

1 Adolescent mental health and behavioural predictors 2 of being NEET: a prospective study of young adults 3 not in employment, education, or training

Q1 4 L. Rodwell^{1,2*}, H. Romaniuk^{1,2,3}, W. Nilsen^{4,5}, J. B. Carlin^{1,2}, K. J. Lee^{1,2} and G. C. Patton^{2,3}

5 ¹ Clinical Epidemiology and Biostatistics Unit, Murdoch Childrens Research Institute, Parkville, VIC, Australia

6 ² Department of Paediatrics, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Melbourne, VIC, Australia

7 ³ Centre for Adolescent Health, Murdoch Childrens Research Institute, The Royal Children's Hospital, Parkville, VIC, Australia

8 ⁴ Work Research Institute, Oslo and Akershus University College of Applied Sciences, Oslo, Norway

9 ⁵ Department of Mental Disorders, Mental and Physical Health, Norwegian Institute of Public Health, Oslo, Norway

10 **Background.** Young adults who are not in employment, education, or training (NEET) are at risk of long-term economic
11 disadvantage and social exclusion. Knowledge about risk factors for being NEET largely comes from cross-sectional
12 studies of vulnerable individuals. Using data collected over a 10-year period, we examined adolescent predictors of
13 being NEET in young adulthood.

14 **Methods.** We used data on 1938 participants from the Victorian Adolescent Health Cohort Study, a community-based
15 longitudinal study of adolescents in Victoria, Australia. Associations between common mental disorder, disruptive
16 behaviour, cannabis use and drinking behaviour in adolescence, and NEET status at two waves of follow-up in
17 young adulthood (mean ages of 20.7 and 24.1 years) were investigated using logistic regression, with generalised esti-
18 mating equations used to account for the repeated outcome measure.

19 **Results.** Overall, 8.7% of the participants were NEET at age 20.7 years and 8.3% at 24.1 years. After adjusting for poten-
20 tial confounders, we found evidence of increased risk of being NEET among frequent adolescent cannabis users [adjusted
21 odds ratio (OR_{adj}) = 1.71; 95% confidence interval (CI) 1.09–2.69] and those who reported repeated disruptive behaviours
22 (OR_{adj} = 1.66; 95% CI 1.13–2.43) or persistent common mental disorders in adolescence (OR_{adj} = 1.58; 95% CI 1.08–2.33).
23 Similar associations were present when participants with children were included in the same category as those in
24 employment, education, or training.

25 **Conclusions.** Young people with an early onset of mental health and behavioural problems are at risk of failing to make
26 the transition from school to employment. This finding reinforces the importance of integrated employment and mental
27 health support programmes.

28 Received 9 March 2017; Revised 27 July 2017; Accepted 28 July 2017

29 **Key words:** Cannabis use, common mental disorder, disruptive behaviour, NEET, unemployment.

30 Introduction

31 With youth unemployment in many high- and
32 middle-income countries at unprecedented high levels
33 since the global financial crisis of 2008, the transition
34 from school into employment has become increasingly
35 difficult, leaving many young adults in unstable, infor-
36 mal employment or unable to find work at all (Lloyd,
37 2005; ILO, 2015).

38 In this context, there has been increased social policy
39 interest in young adults who are failing to make a suc-
40 cessful transition into employment. One indicator used

to identify difficulties with making this transition is
41 'NEET' – not in employment, education, or training. 42
The Organisation for Economic Co-operation and 43
Development (OECD, 2015) estimated the average per- 44
centage of young adults (20–24 years of age) who were 45
NEET in 2014 to be 18%. This group of young adults 46
are more likely to have lower earnings, be in unstable 47
employment conditions and face more frequent and 48
longer periods of unemployment through adult life 49
(Hale *et al.* 2015; ILO, 2015). A young person's risk of 50
being NEET depends on country-specific unemploy- 51
ment rates, government-led employment and training 52
initiatives, and cultural factors (European Union 53
Committee, 2014). Aspects of family background includ- 54
ing socioeconomic status, parental employment, and 55
parental divorce are also associated with NEET status 56
in young adulthood (Coles *et al.* 2002; Eurofound, 2012). 57

* Address for correspondence: L. