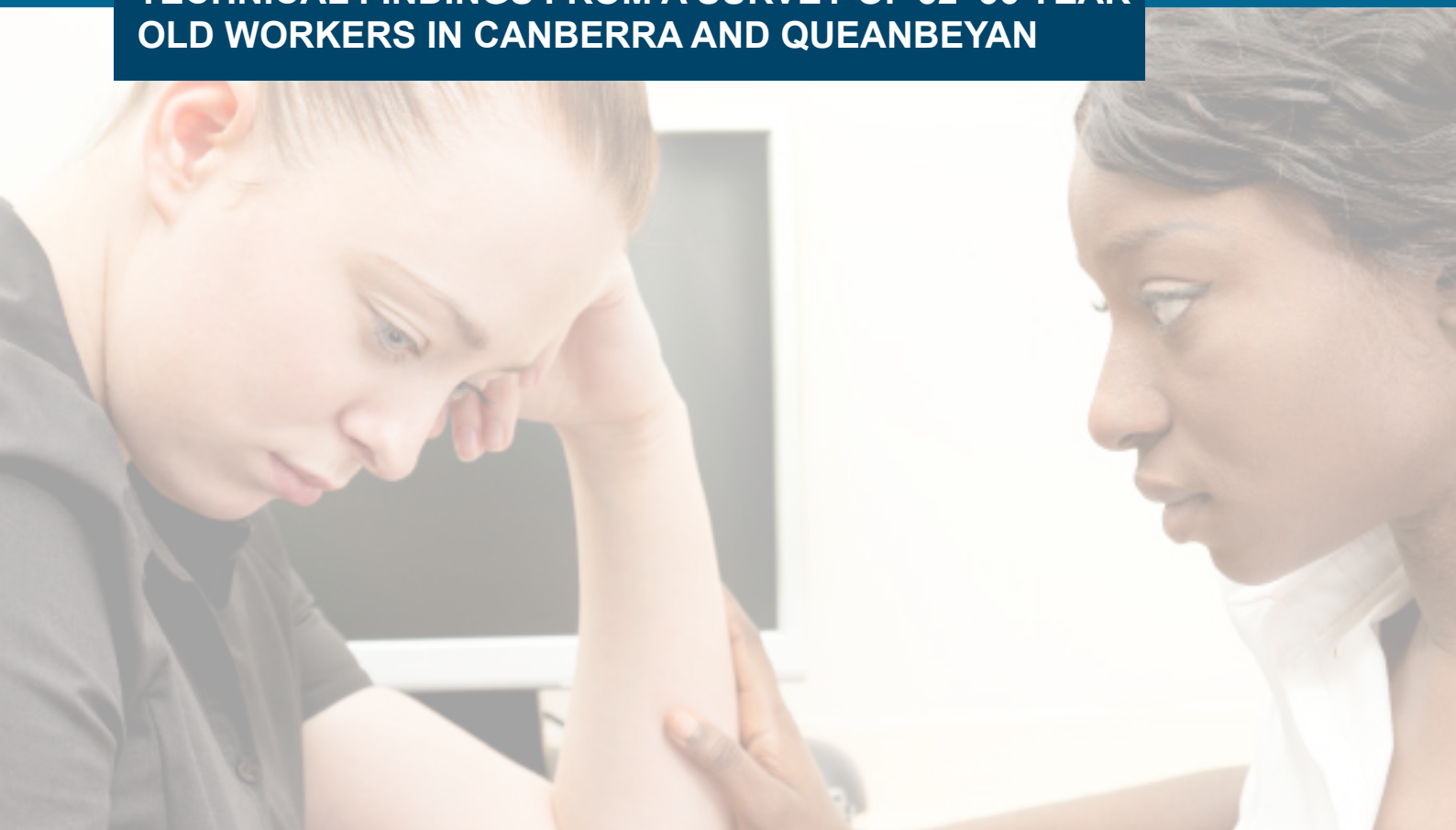# THE RELATIONSHIP BETWEEN WORK CHARACTERISTICS, WELLBEING, DEPRESSION AND WORKPLACE BULLYING

## TECHNICAL FINDINGS FROM A SURVEY OF 32–36 YEAR OLD WORKERS IN CANBERRA AND QUEANBEYAN

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![safe work australia]

This report was produced by Peter Butterworth, Liana S. Leach and Kim M. Kiely of the Centre for Research on Ageing, Health and Wellbeing, The Australian National University under commission from Safe Work Australia.

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# Executive summary

The Work Wellbeing Project 2011/12 was a partnership between Safe Work Australia and The Australian National University to collect the latest wave of data from a cohort participating in the Personality and Total Health (PATH) Through Life Project. Since its inception in 1999, the PATH study has been used to investigate the intersection between work and health. The Work Wellbeing Project collected wave 4 data from 1286 respondents aged 32–36 years through an online survey, and a face-to-face interview with a subsample of 546 respondents. In addition to the topics previously covered in the PATH survey, the wave 4 questionnaire included new items focusing on salient work characteristics and experiences such as workplace bullying, attitudes to work, work-related injury, career interruption and planned return to work, the psychosocial work environment, and sick leave/days out of role. This report has a strong empirical focus and presents an overview of the new data items including analysis of how these employment characteristics are associated with depression.

Highlights from the report include:

• Work-related injury: Around 7% of survey respondents reported that they had experienced a work-related injury or illness in the past 12 months. In comparison the most recent workplace injury and illness data published by the Australian Bureau of Statistics show an overall injury rate of about 4% for the age-range comparable to the PATH 20+ cohort. While the profile of injuries among PATH respondents differed from the national profile, likely reflecting the greater white collar/professional background of those in the sample, the data provides a unique opportunity to examine the prospective determinants of work-related injury. For example analysis showed that psychological characteristics measured four years earlier successfully identified respondents at increased risk of later work-related injury. Respondents who scored high on the trait of impulsivity were at increased risk of later overall and joint/muscle injury, whereas those who scored high on a measure of rumination (a coping style involving a focus on the symptoms of distress and on the causes and consequences of distress) were at increased risk of subsequent stress/mental health injury.

• Sick leave: 27% of the sample reported that they had stayed away from work for more than half a day in the last four weeks because of an injury or illness. In addition, 14% of those who reported taking sick leave had taken some period of leave without pay. The analysis showed that respondents with significant depression symptoms had double the risk of taking time off work than those without depression symptoms. Importantly, the analysis showed that depression was even more strongly associated with unpaid sick leave than with paid sick leave. This may reflect that those with depression are more likely to work in jobs with fewer leave entitlements or that the effect of having a chronic medical disorder leads respondents to exhaust their leave reserves. Nonetheless, the results do point to another key indicator of the social and economic consequences of depression and mental illnesses.

• Support from colleagues and managers: Receiving adequate support from colleagues and managers/supervisors in the workplace has been shown to help buffer the adverse effects of a stressful job. Consistent with this, our analysis of the wave 4 PATH data showed that respondents who reported low levels of support from colleagues and from their managers reported over double the rate of significant depression symptoms than those who reported higher levels of support.

• Perceived benefits of work: Analysis identified four broad categories of benefits that people report they derive through work: working for self-improvement, working to meet material needs, working for personal fulfilment, and working to achieve economic independence. Consideration of these factors may help to understand the different workforce experiences and goals of different groups in society. For example, those in professional occupations were

more likely to nominate work for self-improvement whereas those in trade or manual occupations were more likely to report work for economic independence. Understanding the motivations people have about work may be important in helping to better understand their responses to workplace stressors. For example, while insecure employment has been shown to be associated with increased risk of adverse health including increased risk of depression, the current analysis showed that this effect may be restricted to those who report that they are working to meet their material needs. Respondents who reported that meeting material needs was not a strong reason for working showed little difference in depression whether they had secure or insecure employment. For those who strongly advocated working to meet material needs, the perception of insecure employment was associated with greater odds of depression compared to those in more secure employment.

• Workplace bullying: The report included a focus on workplace bullying. Overall, just over 5% of respondents reported that they were currently experiencing bullying in their workplace, and a further 16% reported that they had previously been bullied in their current workplace. 24% of respondents reported experiencing bullying in a previous workplace. The analysis identified three different types of workplace bullying: person-related bullying (spreading gossip and rumours, persistent attempts to humiliate you), work-related bullying (unreasonable pressure to produce work, withholding necessary information, setting impossible deadlines), and violence and intimidation (verbal threats, threats of physical violence). Workplace bullying was strongly associated with increased risk of significant depression symptoms (over 40% among those currently bullied versus 14% among those who report never being bullied). Workplace bullying was also associated with doubling the risk of suicidal ideation. Workplace bullying can be considered as part of a cycle of vulnerability. Using longitudinal data from the PATH study we showed that compared to those respondents without depression those respondents identified with significant depression symptoms at the baseline interview had almost double the risk of reporting experiencing workplace bullying 12 years later.

The early findings from this study point to a prevalent and complex set of adverse outcomes related to psychosocial work characteristics. Further analysis of the new Work Wellbeing data and existing PATH data, as well as further research, is needed to improve our understanding of the complex relationships involved. One practical implication from the findings to date is that fair reward for effort and support from colleagues and managers may prove to be essential requirements for preventing the occurrence and consequences of bullying and depression in the workplace.

# 1. Introduction

The purpose of this report is to provide an overview of the Work Wellbeing Project 2011/12 and highlight the main findings. The project was a partnership between Safe Work Australia and the Centre for Research on Ageing, Health and Wellbeing at The Australian National University to undertake wave 4 data collection from a cohort participating in the Personality and Total Health (PATH) Through Life Project. This report contains the first analysis of data from the fourth wave of the PATH survey. It presents a summary of the constructs and measures included in the survey for the first time, and an analysis of topics relevant to the portfolio and strategic responsibilities of Safe Work Australia. Box 1 contains highlights of the study's findings.

Since its inception in 1999 the PATH study has included a focus on the intersection between work and health. The workplace represents an important context in which to promote health and wellbeing as well as being a potential source of health risks and adversities. Health, both physical and mental, is a key factor that needs to be taken into account in efforts to achieve policy goals related to productivity and workforce participation. Conversely, the social and economic consequences of disability and ill-health are manifest through low levels and disrupted patterns of workforce participation. The PATH survey provides a resource to inform policy decisions in these and related areas. A major focus of the PATH survey is on the measurement and evaluation of the impact of psychosocial workplace hazards providing a unique longitudinal resource for research and policy development in this important area.

Unlike occupational cohorts – which often only investigate a specific type of workplace and where the scope of data collection may be limited by concerns about the appropriateness of collecting information from workers about their lives outside of the workplace – the PATH study is based on a large community sample. This population perspective is particularly pertinent to broad national policy development. As the survey examines personal experiences across the many domains of a person's life it enables comparison and consideration of the intersection of factors from different aspects of life, including work, family, social, health, cognitive and psychological domains. The PATH study provides rich data on physical and mental health, family and social relationships, socio-demographic characteristics, caregiving and parenting and can aid our understanding of how these factors influence and interact with experiences at work.

The report is set out in seven sections. The current section provides an introduction to the report. Details of the research methodology are presented in Section 2, including an overview of the sample, the approach used in data collection, and a description of the new items and instruments included in the wave 4 survey questionnaire with a summary of important research aims, background from the literature, and specific details of the items. This section also describes the items from previous waves of the PATH survey that are included in the analyses presented in this report.

The report includes four sections describing the project results. The primary goal of the Work Wellbeing Project was to support the collection of wave 4 data from the PATH study cohort aged 20–24 years at wave 1 (the '20+ cohort'). Section 3 provides information on the data collection process, including response and completion rates and an evaluation of the interview processes. Section 4 presents a description of the PATH sample, including the socio-demographic characteristics of all respondents and a focus on those currently in the workforce. Section 5 presents analysis of the new data items and constructs and reports on key associations with individual, workplace and health outcomes. There are several analyses exploring unique aspects of the constructs that very few (if any) other datasets would permit. For example, the analyses examine how personality characteristics can be a predisposing risk for subsequent work-related injury. They show that depression is

associated with use of sick leave but has an even stronger association with the use of unpaid sick leave. The analysis also examines how attitudes and personal reasons for working can explain individual differences in the impact on psychosocial job adversities on health. Section 6 presents a detailed investigation of workplace bullying, perhaps the most important contribution of the new data. This includes consideration of the prevalence and dimensions of workplace bullying, socio-demographic and workplace correlates, personality and personal vulnerability and the association of bullying with depression and suicidal ideation.

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**Box 1: Highlights from the Work Wellbeing Project**

*The survey*

• *Fourth wave of the 20+ cohort of the Personality and Total Health (PATH) Through Life project.*

• *1286 respondents aged 32–36 years were surveyed online. 546 of these respondents were also interviewed face-to-face.*

*Main findings*

• *Around 7% of respondents reported that they had experienced a work-related injury or illness in the past 12 months.*

• *Respondents who 4 years earlier scored high on the personality trait of impulsivity were at increased risk of later overall and joint/muscle injury, whereas those who scored high on a measure of rumination were at increased risk of later stress/mental health injury.*

• *27% of the sample reported that they had stayed away from work for more than half a day in the last four 4 weeks because of an injury or illness. 14% of those who reported taking sick leave had taken some period of leave without pay.*

• *Respondents with significant depression symptoms had double the risk of taking time off work than those without depression symptoms. Depression was more strongly associated with unpaid sick leave than with paid sick leave.*

• *Respondents who reported low levels of support from their colleagues and managers reported more than twice the rate of significant depression symptoms than those who reported higher levels of support.*

• *For respondents who strongly advocated working to meet material needs, the perception of insecure employment was associated with greater risk of depression compared to those in more secure employment.*

• *Just over 5% of respondents reported that they were currently experiencing bullying in their workplace; a further 16% reported that they had previously been bullied in their current workplace; a further 24% reported experiencing bullying in a previous workplace.*

• *Three different types of workplace bullying were identified: person-related bullying, work-related bullying, and violence and intimidation.*

• *Workplace bullying was strongly associated with increased risk of significant depression symptoms: over 40% among those currently bullied versus 14% among those who report never being bullied.*

• *Workplace bullying was associated with double the risk of suicidal ideation.*

• *Respondents with significant depression symptoms measured 4 years earlier had almost double the risk of reporting experiencing workplace bullying 12 years later*

• *Experiences of person-related and work-related workplace bullying were correlated with high job demands, low job control, lack of fair pay, job insecurity, lack of support from colleagues and managers, and poor organisational culture.*

• *Experiences of violent or intimidating workplace bullying were correlated with lack of support from colleagues and poor organisational culture.*

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The report concludes in Section 7 with a brief summary and consideration of future directions. The report includes two appendices. Appendix A presents an overview of the history and methodology of the PATH study, including a synopsis of previous published research using the PATH data to examine the psychosocial aspects of work, and the inter-relationship between work and health. Appendix B provides a brief description of the statistical techniques used and how to interpret the output.

The results presented in the report provide a number of insights into the inter-relationship between the psychosocial aspects of work, health and productivity, and describe important policy-relevant issues. The current findings provide a sign-post to future research.

# 2. Methods

The PATH study began in 1999. It is an ongoing community survey of residents of Canberra and Queanbeyan based on a narrow cohort design: at baseline the participants were aged in their early 20s, 40s and 60s. Participants are reinterviewed every four years. Further details of the PATH study are presented in Appendix A. The goal of the Work Wellbeing Project was to conduct the fourth wave of interviews with respondents in the youngest cohort, aged between 32 and 36 years at wave 4. The project involved data collection through an online survey and face-to-face interviews and the inclusion of new items focused on salient work characteristics and experiences. The broad parameters for data collection were:

• face-to-face interviews with at least 500 PATH respondents which would include a psychiatric clinical interview, tests of physical health, cognitive assessment, and survey items related to workplace bullying and attitudes to work, and

• repeating the core PATH through Life survey questionnaire in an online form with the addition of items related to work-related injury, career interruption and planned return to work, sick leave/days out of role, and aspects of the psychosocial work environment not included in previous PATH surveys.

## 2.1 Sample and data collection

Overall 2050 respondents were in-scope for the wave 4 survey. This comprised the 1978 people who participated in the wave 3 survey and a further 72 people who participated in the wave 2 survey but were temporarily unavailable at the time of the wave 3 survey. The survey managers for the PATH through Life project employ best practice in maintaining the engagement of survey participants. Survey participants receive regular research updates and newsletters which provide feedback on publications and the uses and benefits derived from their ongoing participation in the survey. This regular contact also provides an opportunity to maintain an up-to-date contact registry. Thus at the time of the survey current phone and email details or alternative contact arrangements were available for most respondents.

In previous waves of the PATH study the survey questionnaire was completed directly by participants on a laptop computer. The data collection methodology for wave 4 of the 20+ cohort adopted a somewhat different approach. Respondents completed the survey questionnaire online. While this was broadly consistent with the approach in previous waves, it differed in that this was not conducted at a pre-arranged interview time and did not occur in the presence of an interviewer who was able to answer any questions or queries on the spot. Nonetheless, assistance with technical and content matters was available from the PATH survey team at all times via a mobile phone number that was widely distributed to and used by the PATH participants. In addition to the online survey, a subsample of respondents was selected to complete a face-to-face interview to enable the more intensive data collection aspects of the PATH study, including physical and cognitive assessment.

### 2.1.1 Face-to-face sample

To enable the face-to-face component of the data collection process, a subsample of 580 respondents was randomly selected and invited to complete the online survey and then participate in a personal interview. A trained interviewer initiated contact via phone and arranged a time for the interview at either the respondent's home or at the PATH offices at The Australian National University. The aim was for the online assessment to occur no more than two weeks before the face-to-face interview.

### 2.1.2 Online survey

The interviewers contacted all other potential respondents by phone and invited them to participate in the online survey. A secure log-in and password was provided to all participants. A standard reminder protocol (reminder emails, and follow-up phone calls) was developed to follow-up non-responding survey members.

## 2.2 Questionnaire development – constructs, items and measures

A range of new items, scales and instruments were developed or selected for addition to the wave 4 survey questionnaire. Presented below are the new items included in the final online and face-to-face survey questionnaires together with some discussion of the specific measures used, the rationale for inclusion, and research aims associated with these particular items.

### 2.2.1 Career interruptions and expectations regarding return to work

'Return to work' items were developed to provide additional data on the characteristics of those not participating in the workforce and details of their future return to work plans (Box 2). Facilitating and supporting return to work after injury, illness or time out of the workforce for caring responsibilities is an important strategy to promote levels of workforce participation and engagement.

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**Box 2: Career interruption and expectations items**

*44. What is the main reason that you are not currently in work?*
- *Maternity leave*
- *Pregnancy – but not maternity leave*
- *Prefer to be home with children – but not maternity leave*
- *Have problems finding appropriate child care*
- *Cannot find job with suitable hours*
- *Cannot find job to suit my skills*
- *Cannot find a job nearby*
- *Partner does not want me to work*
- *Studying*
- *Poor health*
- *Caring responsibility (but not for children)*
- *On long term leave - long service leave*
- *On long term leave without pay*
- *Don't need to or want to work*

*45. Do you currently receive pay/salary from your employer? Yes/No*

*46. Do you intend to return to work? Yes/No*

*47. When do you expect to return to work?*
- *0–6 months*
- *7–12 months*
- *1–2 years*
- *2–5 years*
- *more than 5 years*
- *Don't know*

*48. Do you intend to return to the same employer? Yes/No*

*49. Do you intend to return to the same position? Yes/No/Don't know.*

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## 2.2.2 Work-related injury

The topic of work-related injury has received substantial research attention but there remain significant knowledge gaps, particularly regarding information specific to the Australian context. The emphasis given to work-related injury research partly reflects the cost and personal burden associated with these potentially preventable events. For example, the estimated cost of work-related injuries in Australia is $57.5 billion annually (Safe Work Australia, 2012). Work-related injury can be investigated through the interrogation of surveillance data such as compensation claims. However, researchers in Australia and overseas have pointed to limitations of relying exclusively on this approach. For example, the available data usually do not provide an exhaustive description of all workplace injuries or the other factors driving whether or not to report incidents (McKenzie et al., 2010; Mustard et al., 2012).

The Australian Work Health and Safety Strategy 2012–2022 identifies the need for evidence on work health and safety issues to inform and evaluate national and organisational policies, programs and practice. Efforts to reduce the incidence and cost of workplace injuries and inform appropriate policy development and practice in the workplace needs to be based on both understanding of the causes and risks, and the identification of populations vulnerable to experiencing work-related incidents (Vecchio et al., 2010). In particular, there is a need to differentiate between modifiable factors that are readily amendable to change and fixed factors related to either the individual or the work environment that while difficult to alter can provide a focus for targeted approaches, including better training and increased monitoring. A range of risk factors for work-related injuries and incidents has been identified in the literature. These include factors that represent the risks inherent in different work environments and can be captured in classification by occupation and or industry (ABS, 2010). Other important organisation factors are related to the job-preparedness of workers such as the adequacy of training and the provision and use of appropriate safety equipment (e.g., Day et al., 2009). There are well established demographic risk factors for work-related injury and these include younger age, older-age (with mature-age workers being among the groups in the population most at-risk of experiencing a work-related injury), and being male (ABS, 2010). It is possible that the association of these factors with increased risk of injury is mediated through the type of work being undertaken or that these factors themselves make an independent contribution to risk (such as through their association with other unmeasured factors). Research evidence also shows that markers of poorer socio-economic circumstances such as low levels of educational attainment or even inter-generational measures such as parental social class are associated with increased risk of work-related injury (e.g. Rauscher & Myers, 2008).

The psychosocial aspects of work are associated with risk of work-related injuries. For example, Gillen and colleagues (2007) considered elements from both the Demands-Control model and the Effort-Reward Imbalance model. The Demands-Control model conceptualises work stress as being the combination of high job demands with low levels of control or autonomy. In comparison, the Effort-Reward Imbalance model views stress as a function of high job effort which is not balanced by commensurate levels of financial, security or other benefits. Gillen and colleagues found evidence that job stress was associated with increased risk of musculoskeletal workplace injuries in a broad sample of hospital workers. Other aspects of the psychosocial work environment linked to risk of workplace injuries include scheduling and shift work (see Gillen et al. 2007 for further discussion and references). While there is limited Australian research on this topic, a recent study did demonstrate a cross-sectional relationship between levels of psychological distress and previous risk of work-related injuries within a nursing population (Vecchio et al., 2010). The authors hypothesised that the distress reported was a consequence of the psychosocial work environment (i.e., work stress) which in turn had increased the workers' risk of experiencing

a work-related injury. Evidence of an association between psychosocial job characteristics and sickness absence from the PATH study (D'Souza et al., 2006) could also reflect work-related injury as a potential mediating factor. Further research is warranted to better understand these associations and the measurement of work-related injury in the PATH survey will facilitate such investigation.

The work-related injury data collected through the PATH survey will not provide the type of information on injury incidence or on the profile of work-related injuries available in administrative or Australian Bureau of Statistics (ABS) data sources. However, the longitudinal data available in the PATH study will support other types of analysis, such as consideration of the antecedents and underlying personal risk and protective factors for work-related injury. This can include consideration of individual characteristics leading to increased personal vulnerability to work-related injury: data not readily available in other sources, including impulsivity and other personality factors. Furthermore, the extensive health, psychological and social data on which the PATH study focuses will also enable study of the consequences of work-related injury.

Two items (Box 3) were developed to assess work-related injury. The items reflect the conceptual framework used by the ABS (2010) and enable the output of data that will be comparable with and able to be benchmarked against the published ABS national and local data.

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**Box 3: Work-related injury items**

*190. Have you experienced a work-related injury or illness in the PAST 12 MONTHS? Yes/No*

*191. What was your most recent work-related injury or illness?*

• *Fracture*

• *Chronic joint or muscle condition*

• *Sprain/strain*

• *Cut/open wound*

• *Crushing injury/internal organ damage*

• *Superficial injury*

• *Stress or other mental condition*

• *Burns*

• *Other.*

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### 2.2.3 Additional aspects of psychosocial characteristics of work

A significant focus of the PATH through Life project has been on the psychosocial characteristics of work. This reflects the perspective that with the transformation from a manual to a knowledge- and service-based economy the psychosocial aspects of work will become an increasing focus of efforts to promote health and avoid injury and lost productivity in the workplace. Consideration of psychosocial job characteristics reflects theoretical and empirical evidence of the association between the social environment at work, psychological processes and workers' health. There has been considerable research into psychosocial work stressors and study of how these influence the mental and physical health of workers (e.g. Siegrist, 2008; Stansfeld & Candy, 2006). The Job Demands-Control model and the Effort-Reward Imbalance model are the two dominant theories in this area.

