Unemployment and psychosocial outcomes to age 30: A fixed-effects regression analysis

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Abstract

Objective: To examine the associations between exposure to unemployment and psychosocial outcomes over the period from 16-30 years, using data from a well-studied birth cohort.

Method: Data were gathered over the course of the Christchurch Health and Development Study (CHDS). The CHDS is a longitudinal study of a birth cohort of 1265 children, born in Christchurch in 1977, who have been studied to age 30. Assessments of unemployment and psychosocial outcomes (mental health, substance abuse/dependence, criminal offending, adverse life events and life satisfaction) were obtained at ages 18, 21, 25 and 30 years.

Results: Prior to adjustment, increasing duration of unemployment was associated with significant increases in the risk of all psychosocial outcomes. These associations were adjusted for confounding using conditional fixed-effects regression techniques. The analyses showed significant (p<0.05), or marginally significant (p<0.10), associations between duration of unemployment and: major depression (p=0.050), alcohol abuse/dependence (p=0.043), illicit substance abuse/dependence (p=0.012), property/violent crime (p<0.001), arrests/convictions (p=0.052), financial problems (p=0.007) and life satisfaction (p=0.092). To test for reverse causality, the fixed-effects regression models were extended to include lagged time-dynamic variables.
representing the respondent’s psychosocial burden prior to the experience of unemployment. The findings suggested that the association between unemployment and psychosocial outcomes was likely to involve a causal process in which unemployment led to increased risks of adverse psychosocial outcomes. Effect sizes were estimated using attributable risk; exposure to unemployment accounted for between 4.2% and 14.0% (median 10.8%) of the risk of experiencing the significant psychosocial outcomes.

Conclusions: The findings of this study suggest that exposure to unemployment had small but pervasive effects on psychosocial adjustment in adolescence and young adulthood.

Keywords

Unemployment, longitudinal study, fixed-effects regression, psychosocial outcomes
Introduction

It has been widely accepted that unemployment is associated with adverse mental health and reduced well-being (Backhans and Hemmingsson, 2011; McKee-Ryan, Song et al., 2005; Wanberg, 2012). Previous meta-analyses and reviews have linked unemployment to reduced psychological well-being (Luhmann, Hofmann et al., 2012; McKee-Ryan et al., 2005; Murphy and Athanasou, 1999; Paul and Klaus, 2006), reduced life satisfaction (Herbig, Dragano et al., 2013; McKee-Ryan et al., 2005; Paul and Klaus, 2006), alcohol and substance use problems (Henkel, 2011; Herbig et al., 2013), and mental health problems: depression (Herbig et al., 2013; Murphy and Athanasou, 1999; Paul and Klaus, 2006; Paul and Moser, 2009; Rantakeisu and Jönsson, 2003), anxiety (Herbig et al., 2013; Murphy and Athanasou, 1999; Paul and Klaus, 2006; Paul and Moser, 2009; Rantakeisu and Jönsson, 2003) and suicidal behaviours (Classen and Dunn, 2012; Milner, Page et al., 2013a, 2013b).

Unemployment has also been linked with other adverse psychosocial outcomes such as: crime/criminal convictions (Gould, Weinberg et al., 2002; Lin, 2008), financial problems (Georgarakos, Lojschova et al., 2009; McCarthy, 2011) and interpersonal/relationship difficulties (Song, Foo et al., 2011).

While the associations between unemployment and psychosocial outcomes are well-established, the extent to which these associations reflect cause and effect
associations requires further consideration. An important issue concerns the extent to which the associations between unemployment and psychosocial outcomes are explained by third or confounding variables (Greenland and Morgenstern, 2001; Ward and Johnson, 2008). This issue has been addressed in a number of studies in which associations between unemployment and psychosocial outcomes have been adjusted for observed confounding factors such as socioeconomic status, educational achievement and other related factors (e.g. Blakely, Collings et al., 2003; Daly and Delaney, 2013; Georgarakos et al., 2009; Rantakeisu and Jönsson, 2003; Salm, 2009).

A limitation of these studies is that they fail to control for non-observed sources of confounding. However, in studies which collect repeated-measures data, it is possible to control for non-observed confounders by using fixed-effects regression methods (Allison, 2009; Hamerle and Ronning, 1995). Fixed-effects regression models provide a technique for adjusting an association between a time dependent outcome $Y_t$ (e.g. crime) and a time dependent predictor $X_t$ (e.g. unemployment) for non-observed fixed factors $\alpha$, providing that the factors $\alpha$ exert a fixed and constant effect on the outcomes $Y_t$. A more detailed account of the fixed effects model can be found in Allison (2009). Fixed effects regression has been used to examine the associations between unemployment and a number of psychosocial outcomes (Fergusson, Horwood et al., 2001), including: mental health problems (Schmitz, 2011), self-
assessed health (Bockerman and Ilmakunnas, 2009), suicidal behaviour (Fergusson, Boden et al., 2007), criminality (Aaltonen, MacDonald et al., 2013), substance misuse (Popovici and French, 2013a, 2013b) and life satisfaction (Clark, Knabe et al., 2010; Knabe and Rätzel, 2008).

A more complex issue concerns the possibility of reverse causation in which psychosocial burden leads to increased risks of unemployment, rather than unemployment leading to psychosocial burden. The examination of reverse causality requires the availability of longitudinal data to fit cross-lagged or reciprocal models of causation (see Methods for more information on this approach) and has been addressed in a number of studies (Aaltonen et al., 2013; Bockerman and Ilmakunnas, 2009; Fergusson et al., 2007; Fergusson et al., 2001). The majority of these studies (Aaltonen et al., 2013; Bockerman and Ilmakunnas, 2009; Fergusson et al., 2001) concluded that unemployment is related to psychosocial disadvantage even after controlling for reverse causality.

Against this background, this paper reports an investigation of the associations between unemployment on a wide range of psychosocial outcomes in a birth cohort studied from age 18 to 30. The aims of this research were:
a) To describe the associations between duration of unemployment and a series of psychosocial outcomes (mental health, substance misuse, offending, life events and life satisfaction).

b) To adjust the associations between duration of unemployment and psychosocial outcomes for confounding factors using fixed effects regression methods.

c) To examine patterns of reverse causality between duration of unemployment and psychosocial outcome variables.

An important feature of this analysis is to provide information on the consequences of unemployment on psychosocial outcomes, for a contemporary cohort of young adults, during the period (age 16-30 years) when most cohort members had made their transition into the work force.

**Methods**

**Participants**

Participants were members of the Christchurch Health and Development Study (CHDS) birth cohort. The CHDS is a longitudinal study of 1,265 children born in the Christchurch (New Zealand) urban region over a 4-month period during 1977. This cohort has been studied at regular intervals from birth until age 30 (for details see Fergusson and Horwood, 2001). At age thirty, 987 (80%; 52% female) of the surviving
cohort members were interviewed. All phases of the study have been subject to ethical approval by the Canterbury Regional Health and Disabilities Ethics Committee. All data were collected with the signed consent of the study participants.

Measures

Duration of unemployment. Cohort members were interviewed at ages 18, 21, 25, and 30 about their history of employment/unemployment since the previous assessment. Participants were questioned about any times they were unemployed and seeking work since the previous assessment and duration of any unemployment. Using these data a measure of the total duration of unemployment was constructed for each of the interview periods 16-18, 18-21, 21-25, and 25-30 years. For the purposes of this analyses, duration of unemployment was classified as: none, < 3 months, and 3+ months. This classification was used as preliminary analyses showed that risks of psychosocial problems did not increase after 3+ months of unemployment.

Mental health outcomes. At ages 18, 21, 25, and 30 years, participants were questioned about their experience of the following mental health problems during the 12 months prior to each assessment.
Major depression and anxiety disorder. Cohort members were questioned about symptoms of major depression and a range of anxiety disorders (generalised anxiety disorder, panic disorder, agoraphobia, social phobia, specific phobia) in the previous 12 months. Questioning was based on the relevant components of the Composite International Diagnostic Interview (CIDI: World Health Organization, 1993) and DSM-IV criteria (American Psychiatric Association, 1994). Using this information, dichotomous measures were constructed to reflect whether the participant met diagnostic criteria for a diagnosis of a major depressive episode and any anxiety disorder in each of the intervals: 17-18, 20-21, 24-25, and 29-30 years.

Suicidal ideation/attempt. Participants were questioned using custom-written survey items about the occurrence of suicidal thoughts (contemplating, considering or planning suicide) and/or attempts in the 12 months prior to each assessment.

Substance abuse/dependence. At the 18, 21, 25 and 30 year assessments, cohort members were questioned about problems associated with their use of alcohol or illicit drugs in the previous 12 months, using CIDI items to assess DSM-IV symptom criteria for abuse/dependence. Using this information, participants were classified on dichotomous measures reflecting whether they met diagnostic criteria for alcohol abuse/dependence or illicit substance abuse/dependence in each of the intervals: 17-18, 20-21, 24-25, and 29-30 years.
Criminal offending. At ages 18, 21, 25 and 30 years participants were questioned about their involvement in criminal offending and any contacts with the justice system during the 12 months prior to each assessment. Two measures of criminal offending (property and violent offending; arrest/conviction) were used in this study:

Property and violent offending. At each assessment, cohort members were asked about any offences they had committed in the previous 12 months, using the Self-Report Delinquency Inventory (SRDI) (Elliott and Huizinga, 1989; Elliott, Huizinga et al., 1985). Selected items from this scale were used to define dichotomous measures reflecting whether the participant reported engaging in property or violent offending for each of the intervals: 17-18, 20-21, 24-25, and 29-30 years. Violent crime was defined to include: assault, fighting, use of a weapon, threats of violence against a person and related offences. Property crime included: theft, burglary, breaking and entering, vandalism, fire-setting, and related offences.

Arrest/conviction. Participants were questioned as to whether they had been arrested for any reason or received a court conviction in the 12 months prior to the assessment. This information was used to construct dichotomous measures of arrest/conviction for each of the intervals: 17-18, 20-21, 24-25, and 29-30 years.
Adverse life events. At ages 18, 21, 25 and 30 years, cohort members were questioned concerning life events occurring in the previous 12 months, using a life events scale based on the Social Readjustment Rating Scale (Holmes and Rahe, 1967) and Feeling Bad Scale (Lewis, Siegel et al., 1984). Two life events measures were used in the analysis reflecting whether the participant reported: serious financial problems; and interpersonal/relationship difficulties (serious problems or constant arguments with a partner/spouse, parent, sibling, or friend) for each 12 month period.

Life satisfaction score. Information about life satisfaction was collected at ages 18, 21, 25 and 30 using a custom-written scale which required respondents to rate their current satisfaction with 12 areas of their life: work, leisure time, partner relationships, relationships with people of the same sex, relationships with people of the opposite sex, social life, money, independence, daily interactions with others, family life, the future, and life as a whole. Items were scored on a 4-point scale (1=very unhappy to 4=very happy) whereby higher scores indicated greater life satisfaction. Scale scores were created by summing responses to the 12 items to create a general life satisfaction measure. These scales had good internal consistency (α=.85-.89). For the purposes of the present analysis, the life satisfaction scores were dichotomised for each year into those cohort members reporting a life satisfaction score in the lowest
quintile of the distribution and those who reported a life satisfaction greater than the lowest quintile.

**Sample size and sample bias**

*Sample size.* The present analysis is based on 1056 sample members observed on at least one occasion from 18-30 years. However, not all participants were assessed at each age. The number of observations available for each assessment was: 1025 (18 years); 1011 (21 years); 1003 (25 years); 987 (30 years). Sample sizes for the duration of unemployment by psychosocial outcome analyses are reported in Supplement Table 1.

*Sample bias.* To examine whether selection bias due to the processes of sample attrition influenced the findings, the data were reanalyzed using the data-weighting method described by Carlin, Wolfe, Coffey, and Patton (1999). These analyses produced essentially identical conclusions to the reported analyses, suggesting that the findings were unlikely to have been influenced by selection bias.

**Statistical methods**

*Unadjusted associations between duration of unemployment and psychosocial outcomes (Table 1 and Supplement Table 1).* The first phase of the analysis examined
the associations between duration of unemployment (classified as none, <3 months and 3+ months) and rates of dichotomous psychosocial outcomes: mental health, substance abuse/dependence, criminal offending, adverse life events, and life satisfaction. This analysis pooled the repeated observations at ages 18, 21, 25 and 30 to obtain an estimate of the population-averaged association between duration of unemployment and psychosocial outcomes. Linkages between duration of unemployment and psychosocial outcomes were analysed using a general estimating equation (GEE) modelling approach (Zeger and Liang, 1986). These models were extended to include tests of age and gender by unemployment interactions.

*Adjustment for confounding (Table 2).* In the second phase of the analysis, to account for non-observed sources of confounding by fixed factors, adjusted estimates of the associations between duration of unemployment and psychosocial outcomes were obtained by fitting repeated-measures conditional fixed-effects logistic regression models to the outcomes (Allison, 2009; Hamerle and Ronning, 1995). These models were of the form:

\[
\text{logit Pr}(Y_{ijt}=1) = \alpha_i + B_1X_{it} \quad \text{(equation 1)}
\]
where \( \logit \Pr(Y_{ijt} = 1) \) was the log odds of each outcome \( j \) reported by the \( i \)th respondent at each assessment \( t \), and \( X_{it} \) represented the duration of unemployment at each assessment \( t \). In this model, \( \alpha_i \) are individual specific terms that are assumed to reflect the effects of all fixed sources of variation in the outcome \( Y_{it} \).

**Testing for reverse causality (Table 3).** Two approaches were taken to explore this issue. First, the fixed-effects regression models in equation 1 were extended to include lagged time-dynamic variables representing the respondent’s prior history of the outcome \( (Y_{ijt-1}) \) and experience of unemployment \( (X_{it-1}) \) at the preceding assessment. The models were of the form:

\[
\logit \Pr(Y_{ijt} = 1) = \alpha_i + B_1X_{it} + B_2Y_{ijt-1} + B_3X_{it-1} \quad (equation 2)
\]

This analysis was supplemented by an attempt to fit a model of reciprocal causation based on the structural equation model developed by Boden, Fergusson and Horwood (2010).

**Results**
Associations between duration of unemployment and psychosocial outcomes (Table 1 and Supplement Table 1)

Table 1 shows the population-averaged associations between duration of unemployment and a series of outcome measures assessed in the 12-month period prior to 18, 21, 25 and 30 years. Population-averaged estimates were obtained by pooling the data over these time periods (Supplement Table 1 shows the information used to compute these pooled estimates). Table 1 shows statistically significant (p<0.01) linear relationships between duration of unemployment and mental health, substance abuse/dependence, criminal offending, adverse life events and life satisfaction. The analyses were extended to include multiplicative age by unemployment interactions and gender by unemployment interactions. Only one statistically significant interaction was found, suggesting a tendency for the association of unemployment with alcohol abuse/dependence to weaken with increasing age (p=0.003).

INSERT TABLE 1

Adjustment for confounding by non-observed fixed factors (Table 2)

Table 2 summarises the results of the fixed-effects regression models fitted to the repeated-measures data. As noted above, the fixed-effects model controls for all
non-observed confounders, providing these confounders exert a fixed effect on the outcome variable.

The table shows the estimated regression coefficients (B) and standard errors (SE), odds ratios and 95% confidence intervals (OR, 95% CI), and tests of statistical significance (p) for the effect of unemployment on each outcome after adjustment for fixed effects. For comparative purposes, the unadjusted results are also presented. The table shows that following adjustment, there were statistically significant (p<0.05) or marginally significant (p<0.10) associations between duration of unemployment and: major depression (p=0.05), alcohol abuse/dependence (p=0.043), illicit substance abuse/dependence (p=0.012), property/violent offending (p<0.001), arrest/conviction (p=0.052), serious financial problems (p=0.007) and life satisfaction (p=0.092).

To summarise the effects of unemployment on the significant outcomes, estimates of the attributable risk (AR) were computed. Attributable risk measures the estimated reduction in each psychosocial outcome if unemployment was eliminated from the population (Fletcher and Fletcher, 2005). The estimates suggested that unemployment had only small effects on overall rates of the outcomes. The values of AR ranged from 4.2% (life satisfaction) to 14.0% (property/violent offending), with a median of 10.8%.
**TESTING FOR REVERSE CAUSALITY**

The findings in Table 2 suggested that following control for non-observed fixed effects, exposure to unemployment was associated with increased risks of adverse psychosocial outcomes. These findings raise the important issue of the direction of causation between unemployment and these outcomes. It could be argued that unemployment may be a precursor for psychosocial problems such as substance dependence or criminal offending; alternatively it may be suggested that these problems may lead to unemployment.

To examine these alternative explanations, the fixed effects models in Table 2 were extended to include cross-lagged predictor variables (see Method). In these models, the associations between duration of unemployment and adverse psychosocial problems at time $t$ were adjusted for lagged measures of prior history of psychosocial problems at time $t-1$. Table 3 shows estimated associations between unemployment and adverse psychosocial outcomes after adjustment for lagged measures of these variables. Overall, the findings were similar to those reported in Table 2; for nine of the ten outcomes the strength of the association increased slightly after adjustment for previous history of these problems.
Discussion

In this study, we have examined the associations between duration of unemployment and rates of psychosocial adversity in a New Zealand birth cohort, studied to the age of 30. The aims of this study were to examine the extent to which there were cause and effect associations between exposure to unemployment and a range of outcomes that spanned mental health, substance abuse/dependence, criminal offending, adverse life events and life satisfaction.

The first stage of the analyses showed pervasive and significant associations between the duration of unemployment and all outcomes. These findings are consistent with a large body of previous research that has found associations between unemployment and adverse life-course outcomes (e.g. McKee-Ryan et al., 2005; Paul and Moser, 2009).

To address issues of confounding, the data were re-analysed using fixed-effects regression models. This analysis method controls for sources of non-observed confounding, providing these sources exert fixed effects on the outcome measures. The results of the fixed-effects regression analyses showed substantially reduced
associations between unemployment and psychosocial outcomes, suggesting a large component of these associations was non-causal. However, significant or marginally significant associations remained between unemployment and a number of outcomes: major depression (p=0.050), alcohol abuse/dependence (p=0.043) and illicit substance abuse/dependence (p=0.012), property/violent offending (p<.001), arrest/conviction (p=0.052), serious financial problems (p=0.007) and life satisfaction (p=0.092). To assess the strength of the associations, attributable risk (AR) estimates were calculated for these outcomes. This analysis suggested that unemployment exerted only weak effects on population rates of adversity, with values of the AR ranging from 4% to 14% (median=10.8%).

The analysis was then extended to consider possible reverse causal associations using two approaches. The first approach used methods of lagged regression and produced results that were consistent with the conclusion that there was a cause and effect association between unemployment and some outcome measures. Unfortunately, it was not possible to replicate these findings using a reciprocal cause structural equation model, due to problems of model convergence.

Finally, tests of interaction showed that, with one exception, the effects of unemployment on psychosocial outcomes did not vary detectably with age or gender.
The present study has a number of strengths for examining associations between unemployment and psychosocial outcomes. These strengths included the use of: a well-defined birth cohort with high sample retention rates; repeated-measures data on unemployment and a wide range of outcomes; and fixed-effects regression methods to control for non-observed sources of confounding. The net result of this is that the present study provides a more comprehensive and searching analysis of the linkages between unemployment and psychosocial well-being than has been the case in previous studies. However, a limitation of this study is that it is based on self-report interview data.

Finally, this study has important implications for on-going political and social debates about psychosocial consequences of unemployment. These debates have tended to polarise support into those who argue that unemployment has large effects on population well-being, and those who minimise the impact of unemployment. The present study leads to a middle-of-the-road position which suggests that while unemployment may have adverse consequences for a number of outcomes, these effects are relatively small.

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Declaration of Conflicting Interests
The Authors declare that there is no conflict of interest.

References


Table 1. Rates (%) of psychosocial outcomes by duration of unemployment pooled over observations at ages 18, 21, 25 and 30.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Unemployment</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>&lt;3 months</td>
<td>3+ months</td>
<td>p</td>
<td></td>
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<tr>
<td><strong>Mental health</strong></td>
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<tr>
<td>Major depression (%)</td>
<td>14.1</td>
<td>19.4</td>
<td>23.2</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Anxiety disorder (%)</td>
<td>12.9</td>
<td>18.3</td>
<td>19.1</td>
<td>0.009</td>
<td></td>
</tr>
<tr>
<td>Suicidal ideation/attempt (%)</td>
<td>6.1</td>
<td>9.0</td>
<td>12.4</td>
<td>&lt;0.001</td>
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<tr>
<td><strong>Pooled sample size</strong></td>
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<tr>
<td><strong>Substance dependence/abuse</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Alcohol dependence/abuse (%)</td>
<td>13.4</td>
<td>22.7</td>
<td>24.7</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Illicit substance dependence/abuse (%)</td>
<td>6.5</td>
<td>14.7</td>
<td>23.0</td>
<td>&lt;0.001</td>
<td></td>
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<tr>
<td><strong>Pooled sample size</strong></td>
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<td></td>
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</tr>
<tr>
<td><strong>Criminal offending</strong></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Property/violent offending (%)</td>
<td>11.1</td>
<td>22.3</td>
<td>27.6</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Arrest/conviction (%)</td>
<td>2.7</td>
<td>7.2</td>
<td>11.4</td>
<td>&lt;0.001</td>
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<tr>
<td><strong>Pooled sample size</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Adverse life events</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serious financial problems (%)</td>
<td>7.4</td>
<td>10.4</td>
<td>20.3</td>
<td>&lt;0.001</td>
<td></td>
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<tr>
<td>Interpersonal/relationship difficulties (%)</td>
<td>27.2</td>
<td>33.1</td>
<td>38.5</td>
<td>&lt;0.001</td>
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<tr>
<td><strong>Pooled sample size</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lowest quintile life satisfaction score (%)</td>
<td>17.9</td>
<td>25.9</td>
<td>31.6</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Pooled sample sizes (person-years)</td>
<td>n=2992</td>
<td>n=278</td>
<td>n=753</td>
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</tr>
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</table>
Table 2. Estimated effects of duration of unemployment on psychosocial outcomes before and after adjustment for confounding by non-observed fixed factors.¹