The measures of psychosocial job quality included in the PATH study have been largely based on the Job Demands-Control model, also known as Job Strain theory (Karasek, 1979). This theory posits two important dimensions of the psychosocial work environment: psychological demands and decision latitude. Demands reflect the level of workload and responsibility placed on an individual. Decision latitude is often referred to as 'control'. The

theory differentiates two aspects of job control: having control over the way one works, including the content and timing of work (decision authority) and having control over one's experiences or opportunities, including works experiencing variety and the opportunity to use and develop new skills (skill discretion). In the PATH study control is assessed by 15 items from the Whitehall study measuring aspects of both decision authority and skill discretion. While these different aspects of work have been shown to be associated with health outcomes, the theory posits it is the combination of the two dimensions (demands and control) that is critical (Figure 2.1). High-strain jobs, characterised by the combination of high job demands and low levels of control over how these demands are managed, are most strongly associated with adverse health outcomes including mental and physical health conditions. In contrast, jobs that may entail high demands but in which workers have adequate control over how this work is done and the skills that they utilise to undertake this work (labelled as active jobs) do not lead to greater risk and are thought to be associated with increased motivation and satisfaction. Low-strain jobs (low levels of demands and high levels of control) are thought to be protective of health, while the passive jobs (low levels of demands and low levels of control) may be demotivating and also have adverse psychological and health effects though processes similar to learned helplessness.

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**Figure 2.1: Job Strain model – interaction of Demands and Control**

|  | **Low demands** | **High demands** |
|---|---|---|
| **High control** | Low strain | Active |
| **Low control** | Passive | High strain |

---

Job strain theory was later adapted by the inclusion of social support in the workplace. This was based on recognition that similar to the role of social support in the non-work domains of life, the support that workers receive from their supervisor or co-workers can buffer the stressful effects of high demands, low control and job strain (Johnson et al., 1989; Johnson & Hall, 1988). Thus the revised Demand-Control-Support model incorporates items to enable analysis of the potentially moderating role of social support at work.

New items assessing social support at work were included in wave 4 of the PATH survey (Box 4). These items were drawn from the 2007 Adult psychiatric morbidity in England survey (McManus et al., 2009) which was adapted from the Whitehall II study (Karasek, 1979; North et al., 1996). The inclusion of the items will enable evaluation of the buffering effects of social support in an Australian context. Analysis will also examine whether low levels of support from colleagues and supervisors is an independent predictor of ill health and evaluate the inter-relationship between the different psychosocial aspects of work; for example, the extent to which high job demands, workplace bullying and low social support co-occur. Future research will also consider the consistencies and differences evident in the levels of social support individuals report receiving from their family, from their friends and from their work colleagues and managers.

The other dominant model of psychosocial work stress is the effort-reward imbalance model (Siegrist, 1996; Siegrist, 2002). According to this model, work offers a range of benefits to the individual – including esteem, status, security and material rewards – but these come at a cost, such as the demands of the job. The theory posits that psychological distress is a consequence of situations in which there is a lack of reciprocity in this social exchange. That is, stress occurs when the individual perceives that their efforts far outweigh the benefits they derive.

> **Box 4: Social support items**
>
> *186. How far do these statements reflect your work situation?*
>
> *(Response scale: Strongly agree, Slightly agree, Slightly disagree or Strongly disagree)*
>
> • *I get help and support from my colleagues*
>
> • *I get help and support from my (line) manager.*

Measures of effort-reward imbalance have not been included in the PATH study. However, among the new items added to the wave 4 survey is a single item assessing financial rewards relative to effort (Box 5). Again this item was used in the 2007 Adult psychiatric morbidity in England survey (McManus et al., 2009) and drawn from the ERI questionnaire (Siegrist et al., 2009). Our research interests will include the extent to which this item is associated with other psychosocial job adversities and independent of actual income.

> **Box 5: Financial reward item**
>
> *186. How far does this statement reflect your work situation?*
>
> *(Response scale: Strongly agree, Slightly agree, Slightly disagree or Strongly disagree)*
>
> • *I get paid fairly for the things I do in my job.*

Finally, the measures of the psychosocial environment at work used in the PATH study are largely concerned with the characteristics of the job or the interactions an individual has in the workplace. It is important to recognise that behaviour and interaction at work occurs within and is influenced by the underlying social structures of an organisation (e.g. Elovainio et al., 2002; Ferrie et al., 2006; Kivimaki et al., 2004). Aspects of organisational justice set the context for the task-related and interpersonal aspects of work and perceptions of injustice can affect health and wellbeing, and influence how individuals act in the workplace.

The focus of the new items included in wave 4 of the PATH study is on aspects of distributive justice and procedural justice. Distributive justice refers to fairness and openness in treatment, the outcomes of decision-making processes, and the distribution of rewards and compensation. Procedural justice reflects the extent to which individuals perceive that the decision making process is fair and consistent, and that they have involvement in the process. These aspects of relational justice have been shown to be directly related to health and wellbeing independent of the traditional psychosocial workplace characteristics (e.g. Elovaninio et al., 2001).

We included five items (Box 6) from the Whiltehall II study which have been used to assess the procedural and distributive components of relational justice (Kivimaki et al., 2004). In addition to evaluating the independent health effects of organisational culture, these items will enable investigation of the extent to which adverse psychosocial job characteristics and workplace bullying occur in the context of low levels of relational justice, and the personal and social consequences, including mental and physical health, suicidal ideation, absenteeism and reduced productivity.

## 2.2.4 Sick leave and days-out-of-role

Items assessing these two related constructs were included in the PATH wave 4 online questionnaire. Sickness absence is an obvious and key outcome measure for research into workforce participation and the impact of health on productivity. It has been an outcome in previous research using the PATH data (see discussion in Appendix A). Better understanding of the personal and workplace drivers of sickness absence is an important direction for future research (Hussey et al., 2012). Such research may also aid the development of new policy approaches to sickness absence and the identification of ways to facilitate and maintain connection to the workforce; for example, change to fit rather than sick notes in the UK context. While there is a strong tradition of this type of research internationally, there is scope for similar research in a local Australian context to inform current priorities. Two items assessing sick leave were developed for the PATH through Life project (Box 7).

Days out of role is a key measure of disability and reflects disruption in a person's ability to perform their role within their family and their community, as well as their role as a member of the workforce. It explicitly refers to being unable to complete normal and work related activities or responsibilities (Kessler et al., 2004). Days out of role measures recognise that a person's functional role extends beyond the workplace and is therefore a related but broader concept than absenteeism which is typically restricted to occupational and educational settings (see above). These are important outcome measures for not only the study of workplace characteristics (Hensing et al., 1998), but also for investigation of the burden and consequences of diseases and health conditions (Bruffaerts et al., 2012; Kessler, et al., 2004). Days out of role and absenteeism provide a marker of lost productivity, may be a pre-curser to longer-term unemployment, and have been linked with workplace satisfaction (Hensing et al., 1998).

The focus on mental health in the PATH study provides an important context for investigation of both sickness absence and days out of role. Reports from the World Health Organization's World Mental Health surveys have rated depression and bipolar disorder as the two most severely disabling mental disorders in developed countries (Kessler, et al., 2009). Analysis of multi-nation data from the WHO World Mental Health surveys has shown that in higher income countries depression is associated with an average of 34.8 days out of

role per year (Alonso et al., 2011). Depression has consistently been shown to be a leading contributor globally to years lived with disability (Mathers & Loncar, 2006; Murray & Lopez, 1996), with the burden particularly high among women (McKenna et al., 2005). In Australia the situation is no different, with depression and anxiety disorders estimated to be the leading causes of non-fatal burden of disease among men and women (Begg et al., 2007). Analyses of the National Survey of Mental Health and Wellbeing indicated that over 40% of Australians are likely to have experienced a mental disorder in their lifetime (ABS, 2009). Depression is also a risk factor for other disabling chronic conditions and is often reported to be comorbid with conditions like cardiovascular disease and major neurological impairment. Mental illness comorbidities may have additive or multiplicative impacts on individuals and have been liked with lower economic status and higher rates of hospitalisation. Importantly, Australians with a mental disorder comorbid with another chronic condition are almost twice as likely to have more than seven days out of role a month compared to Australians without comorbidity (Australian Institute of Health and Welfare, 2011). The measurement of days out of role in the PATH study will enable longitudinal analysis to investigate prospective effects and trajectories of change over time.

Two items were used to determine days out of role over the past 30 days (Box 8). These items assessed both full and partial role limitations. These items are consistent with other surveys that measure days out of role, including the Australian Survey of Mental Health and Wellbeing (Korten & Henderson, 2000) and the US National Comorbidity Survey (Kessler et al., 2004).

> **Box 8: Days out of role items**
>
> *Beginning yesterday and going back 30 days*
>
> *1. How many days out of the past 30 were you totally unable to work or carry out your normal activities?*
>
> *2. How many days out of the past 30 were you able to work or carry out your normal activities but had to cut back on what you did or did not get as much done as usual?*

## 2.2.5 Workplace bullying

Workplace bullying is increasingly recognised in Australia and internationally as being a concern in the workplace. However, this recognition is occurring in a context characterised by a lack of relevant information and data. The Productivity Commission's recent review of psychosocial work hazards emphasised the enormous costs of workplace bullying (Productivity Commission, 2010). These costs do not only reflect the personal costs to those who are bullied, but also the financial costs to employers arising from absenteeism, presenteeism, staff turnover and other organisational processes/changes that are a direct consequence of bullying. Due to the lack of local data on the prevalence of workplace bullying in Australia, the Productivity Commission estimate was based on international data and therefore included considerable uncertainty, hence a range of $6–$36 billion annually. This estimate does not include more widespread costs to the economy such as those associated with welfare or health expenditure.

Workers' compensation data provides another source of information on workplace bullying in Australia. Workplace bullying and harassment are among the highest cost subcategories within mental health claims, and are associated with among the longest median time away from the workplace (Productivity Report, 2010). However, such data have limitations due to jurisdictional differences in definitions and data collection, the coverage and representativeness of the compensation data, and uncertainty about differences between the number of workers who may experience workplace bullying and the number who initiate a compensation process.

### Defining workplace bullying

There remains uncertainty in both research and practice about very fundamental features of workplace bullying, such as an agreed definition or consensus on how to best measure workplace bullying. At its most basic level, the term workplace bullying is used to refer to negative and aggressive behaviours at work, which are often of a psychological nature (Leymann, 1996). However, there is also agreement of the need to differentiate workplace bullying from single, more limited exposure to negative acts and behaviours, which can more accurately be defined as harassment or workplace incivility (Lim & Cortina, 2005). Some suggest the key feature of workplace bullying is the differentiation between discrete or isolated events or behaviours, and those that can be characterised as being markers of a persistent and hostile interpersonal relationship (Einarsen et al., 2009; Kivimaki et al., 2003; Lahelma et al., 2012; Nielsen et al., 2010). An agreed and commonly adopted approach to defining workplace bullying is to focus on the persistence of behaviours: persistent in terms of the repetition of specific behaviours, the duration of the behaviours, and also consideration of patterns of behaviour (i.e. experience of a variety of different bullying behaviours; Einarsen et al, 2003).

Vartia (1996) identified different types of bullying, differentiating between 'person-related' bullying and 'work-related' bullying. Person-related bullying includes behaviours such as verbal abuse and persistent threats whereas work-related bullying reflects task-related behaviours such as unreasonable monitoring and checking of work, setting of unreasonable workloads or meaningless activities. Further empirical analysis by Einarsen and colleagues (2009) showed that physically intimidating or explicitly physically violent behaviours could be conceptualised as a separate third category of workplace bullying.

Some researchers also identify a power imbalance between instigator and recipient of the bullying behaviour as a necessary prerequisite in the definition of workplace bullying (Einarsen et al., 2009), though this is not universally the case (e.g. Kivimaki et al., 2003). This can be an imbalance of formal power, tied to organisational structures and seniority in the organisation or it can be informal power based on superior social connections or knowledge that one individual or group of individuals has over another.

In summary, a common definition of workplace bullying conveys the persistence of bullying, the effect on the recipient rather than the intention of the bully, and the negative effects perceived by the victim. Workplace bullying can cover a wide range of different behaviours. In her study of workplace bullying in a National Health Service community trust, Quine (1999) developed an instrument with items reflecting five categories of bullying behaviour identified by Rayner & Hoel (1997): threats to professional status, threats to personal standing, isolation, overwork and destabilisation.

### Workplace bullying research

Much of the existing research on workplace bullying is from Scandinavia, particularly Finland and Norway. There is also a strong research focus on workplace bullying within the health system (e.g. Quine, 1999). While there are many different instruments and questionnaires used, there are two main approaches to the measurement of workplace bullying in research.

One approach, the subjective or self-labelling approach, involves the presentation of a definition of bullying and asks respondents to nominate if they had been subject to such behaviours in the workplace over a specific time frame or ever. This is the approach of researchers such as Kivimaki and colleagues (2003), and one we draw on in the development of one of the items which we included in the online wave 4 questionnaire for the PATH 20+ cohort (Box 9). This type of item can produce a general estimate of prevalence which can be compared across studies, countries and workplaces. The item

used in PATH has some limitations, but was chosen as being one of the most commonly used items in the research literature so as to enable cross-national comparisons.

> **Box 9: Workplace bullying item for the online survey – self-labelling approach**
>
> *Mental violence or workplace bullying refers to isolation of a team member, underestimation of work performance, threatening, talking behind one's back or other pressurizing[1].*
>
> *Have you experienced such bullying?*
> * *Never*
> * *Yes, currently*
> * *Yes, previously in this workplace*
> * *Yes, previously in another workplace*
> * *Cannot say.*

The alternative approach, the operational method, assesses the frequency of specific acts or behaviours, often using a Likert-type scale reflecting the frequency and/or persistence with which the behaviours are experienced. One advantage of this approach is that the behaviours are not labelled as bullying and this therefore avoids the negative emotional connotations associated with the term. However, the disadvantage of this approach is that one can never cover the complete constellation of specific behaviours that make up workplace bullying and thus may underestimate the experience of bullying. However, these types of measures do provide a representation of the continuum of bullying behaviours and experiences which can support a more nuanced analysis and perspective on workplace bullying than is feasible with a simple categorical or binary response.

The Negative Acts Questionnaire (NAQ) is in this operational tradition and is one of the most widely used workplace bullying instruments available in a variety of languages (Einarsen & Rakness, 1997). Through analysis seeking to group items into higher-order factors and latent class or cluster analysis, data from the NAQ has provided empirical support for different dimensions of bullying behaviour, confirmed the salience of differentiating between person-related, work-related and physically-intimidating bullying behaviours, and also identified meaningful groupings of individuals based on their divergent workplace bullying experiences (Einarsen et al., 2009). It is of interest that the underlying factor structures may vary for different cultures or countries, with analysis of the Japanese NAQ demonstrating a different structure to the English version, perhaps reflecting the more collective workplace culture (Tsuno et al., 2010).

Because the operational and self-labelling approaches serve different purposes, some advocate using both in workplace bullying research (Salin, 2001). This is the approach adopted in the PATH study.

The face-to-face interview of the PATH 20+ wave 4 survey included a battery of 21 questions in the operational tradition that assessed different bullying behaviours (Box 10). This was adapted from the scale used by Quine (1999), supplemented by an additional item. The scale had been used previously in an Australian context (Eliza Ahmed, personal communication) and in workplaces in Bangladesh (Ahmed & Braithwaite, in press). In the

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[1] In the draft code of practice *Preventing and responding to workplace bullying*, workplace bullying is defined as 'repeated, unreasonable behaviour directed towards a worker or a group of workers that creates a risk to health and safety'. The two measurement approaches used in this project use concrete examples to quantify the concepts referenced in the code.The self-labelling approach has a more operational definition than that used in the draft code of practice but differs in a lack of emphasis on repeated behaviour. The operational method further isolates the unreasonable behaviour and considers the behaviours' frequency. Together, the two approaches to workplace bullying used in this project are consistent with the more conceptual definition in the draft code of practice.

PATH questionnaire, each item asked respondents to indicate whether, in the past six months they had experienced each behaviour 'never', 'a few times', 'sometimes' or 'often'.

While the self-labelling measure will provide insight into the prevalence of bullying experiences within the population, the operational method will identify different aspects of bullying behaviours, provide data on the severity of bullying experience, with scores on a dimensional scale rather than a simple yes/no category, and enable consideration of how exposure to different types of bullying is related to occupational, psychological and health outcomes.

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**Box 10: Workplace bullying item for the face-to-face interviews – operational method**

*How often have any of the following occurred to you in your workplace over the past 6 months? Choose the response closest to your experiences.*

*(Response scale: Never; A few times, Sometimes or Often)*

 *• Persistent attempts to belittle and undermine your work*
 *• Persistent unjustified criticism and monitoring of your work*
 *• Persistent attempts to humiliate you in front of colleagues*
 *• Undermining your personal integrity*
 *• Destructive innuendo and sarcasm*
 *• Making inappropriate jokes about you*
 *• Persistent attempts to demoralize you*
 *• Spreading of gossip and rumours about you*
 *• Withholding necessary information from you*
 *• Being ignored or excluded*
 *• Unreasonable refusal of applications for leave, training or promotion*
 *• Unreasonable pressure to produce work*
 *• Setting of impossible deadlines*
 *• Shifting of goalposts without telling you*
 *• Constant undervaluing of your efforts*
 *• Removal of areas of responsibility without consultation*
 *• Verbal threats to you*
 *• Persistent teasing to you*
 *• Threats of physical violence to you*
 *• Threats of violence to your property*
 *• Being shouted at or being the target of spontaneous anger.*

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### *Prevalence of bullying*

Estimating the costs of workplace bullying and quantifying the impact in the community requires data on prevalence. Many submissions to the House of Representatives Inquiry into workplace bullying noted the lack of Australian data on the prevalence of workplace bullying. In reviewing the international literature, Tsuno and colleagues (2010) report European estimates of the prevalence of workplace bullying range between 3.6% and 16%. Using perhaps the most comprehensive data on workplace bullying in Australia to date, Dollard and colleagues estimated that 6.8% of Australian workers had experienced bullying in the previous 6 months or longer. These data from the Australian Workplace Barometer project were collected using the subjective/self-labelling approach (Dollard & Bailey, 2013 forthcoming).

### Causes of bullying

The research collected through the PATH project will add to existing international literature to increase understanding of the causes of workplace bullying. Attention has focused on aspects of the work environment including organisational culture (Kivimaki et al., 2003). Some argue for example that workplace bullying reflects a deficiency in perceived organisational justice and fairness. Others have identified bullying as a consequence of a lack of leadership and an inability within an organisation to manage change (Einarsen et al., 2009). Other approaches focus on specific job characteristics. In a comprehensive analysis considering a range of job-related antecedents of workplace bullying, Notelaers and colleagues (2010) identified role conflict as the strongest determinant of bullying. This research also found that a lack of involvement in decision making, low skill utilisation, role ambiguity, high job demands, and job insecurity were also independently related to increased risk of bullying behaviour. Within a framework recognising the importance of the psychosocial aspects of work, Dollard and colleagues identify lack of material resources to undertake one's job, high job demands, low job support, and poor organisational climate as the factors most relevant to workplace bullying in an Australian context.

### Personal consequences of bullying

The persistent and ongoing nature of the bullying experience makes it a pernicious social stressor. There is much research evidence demonstrating the association between bullying and psychological distress, depression, anxiety, and chronic health conditions (e.g. Kivimaki et al., 2003; Nielsen et al, 2012; Quine, 1999). Workplace bullying has an adverse effect on such health outcomes over and above the effect of other established psychosocial job stressors such as job demands, decision authority, role ambiguity and role conflict (Hauge et al, in press). Workplace bullying also has a quantifiable adverse effect on organisational or workplace outcomes such as staff turnover and absenteeism. For example, workplace bullying was shown to increase risk of sickness absence by over 25% (Kivimaki et al., 2000).

Importantly while there is some evidence from longitudinal studies that workplace bullying precedes the onset of adverse health outcomes, there are also results showing that individual vulnerability, such as a history of depression, may increase one's risk of a subsequent experience of workplace bullying (Kivimaki et al., 2003). Experience of workplace bullying may lead individuals to perceive themselves as victims, provoking a sense of hopelessness and pervasive despair, which may influence subsequent interactions in the workplace. That is, a vicious cycle of increasing vulnerability, distress and bullying may develop over time. The effect of workplace bullying may be mediated through psychological factors such as the predisposition to ruminate (Nielsen et al., 2012).

### The aims with PATH data

One of the most immediate aims of inclusion of workplace bullying items in the PATH survey is to document the prevalence and profile the experience of workplace bullying in the Australian context. The investigation of workplace bullying will be a long-term focus of PATH data analysis seeking to investigate the dimensions of workplace bullying. The PATH data will be used to evaluate the health and psychological consequences of exposure to workplace bullying, and identify risk and protective factors through prospective analysis taking advantage of the data from up to 12 years before the wave 4 assessment. A particular focus of the planned program of research is to investigate the extent to which workplace bullying is an extension of other psychosocial workplace hazards, and the role of bullying in the complex interplay between personal, psychological, health, organisational, job and broader social factors.

## 2.2.6 Perceived benefits of work

Research from across many different disciplines has investigated and identified a range of benefits (and conversely the personal costs) that individuals may derive from work, including financial security, a sense of purpose and identity, a way to structure their time, or a context for social interaction. For example, Warr's Vitamin model (Warr, 1987) provides a comprehensive perspective of a variety of job characteristics that may impact on individual health and wellbeing. However, not all aspects of work may be important to all individuals at all times. The perspective on work of a highly trained professional with sought-after specialist skills is likely to differ markedly from that of a person with few vocational skills who has been excluded from the workforce and society more generally for many years due to their severe mental illness. These different experiences will likely be manifest in different attitudes towards work and these attitudinal differences may moderate the impact of adverse psychosocial job characteristics on health and wellbeing.

To enable investigation of the potential interactions between job characteristics, individual circumstances, and attitudes to work, the wave 4 PATH survey included 14 items asking about the perceived benefits of work (Box 11). Each item asked respondents to rate how important a potential benefit was from 1 'not important at all' to 7 'very important'. These items were drawn from the Self Completion Questionnaire of the Household Income and Labour Dynamics in Australia (HILDA) Survey. This scale will provide information about why people work or would like to work. There may be important differences based on gender, job level and job quality. It may also be the case that the effects on health of adverse psychosocial job characteristics such as insecure employment may depend upon the expectations that one has and the importance that one places on one's work. In addition, the data may offer important insights regarding the perceptions of those not currently in work, including those with young children and care giving responsibilities, and their intentions about future employment. Longitudinal analyses using data from previous waves of the PATH survey can be used to investigate how people's perceptions of work are a reflection of their past employment experiences and current life circumstances.

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**Box 11: Benefits of work items**

*The following is a list of benefits that people report that they get from paid employment. Please indicate how important each is to you. This is not just about your present situation. Think about your total working life or the benefits you would get if you were working.*
*(Response scale: 1 = 'not important at all' to 7 = 'very important')*
 • *More money for everyday needs/making ends meet*
 • *More money to provide better opportunities/material benefits (for kids)*
 • *More money to clear debts/repay loans/pay off house*
 • *Status, prestige and self esteem*
 • *Economic independence (not relying on hand-outs from partner)*
 • *Something to do/relief from boredom*
 • *Socializing and communication with other people*
 • *Opportunity to develop new skills and develop a career*
 • *The enjoyment and satisfaction from work*
 • *A useful way to serve society*
 • *Being able to contribute to the financial costs of maintaining a household*
 • *Not having to be reliant on the government for income support*
 • *A feeling of doing something meaningful*
 • *A more varied and interesting lifestyle*

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## 2.2.7 Existing measures

This section contains a brief overview of the items and scales included in previous waves of the PATH Survey that are most relevant to the current analysis.

### Socio-demographic characteristics

The PATH Survey assesses a standard range of socio-demographic measures including age, sex, relationship status (married and de facto), relationship history, presence/details of children, housing tenure, experience of financial strain/hardship, source of income, and household income in bands (wave 3 onwards).

### Employment characteristics

The PATH survey has also assessed several employment characteristics including the following:

• whether employed, unemployed and actively looking for work, or not in the labour force

• whether in permanent, fixed-term or casual employment

• whether employed full-time or part-time

• whether employed by a Commonwealth or state/territory government, the private sector, or a non-government organisation

• whether self-employed, an employee or an employer

• whether in a supervisory or managerial role

• hours worked per week, and

• occupation categorised by Australian and New Zealand Standard Classification of Occupations (ANZSCO) coding but summarised into three levels for the current analysis.

### Psychosocial job characteristics

Job demands and job control were measured using 19 items taken from the Whitehall study (Bosna et al., 1997) which adapted the items from the original Job Content Questionnaire (Karasek, 1979). This is a version of the scale commonly used in large-scale epidemiological studies. Job demands are assessed by four items such as 'Do you have to work very fast?' and job control is measured by 15 items such as 'Others take decisions concerning my work'. All items had four response categories (1 = 'often', 2 = 'sometimes', 3 = 'rarely' and 4 = 'never').

Perceived job insecurity was assessed by the question 'How secure do you feel about your job or career future in your current workplace?' There were four responses categories (1 = 'not at all secure', 2 = 'moderately secure', 3 = 'secure' and 4 = 'extremely secure').

### Health

Respondents were identified as experiencing significant depression symptoms using the Patient Health Questionnaire (Spitzer et al., 1999) which is a self-completion measure of depression based on the classification criteria in DSM-IV, and assesses the experience of depression symptoms in the past two weeks. Respondents identified with major, minor or sub-syndromal depression according to the scoring protocols of the Patient Health Questionnaire (PHQ) depression scale were classified with significant depression symptoms for the analyses presented in this report.

Suicidality was measured using the suicidality subscale from The Psychiatric Symptom Frequency Scale (Lindelow et al., 1997). The subscale consists of the following items concerning suicidal ideation and behaviour which are each presented with dichotomous response options (0 = 'No', 1 = 'Yes'):

• in the last year have you felt life was hardly worth living?

• in the last year have you thought you would be better off dead?, and

• in the last year have you ever thought about taking your own life?

*Social context*

Participants were asked about their experience of eight Negative Life Events during the past six months. Six of these events were taken from Brugha and Cragg's (1990) List of Threatening Experiences, and enquired about personal injury or illness, family injury or illness, close family death, close friend or other relative's death, a steady relationship ending, and any serious problems with a close friend, neighbour or relative. Two further questions taken from the British National Survey of Health and Development (Rodgers, 1996) referred to a work or career crisis and the threat of losing employment. Response options for each of these items were 'not experienced' or 'experienced'. It is acknowledged there may have been additional relevant life events not assessed in this list.

Level of social networks was assessed using the brief 6-item Lubben Social Network Scale (LSNS-6; Lubbin et al., 2006). This scale contains six items asking about numbers of relatives and friends the respondent sees regularly, is at ease with, and is close to (ranging from '0' to '9 or more'). A total scale score is calculated by adding the total number of support networks stated in each item.

*Psychological factors*

Several psychological scales are considered in this analysis. These represent only a small proportion of the data available from the PATH study in this domain.

'Ruminative style' is a type of emotion-focused coping categorised by a chronic focus on negative emotions and their meaning. It is hypothesised to have a key role in the aetiology of depression. This construct was assessed using a 10-item short scale drawn from the 21-item Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Parker, & Larson, 1994). The questionnaire was a Likert-type scale with four response categories (0 = 'Never' to 3 = 'Always'). Total scale scores ranged from zero to 30 with higher scores indicating a greater degree of rumination about negative feelings and experiences.

'Mastery', or perceived control over one's future, was measured using a 7-item scale developed by Pearlin and colleagues (1981). This scale was created for use in community-based samples. Each item used a 4-point Likert-type scale (1 = 'Strongly Disagree' to 4 = 'Strongly Agree'). Total scale score ranged from seven to 28 with higher scores indicating a greater level of mastery.

'Impulsivity' was measured using four items from the 24-item Behavioral Inhibition and Activation Scale (BIS-BAS; Carver & White, 1994). Behavioural Inhibition System (BIS) and Behavioural Activation System (BAS) is a neuropsychological theory of personality to explain dispositional tendencies in avoidance and approach behaviours. Behavioural inhibition represents an individual's sensitivity to negative outcomes, with high levels corresponding with avoidance behaviour and negative emotional responses such as proneness to anxiety. In contrast, high levels of BAS sensitivity are characterized by goal-directed behaviour whereas extreme levels have been linked to impulsivity disorders. The component of the BIS-BAS scale used in this study is known as the BAS-fun-seeking element and reflects individual differences in the degree of impulsivity associated with approach behaviour. The questionnaire used a 4-point Likert-type scale (0 = 'Very false for me' to 3 = 'Very true for me'). Total scale score for impulsivity ranged from zero to 12 with higher scores indicating a greater level of impulsivity.

'Neuroticism' refers to a personality trait similar to negative affect and characterised by a persistent disposition to anxiety, depression and worry. The scale was measured using 12 dichotomous items from the short form of the Eysenck Personality Questionnaire (EPQ; Eysenck, Eysenck, & Barrett, 1985), with responses options of either 'yes' (1) or 'no' (0).

Total scale scores ranged from zero to 12 with higher scores on each measure indicating greater levels of the associated personality trait; in this case, neuroticism.

The analysis also incorporates a personality measure related to trait-negative affect: the 7-item Behavioural Inhibition Scale (BIS; Carver and White, 1994). Analysis has shown that the BIS scale (range 0-21) represents a neuroticism/negative affectivity super-factor (Jorm et al., 1999), reflecting propensity for anxiety rather than experienced anxiety.

# 3. Results: Response rates and interview completion

As outlined above, a key component of the Work Wellbeing Project was the collection of wave 4 data from the 20+ cohort. This included the online interview of all survey respondents and a face-to-face interview with a subsample of at least 500 survey participants. With the new instruments and measures added to wave 4, the data on work, health and wellbeing, and the availability of four waves of data over 12 years, the PATH survey will provide a rich and valuable resource for the research and policy community in Australia.

Data collection for the online and face-to-face components of the Work Wellbeing Project was completed in May 2012. Online and most data from the face-to-face interview was cleaned and became available for analysis over the period from July to August 2012.

## 3.1 Face-to-face sample

From the subsample of 580 respondents randomly selected and contacted for participation in this component of the study, 546 face-to-face interviews were completed. This represents a 94% completion rate. This response rate is very high, both as an absolute figure and also relative to attrition rates observed in other large-scale community surveys. However, the rate is consistent with previous wave-to-wave attrition rates observed in the PATH study (see Appendix A). All respondents participating in the face-to-face interview also completed the online survey.

## 3.2 Online survey

Of the 1470 potential respondents who had not been invited to complete a face-to-face interview (2050 in the cohort contacted minus 580 in the face-to-face subsample), 740 commenced the online survey (50.3%) and 645 (43.9%) completed the survey. Overall, combining the online data collected from those in the face-to-face sample and the data from the online-only respondents shows that 62.7% of the contacted respondents provided data.

## 3.3 Interpretation

It was evident during the data collection process that there were some problems which interfered with participant involvement in and accessibility to the online survey. The response and completion rates were lower than anticipated for this component of the project. In part this can be attributed to technical issues experienced by some respondents. There were some reports of software compatibility and operational problems by some respondents with dated operating systems or hardware. Some potential respondents had difficulty logging into and completing the survey from their home computers. Other potential respondents reported that they were unable to access the online survey from their workplace due to firewall or other security measures.

There was also an issue with some respondents unable to access their log-in details having provided the interviewers or PATH survey manager with an out-of-date email address, such as addresses associated with a previous place of employment. Hence some potential participants did not receive the information sent to them with the protocols and links to access the online assessment.

However, the striking difference in the response rates to the online-only and face-to-face interviews and also compared to previous waves of the PATH through Life project suggests that a major barrier to survey completion was the lack of personal attention. Although the PATH interviewers initiated telephone contact with all potential respondents and followed-up those who had not completed the survey, in previous waves of data the interviewers and respondents would agree to meet at a specific interview time and place. This concrete event ensured respondents did participate and complete the survey. Many potential respondents

reported that they had intended to complete the online survey but that they had been distracted by other activities at home or work, and that it was easier to defer completing the online survey and dismiss/delete the reminder emails than it had been in previous waves to reschedule or ignore an interview that they had arranged, particularly if the interview was to be conducted at their own home. Thus, the difference between the response rate for the online only sample and the random sample contacted for a face-to-face interview provides an indication of the contribution of this personal contact to the response rate.

Despite the negativity in the discussion thus far about the data collection process, it is important to put the current findings in a broader context. A participation rate of 63% for a 12-year old survey is a strong result. It is only disappointing when one's expectations are shaped by the extremely high completion rates in previous waves. These results potentially illustrate some of the limitations of online surveys, even when the level of engagement and commitment of the survey sample is very high.

Before dismissing the notion of online data collection for projects such as PATH, it is also important to note that many respondents reported their satisfaction with the online survey and the ease and flexibility it provided. Therefore it is recommended that future waves of data collection support a variety of different modes of completion. An online survey can be offered as the first option, but having phone or personal interviews, or paper and pencil options, seems a necessary option to maximise response rates. Towards the end of the data collection process, a number of interviews were conducted over the phone to accommodate requests from some participants for an interviewer-led survey. The data from those who completed the survey using different methods will be analysed to ascertain whether there were differences between those participants who elected to use different modalities of completion and/or whether modality of completion influenced the reported results.

# 4. Results: Description of the PATH wave 4 sample

## 4.1 Social-demographic characteristics

The results presented in this section used survey data from wave 4 and previous waves to describe the PATH sample, with a focus on employment characteristics. However the analysis also examines the social and demographic characteristics of respondents so as to understand the context in which participants' employment experiences are embedded. The results also contrast the respondents who only completed the online survey with the subgroup who also participated in the face-to-face interview and provided additional information on psychiatric disorders, physical health, cognitive functioning, experience of workplace bullying and attitudes towards work.

### 4.1.1 What does the PATH sample look like?

When originally interviewed at wave 1, the respondents were aged in their early to mid-20s. The profile of the sample was broadly consistent with 2001 Australian census data for similarly aged residents of the Canberra and Queanbeyan region (Table 4.1). In comparison to the population, the survey participants had a somewhat higher socio-economic profile, with higher levels of educational attainment, and higher rates of employment. These are characteristics that have been shown to be associated with higher rates of participation in research both in Australia and internationally.

**Table 4.1: Wave 1 PATH 20+ cohort compared to 2001 Canberra/Queanbeyan census data**

| | Males | | Females | |
|---|---|---|---|---|
| | **PATH** | **Census** | **PATH** | **Census** |
| | Percent of age cohort | | | |
| **Registered marital status** | | | | |
| Married | 6.1 | 4.5 | 11.5 | 9.2 |
| **Employment Status** | | | | |
| Employed (full-time or part-time) | 85.8 | 78.7 | 84.3 | 79.0 |
| Unemployed | 6.7 | 8.8 | 4.8 | 4.9 |
| Not in the labour force | 7.4 | 12.5 | 10.9 | 16.2 |
| **Education completed** | | | | |
| Post-school qualifications | 51.6 | 37.5 | 59.3 | 44.2 |
| **Undertaking current study** | | | | |
| Full- or part-time study | 48.4 | 39.6 | 42.9 | 41.4 |
| Full-time | 57.1 | 67.0 | 58.0 | 69.0 |
| Part-time | 42.9 | 33.0 | 42.0 | 31.0 |

*Note*: Some PATH variables do not sum to 100% due to a small amount of missing data.

Examining data from all wave 4 survey respondents who participated in the online survey, a little over half of all respondents were female (57%) and 75% reported that they were married or in a de facto relationship. Sixty-two percent of the respondents had children and 67% reported that they were purchasing or owned outright their home. Two-thirds reported that they had completed over 15 years of education or training. Just 12% were currently smokers and 55% reported that they consumed alcoholic drinks weekly or less frequently.

### 4.1.2 Comparison of face-to-face and online-only samples

Despite the difference in the response rates across the two samples, there is broad consistency between the two different groups of respondents in the face-to-face and online-only samples on key socio-demographic measures. For example, 57% of respondents in the online-only sample were female compared to 59% in the face-to-face sample ($\chi^2$ test of association = 0.38, df = 1, $p$ = 0.538). Similarly, 85% of respondents in the online-only sample were currently employed and 6% on long-term leave compared to 87% and 6% for those in the face-to-face sample ($\chi^2$ = 2.46, df = 2, $p$ = 0.292). The two groups also did not differ in terms of partner status, occupational skill level, and part-time work status. Those in the face-to-face sample were more likely to be employed in the for-profit and not-for-profit (NGO) sectors rather than the public sector ($\chi^2$ = 46.66, df = 3, $p$ < .001) and more likely to report having children ($\chi^2$ = 13.23, df = 1, $p$ < .001) than those in the online-only sample.

### 4.1.3 Who isn't participating in the workforce?

While the analyses presented in this report are largely focused on employed respondents, this preliminary analysis also considers the profile of those who were not actively participating in work. In total 86% of wave 4 respondents were employed: 66% in full-time work and 20% were working part-time. Most part-time workers (90%) were women and considered from the other perspective around 40% of working women were employed part-time.

Unemployment was an uncommon state with just over 2% of respondents (n = 30) unemployed at the time of the interview. However, just over 5% of respondents reported that they had been 'sacked' or became unemployed at some point during the previous 12 months. There were 12% of respondents who were not actively participating in the workforce; that is, neither working nor actively looking for work. This group was fairly evenly split between those who reported that while not working they were on long-term leave and maintained an attachment to the workforce through their previous employer and a second group that could be more traditionally defined as not participating in the workforce. Among those in the latter group, around 90% were women and the majority (around 80%) were involved in caregiving for children or an aged or disabled person or reported that they were in a home duties role.

This profile of workforce participation is not unexpected given the age and life stage of the sample. PATH participants were aged in their early to mid-30s and as described above most were in a relationship and had children. In fact, 75% of the respondents who were parents had pre-school aged (< 5 years) children.

The survey data provides other insights into the workforce history of participants. Although around 8% of respondents were unemployed or not participating in the labour-force at wave 4, all but 4% of these did report some prior work history. Thus employment is the dominant norm for this cohort. Around one third of those currently not working had been out of the workforce for less than one year, and around 50% for less than two years. Further, there is a moderate relationship (r = 0.36) between the age of respondents' oldest child and their time out of the workforce and the majority of those who were identified as unemployed or not participating in the workforce reported that they had dominant responsibility for household tasks and care of children. These findings indicate that parenthood is the dominant factor associated with absence from work for the respondents in the 20+ cohort of the PATH survey.

Even among those who were currently in the workforce, their work experiences were not static. Participants reported considerable change in their employment circumstances over time. As mentioned above, just over 5% reported an experience of unemployment in the previous 12 months. Moreover, 67% reported that they had changed jobs since their

previous PATH interview four years earlier. Future analysis is planned to capitalise on the longitudinal data available to examine trajectories and profiles of employment change over time as the PATH participants mature and adopt different roles within the workforce. This future research will not only examine the circumstances of respondents at specific points in time, but also examine how the trajectories of workforce and family responsibilities are influenced by gender, family responsibilities and attitudes towards work.

## 4.2 The profile of workers from the PATH survey

Details of the socio-demographic (Table 4.2) and work (Table 4.3) characteristics of the employed PATH wave 4 respondents are presented below. Consistent with the overall sample profile reported above, there were somewhat more female than male respondents, and most respondents had a partner and children. Reflecting the location in the Canberra/Queanbeyan region, just over half of the working respondents were employed in the public sector (either Commonwealth or state/territory government) and most were employed in professional or semi-professional occupations according to broad classification of ANZSCO codes. While this may raise concerns about the generalisability of the research findings, it is important to recognise that occupational cohorts are also subject to limitations to generalisability. Further, some of the most profound insights in epidemiological research have come from well-studied and documented cohort studies which themselves had limitations around generalisability; for example, the Whitehall study, the Framingham study and the British Doctors study. A necessary feature is the presence of variability in exposure levels that can be linked to outcomes and a justifiable assumption that while the sample may not be representative of the broader population on all characteristics, the relationship observed between exposures and outcomes is similar in the population examined as in other populations.

Although the population of Canberra and Queanbeyan may differ in some ways from the broader Australian population, there is representation in the sample across important socio-demographic dimensions such as social disadvantage and employment circumstances. Although at an average population level the Canberra community is relatively advantaged, this prosperity is not shared evenly among all residents and around 13% of Canberra households are in the bottom national income quintile. Further, the town of Queanbeyan does not share Canberra's socio-economic advantage and is closer to the national average on a variety of economic measures (see Butterworth et al., 2009). There is no reason to anticipate that the association between insecure employment and depression or between experience of workplace bullying and suicidal ideation would be different in the PATH cohort to what one would observe in a sample drawn from another Australian town or city.

Other features of the sample include the fact that half of the respondents were employed in managerial or supervisory roles, the majority had permanent employment, and on average respondents worked just on 40 hours per week. This last figure is slightly deceptive as it combines hours worked for those working part-time and full-time. Differentiating between these two groups shows that the mean hours worked per week are 44.4 hours for those employed full-time and 25.4 hours for those employed part-time. Table 4.3 also shows that around a quarter of respondents had taken at least one day sick leave during the four week period prior to their interview.

Based on answers to the PHQ it is estimated that 21% of respondents to the PATH 20+ cohort wave 4 survey experienced some level of depression symptoms: 11.7% at the sub-syndromal level, 4.5% with minor depression and 4.7% with major depression. As expected based on the existing literature, women were more likely to report depression symptoms than men (24.2% vs 16.5%). These results are broadly consistent with expectations based on existing evidence. For example, analysis of data of 32 to 36 year old respondents in the nationally representative 2007 National Survey of Mental Health and Wellbeing found that

3.1% of respondents were identified with a 30-day affective disorder while 9.0% were identified with a 12-month affective disorder. To get an approximation of general (including subsyndromal) distress from this Australian dataset we analysed data from the K10 instrument which showed that 34.2% of respondents were identified as having medium or high risk of depression or anxiety symptoms. Considering other data using the PHQ, a very large (n = 198,678) representative telephone survey in the United States identified 9.1% of respondents with a depressive disorder (either minor or major depression; Kroenke et al., 2009), which closely matches the estimate of 9.2% derived from the current PATH survey. Based on these results comparing the current results with Australian data using other depression instruments and international comparison of results obtained with the PHQ, we conclude that the experience of depression symptoms among PATH survey participants is consistent with expectations.

**Table 4.2: Socio-demographic characteristics of respondents from wave 4 of the PATH 20+ cohort**

| Characteristic | Statistic |
|---|---|
| | **Number** |
| Total respondents | 1286 |
| Employed | 1094 |
| | **Percent of those employed** |
| Sex | |
| Male | 47.2 |
| Female | 52.8 |
| Age (at time of interview) | |
| 32 years | 5.9 |
| 33 years | 20.8 |
| 34 years | 21.5 |
| 35 years | 17.8 |
| 36 years | 21.1 |
| 37+ years | 13.0 |
| Partner status | |
| No partner | 25.8 |
| Partner (marriage or de facto) | 74.2 |
| Children | |
| No | 41.2 |
| Yes | 58.8 |
| Household income | |
| < $1075 per week | 13.1 |
| < $1700 per week | 21.1 |
| < $2400 per week | 25.1 |
| $2400+ per week | 36.5 |
| NA | 4.2 |

**Table 4.3: Employment characteristics of respondents from wave 4 of the PATH 20+ cohort**

| Characteristic | Statistic |
|---|---|
| | **Number** |
| Total respondents (n) | 1286 |
| Employed (n) | 1094 |
| | **Percent of those employed** |
| Employment status | |
| Employed full-time | 77.2 |
| Employed part-time | 22.8 |
| Employment sector | |
| Public sector – Commonwealth | 41.3 |
| Public sector – State/Territory | 12.5 |
| Private sector | 31.7 |
| Not for Profit/other | 14.5 |
| Occupational skill level | |
| Professional | 59.2 |
| Semi-professional | 21.1 |
| Trade/manual | 10.5 |
| Other | 9.1 |
| Managerial position | |
| Manager | 31.0 |
| Supervisor | 19.5 |
| Non-management | 49.4 |
| Employment type | |
| Permanent | 86.4 |
| Fixed-term contract | 8.8 |
| Casual | 4.8 |
| Sick leave during last 4 weeks | |
| Yes | 27.5 |
| No | 72.5 |
| Days away in last 4 weeks | |
| 0 | 72.9 |
| 1 | 10.8 |
| 2 | 6.2 |
| 3 | 3.3 |
| 4 | 2.9 |
| 5 | 1.4 |
| 6+ | 2.5 |

| | **Mean** | **Interquartile range** |
|---|---|---|
| Hours worked per week | 40.1 | 36 to 45 |

# 5. Results: Analysis of PATH wave 4 data

## 5.1 Preliminary

The current section provides an overview by theme of the new data items added to the wave 4 PATH survey. This includes analysis to derive meaningful and interpretable scales and factors from the multiple items in a domain, a description of incidence or rates within the sample population, and cross-tabulation or tests of association with important covariates, such as associations by sex, work characteristics, or by health and psychological constructs. The aim of the analysis reported in this section is to provide an introduction to the new data, to identify important features, and to test key hypotheses involving these factors. For example, we examine whether prior mental health, substance-use and personality traits such as impulsivity are prospectively associated with increased risk of experiencing a work-related incident or injury. This section has an empirical focus and, consistent with the expertise of the PATH investigators, a focus of these analyses is on how the different employment characteristics and work experiences are associated with depression.

In addition, the report includes more detailed analysis of the new content area that has the most policy salience at present: workplace bullying and harassment. Aside from the presentation of prevalence/incidence statistics and analysis to elucidate the key demographic and workplace factors associated with the experience of workplace bullying, we report on factor analysis and regression models which provide insight into the dimensions of workplace bullying, how these inter-relate, and the psychological and health antecedents and consequences of workplace bullying. In particular, we focus on measures of personality in consideration of how the reported experience of workplace bullying may be associated with underlying individual differences that may i) influence reporting and the perceptions of workplace interactions or ii) increase individual vulnerability and susceptibility to bullying. Our analysis of the mental health consequences of workplace bullying addresses a key policy concern, and includes one of the few investigations at a population level of how the experience of workplace bullying may increase an individual's risk of feelings of hopelessness, despair, and suicidal ideation. Again, drawing on the richness of the PATH data to consider responses from 12 years before the reporting of workplace bullying, we also consider whether prior experiences of depression and/or anxiety are associated with a predisposition to the later experience of workplace bullying.

The results reported in the next two sections provide important insights into key dimensions of the relationship between work, health and wellbeing, and particularly with regard to the psychosocial aspects of the workplace. However, we reiterate that they represent only the first consideration of the PATH wave 4 data. Outputs and benefits from the wave 4 data will increase enormously with more time for researchers to analyse and evaluate the data and with the finalisation of the remaining components of the data collection process; that is, with the final coding of the structured psychiatric diagnostic instrument and cognitive data and with the arrival of linked Medicare and Pharmaceutical Benefits Scheme data.

## 5.2 Work-related injury

The items assessing the experience of work-related injuries and illnesses were introduced in the online questionnaire at wave 4. Overall 7% of respondents (n = 73) reported that they had experienced a work-related injury or illness in the past 12 months. There were no significant gender differences in the reported experience of work-related injuries (men: 7.5%; women: 6.6%). Table 5.1 lists the types of injuries/illnesses reported by the survey respondents.

**Table 5.1: Reported experience of work-related injury in the past 12 months**

| Type of injury/illness | Percent of injuries/illnesses |
|---|---|
| Chronic joint or muscle condition | 24.7 |
| Sprain/strain | 21.9 |
| Stress or other mental condition | 15.1 |
| Superficial injury | 8.2 |
| Cut/open wound | 6.9 |
| Fracture | 5.5 |
| Crushing injury/internal organ damage | 1.4 |
| Burns | 1.4 |
| Other | 15.1 |

The most common types of workplace injury or illnesses reported by respondents from the 20+ cohort at wave 4 were joint or muscle conditions, sprains and strains, and stress or other mental conditions. By comparison, the most recent published data on workplace injury and illness from the ABS (ABS 2010) reported a somewhat lower overall injury rate across all ages (5.3%) and a rate that was lower again for the age-range comparable to the PATH 20+ cohort (4.0%). The profile of injuries also differed between the ABS and PATH samples. Compared to the PATH results, the ABS data reported for all ages combined showed a higher proportion of injuries within the categories of fractures (7.5%), sprains/strain (30%), cut/open wound (15.7%), crushing injury/internal organ damage (7%) and burns (5%). In contrast, the PATH data show a higher proportion of injuries in the categories of chronic joint or muscle condition (vs 17.7% in the ABS data), superficial injury (vs 3.8%) and stress or other mental conditions (vs 4.9%). These differences most likely reflect differences in the occupational profile of the PATH sample compared to the broader Australian population. However, as discussed earlier the PATH injury data were not collected for the purpose of reporting on prevalence of injury or to extrapolate from the findings to a wider population. Rather, it is the use of the comprehensive survey data and particularly the data collected at waves prior to the injury data that is of most interest in the identification of risk and/or protective factors.

Given the sample size and relative rareness of work-related injuries, there is only limited capacity to undertake analyses involving data on the different types of workplace injuries. Perhaps such analysis will have to await the accumulation of data from other PATH cohorts. However, some analysis of the overall experience of work-related injuries and of the main injury categories is possible.

For this report, we examined whether the risk of work-related injury is associated with key socio-demographic, occupational, health, lifestyle and personality characteristics. Where relevant, measures used in this analysis were drawn from the previous wave of data collection conducted four years earlier so that the analysis is investigating predispositions and risks for later injury rather than the consequences of injury. The exception to this was the respondents' current occupation. The findings presented here arise from a series of simple logistic regression models in which the dichotomous measure of having experienced a work-related injury or not is 'regressed' on each of the covariates listed in Table 5.2 (see Appendix B for a brief explanation of the statistical technique). Table 5.2 presents the results for overall work-related injury (results for individual types of injury are not shown but are available upon request).