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Unadjusted</th>
<th>Adjusted for non-observed fixed factors</th>
<th>AR (%)²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B (SE)</td>
<td>OR (95% CI)</td>
<td>p</td>
</tr>
<tr>
<td>Mental health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major depression</td>
<td>0.215 (0.050)</td>
<td>1.23 (1.12-1.35)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>0.140 (0.054)</td>
<td>1.15 (1.03-1.28)</td>
<td>0.009</td>
</tr>
<tr>
<td>Suicidal thoughts/ attempts</td>
<td>0.276 (0.072)</td>
<td>1.32 (1.14-1.52)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Substance dependence/abuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol dependence/abuse</td>
<td>0.312 (0.051)</td>
<td>1.37 (1.24-1.51)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Illicit substance dependence/abuse</td>
<td>0.463 (0.059)</td>
<td>1.59 (1.42-1.78)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Criminal offending</td>
<td></td>
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<tr>
<td>Property and violent offending</td>
<td>0.442 (0.053)</td>
<td>1.56 (1.40-1.72)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Arrest/conviction</td>
<td>0.661 (0.080)</td>
<td>1.94 (1.65-2.66)</td>
<td>&lt;0.001</td>
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<tr>
<td>Adverse life events</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serious financial problems</td>
<td>0.529 (0.059)</td>
<td>1.69 (1.51-1.90)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Interpersonal/ relationship difficulties</td>
<td>0.185 (0.046)</td>
<td>1.20 (1.09-1.31)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Life satisfaction</td>
<td>0.252 (0.046)</td>
<td>1.28 (1.06-1.40)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Note. ¹ This table is based on 4023 person-years of observation.
² Attributable risk (AR) was calculated after fitting repeated measures conditional fixed-effects logistic regression models to the outcomes.
Table 3. Estimated effects of duration of unemployment on psychosocial outcomes from conditional fixed-effects regression models controlling for lagged measures of psychosocial outcomes.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Person-years</th>
<th>B (SE)</th>
<th>OR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mental health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major depression</td>
<td>3872</td>
<td>0.234 (0.088)</td>
<td>1.26 (1.06-1.50)</td>
<td>0.008</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>3869</td>
<td>0.142 (0.092)</td>
<td>1.15 (0.96-1.38)</td>
<td>0.124</td>
</tr>
<tr>
<td>Suicidal thoughts/ attempts</td>
<td>3872</td>
<td>0.174 (0.119)</td>
<td>1.19 (0.94-1.50)</td>
<td>0.143</td>
</tr>
<tr>
<td><strong>Substance dependence/abuse</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol dependence/abuse</td>
<td>3872</td>
<td>0.192 (0.087)</td>
<td>1.21 (1.02-1.44)</td>
<td>0.027</td>
</tr>
<tr>
<td>Illicit substance dependence/abuse</td>
<td>3869</td>
<td>0.378 (0.212)</td>
<td>1.45 (0.91-2.34)</td>
<td>0.117</td>
</tr>
<tr>
<td><strong>Criminal offending</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property and violent offending</td>
<td>3864</td>
<td>0.436 (0.102)</td>
<td>1.55 (1.27-1.89)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Arrest/conviction</td>
<td>3954</td>
<td>0.313 (0.159)</td>
<td>1.37 (1.00-1.87)</td>
<td>0.049</td>
</tr>
<tr>
<td><strong>Adverse life events</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serious financial problems</td>
<td>3951</td>
<td>0.318 (0.108)</td>
<td>1.37 (1.11-1.70)</td>
<td>0.003</td>
</tr>
<tr>
<td>Interpersonal/relationship difficulties</td>
<td>3954</td>
<td>0.134 (0.078)</td>
<td>1.14 (0.98-1.33)</td>
<td>0.085</td>
</tr>
<tr>
<td>Life satisfaction</td>
<td>3952</td>
<td>0.101 (0.080)</td>
<td>1.11 (0.95-1.29)</td>
<td>0.206</td>
</tr>
</tbody>
</table>