**Table 5.2: Logistic regression analysis of the factors associated with work-related injury**

| Characteristic | Odds ratio | 95% confidence interval |
| --- | --- | --- |
| **Sociodemographic (current)** | | |
| Male vs Female | 1.15 | 0.72 – 1.85 |
| Not partnered vs Partnered | 1.73 | 1.05 – 2.85 |
| **Occupation (current)** | | |
| Trade/manual vs Professional | 4.62 | 2.50 – 8.53 |
| Non-manager vs Manager | 1.35 | 0.74 – 2.45 |
| Private sector vs Public sector | 1.76 | 1.00 – 3.07 |
| Non-government organisation vs Public sector | 2.03 | 1.03 – 3.98 |
| **Personality (prior)** | | |
| Impulsivity | 1.37 | 1.09 – 1.71 |
| Ruminative style | 1.04 | 1.00 – 1.08 |
| Negative affect | 1.01 | 0.96 – 1.05 |
| **Mental health (prior)** | | |
| Anxiety symptoms | 1.06 | 0.97 – 1.16 |
| Depression symptoms | 1.10 | 1.01 – 1.21 |
| **Lifestyle (prior)** | | |
| Tobacco smoker | 1.89 | 1.06 – 3.36 |
| Harmful alcohol consumption | 2.01 | 0.95 – 4.25 |

*Note*: Prior = 4 years earlier.

Considering the overall injury data in Table 5.2, we confirm the absence of gender differences as detailed earlier. However, respondents who were not in a marriage-like relationship had an elevated risk of a work-related injury. Consistent with much published data, those working in the trades or manual occupations had an elevated risk of injury, particularly sprain/strain injuries (OR = 19.38, 1.99–188.37), compared with those in professional occupations. While unsurprising, the fact that we have demonstrated these well-established relationships in the PATH data increases our confidence in the validity of the data and the robustness of the more unusual results which follow. The analysis also shows that respondents employed by non-government organisations had an elevated risk of injury relative to those working in the public sector.

The novelty of the PATH data is the ability to consider the role of personality and health (for example) as factors which may increase an individual's risk or vulnerability to work-related injury. The evidence presented above shows that the personality trait of impulsivity measured four years before the assessment of work-related injury is strongly associated with risk of subsequent work-related injury and identified an important individual characteristic at play in the workplace. Similarly, prior symptoms of depression also increased the risk of work-related injury as did the personality trait of ruminative style when the injury was classified as stress or other mental condition (OR = 1.12, 1.03–1.21). It was somewhat of a surprise that prior harmful levels of alcohol consumption were not related to experience of work-related injury, although there was evidence of a contemporaneous association (results not presented) but with wide confidence interval. The association between tobacco smoking

and risk of injury may well be confounded by socio-economic status and needs to be investigated further.

Reducing the risk of work-related injury requires consideration of the interface between the person, job and environment. These results highlight the relevance of factors such as personality, health and employment sector to an individual's risk of reporting a work-related injury. Further analysis needs to examine how these types of characteristics interact with the more traditional risks, and also consider how this knowledge can aid efforts to improve workplace health and safety.

## 5.3 Career interruptions and return to work plans

As discussed earlier, the respondents in the PATH 20+ cohort wave 4 survey, who were then aged in their early to mid-30s, reported high levels of workforce participation, were mostly married or in marriage-like relationships, and over 60% had children. This represents an age where work and family responsibilities intensify. Of those respondents who were not in the workforce, the vast majority reported involvement in family and care responsibilities. Aside from those currently working and those with no form of labour-force connection, there were 78 respondents who while not working did describe themselves as employed but on long-term leave from the workforce. This represents an interesting sub-group of survey participants to consider further.

Of these respondents 95% were women with 72% on maternity leave and a further 12% reporting they were staying home to be with their children. The vast majority (96%) were in a relationship and almost three quarters (73%) had either one or two children at the time of the interview. Around 47% were currently receiving a salary from their employer, and all respondents expressed their intention to return to work, with the majority (81%) intending to return to work within 12 months. Most planned to return to the same employer (90%) and most to the same position (60%).

## 5.4 Sick leave

The analysis in this section considers respondents' use of sick leave. The data collected through the online survey showed that 27% of respondents reported that they had stayed away from work for more than half a day in the last four weeks because of an illness or injury. Figure 5.1 presents the characteristics of those who reported taking sick leave, with the descriptive presentation supported by a series of univariate logistic regression models assessing the statistical significance of the differences observed. The results demonstrate that women were more likely to report taking sick leave than men (Odds Ratio [OR] = 1.34, 95% Confidence Interval [CI] = 1.04–1.80), and that those employed in the private or NGO sector were least likely to take sick leave compared with Commonwealth Government employees (OR = 0.63, 0.45–0.89; and OR = 0.51, 0.32–0.80, respectively). There was no significant difference in the use of sick leave across the broad occupation classification, by managerial status, or between those employed full-time or part-time.

In considering respondents use of sick leave, it was found that 14% of those who reported taking sick leave, and 4% of the total sample of PATH respondents who were employed, had taken at least some days of unpaid sick leave. When considered as a proportion of the days of sick leave, 83% of leave days were paid leave and 17% of all days of sick leave were unpaid. This distinction between paid and unpaid leave could represent an important dichotomy in investigation of sickness absence and we consider those respondents who reported taking unpaid sick leave in more detail.

**Figure 5.1: Proportion of respondents reporting any sick leave in the past 30 days by respondent characteristics**
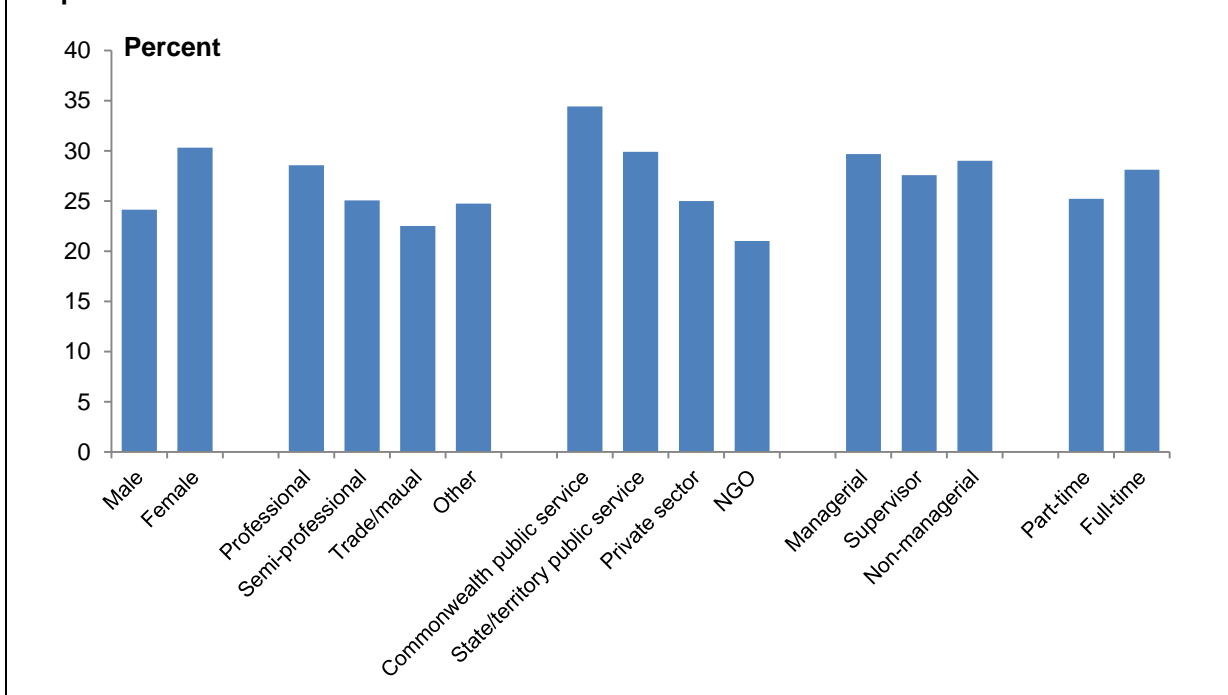


Figure 5.2 shows that women were somewhat (though not significantly) more likely to report using unpaid sick leave than men (OR = 1.81, 95% CI = 0.92–3.55). Those clearly more likely to use unpaid sick leave were those in non-managerial positions versus managers (OR = 3.74, 1.28–10.93) and those working in the private sector versus Commonwealth Government employment (OR = 2.42, 1.00–5.86). A similarly strong difference was evident for those working part-time who had over three times the odds of unpaid sick leave compared to those working full-time (OR = 3.26, 1.72–6.17). Further analysis (not presented) showed that both those who reported that they were employed on fixed-term contracts (11.6%) and those in casual employment (11.6%) were more likely to have used unpaid sick leave than those employed in permanent positions (1.7%).

The use of unpaid sick leave could reflect that respondents were employed in circumstances where they did not have an entitlement to paid sick leave or that they had used all of their leave entitlements. The relationship between unpaid sick leave and part-time and casual/fixed-term employment suggests that the first explanation is likely to have some salience. We now consider the pattern of sick leave use among those respondents with significant depression symptoms. Depression is a chronic health condition and this analysis may provide some insight into the second of these alternative explanations.

Figure 5.3 presents data on the number of days of sick leave taken by PATH survey respondents in the past four weeks. While most respondents reported no use of sick leave, there is a considerable tail on the distribution, representing high levels of sickness absence. Overall, the average number of days of sick leave for the total sample of respondents was 0.8, however among those who had taken sick leave the average was three days, with a range of 1–28 days.

**Figure 5.2: Proportion of respondents reporting any unpaid sick leave in the past 30 days by respondent characteristics**
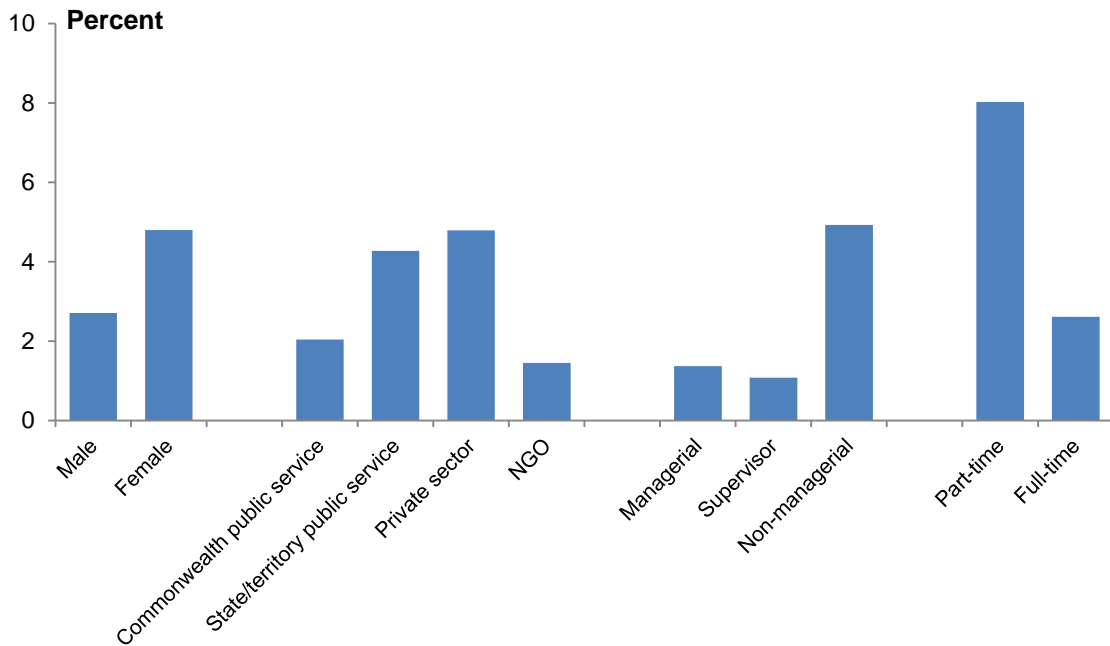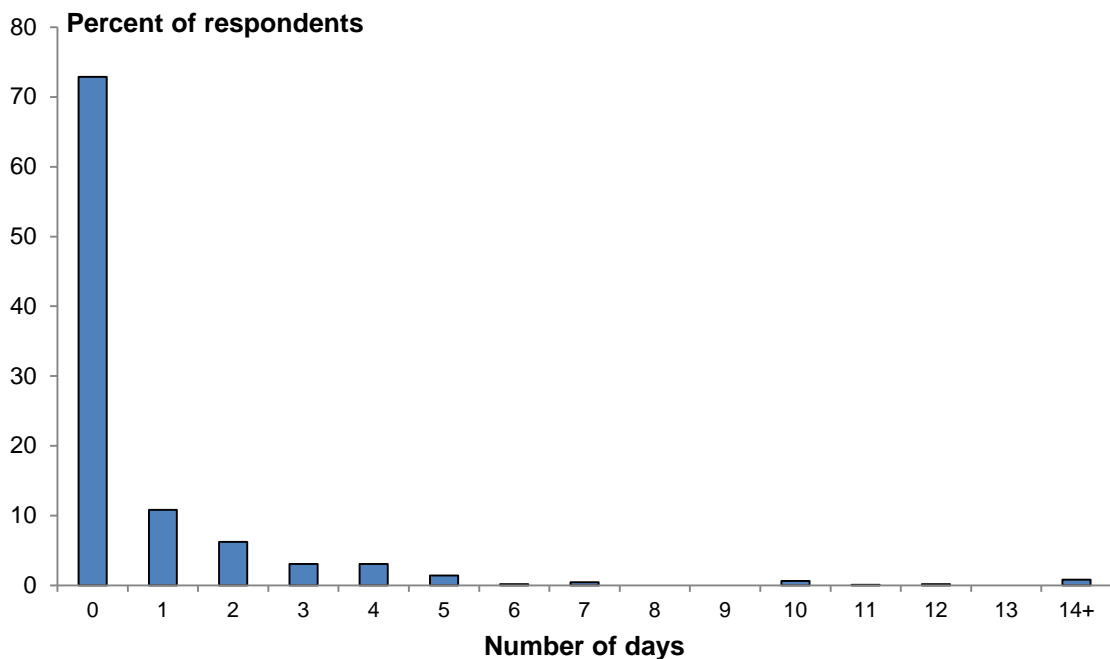


**Figure 5.3: Number of days of sick leave in past 30 days**



Depression is one of the leading causes of disability and burden of disease. It is associated with decreased productivity and high levels of sickness absence. To investigate the effects of depression on sickness absence, we used negative binomial regression models to evaluate differences in the number of days of sick leave taken in the past four weeks for those identified with and without significant depression symptoms (see Appendix B for a brief

explanation of the statistical technique). An Incidence Risk Ratio (IRR) of 2.4 (95% CI = 1.9–2.9) demonstrates that those with depression have a doubling of their risk of days off work. This is little influenced by the inclusion of other covariates including part-time work and gender. On the basis of this model, it is predicted that respondents without significant depression symptoms had 0.6 days of sick leave in the past four weeks compared to 1.6 days for those with significant depression symptoms.

Interestingly, depression is also strongly associated with the use of unpaid sick leave. Regression models predicting days of unpaid sick leave found that respondents with significant depression symptoms were over 11 times more likely to take days of unpaid sick leave than were those without depressive symptoms (IRR = 11.0, 95% CI = 4.2 – 28.7), with predictions of those with depression taking 0.5 days of unpaid sick leave versus 0.05 for those without depression. Admittedly this increased risk is from a very low base. But in analysis restricted to those who did use unpaid leave, those with depression continued to show much elevated risk: around 3.5 times the risk, with the model estimating use of 6.1 days of unpaid sick leave over four weeks compared to 1.7 days for those without depression. These results demonstrate not only that depression is associated with significant time off work, but also that the experience of depression is disproportionately associated with greater use of unpaid sick leave. It may be that the chronic and ongoing personal burden associated with depression has meant that people have depleted their leave entitlements and subsequently had to rely on unpaid leave. An alternative is that those with depression are more likely to be employed in jobs with fewer entitlements. Either way, the analysis presented here demonstrates the additional social and economic burden experienced by those in the community with significant depression and points to a need to better understand these circumstances so as to ensure appropriate protection in the workplace.

## 5.5 Additional aspects of the psychosocial characteristics of work

The online survey included several new measures of the psychosocial aspects of work not previously included in the PATH survey. This section provides an overview of the new measures and how they are associated with key socio-demographic and work characteristics. The new measures will be used in conjunction with the existing psychosocial measures to investigate workplace correlates of health, wellbeing and productivity, but will also have a role in analysis as potential moderating and mediating effects of other work stressors; for example, social support at work as a buffer against high job demands or workplace bullying. In addition to describing the profile of these new measures, the current section will also report how each of the measures is associated with significant depression symptoms, to illustrate the potential personal consequences of these workplace characteristics.

The wave 4 data collection was the first wave of the PATH survey to include an item assessing perceptions of being fairly paid given job demands: an aspect of the Effort-Reward Imbalance model. For the analyses in this section we collapse across the strongly and slightly agree/disagree response categories, to produce a binary response. Overall, 14.1% of working respondents reported that they did not consider that they were paid fairly for the things they did in their job. Figure 5.4 presents responses by key socio-demographic characteristics. While there was no sex difference in perceptions of unfair pay, those working in trade/manual or 'other' job types were more likely to report unfair pay (OR for trade/manual vs professional was 2.01, 95% CI = 1.20–3.36; and 'other' OR = 1.75, 1.01–3.06). Those respondents working in the Commonwealth public service were significantly less likely to report being unfairly paid in comparison to all other employment sectors (state/territory government: OR = 0.23, 0.13–0.40; Private sector: OR = 0.39, 0.24–0.63; and NGO: OR = 0.34, 0.19 - 0.60). Figure 5.5 presents the prevalence of depression symptoms for the different psychosocial measures examined. This figure shows that the perception of unfair pay is associated with increased risk of depression (OR = 1.57, 1.04–2.35).

**Figure 5.4: Proportion of respondents reporting unfair pay for effort by respondent characteristics**
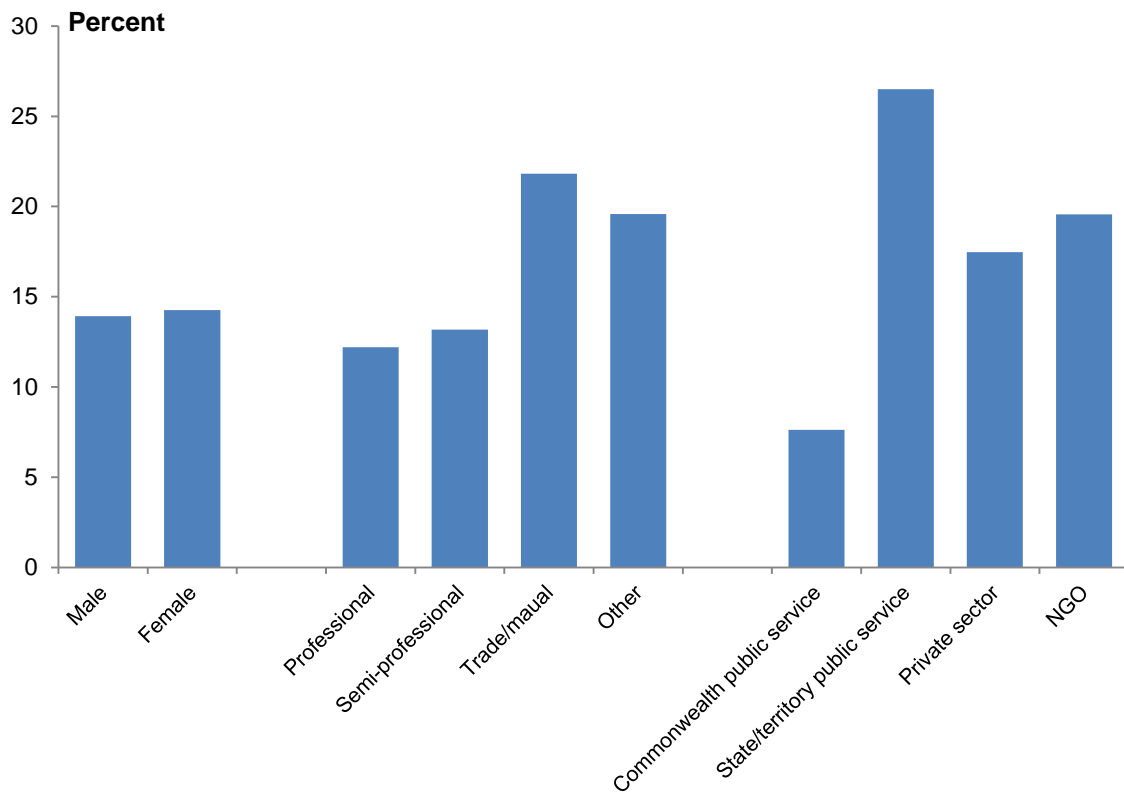
**Figure 5.5: Proportion of respondents reporting significant depression symptoms by psychosocial characteristics**
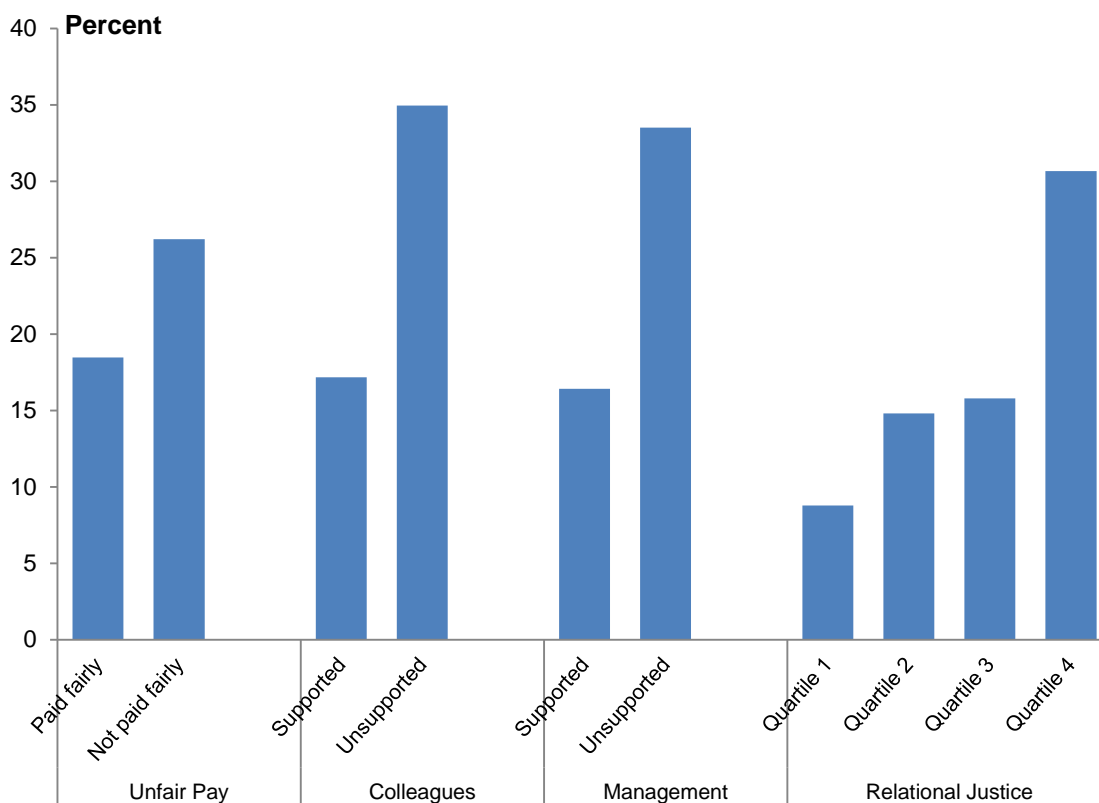


*Notes:* 'Relational justice' is an aspect of organisational culture; Quartile 1 = high relational justice, Quartile 4 = low relational justice.

Two items were included in the wave 4 survey assessing reported support from work colleagues and from managers. Overall 86.7% of working respondents reported receiving help and support from their colleagues and 79.5% reported receiving help and support from their manager. These results show that only a minority of respondents report an absence of adequate support at work. The plot of results once again shows no evidence of gender differences in levels of support from colleagues (Figure 5.6), and also no significant difference across different types of organisations. However, there was evidence that those respondents in semi-professional (OR = 1.61, 95% CI = 1.02–2.56) and trade/manual occupations (OR = 2.18, 1.26–3.76) reported lower levels of support from colleagues compared to those in professional occupations. There was also a striking difference in the risk of depression across the two groups, with those who reported low levels of support from colleagues having twice the rate of significant depression symptoms to those who report having support (OR = 2.59, 1.72–3.90). There was little difference across the respondent characteristics in the reported level of support from managers (Figure 5.7). Those employed in the Commonwealth public sector reported lower levels of support from managers compared to those employed in the state/territory public service (OR = 0.56, 0.33–0.94) and in comparison to those employed in NGOs (OR = 0.60, 0.37–0.98). Consistent with the association between support from colleagues and depression, low levels of support from one's manager was also associated significantly with elevated risk of depression symptoms (OR = 2.57, 1.79–3.67).

The wave 4 survey included five items assessing aspects of organisational culture, namely relational justice. These items were drawn from the Whitehall II study, and were summed to

produce a scale with a 5–20 range of scores, with low scores corresponding to respondents reporting high levels of relational justice in their workplace; for example, supervisors providing sufficient information, being willing to listen to problems, and providing praise. Mean scale scores for the various demographic groups are plotted in Figure 5.8, and show little difference between men and women or across different occupational categories. There was some evidence that those working in NGOs rated the organisational culture of their employer more favourably than employees from other sectors. Finally, to explore the association between relational justice and depression, the scale was categorised into quartiles and the prevalence of significant depression symptoms calculated for each category. The results show a pattern of increasing risk of depression with declining levels of relational justice, with those reporting the poorest organisational culture showing significantly greater risk of depression compared to those reporting the best (OR = 4.59, 2.05–10.26).

The analyses in this section show that the new measures of psychosocial work characteristics introduced to the wave 4 survey seem to be salient and important factors in future investigation of the psychosocial work environment and are consistently associated with increased risk of depression.

**Figure 5.6: Proportion of respondents reporting lack of support from work colleagues by respondent characteristics**
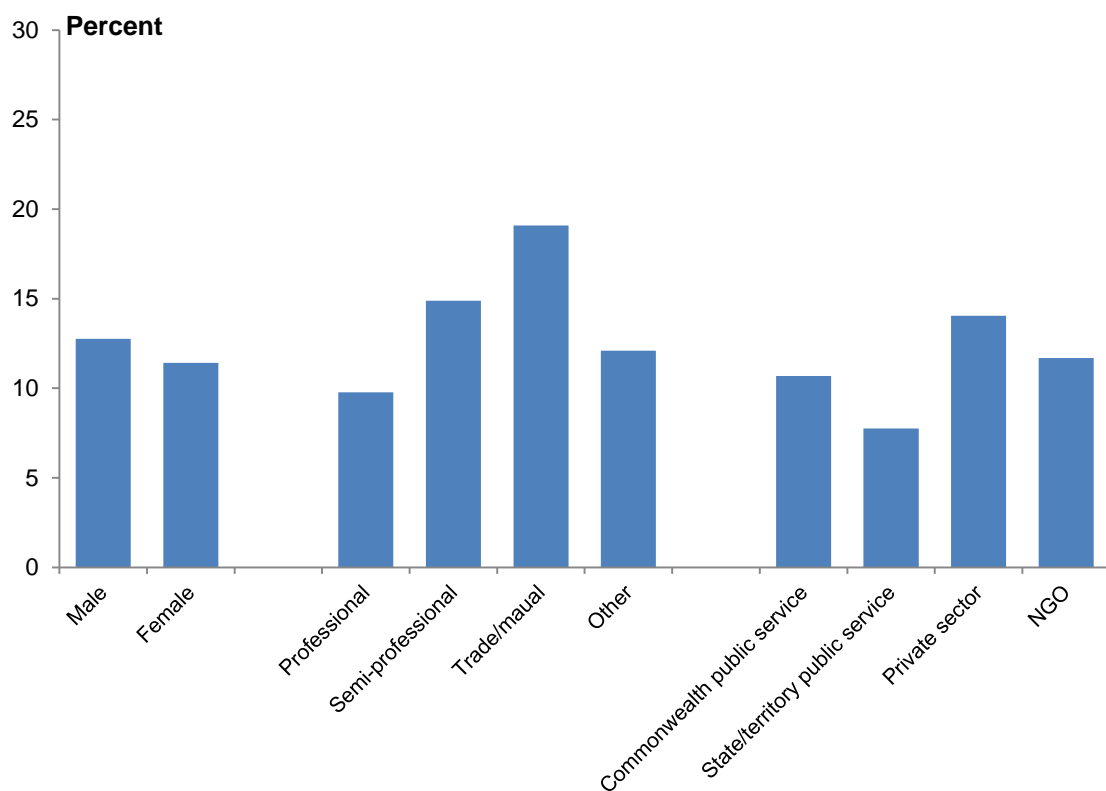
**Figure 5.7: Proportion of respondents reporting lack of support from manager by respondent characteristics**
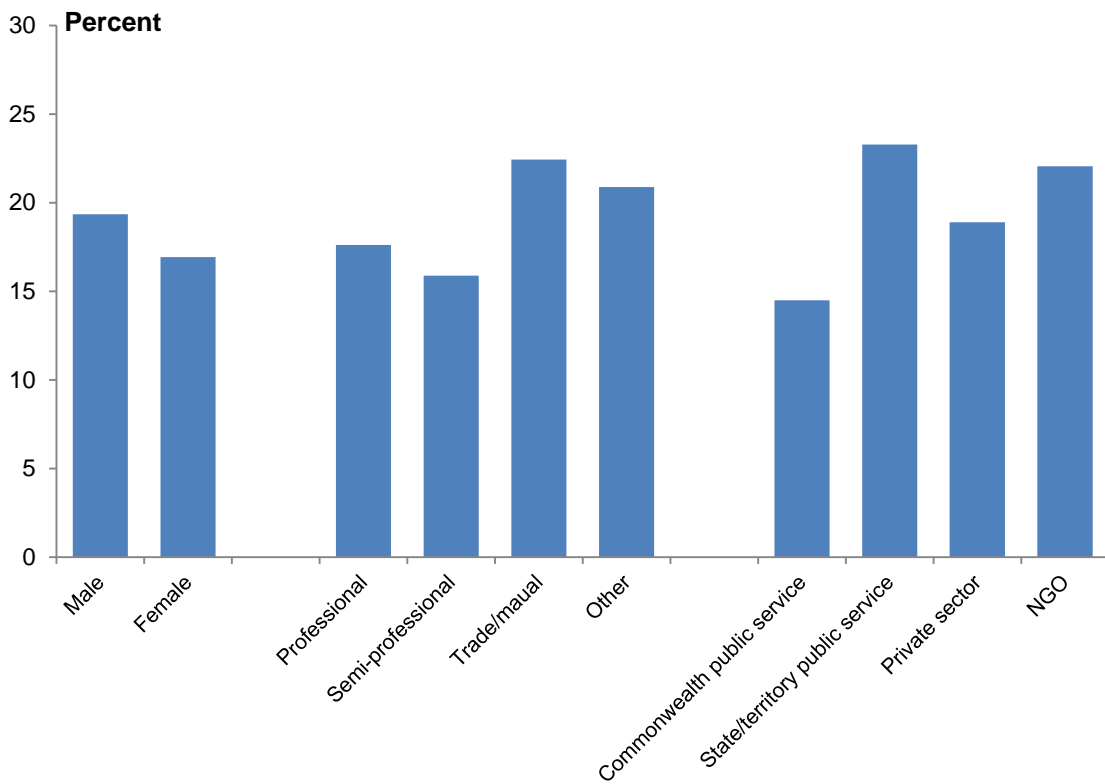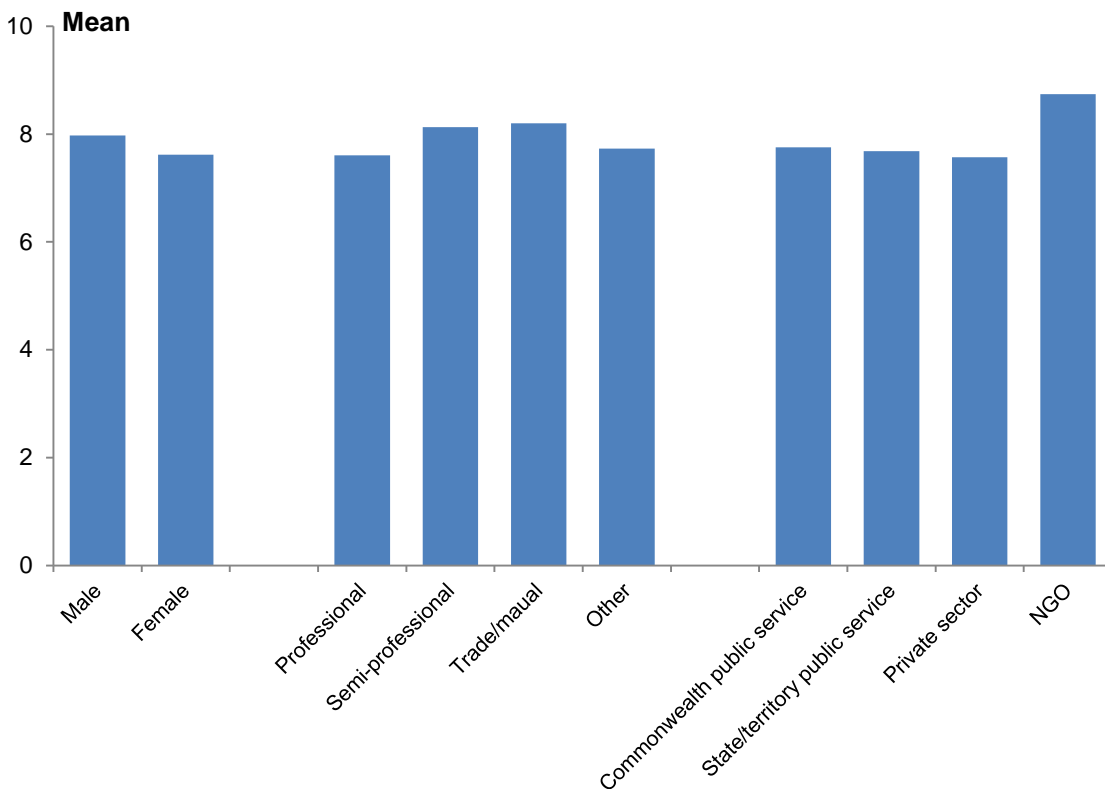


**Figure 5.8: Mean score on relational justice scale by respondent characteristics**

## 5.6 Perceived benefits of work

All face-to-face interview respondents completed a battery of items assessing their perceptions of the benefits that they derive from work. In this analysis we consider these items and seek through an empirically-driven process to identify underlying factors and examine the potential utility of these constructs.

Principal components analysis of the 14 items identified four distinct factors. These four factors accounted for 65% of the total variance in the items. To allow some correlation between factors, an oblique rather than orthogonal rotation was applied. Factor scores were standardised to have a mean of zero and a standard deviation of one. The classification of items for the 4-factor solution was readily interpretable with the factors given the following labels:

• Self-improvement: working for reasons such as i) the opportunity to develop new skills and develop a career, ii) the enjoyment and satisfaction from work, iii) a useful way to serve society, iv) a feeling of doing something meaningful, and v) a more varied and interesting lifestyle;

• Meeting material needs: working for reasons such as i) more money for everyday needs/making ends meet, ii) more money to provide better opportunities/material benefits for kids, and iii) more money to clear debts/repay loans/pay off house

• Personal fulfilment: working for reasons such as i) status, prestige and self-esteem, ii) something to do/relief from boredom, and iii) socialising and communication with other people, and

• Economic independence: working for reasons such as i) economic independence including not relying on handouts from the partner, ii) being able to contribute to the financial costs of maintaining a household, and iii) not having to be reliant on the government for income support.

This classification seems to provide a reasonable characterisation of broad reasons why people work. Of course the strength of any factor analysis depends on the quality of the items and the data collected and the extent to which the items adequately cover the important issues in an area. To help evaluate the current result a number of preliminary analyses examined the utility of the classification. The reported benefits derived from work differed across occupational skill level. In contrast to those in lower skilled jobs, respondents in high skilled professional jobs were more likely to ascribe importance to reasons as self-improvement or personal fulfilment, but those in low skilled occupations were more likely to nominate reasons of economic independence than other groups. The mean scores on each of the factors for each group can be plotted to provide a profile of work attitudes for different groups. Figure 5.9 presents the profile across factors by occupational type and clearly demonstrates the pattern described above.

Women were more likely to consider personal fulfilment as an important benefit of work relative to men. Those respondents with children were more likely to nominate meeting material needs and economic independence as important reasons to work compared to respondents without children. In contrast, those working part-time were less likely to focus on the importance of meeting material needs and self-reliance relative to those working full-time. Finally, those with a partner were also less likely to rate economic independence as an important reason to work compared to those without a partner.

**Figure 5.9: Mean score on benefits of work scale by benefits of work category and occupational group**
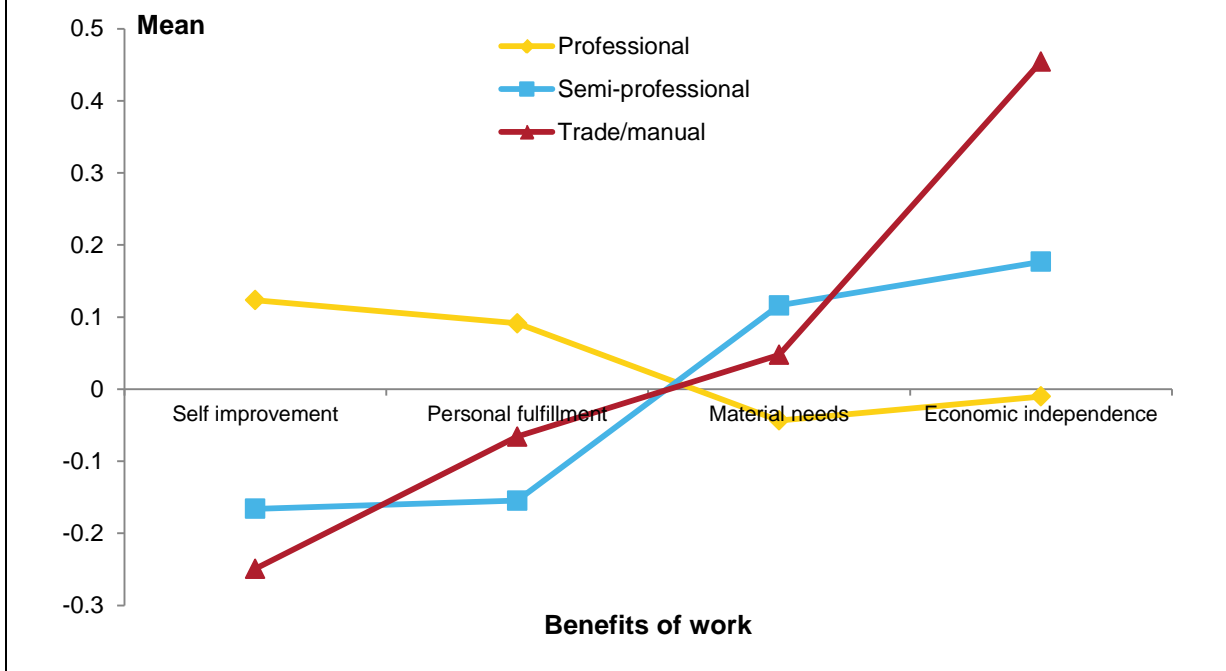


Thus, the factors defining different perceived benefits of work are readily interpretable and align with different socio-demographic characteristics. Examining the different profiles of perceptions about work across different socio-demographic groups demonstrates how these factors can provide a framework with which to investigate how financial, family and social circumstances may influence values and attitudes to work. This could provide a way of targeting different and appropriate strategies to different groups within society. However, there are other ways in which a focus on classifying differences in the perceived benefits of work could improve understanding of an individual's workforce experiences.

It is possible for example that attitudes towards work have a role in determining an individual's response to stressors in the workforce. For example while previous research, including research using PATH data, has shown that perceived job insecurity is a strong correlate of depression this effect may be moderated by one's attitude towards and reasons for working. For respondents who place a high emphasis on working to meet their material needs, job insecurity may be a particularly stressful experience and strongly associated with depression whereas this may not be the case for those who report that work has little to do with meeting their material needs. Figure 5.10 confirms that this is the case.

Respondents with scores in the lowest tertile of the job insecurity scale were identified as having insecure jobs. Those respondents have almost twice the odds of experiencing significant depression symptoms compared with those in more secure employment (OR = 1.8, 95% CI = 1.1–3.1). This effect is largely restricted to those who report that the reason to work is to provide for their material needs (OR = 2.6, 1.01–6.5). Job insecurity has no association with depression for those respondents who disagree with statements indicating that they are working to meet their material needs (OR = 1.2, 0.5–2.8).

**Figure 5.10: Proportion of respondents reporting significant depression symptoms by reported importance of work to meet material needs and job insecurity**
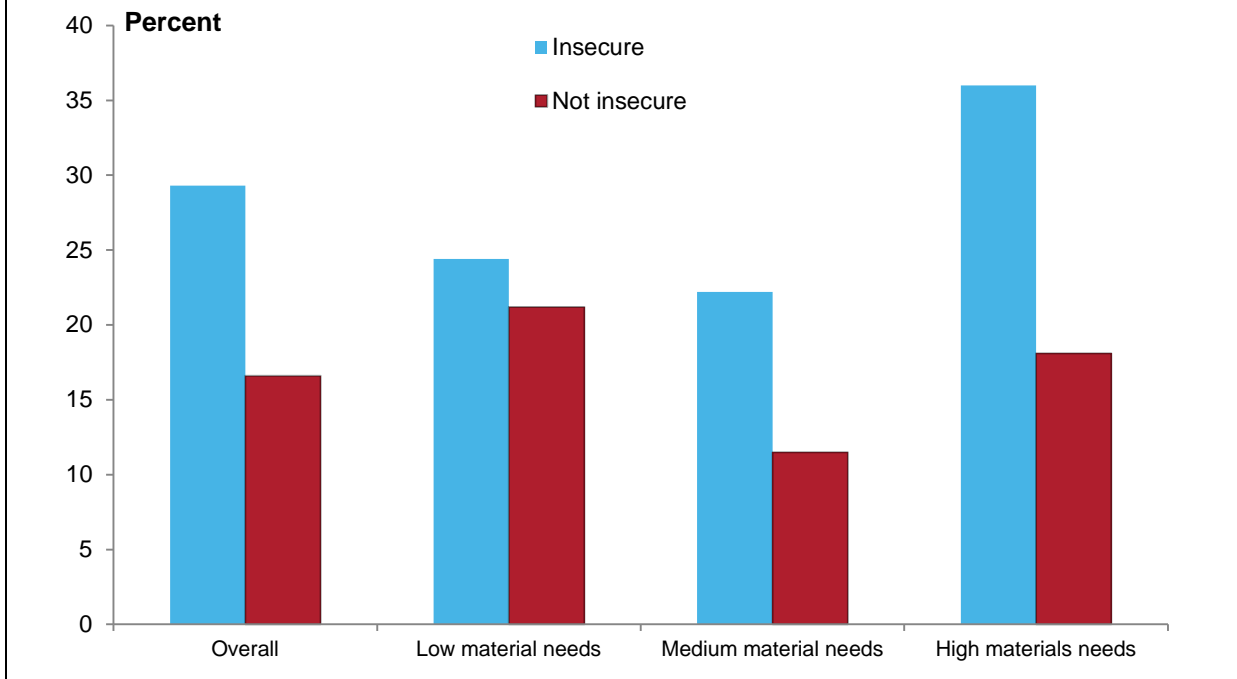


This section reported analysis to understand people's different personal motivations and reasons for working. The four factors identified represent different dimensions along which individuals can be ranked: self-improvement, meeting material needs, personal fulfilment, and economic independence. The average scores on these factors showed distinct profiles for individuals with different socio-demographic characteristics and also seemed to have utility in explaining differences in the psychological impact of workplace stressors. Identification of the reasons that people work provides a way of applying an individual-differences approach to research and theorising about the benefits of work (e.g. Warr, 1987). For example, not everyone wants or needs to derive personal fulfilment through their job. A focus on identifying the particular aspects or benefits of work that are salient for different individuals is a key to help individuals find work consistent with their goals and aspirations and this may also provide a framework to help anticipate the impact of various work and social stressors on individuals.

# 6. Results: A case study of workplace bullying

This section reports analysis of the workplace bullying items introduced to the wave 4 survey. Two different measures were included in the PATH 20+ interview: a single item assessing the experience of bullying from the self-labelling perspective which will be used to provide prevalence estimates of bullying and a module of 21 questions assessing workplace bullying from the operational perspective.

## 6.1 The prevalence of workplace bullying

The global measure of bullying enquired about current and lifetime experiences of workplace bullying and was included in the online survey. Therefore there is data available on the question for the full sample (Table 6.1).

**Table 6.1: Reported workplace bullying in wave 4 of the PATH 20+ cohort**

|  | Number of respondents | Percent |
|---|---|---|
| Never bullied | 519 | 49.8 |
| Currently bullied | 54 | 5.2 |
| Previously in current workplace | 164 | 15.7 |
| In a previous workplace | 251 | 24.1 |
| Cannot say | 55 | 5.3 |
| Total | 1043 | |

*Note*: Response categories are mutually exclusive. If a respondent experienced bullying in more than one setting their response would be for the closest according to time or place, e.g., 'previously in current workplace' before 'in a previous workplace'.

Analysis of the overall PATH sample found that just over 5% of respondents reported that they were currently experiencing bullying in their workplace. This is consistent with international research using this instrument (e.g. Lahelma et al., 2012). A further 16% of respondents reported that they had previously experienced bullying in their current workplace. Thus, in total, around 21% of respondents had experienced workplace bullying at some time in their current workplace. In addition a further 24% of respondents reported an experience of bullying in a previous workplace. Therefore, around 45% of all respondents reported some experience of workplace bullying during their working lives. Analysis showed no difference in the reported experience of bullying between those respondents in the face-to-face sample and those who only completed the online survey ($\chi^2$ = 5.92, df = 4, *p* = 0.205).
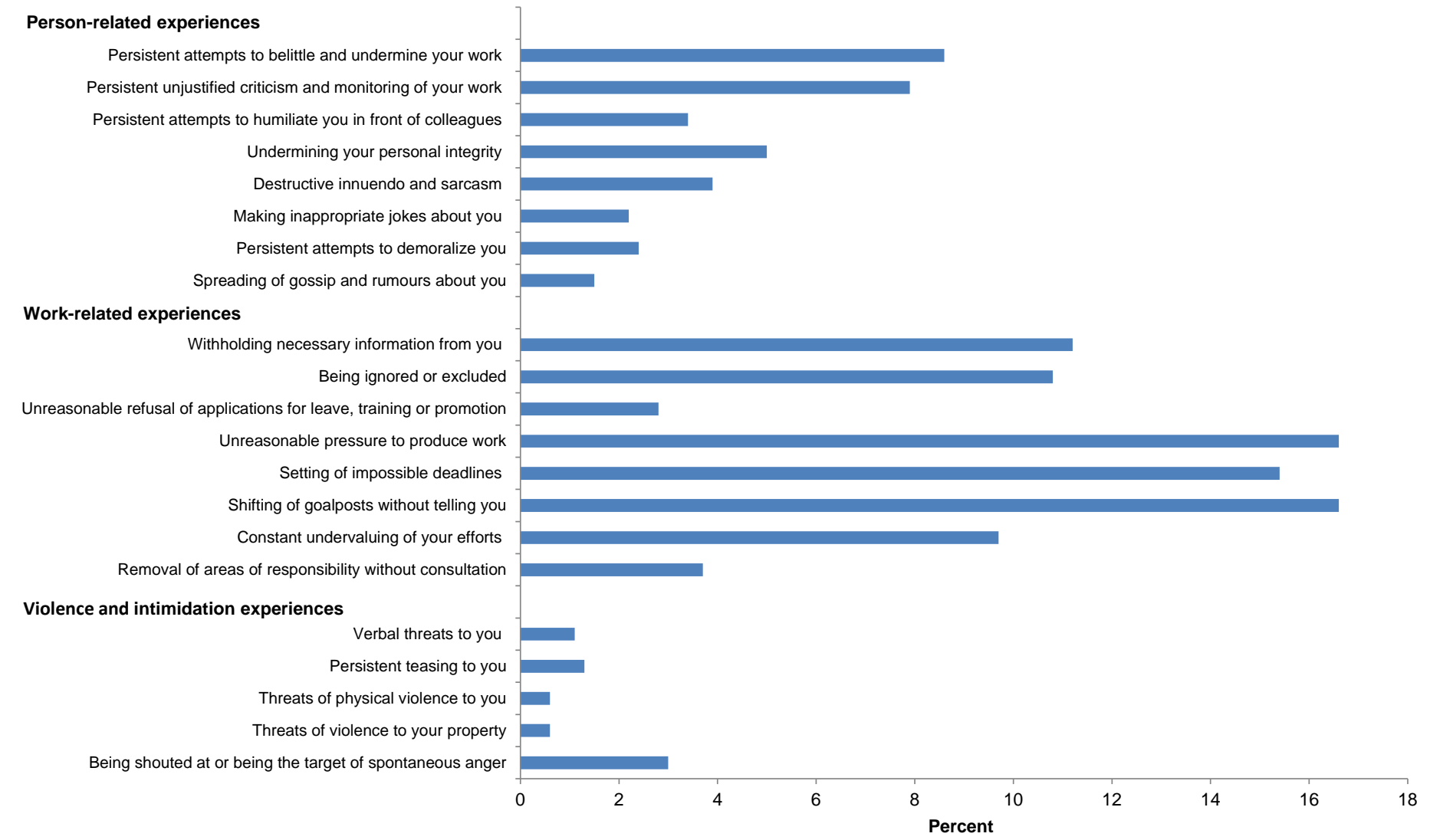
> **Box 12: Key finding**
>
> *Approximately 21% of respondents in the PATH survey reported that they had experienced bullying in their current workplace. Overall, 45% reported that they had experienced workplace bullying at some point.*

## 6.2 Dimensions of workplace bullying

As described earlier, the face-to-face interview included an adaptation of the Quine (1999) bullying questionnaire. These items assessed the experience of different types of bullying behaviour in the past six months and used a 4-category response scale. The prevalence of each different type of workplace bullying is presented in Figure 6.1.

**Figure 6.1: Proportion of respondents reporting workplace bullying experiences in the past 6 months**

**Person-related experiences**

| Experience | Percent |
|---|---|
| Persistent attempts to belittle and undermine your work | 8.6 |
| Persistent unjustified criticism and monitoring of your work | 7.9 |
| Persistent attempts to humiliate you in front of colleagues | 3.4 |
| Undermining your personal integrity | 5.0 |
| Destructive innuendo and sarcasm | 3.9 |
| Making inappropriate jokes about you | 2.2 |
| Persistent attempts to demoralize you | 2.4 |
| Spreading of gossip and rumours about you | 1.5 |

**Work-related experiences**

| Experience | Percent |
|---|---|
| Withholding necessary information from you | 11.2 |
| Being ignored or excluded | 10.8 |
| Unreasonable refusal of applications for leave, training or promotion | 2.8 |
| Unreasonable pressure to produce work | 16.6 |
| Setting of impossible deadlines | 15.3 |
| Shifting of goalposts without telling you | 16.6 |
| Constant undervaluing of your efforts | 9.7 |
| Removal of areas of responsibility without consultation | 3.7 |

**Violence and intimidation experiences**

| Experience | Percent |
|---|---|
| Verbal threats to you | 1.1 |
| Persistent teasing to you | 1.3 |
| Threats of physical violence to you | 0.6 |
| Threats of violence to your property | 0.6 |
| Being shouted at or being the target of spontaneous anger | 3.0 |

Percent

*Note:* Based on behaviour experienced 'sometimes' or 'often' in past 6 months.

An initial analysis examined the grouping of items to identify the underlying factor structure. Exploratory principal components analysis with orthogonal rotation showed a clear 3-factor solution[2]. Overall, the 3-factor model accounted for 57.7% of the variance in the 21 bullying items. The 3-factor solution has the additional benefit of being broadly consistent with other interpretations evident in the literature (e.g. Einarsen et al., 2009). We labelled the three factors as:

• person-related bullying: eight items such as 'spreading gossip and rumours about you'

• work-related bullying: eight items such as 'unreasonable pressure to produce work' and 'removal of areas of responsibility without consultation', and

• violence or intimidating behaviour: five items such as 'verbal threats to you', 'threats of violence to your property', and 'threats of violence to you'.

The loadings for each item on its corresponding factor ranged between 0.46 and 0.93.

There was some conceptual overlap and evidence of cross-factor loading for some items. Two items loading most strongly on the person-related bullying factor were concerned with aspects of work; for example, persistent attempts to belittle and undermine your work, persistent unjustified criticism and monitoring of your work. These items were also more similar in frequency of occurrence to other items loading on the work-related bullying factor. However, the cross-loadings of these items onto the work-related bullying factor were modest (0.31 and 0.40 vs 0.73 and 0.66 on the person-related factor). Further, it seems that the focus of the bullying behaviour in these items is more upon the individual and their capacity and reputation in the workplace rather than a concern about the work load or the imposition of unreasonable work requirements. Similarly, the item 'persistent teasing to you' could be considered an aspect of person-related bullying rather than violence and intimidation as classified by the factor analysis. Accordingly, while the item loaded most strongly on the violence and intimidation factor (0.53), it also had a moderate loading on the person-related bullying factor (0.44). Nonetheless, despite these boundary definition and classification issues, the three factor solution does provide a parsimonious interpretation and has the additional benefit of empirical consistency.

For the current analysis, we constructed three scales by simply summing items identified by the factor analysis and standardising the scale scores to have a mean of zero and standard deviation of one across the sample. Cronbach's alphas for the three bullying scales were 0.87 (person-related), 0.87 (work-related) and 0.83 (physical violence). The correlations between these scales were moderate to strong, 0.62 between person-related and work-related; 0.54 between person-related and violence; and 0.34 between work-related and violence. This suggests that there may be considerable co-occurrence of the different types of bullying experiences.

It is clear from the prevalence data in Figure 6.1, which shows responses of 'sometimes' or 'often' so as to capture the persistent nature of bullying, that work-related bullying experiences were more common than other forms of bullying, with physical threats and intimidation the least frequently experienced workplace bullying behaviours.

The number of different types of workplace bullying experiences reported by respondents from the face-to-face interview is presented in Figure 6.2. It is evident that the majority of respondents (65%) reported no experience of workplace bullying in the past six months based on responding 'sometimes' or 'often' to the survey question. A further 10% reported

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[2] A 5-factor solution generated from the factor analytic process did differ considerably from the categories of bullying proposed by Quine (1999) and Ahmed & Braithwaite (in press). We do not pursue this solution any further.

only a single type of bullying. There were however 14% of respondents who reported four or more types of bullying.

**Figure 6.2: Number of different types of workplace bullying experiences in past 6 months**
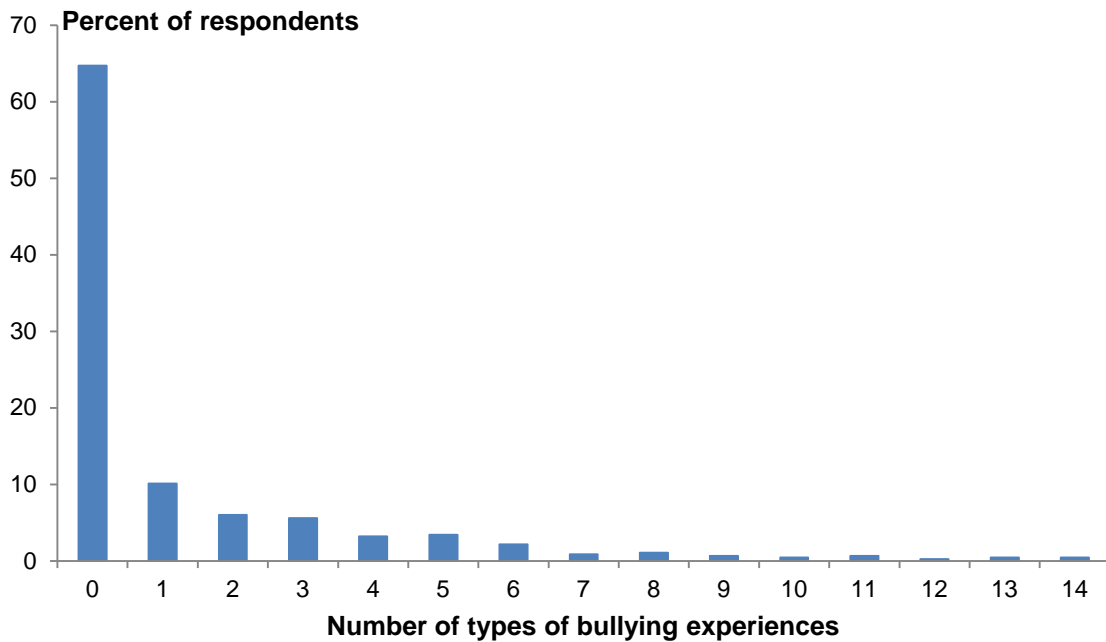


Overall 14.4% of respondents from the face-to-face sample reported one or more type of person-related bullying experience based on reporting 'sometimes' or 'often', 32.5% reported one or more type of work-related bullying experience, and 3.9% reported one or more type of violent or intimidating bullying experience. Importantly it was also the case that all respondents who reported an experience of violent or intimidating bullying also reported other types of bullying behaviours. That is, the experience of what is potentially the more severe form of bullying never occurred on its own but always in conjunction with the experience of person-related and/or work-related bullying.

The data collected in the PATH survey also enables comparison of the different measures of workplace bullying. That is, we can examine the extent to which the self-labelling measure of bullying was associated with the individual measures of specific bullying behaviour and/or the three underlying factors. Figure 6.3 presents the mean bullying scores on each of the three scales for the different categories of overall bullying experienced. The figure clearly demonstrates that those who report that they are currently experiencing bullying or had previously experienced bullying in their current job reported higher scores on each of the three factor scales than those respondents who reported having never been bullied or those who only experienced bullying in a previous workplace.

The mean factor scores across these groups were demonstrated to be significant in ANOVA models (person-related: $F_{(4, 447)} = 35.97$, $p < .001$; work-related: $F_{(4, 442)} = 22.97$, $p < .001$; and violence: $F_{(4, 449)} = 4.20$, $p < 0.01$). In fact the same pattern of results was evident for all of the individual bullying items with the exception of the low frequency violence items, such as 'threats of physical violence to you' and 'threats of violence to your property'. For these items, respondents who stated that they were currently being bullied reported no greater exposure to violent behaviours than those who reported no bullying. However, respondents

who reported having experienced bullying in a previous workplace were somewhat more likely to report these violent bullying experiences compared to respondents with no prior bullying experiences ('threats of physical violence to you': Beta = 0.054, standard error [se] = 0.028; $p$ = .054; 'threats of violence to your property': Beta = 0.059, se = 0.028; $p < 0.05$). This pattern of results is consistent with an interpretation that the experience of violent bullying is rare but strongly associated with quickly leaving the bullying workplace.

**Figure 6.3: Mean score on workplace bullying scale by bullying dimension and overall reported bullying**
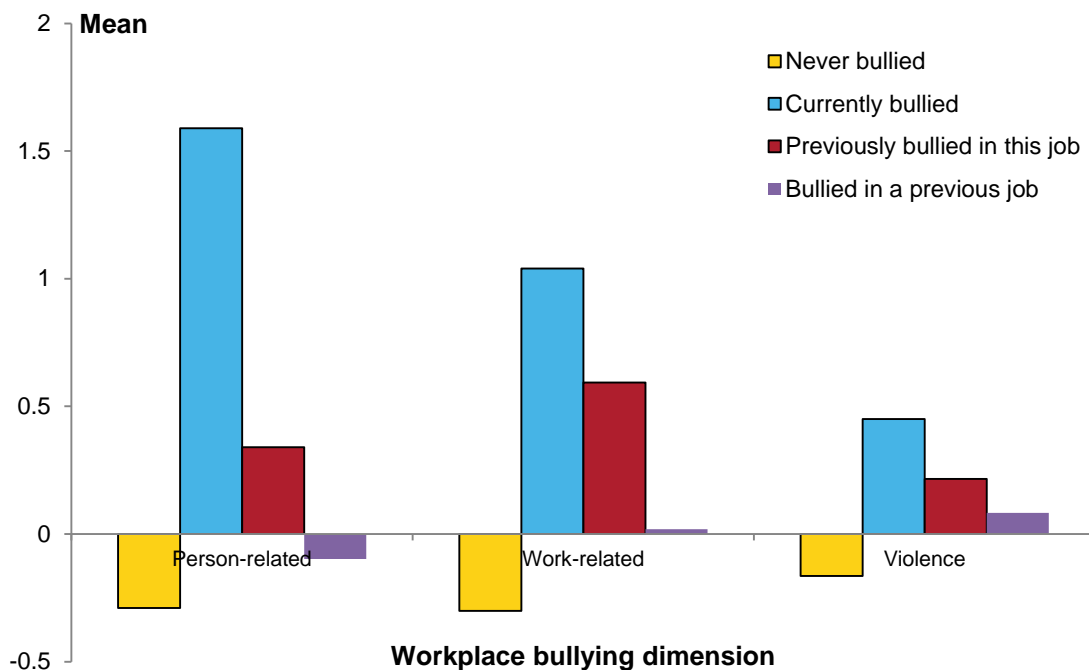


*Note*: Each of the three workplace bullying scales has a mean of 0 and standard deviation of 1.

While evidence of the correspondence between the different measures of bullying is not a very surprising finding, it must be remembered that these two bullying measures were assessed in different ways and times: the self-labelling measure in the online questionnaire and the operational measure of specific bullying experiences in the face-to-face interview. The evidence of a gradient in factor scores across the categories reflecting the timing and location of bullying experiences (current bullying, previous bullying in current job, bullying in previous job) provides support for the validity and sensitivity of the measures, showing declining severity with greater 'distance'.

The same pattern of results and almost identical regression coefficients were obtained from models which included the important covariates of sex, partner status, occupation skill level, and whether working full-time or part-time.

The research literature differentiates between workplace bullying and other behaviours such as harassment or incivility in part on the basis of the persistence of the behaviours. It may be possible therefore to consider aspects of workplace harassment versus bullying using the data collected through the operational questionnaire and examining the experience of the specific workplace behaviours at less frequent levels, that is those reporting a few times rather than sometime or always. However, this is beyond the scope of the current analysis.

## 6.2.1 Correlates of bullying

Consideration of the workplace correlates of bullying, including psychosocial and job characteristics, is important for a number of reasons. Reports of bullying assessed via a self-completion scale may be influenced by underlying individual characteristics and/or an individual's response bias. For example, personality characteristics may make an individual more or less likely to view their experiences within their workplace in a negative light and thereby influence their likelihood of identifying a bullying experience. Such a predisposition would be expected to consistently affect other scales and therefore would inflate observed correlations. Secondly, there may be real conceptual overlap between different bullying and other psychosocial workplace concepts. The experience of what we have labelled as 'work-related bullying' could be strongly correlated with and perhaps be a measure of the behaviour of managers and supervisors in jobs that would be characterised as having excessive workloads and unreasonable time pressures, that is high job demands in the DCR model. Finally, working conditions and experiences may be viewed as antecedents or causes of workplace bullying (see Notelaers et al., 2010). For example, workers with a sense of insecurity about their job future could be prepared to tolerate exposure to workplace bullying and create an incentive for other staff to engage in bullying behaviours. This analysis examines correlations among different aspects of the workplace. While uniformly strong associations would favour the first explanation, diverging patterns of correlations would offer support for subsequent notions.

Table 6.2 presents the correlation of each of the bullying scales with several measures assessing the psychosocial characteristics of work. The results suggest that all of these work characteristics were associated with increased experience of person-related and work-related bullying. However, there was little evidence that these psychosocial aspects of work apart from lack of support from colleagues and poor organisational culture were associated with reported experience of violent or intimidating bullying.

A series of analyses were conducted using data from the full sample to consider the relationship between several workplace characteristics and the self-labelling measure of bullying in the current workplace. There was no difference in the prevalence of bullying reported by respondents in professional, semi-professional, trades or manual occupations and other occupations. Similarly, managers and supervisors reported a similar level of bullying to those respondents in non-managerial positions. Interestingly, respondents in fixed-term (OR = 0.34, 95% CI 0.17–0.68) and casual contracts (OR = 0.38, 95% CI 0.15–0.99) were less likely to report bullying than respondents in permanent positions. There was also no difference in the level of bullying reported by respondents employed in the Commonwealth, state/territory, NGO and private sectors. Also, hours worked and reported household income were not associated with current bullying.

**Table 6.2: Correlation between measures of psychosocial job characteristics and dimensions of workplace bullying**

| Psychosocial work characteristic | Workplace bullying dimension | | |
|---|---|---|---|
| | **Person-related** | **Work-related** | **Violence or intimidation** |
| | **Correlation coefficient** | | |
| High job demands | 0.16** | 0.34** | 0.08 |
| Control | -0.19** | -0.23** | -0.08 |
| Fair pay for effort | -0.18** | -0.25** | -0.06 |
| Job insecurity | 0.23** | 0.26** | 0.03 |
| Lack of support from manager | 0.24** | 0.36** | 0.07 |
| Lack of support from colleagues | 0.27** | 0.35** | 0.10* |
| Poor organisational culture | 0.45** | 0.59** | 0.18** |

* $p < .05$; ** $p < .001$.
*Note*: Coefficients are from pairwise Pearson's correlation analysis.

## 6.2.2 Personality and vulnerability

A series of linear regression models using data from the full sample were constructed to consider the association between personality characteristics, personal characteristics and current workplace bullying experiences (see also Figures 6.4 to 6.9). Compared to those respondents who reported no experience of bullying, those who reported that they were currently being bullied demonstrated higher scores on the scales of neuroticism (Beta = 2.16, se = 0.47, $p < .05$), negative affect (Beta = 3.18, se = 0.94, $p < .01$) and ruminative style (Beta = 5.03, se = 0.85, $p < .001$), and lower scores on the scale of personal control/mastery (Beta = -2.05, se = 0.50, $p < .001$). In terms of personal resources, those reporting current bullying also reported a smaller network of family and friends (Beta = -1.63, se = 0.73, $p < .05$) and a greater number of adverse life events in the past six months (Beta = 0.77, se =.20, $p < .001$).

These are potentially important findings. The individual differences in personality and personal resources could contribute to the observed differences in the prevalence of bullying or may explain differences in health and wellbeing reported by those who do report having experienced bullying. However, it is also the case that these characteristics may moderate the impact of exposure to bullying on an individual. That is, personality factors and access to support from family and friends may reduce the impact that exposure to workplace bullying has on a person's mental health, their productivity and time away from work, and/or their likelihood of changing jobs or even leaving the workforce. This will be a focus of our future research.

**Figure 6.4: Mean score on neuroticism scale by whether experienced workplace bullying never or currently**
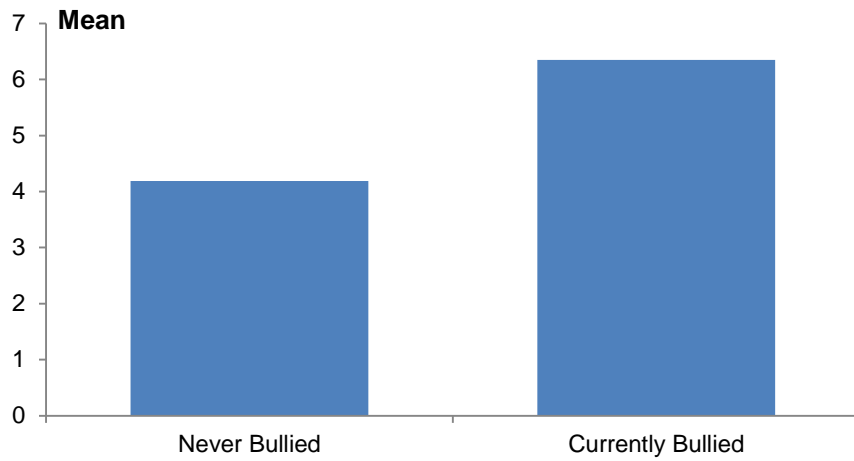


**Figure 6.5: Mean score on negative affect scale by whether experienced workplace bullying never or currently**
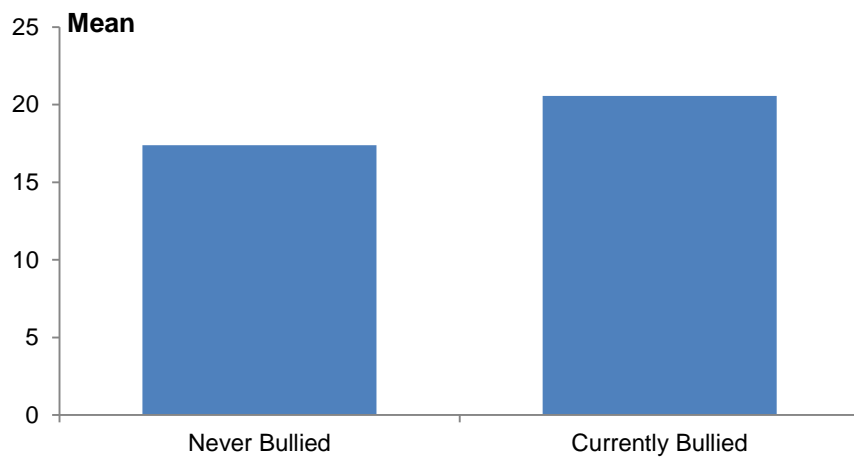


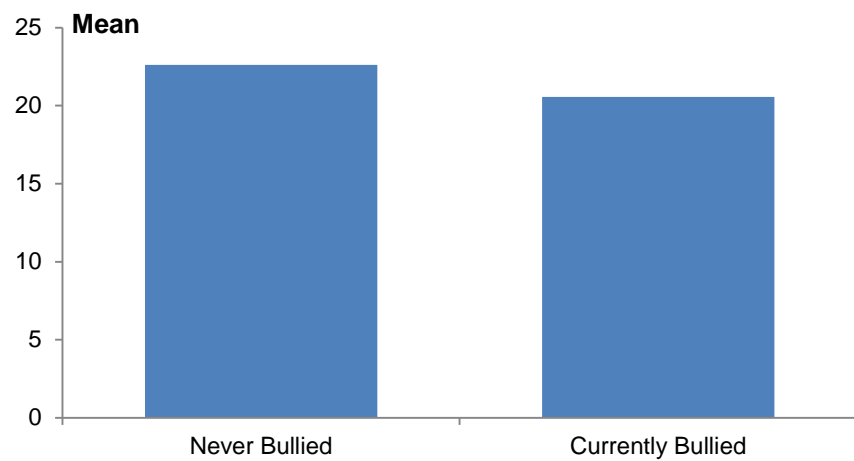**Figure 6.6: Mean score on mastery scale by whether experienced workplace bullying never or currently**

**Figure 6.7: Mean score on ruminative style scale by whether experienced workplace bullying never or currently**
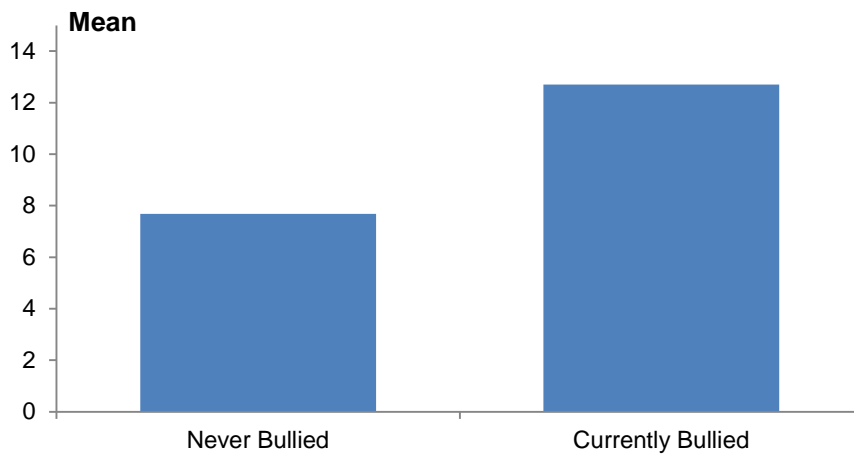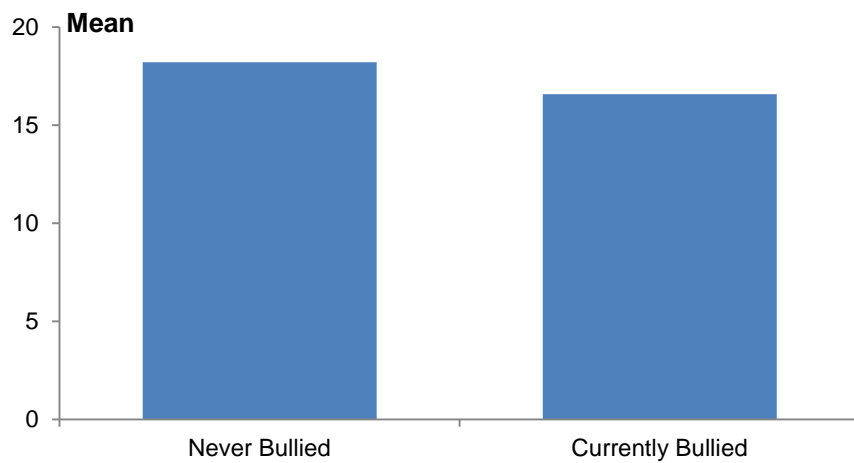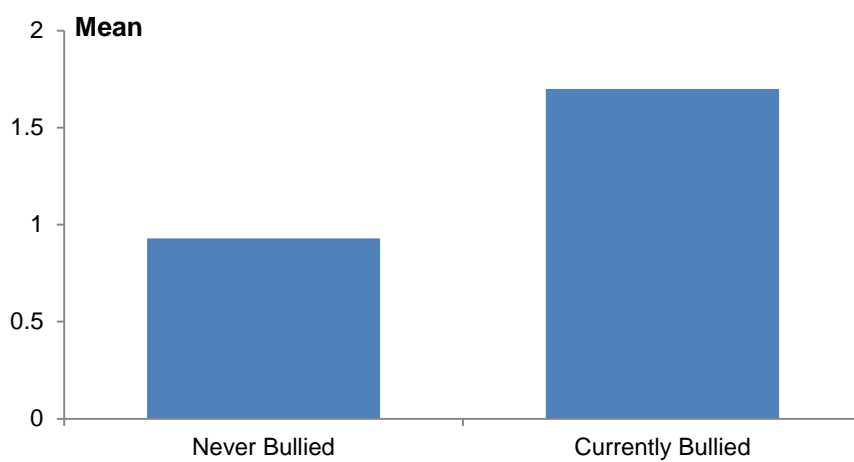


**Figure 6.8: Mean social network size by whether experienced workplace bullying never or currently**



**Figure 6.9: Mean number of significant life events in past 6 months by whether experienced workplace bullying never or currently**

## 6.2.3 Depression and bullying

An advantage of examining bullying and other workplace experiences using data from the PATH through Life study is the potential to consider the extensive longitudinal data on physical and mental health, wellbeing, cognition, and health service use, including linked Medicare and PBS data.

The final set of analyses examined the associations between the experience of bullying (the global measure) and (1) current depression symptoms, combining categories of sub-syndromal, minor and major depression and assessed using the PHQ depression scale; (2) levels of current suicidal ideation; and (3) a measure of depression symptoms experienced at the time of the wave 1 interview 12 years earlier based on the Goldberg depression scale.

Those respondents who reported that they were subject to current workplace bullying had odds of having significant depression symptoms over four and a half times the odds of respondents with no history of workplace bullying (Table 6.3). All other respondents with a history but not current bullying experience also reported elevated risk of depression relative to those who had never been bullied, though the effects were much weaker than for those currently bullied. Importantly, the relationship between current bullying experiences and depression was attenuated but remained significant after controlling for all of the potential covariates described previously: sex, partner status, children, occupational skill level, part-time status, ruminative style, neuroticism, negative affect, mastery, resilience, social network size, experience of adverse live events. That is, after controlling for all of these factors, the experience of current workplace bullying still increased a person's odds of depression over two and a half times that of respondents who had never experienced workplace bullying.

**Table 6.3: Logistic regression analysis of the association between bullying experiences and likely depression**

|  | Simple model[1] | | With covariates[2] | |
|---|---|---|---|---|
| **Bullying experiences** | **OR** | **95% CI** | **OR** | **95% CI** |
| Never bullied | 1.00 | | 1.00 | |
| Currently bullied | 4.53 | 2.50 – 8.21 | 2.46 | 1.18 – 5.11 |
| Previously bullied in this workplace | 1.72 | 1.10 – 2.68 | 1.08 | 0.83 – 1.86 |
| Bullied in previous workplace | 1.92 | 1.31 – 2.81 | 1.36 | 0.85 – 2.17 |
| Cannot say | 1.83 | 0.92 – 3.66 | 1.25 | 0.54 – 2.89 |

(1) Not controlling for the effects of covariates.
(2) Controlling for the effects of covariates.
Note: Likely depression based on the Patient Health Questionnaire (PHQ).

The raw estimates derived from the data (see Figure 6.10) show that over 40% of respondents who identify that they were currently experiencing workplace bullying were identified with significant depression symptoms compared with around 14% of those who report they have never been bullied in the workplace.

It is not just the experience of depression symptoms that is seen to be elevated among those who experience workplace bullying. Figure 6.11 presents data on respondents' report of suicidal ideation in the past 12 months by current bullying status. The results show that those who are currently bullied at work are twice as likely as those never bullied to report feeling that their life is hardly worth living, report feeling that they would be better off dead and report that they had thought of taking their own life. These findings cogently demonstrate the potential personal costs and consequences of workplace bullying.

**Figure 6.10: Proportion of respondents reporting significant depression symptoms by whether experienced workplace bullying never or currently**
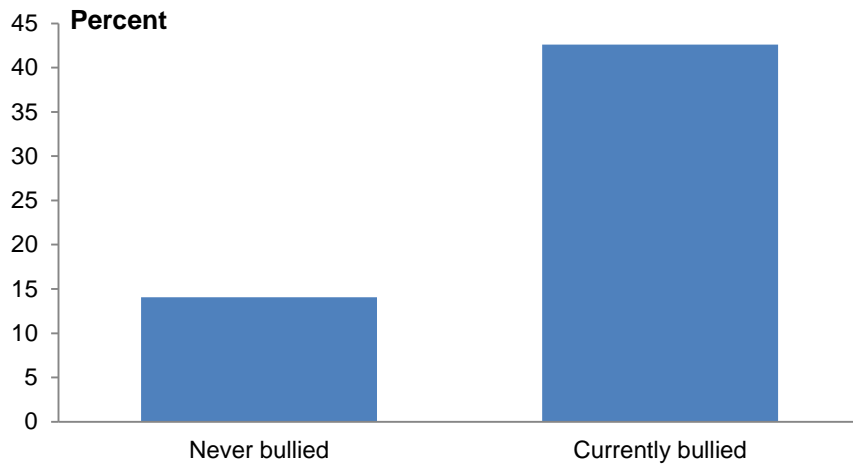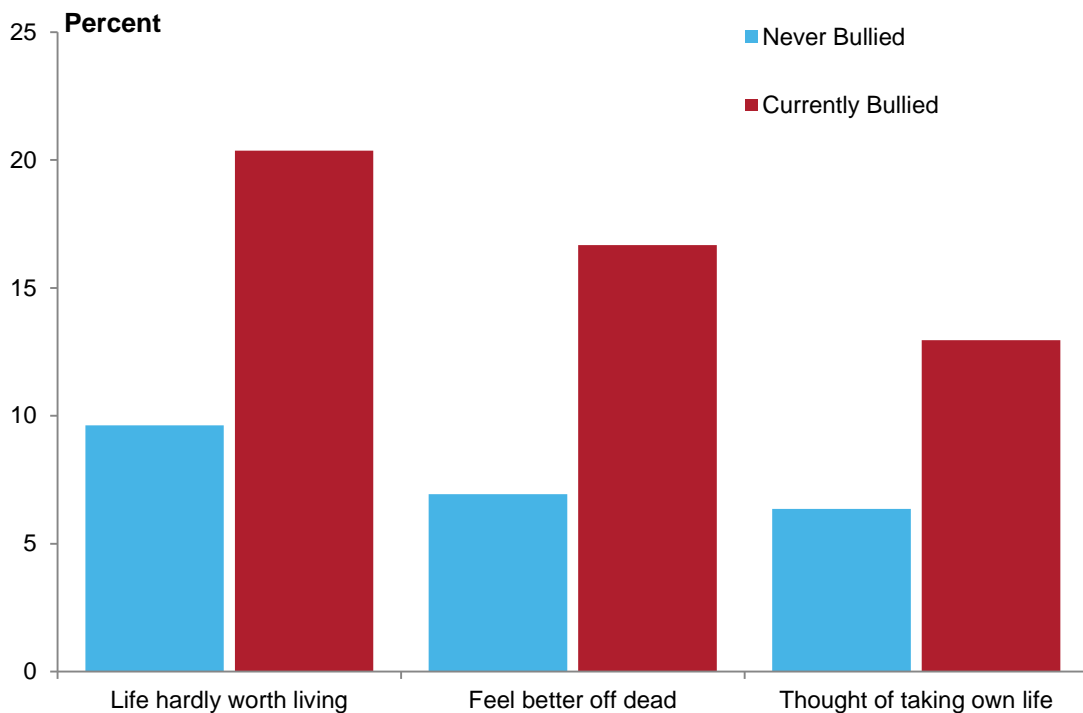


**Figure 6.11: Proportion of respondents reporting suicidal ideation in past 12 months by type of suicidal thought and whether experienced workplace bullying never or currently**



However, it is important to recognise the potential role of mental health problems in increasing individual vulnerability and risk of workplace bullying, with some research demonstrating that those who experience depression or psychological distress are at increased risk of subsequent experience of workplace bullying (Kivimaki et al., 2003). With the four waves of PATH data, we were able to provide an extreme test of this hypothesis by

investigating whether high levels of depression symptoms at wave 1 of the study were associated with reported experiences of workplace bullying 12 years later. The results of this analysis are presented in Figure 6.12.

**Figure 6.12: Proportion of respondents reporting current workplace bullying by depression status at wave 1 (1999)**
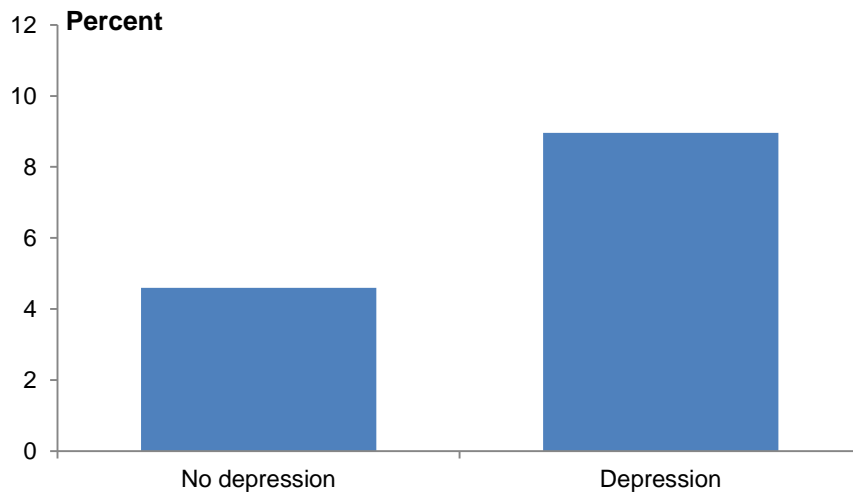


Whereas the rate of reported current workplace bullying among those who reported no depression at wave 1 was just under 5% (a little below the overall level in the sample), those respondents who were identified with high levels of depression 12 years earlier have almost double the risk of currently experiencing workplace bullying. While these somewhat surprising results could reflect a sustained response bias, with enduring personality characteristics influencing the responses to survey items, the results could also point to the cycle of vulnerability described by Kivimaki, with the experience of depression increasing an individual's vulnerability to workplace bullying which in turn reinforces the despair and hopelessness experienced by the individuals. The longitudinal data available through the PATH project will enable further investigation of these effects.

### 6.2.3 Workplace bullying conclusions

While this is a preliminary analysis of the new data it does serve to demonstrate how workplace bullying may be an important determinant of mental health and highlights the significant personal consequences of bullying experiences. Although the analyses identified the strong correlation between workplace bullying and other psychosocial hazards, the results of multivariate modelling suggested that workplace bullying remained an independent predictor of depression over and above the contribution of these other factors.

# 7. Conclusion, implications and future opportunities

This report provided an overview of the Work Wellbeing Project which is a collaboration between Safe Work Australia and the Centre for Research on Ageing, Health and Wellbeing at The Australian National University. The project supported the collection of wave 4 data for the 20+ cohort of the PATH study. The PATH study is a longitudinal community survey of residents of Canberra and Queanbeyan. It includes a strong focus on the intersection between work and health, and emphasises psychosocial workplace hazards. It provides an important resource for research and policy development in this area.

The report described the items and measures added to the survey for wave 4 and provided the first public presentation of results. The scope of this report was broad, so the analysis was built around enhancing the evidence base for the interrelationship between work characteristics and depression. We also used the report to provide examples of how the focus in the PATH study on personal characteristics and the longitudinal data following individuals over time provides an opportunity to identify risk and protective factors, and characteristics that may increase an individuals' vulnerability to later workplace adversity.

The analysis of data on work-related injury collected through the PATH survey did not match the national profile of injury produced by the ABS. This is a consequence of differences between the survey population and the broader Australian population. However, the longitudinal data was able to show how factors such as depression and impulsivity were prospectively associated with later risk of work-related injury: a finding that will generalise across populations. The identification of factors associated with increased risk of later work-related injury could provide insights to increase workplace safety.

Consistent with local and international research, we demonstrated that depression was associated with increased levels of sickness absence in terms of both measures of any sick leave and overall days of leave. Perhaps more importantly, the analysis showed that depression was more strongly associated with unpaid sick leave. There are a number of possible explanations for this effect, including the possibility that chronic illness leads to the depletion of leave entitlements. Further research is warranted, but the results do provide another demonstration of the economic and social impact of depression specifically and chronic illnesses more generally. Further analysis of PATH data can aid in better understanding this association and providing an evidence base for future policy development.

The analysis of the newly introduced psychosocial work hazards – perceptions of unfair pay, social support from colleagues and managers, low levels of relational justice – found that each was associated with increased risk of depression. However, the main focus of the report was on workplace bullying. This was a major addition to the PATH through Life survey. The inclusion of both self-labelling and operational measures produced different but complementary results. We identified that the prevalence of current workplace bullying in the PATH sample was around 5%. This is broadly consistent with other Australian and international figures. When considering the various aspects of bullying, the majority of people did not report any bullying behaviours but there were 14% who reported four or more different bullying behaviours. While organisations such as the Productivity Commission have documented the costs to employers of workplace bullying, the adverse personal consequences for the recipient of bullying was cogently demonstrated in more than doubling of the risk of depression and suicidal ideation. These data provide compelling evidence for policy action. However, the inter-relationship between depression and bullying is complex, with evidence showing that those with prior depression from 12 years earlier reported almost double the rate of workplace bullying as those who did not report prior depression.

These preliminary results highlight the potential of the PATH data as a resource for researchers and policy makers in the work health and safety area.

# References

ABS (Australian Bureau of Statistics). (2009). Australian social trends. Catalogue No. 4102.0 Canberra: Commonwealth of Australia.

ABS (Australian Bureau of Statistics). (2010).Work-related injuries, Australia, 2009-10. Catalogue No. 6324.0. Canberra: Commonwealth of Australia.

Ahmed, E. & Braithwaite, J. (in press). Shame, pride and workplace bullying. In S. Karstedt, I. Loader and H. Strang (Eds.), Emotions, crime and justice. Hart Publishing.

Alonso, J., Petukhova, M., Vilagut, G., Chatterji, S., Heeringa, S., Ustun, T. B., et al. (2011). Days out of role due to common physical and mental conditions: results from the WHO World mental health surveys. Molecular Psychiatry, 16(12), 1234-1246.

Anstey, K.J., Christensen, H., Butterworth, P., Easteal, S., Mackinnon, A., Jacomb, T., Maxwell, K., Rodgers, B., Windsor, T., Cherbuin, N. & Jorm, A.F. (2012). Cohort profile: The PATH through life project. International Journal of Epidemiology, 41, 951-960.

Australian Institute of Health and Welfare. (2011). Comorbidity of mental disorders and physical conditions, 2007. Catalogue No. PHE 155. Canberra: AIHW.

Begg, S., Vos, T., Barker, B., Stevenson, C., Stanley, L., & Lopez, A. D. (2007). The burden of disease and injury in Australia 2003. Catalogue No. PHE 82. Canberra: AIHW.

Broom, D. H., D'Souza, R. M., Strazdins, L., Butterworth, P., Parslow, R., & Rodgers, B. (2006). The lesser evil: bad jobs or unemployment? A survey of mid-aged Australians. Social Science and Medicine, 63(3), 575-586.

Bruffaerts, R., Vilagut, G., Demyttenaere, K., Alonso, J., Alhamzawi, A., Andrade, L. H., et al. (2012). Role of common mental and physical disorders in partial disability around the world. British Journal of Psychiatry, 200(6), 454-461.

Brugha, T. S., & Cragg, D. (1990). The List of Threatening Experiences: the reliability and validity of a brief life events questionnaire. Acta Psychiatrica Scandinavica, 82(1), 77-81.

Butterworth, P., Rodgers, B., Windsor, T.D. (2009). Financial hardship, socio-economic position and depression: results from the PATH Through Life Survey. Social Science & Medicine, 69, 229–38.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. Journal of Personality and Social Psychology, 67, 319-333.

Day L, Voaklander D, Sim M, Wolfe R, Langley J, Dosman J, Hagel L, & Ozanne-Smith J. (2009) Risk factors for work related injury among male farmers. Occupational and Environmental Medicine. 66(5):312-8.

Dollard, M.F. & Bailey, T. S. (Eds) (2013 forthcoming). Australian workplace barometer: psychosocial safety climate and working conditions in Australia. Canberra: Australian Federation Press.

D'Souza, R. M., Strazdins, L., Broom, D. H., Rodgers, B., & Berry, H. L. (2006). Work demands, job insecurity and sickness absence from work. How productive is the new, flexible labour force? Australian and New Zealand Journal of Public Health, 30(3), 205-212.

D'Souza, R. M., Strazdins, L., Clements, M. S., Broom, D. H., Parslow, R., & Rodgers, B. (2005). The health effects of jobs: status, working conditions, or both? Australian and New Zealand Journal of Public Health, 29(3), 222-228.

D'Souza, R. M., Strazdins, L., Lim, L. L., Broom, D. H., & Rodgers, B. (2003). Work and health in a contemporary society: demands, control, and insecurity. Journal of Epidemiology & Community Health, 57(11), 849-854.

Einarsen, S., Hoel, H. & Notelaers, G. (2009). Measuring exposure to bullying and harassment at work: validity, factor strudture and psychometric properties of the Negative Acts Questionnaire- Revised. Work and Stress, 23, 24-44.

Einarsen, S., Hoel, H., Zapf, D. & Cooper, C.L. (Eds.). (2003). Bullying and emotional abuse in the workplace. International perspectives in research and practice. London: Taylor & Francis.

Elovainio, M., Kivimaki, M. & Helkama, K. (2001). Organizational justice evaluations, job control and occupational strain. Journal of Applied Psychology, 86, 418-424

Elovainio, M., Kivimaki, M. & Vahtera, J. (2003). Organizational justice and health of employees: prospective cohort study. Occupational and Environmental Medicine, 92, 105-108.

Eysenck, S. B., Eysenck, H. J., & Barrett, P. (1985). A revised version of the Psychoticism scale. Personality and Individual Differences, 6, 21-29.

Ferrie, J.E., Head, J., Shipley, M.J., Vahtera, J., Mrmot, M.G. & Kivimaki, M. (2006). Injustice at work and incidence of psychiatric morbidity: the Whitehall II study. Occupational and Environmental Medicine, 61, 443-450.

Gillen, M., Yen, I.G., Trupin, L., Swig, L., Rugulies, R., Mullen, K., Font, A., Burian, D., Ryan, G., Janowitz, I., Quinlan, P.A., Frank, J. & Blanc, P. (2007). The association of socioeconomic status and psychosocial and physical workplace factors with musculoskeletal injury in hospital workers. American Journal of Industrial Medicine, 50, 245-260.

Gillen, M., Yen, I.H., Trupin, L., Swig, L., Rugulies, R., Mullen, K., Font, A. Burian, D., Ryan, G., Janowitz, I., Guinlan, P.A., Frank, J. & Blanc, P. (2007). The association of socioeconomic status and psychosocial and physical workplace factors with musculoskeletal injury in hospital workers. American Journal of Industrial Medicine, 50, 245-260.

Hensing, G., Alexanderson, K., Allebeck, P., & Bjurulf, P. (1998). How to measure sickness absence? Literature review and suggestion of five basic measures. Scandinavian Journal of Social Medicine, 26(2), 133-144.

Hussey, L., Turner, S., Thorley, K., McNamee, R. & Agius. R. (2012). Work-related sickness absence as reported by UK general practitioners. Occupational Medicine, 62, 105-111.

Johnson , J.V., & Hall , E.M. (1988). Job strain, work place social support, and cardiovascular disease : a cross-sectional study of a random sample of the Swedish working population. American Journal of Public Health , 78, 1336-1342.

Johnson, J.V., Hall, E.M., & Theorell , T. (1989). Combined eVects of job strain and social isolation on cardiovascular disease morbidity and mortality in a random sample of the Swedish male working population. Scandinavian Journal of Work, Environment and Health, 15, 271-279.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. Administrative Science Quarterly, 24(2), 285-308.

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., et al. (2009). The global burden of mental disorders: an update from the WHO World Mental Health (WMH) surveys. Epidemiologia e Psichiatria Sociale, 18(1), 23-33.

Kessler, R. C., Berglund, P., Chiu, W. T., Demler, O., Heeringa, S., Hiripi, E., et al. (2004). The US National Comorbidity Survey Replication (NCS-R): design and field procedures. International Journal of Methods in Psychiatric Research, 13(2), 69-92.

Kivimaki, M., Ferrie, J.E., Head, J., Shipley, M., Vahtera, J. & Marmot, M.G. (2004). Organisational justice and change in justice as predictors of employee health: the Whitehall II study. Journal of Epidemiology and Community Health, 58, 931-937.

Kivimaki, M., Virtanen, M., Vartia, M., Elovainio, M., Vahtera, J. & Keltikangas-Javinen, L. (2003). Workplace bullying and the risk of cardiovascular disease and depression. Occupational and Environmental Medicine, 60, 779-783.

Korten, A., & Henderson, S. (2000). The Australian National Survey of Mental Health and Well-Being. The British Journal of Psychiatry, 177(4), 325-330.

Kroenke K, Strine TW, Spitzer RL, Williams JB, Berry JT, and Mokdad AH. (2009). The PHQ-8 as a measure of current depression in the general population. Journal of Affective Disorders, 114, 163-173.

Lahelma, E., Lallukka, T., Laaksonen, M., Saastamoinen, P. & Rahkonen, O. (online 20 January 2011). Workplace bullying and common mental disorders: a follow-up study. Journal of Epidemiology and Community Health.

Leach, L. S., Butterworth, P., Strazdins, L., Rodgers, B., Broom, D. H., & Olesen, S. C. (2010). The limitations of employment as a tool for social inclusion. BMC Public Health, 10, 621.

Leymann, H. (1996). The content and development of mobbing. European Journal of Work and Organizational Psychology, 5. 165-184.

Lim, S. & Cortina, L.M. (2005). Interpersonal mistreatment in the workplace: the interface and impact of general incivility and sexual harassment. Journal of Applied Psychology, 90, 483-496.

Lindelow, M., Hardy, R., & Rodgers, B. (1997). Development of a scale to measure symptoms of anxiety and depression in the general UK population: the psychiatric symptom frequency scale. Journal of Epidemiology & Community Health, 51(5), 549-557.

Lubben, J., Blozik, E., Gillmann, G., Iliffe, S., von Renteln Kruse, W., Beck, J. C., et al. (2006). Performance of an Abbreviated Version of the Lubben Social Network Scale Among Three European Community-Dwelling Older Adult Populations. The Gerontologist, 46(4), 503-513.

Mathers, C. D., & Loncar, D. (2006). Projections of Global Mortality and Burden of Disease from 2002 to 2030. PLoS Med, 3(11), e442.

McKenna, M. T., Michaud, C. M., Murray, C. J., & Marks, J. S. (2005). Assessing the burden of disease in the United States using disability-adjusted life years. American Journal of Preventive Medicine, 28(5), 415-423.

McKenzie, K., Campbell, M.A., Scott, D.A., Driscoll, T.R., Harrison, J.E., McClure, R,J. (2010). Identifying work related injuries: comparison of methods for interrogating text fields. BMC Medical Information Decision Making, 7, 9.

McManus, S., Meltzer, H., Brugha, T., Bebbington, P. & Jenkins, R. (2009) Adult psychiatric morbidity in England 2007: Results of a household survey. Leeds: The Health and Social Care Information Centre.

Murray, C. J. L., & Lopez, A. D. (1996). The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Cambridge, MA: Harvard School of Public Health on behalf of the World Health Organization and the World Bank.

Mustard CA, Chambers A, McLeod C, Bielecky A, & Smith PM. (2012) Comparison of data sources for the surveillance of work injury. Occupational and Environmental Medicine. 69(5):317-24.

Nielsen, M.B., Hetland, J., Matthiesen, S.B. & Einarsen, S. (2012). Longitudinal relationships between workplace bullying and psychological distress. Scandinavian Journal of Work, Environment and Health, 38, 38-46.

Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. Psychological Bulletin, 115(3), 424-443.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta Earthquake. Journal of Personality and Social Psychology, 61(1), 115-121.

North, F.M., Syme, S.L. Feeney, A., Shipley, M. & Marmot, M. (1996). Psychosocial work environment and sickness absence among British civil servants: The Whitehall II Study. American Journal of Public Health, 86, 332-340.

Notelaers, G., Witte, H.D. & Einarsen, S. (2010). A job characteristics approach to explain workplace bullying. European Journal of Work and Organizational Psychology, 19, 487-504.

Parslow, R. A., Jorm, A. F., Christensen, H., Broom, D. H., Strazdins, L., & RM, D. S. (2004). The impact of employee level and work stress on mental health and GP service use: an analysis of a sample of Australian Government employees. BMC Public Health, 4, 41.

Parslow, R. A., Jorm, A. F., Christensen, H., Rodgers, B., Strazdins, L., & D'Souza, R. M. (2004). The associations between work stress and mental health: A comparison of organizationally employed and self-employed workers. Work & Stress, 18(3), 231-244.

Pearlin, L. I., Lieberman, M. A., Menaghan, E. G., & Mullan, J. T. (1981). The stress process. Journal of Health and Social Behavior, 22(4), 337-356.

Productivity Commission 2010, Performance Benchmarking of Australian Business Regulation: Occupational Health & Safety, Research Report, Canberra.

Quine, L. (1999). Workplace bullying in NHS community trust: staff questionnaire survey. BMJ, 318, 228-232.

Rayner, C. & Hoel, H.A. (1997). A summary review of literature relating to workplace bullying. Journal of Community and Applied Social Psychology, 7, 181-191.

Rodgers, B. (1996). Reported parental behaviour and adult affective symptoms. 1. Associations and moderating factors. Psychological Medicine, 26(1), 51-61.

Safe Work Australia. (2012). The cost of work-related injury and illness for Australian employers, workers and the community: 2008-09. Canberra: Commonwealth of Australia.

Salin, D. (2001). Prevalence and forms of bullying among business professionals. A comparison of two different strategies for measuring bullying. European Journal of Work and Organizational Psychology, 10, 425-441.

Siegrist, J. (2002). Effort-reward imbalance at work and health. In P.L. Perrowe, D.C. Ganster (Eds.), Historical and current perspectives on stress and health, JAI Elsevier, Amsterdam, pp. 261–291.

Siegrist, J. (2008). Chronic psychosocial stress at work and risk of depression: evidence from prospective studies. European Archives of Psychiatry and Clinical Neuroscience, 258, 115-119.

Siegrist, J. 1996. Adverse health effect of high effort-low reward conditions at work. Journal of Occupational Health Psychology, 1, 27-43.

Siegrist, J., Wege, N., Puhlhofer, F. & Wahrendorf, M. (2009). A short generic measure of work stress in the era of globalization: Effort-reward imbalance. International Archives of Occupational and Environmental Health, 82, 1005-1013.

Rauscher, K.J., & Myers, D. J. (2008) Socioeconomic disparities in the prevalence of work-related injuries among adolescents in the United States. Journal of Adolescent Health. 42(1):50-7.

Stansfeld, S., & Candy, B. (2006). Psychosocial work environment and mental health: A meta-analytic review. Scand J Work Environ Health, 32(6), 443-462.

Strazdins, L., D'Souza, R. M., Clements, M., Broom, D. H., Rodgers, B., & Berry, H. L. (2011). Could better jobs improve mental health? A prospective study of change in work conditions and mental health in mid-aged adults. J Epidemiology and Community Health, 65(6), 529-534.

Strazdins, L., D'Souza, R. M., Lim, L. L., Broom, D. H., & Rodgers, B. (2004). Job strain, job insecurity, and health: rethinking the relationship. Journal of Occupational Health Psychology, 9(4), 296-305.

Tsuno, K., Kawakami, N., Inoue, A. & Kiyoko, A. (2010). Measuring workplace bullying: reliability and validity of the Japanese version of the Negative Acts Questionnaire. Journal of Occupational Health, 52, 216-226.

Vartia, M. (1996). The sources of bullying: Psychological work environment and organizational climate. European Journal of Work and Organizational Psychology, 5, 203-214.

Vecchio, N., Scuffham, P.A., Hilton, M.F. & Whiteford, H.A. (2011). Work-related injury in the nursing profession: an investigation of modifiable factors. Journal of Advanced Nursing, 67, 1067-1078.

Vecchio, N., Scuffham, P.A., Hilton, M.F. & Whiteford, H.A. (2011). Work-related injury in the nursing profession: an investigation of modifiable factors. Journal of Advanced Nursing, 67, 1067-1078.

Warr, P. (1987). Work, Unemployment, and Mental Health. Oxford, UK: Clarendon Press.

# Appendix A: The PATH Project

The Personality and Total Health (PATH) Through Life Project began in 1999 with a community survey of 7485 people from Canberra and Queanbeyan in south-eastern Australia. It is a longitudinal and ongoing project, and data has been collected from survey respondents at regular intervals over the past 13 years. The original aims of the study were to document the prevalence and incidence of common mental disorders, substance use and cognitive ability across the adult life span, and to consider the environmental and genetic risk factors.

Over time the aims of the study have broadened; for example, to include a greater focus on physical functioning and chronic health conditions. In part this reflects the richness of the data available, a more intensive consideration of factors originally envisaged only as risk or protective factors, and the opportunity with each wave and cohort to investigate specific age-relevant or time-based contextual factors in more detail. Examples of the latter include consideration of the consequences arising from the 2003 Canberra bushfires; the health effects of Global Financial Crisis in wave 3 data collection. Several sub-studies have also been developed as extensions of the main study including a Magnetic Resonance Imaging (MRI) substudy of normative brain ageing, a cardiovascular risk assessment substudy, and a health and memory study of cognitive decline in the elderly.

The PATH survey was based on a narrow cohort design. Potential respondents were identified via a simple random sample drawn from the electoral role within three cohorts with birth years 1975–1979, 1956–1960 and 1937–1941. At the start of the study respondents in these cohorts were aged 20–24 years (the 20+ cohort.), 40–44 years (40+) and 60–64 years (60+). The initial rate of recruitment into the survey was between 58% and 65% across the three cohorts and the subsequent retention rate has been very high: a reinterview rate of between 87% and 93% across cohorts and waves. A representation of the research design (prior to the commencement of wave 4) is presented in Figure A1. The plan is to reinterview each cohort every four years for 20 years, at which point the age groups will overlap, thus capturing the total adult life span. At the end of 2010, three waves of data had been collected for all three cohorts. The Human Research Ethics Committee of The Australian National University has approved each wave of the study and all sub-studies.

Data collection for the first three waves of the PATH project was conducted primarily through face-to-face interviews. Survey interviews were conducted by highly trained interviewers, either at the participant's home or at The Australian National University. Over time, as members of the sample moved out of the original survey region, efforts were made to maintain their involvement in the survey. Interviewers travelled around Australia to locations where sufficient survey members had relocated; for example, major capital cities and the NSW south coast. Postal and email options have been offered to those who had moved to other areas interstate or internationally and where it has not been cost-effective to travel to conduct face-to-face interviews.

Although the PATH project was based on a personal interview, the data collected through the survey questionnaire was entered directly by the participant on a laptop computer. This approach was used so as to maximise respondent privacy and reduce the potential impact of response bias. However the interviewers did directly administer physical tests such as for blood pressure and forced vital capacity and cognitive tests, including episodic memory and mental processing speed. The data collection methodology for wave 4 of the 20+ cohort adopted a somewhat different approach. Respondents completed the survey questionnaire online. This approach is broadly consistent with the previous approach of completion on a laptop, though not at an agreed appointment time and not in the presence of an interviewer. In addition, a subsample of respondents was selected to complete a face-to-face interview

which comprised a clinical psychiatric interview, the physical assessment, and cognitive tests.

**Figure A1: Diagrammatic representation of the PATH through Life Project study design**
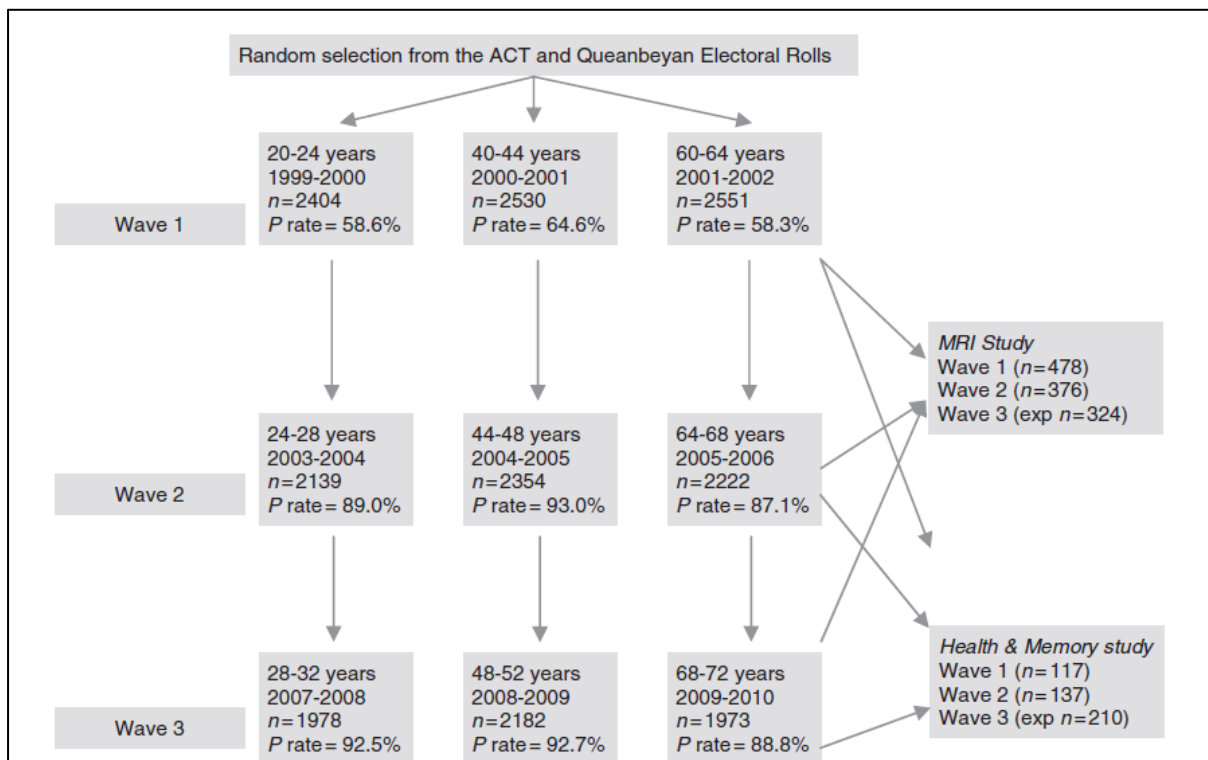


Few epidemiological studies in Australia are as comprehensive or have collected the diversity of data present in the PATH study. Since wave 1, information has been collected on physical health and chronic health conditions, disability, genetic risk factors, early life adversity, other personal history (including past mental health problems, adolescent transitions, marital history and family formation), personality measures, physical activity, life stress and social support, diet, employment circumstances and occupational stress, anxiety and depression, substance use and cognitive abilities. Generally, the scales and items included in the PATH study are well established, widely used and validated instruments so as to facilitate comparison across studies and ensure data quality. For example, there is considerable overlap between the measures of psychosocial job characteristics in the PATH Study and the measures used in the highly influential Whitehall studies in the United Kingdom. In successive waves of data collection, new questions have been added to assess major life transitions, significant life events, and lifestyle changes relevant to each cohort and age. These include (in)fertility and pregnancy, changes in family structure, relationship formation and separation, menopause, changes in work environments, job characteristics, workforce status and retirement.

The PATH study is much more than just a comprehensive survey questionnaire. It provides a relatively rare opportunity to link detailed self-report survey data to more objective physical, biological, cognitive and genetic data. With consent rates > 90%, it is linked to Medicare and PBS data, enabling the investigation of associations between reported health and social circumstances and administrative data on health service and medication use. The survey data is linked to census data characterising the suburbs and location of residence. Perhaps even more importantly, it provides up to 12 years of longitudinal data with measurement on four separate occasions to enable evaluation of transitions and trajectories of change over

time. A more detailed description of the PATH study is available in the open access cohort profile paper by Anstey and colleagues (2012). To date over 120 publications in peer-reviewed journals and reports for Commonwealth and state/territory Government departments have been produced using data from the PATH study.

## Research into work and health using the PATH study

The PATH study enables study of the inter-relationship between work and health across the life course. For example the longitudinal data already available from the three cohorts can support investigation of: the transition into the workforce and career establishment; the normative retirement transition; early retirement; the interaction between work and family formation; and ways that people combine work, family and caring responsibilities and the consequences of these multiple roles.

To date the PATH survey has included a range of standard measures of employment characteristics, including tenure, hours worked, occupation, and whether holding a supervisory or managerial role. The survey has also collected data on sickness absence, income and measures of financial deprivation. The unique opportunity presented by the PATH study is that these workplace factors can be examined in relation to the very detailed and extensive longitudinal data on mental health and wellbeing, physical functioning and chronic health conditions, disability and days out of role, linked administrative data on health service and medication use, and (innovatively) cognitive measures such as memory, processing speed and verbal intelligence. The selection of psychometrically sound and widely used measures increases confidence in the validity of the PATH findings and may facilitate comparison with data drawn from different geographic, political and social contexts.

Traditionally, work health and safety research has focused on identifying and addressing physical hazards such as chemicals and dangerous work-sites and structural aspects of work such as work hours and shift work. However, the nature of work has changed. For example there has been an increase in 'white-collar' and knowledge-based jobs, globalisation and corresponding trends towards insecure employment and work intensification. Also, there is increasing recognition of the widespread prevalence and burden of mental health problems within the workplace. Policy and research attention has focused on the characteristics of work most relevant to this new workforce and on the factors most likely to impact on workers' mental health. These characteristics have been labelled the psychosocial aspects/characteristics of work.

Since its onset the PATH study has considered psychosocial job characteristics as highly salient environmental risk factors for mental disorders and included appropriate measures in the survey questionnaire. PATH has drawn upon the Job Demand-Control model of Karasek (1979) in considering how a job is organised, and especially the psychological and workload demands that are placed on workers and the level of autonomy that workers have over how they choose to manage these demands. The theoretical framework utilised in PATH also places emphasis on the broader context in which work is conducted, looking at how job insecurity (for example) interacts with the impact of these other psychosocial adversities (Strazdins et al., 2004). The PATH work and health research program aims to identify the most parsimonious and powerful combination of psychosocial job characteristics.

There is already a substantial body of work-related research using the PATH data, particularly with a focus on the psychosocial characteristics of work and this output provides insight into the links between job conditions and health in the Australian workforce. Stressful or adverse psychosocial work conditions have been conceptualised as involving excessive job demands, poor job control, and a lack of job security and future job prospects. For example, research conducted by D'Souza et al., in 2003 and Strazdins et al., in 2006 used Wave 1 PATH data from the 40+ cohort to show how insecure employment and high job

strain (a combination of excessive demands and low job control) was strongly associated with poorer physical and mental health, specifically anxiety and depression. An important follow-up paper showed that the association between adverse psychosocial job characteristics and poor health did not differ between high and low status jobs (D'Souza et al., 2005). Similarly, a 2004 article by Parslow and colleagues restricted to the 806 employees of the Australian Public Service (APS) in the PATH 40+ cohort, explored the association of job characteristics and psychosocial work stressors – including employee level, job demands, job control, skill discretion, and job security – with health outcomes within a more defined occupational cohort. The results showed that both men and women who reported higher levels of work stress had poorer mental health and again these effects were independent of seniority or level within the APS. This is critical evidence for policy makers seeking to understand the characteristics of the workplace that lead to ill-health, particularly in the context of increasing workers' compensation claims around psychological health issues. More compelling evidence of the link between adverse psychosocial work conditions and poor health has been provided by longitudinal research considering Waves 1 and 2 of PATH 40+ cohort to examine whether changes in psychosocial work conditions can be linked to changes in mental health (Strazdins et al., 2011). This was found to be the case with improvements and deterioration in work conditions corresponding to improvements or deterioration in mental health.

The impact of poor psychosocial job quality on sickness absence from work has also been investigated using data from the PATH project. D'Souza and colleagues (2006) used data from Wave 1 of the PATH 40+ cohort and found that high levels of job insecurity and high levels of job demands were associated with long-term but not short-term sickness absence. Increased depression and anxiety symptoms partly explained this link. The study concluded that adverse work conditions may reduce productivity via an effect on mental health which in turn leads to longer periods of absence from the workplace. Differences in the impact of poor psychosocial work conditions between employees (i.e. those identified as organisationally employed) and those respondents who are self-employed have also been examined using PATH data. In a 2004 study using Wave 1 data from the 40+ PATH cohort, Parslow and colleagues found that those who were self-employed reported higher levels of job demands but also greater job control than those in organisational employment. Overall the authors concluded that self-employment was associated with relatively few health benefits.

More recently PATH research has used the range of measures of job characteristics to construct a continuum of psychosocial job quality and examine in broader terms the nature of the association between work, labour-force participation and health. Research by Broom and colleagues (2006) using data from the 40+ cohort in Wave 1 found that poor quality jobs characterised by high levels of insecurity, low marketability/future prospects, high demands and low control were associated with worse physical health, higher rates of depression, and worse self-rated health when compared to jobs with few or no stressors. Importantly, there were no differences evident in the health status of those in the poorest quality jobs and those who were unemployed, suggesting the health benefits of work are restricted to good quality employment. A more recent 2010 publication by Leach and colleagues drew on data from two waves for both the 20+ and 40+ PATH cohorts to examine change over time in the relationship between poor health and poor quality work. The research examined both causal directions of this cycle: a) how poor health might act as a barrier to gaining high quality work, and the reverse b) how high quality work might be an important pre-requisite for positive health outcomes. The results showed that those with pre-existing poor physical and mental health were less likely to move into high (psychosocial) quality work. Also, those who moved into poor quality work from unemployment showed an increase in depressive symptoms compared to those who moved into high quality work. The study concluded that moving from unemployment into a poor quality job does not seem to improve health and may in fact result in increased depression.

# Appendix B: Statistical techniques and output referred to in this report

## Describing the data

### *Standard error*

The mean of the observations (scores) in a sample is an estimate of the parametric mean, that is the mean of the whole population. A useful indicator of the accuracy of the estimate is the standard error of the mean.

The standard error of the mean can be obtained by drawing many random samples from a population and calculating the standard deviation (square-root of the variance) of these sample means. A much simpler and less expensive way to estimate the standard error of the mean is to divide the standard deviation of the observations in a sample by the square root of the sample size. Hence, in general larger samples have smaller standard errors and more accurate estimates.

### *Confidence interval*

The confidence interval is a range of values that has a given probability (usually 95%) of containing the true value of a population parameter, such as a mean, proportion or rate. The confidence interval is calculated from the observations in a sample.

The width of the confidence interval gives an indication of the degree of uncertainty about the estimate of the parameter, with wider intervals indicating the need for more observations or greater precision of measurement. Therefore, confidence intervals are often more informative than probability levels (*p* values) that indicate whether or not an outcome is 'statistically significant'.

## Comparing scores

### *Chi-square*

Chi-square ($\chi^2$) is used to test whether distributions of categorical variables differ from one another. For example, it can be used to compare the frequency of categorical responses between two or more groups. It can also be used to compare observed data with data from a theoretical distribution. If the chi-square statistic is statistically significant ($p < .05$) we conclude that the difference between the compared frequencies is not likely to be due to chance alone.

### *Analysis of Variance*

Analysis of Variance (Anova or F-test) is used to test differences between the means among two or more groups. The test involves two types of variables: 'dependent variables', which are measured variables from which means are calculated, and 'independent variables', or 'factors', which are categorical variables from which groups are formed. The test operates under the assumption that dependent variable scores from the sampled populations are normally distributed.

Anova separates the total variance in scores into the variance that occurs within-groups and variance that occurs between groups. If the ratio between these variance components is greater than that expected at a certain probability level (usually .05) the 'null hypothesis' of no differences between means is rejected and it is concluded that the differences between means are statistically significant.

**Reducing the data and revealing underlying structure**

*Factor analysis*

Factor analysis is a technique for reducing data to reveal underlying constructs called latent variables or factors that are reflected in the covariation among observed variables. Factors are 'extracted' by separating the shared variance of a variable from its unique variance and error variance to reveal the underlying factor structure based only on the shared variance. Principal component analysis is similar to factor analysis but does not separate shared and unique variance. Therefore, it is used only to reduce data rather than to reveal underlying factor structure.

Factor loadings are the correlations of each of the observed variables in the analysis with a factor. The ultimate aim of the analysis is to achieve 'simple structure' whereby each variable loads highly on only one factor. In practice, this can only be achieved, or approximated, by geometrically 'rotating' the factors. There are many factor rotation techniques depending on whether the factors are required to be uncorrelated or are allowed to be correlated. Varimax is the most common technique used for the 'orthogonal rotation' of uncorrelated factors whereas promax and oblimin are techniques used for the 'oblique' rotation of correlated factors.

As well as the choice of rotation technique, the researcher needs to set the criteria or adopt a technique for the number of factors to extract. The initial extraction is usually based on an arbitrary number of factors and will therefore usually result in an uninterpretable solution. The matrix algebra involved in factor analysis produces 'eigenvalues', which are used to condense or consolidate the variance in a correlation matrix. That is, the factor with the largest eigenvalue has the most variance and so on. The 'eigenvalues-greater-than-one rule' proposes that only eigenvalues greater than one are reliable and meaningful. Hence, this rule can be used to determine the number of factors to rotate after the initial extraction. Another approach is to examine the plot of eigenvalues from the initial extraction to detect a flattening out of the plot, or 'scree'. The number of factors before the scree represents the number of factors to extract and rotate.

The many options available for extracting factors, selecting the number of factors to extract and rotating factors means analysis of the same data set often produces several potential interpretable 'solutions' approaching, if not achieving, simple structure. That is, factor analysis rarely produces a single 'correct' solution.

*Conbach's alpha*

Cronbach's alpha is a measure of the internal consistency, or reliability, of a set of items used to represent an underlying construct, such as a test scale. A high alpha suggests that the items within the set are highly related; however, it does not necessarily indicate the presence of a unidimensional latent variable, for which factor analysis is required. A very high alpha (e.g. > .90) suggests that the item set contains redundancy.

**Predicting outcomes**

*Correlation and linear regression*

The correlation between two variables ($r$) is a measure of the strength of the linear or straight-line relationship between them. The correlation indicates the degree to which the deviation of one variable from its mean can be predicted by knowing the deviation of the other variable from its mean.

Simple linear regression is used to represent, or model, the relationship between two variables with an equation that considers one variable as the independent variable or predictor, and the other as the dependent variable or outcome.

This equation [Y = a + bX + e] is in the form of a straight line where 'Y' is the dependent variable, 'X' is the independent variable, 'a' is the intercept or constant (the value of Y when X = 0), 'b' is the slope of the line and 'e' is the error in prediction. The slope, or regression coefficient, can be positive or negative depending on the direction of the regression line. In linear regression the dependent variable must be a continuous variable; that is, a variable measured with a continuous numerical scale. The independent variable can be continuous or in certain circumstances a dichotomy.

Multiple linear regression involves more than one independent variable. In this case the regression line equation is extended to reflect the number of independent variables, each with its own regression coefficient but with one common intercept. The $R^2$ statistic in multiple regression represents the proportion of the variation in the dependent variable accounted for by the set of independent variables. Therefore, it indicates the predictive strength of the independent variables as a set.

In simple regression, the regression coefficient indicates the change in the dependent variable predicted when the independent variable changes by one, in other words, a unit change. In multiple regression, each coefficient indicates the predicted change in the dependent variable associated with a unit change in the corresponding independent variable while holding constant the influence of all other independent variables.

The linear regression approach can be generalised to outcome variables other than normally distributed continuous variables. These outcomes include binary outcomes examined by logistic regression and count variables examined by Poisson or negative binomial regression.

### Logistic regression

Logistic regression is used to find the best fitting model to describe the relationship between a dichotomous dependent variable (2 outcome or response categories, usually coded 0 and 1) and one or more independent variables (predictors). In contrast to linear regression, there is no requirement for the variables in logistic regression to be linearly related or normally distributed.

Association between the outcome variable and predictors is represented by the odds ratio (OR), which is the exponentiation of the regression coefficient. Odds ratios greater than one indicate that, compared with the odds of the outcome being in the category coded zero '0', the odds of the outcome being in the category coded '1' are greater as the predictor increases in value; conversely for ORs less than one.

For a continuous predictor, an OR of 1.6 (for example) means that the outcome labelled '1' has 1.6 greater odds with a unit increase, or a 60% increase in odds. Alternatively, an OR of 0.8 means that the outcome labelled '1' has 0.8 of the odds with a unit increase, or a 20% decrease. For a dichotomous predictor, an OR of 1.6 means that the odds of the outcome labelled '1' is 1.6 (60%) greater in the predictor group labelled '1' compared with the predictor group labelled '0' the reference group).

The odds of an outcome are equivalent to the risk (likelihood) of the outcome only when the outcome is uncommon. This often makes the results of logistic regression analysis difficult to interpret.

### Negative binomial regression

Negative binomial regression is similar to logistic regression but is used when the outcome variable is the number of events (counts) rather than response categories. The negative binomial model is often preferred over other count models such as Poisson regression because it makes fewer assumptions about the relationship between the mean and variance of the distribution.

Negative binomial regression is usually interpreted in terms of the incidence rate ratio (IRR) rather than an odds ratio. This distinction is based on the nature of the outcome data. The regression coefficient (parameter estimate) can be referred to as the log of the ratio of expected counts (hence, the 'ratio' in incidence rate ratio). Also, a 'count' in negative binomial regression is technically an incidence rate (the number of new events over a period of time). Therefore, the regression coefficients can be referred to as the log of the incidence rate ratio.

# Lists

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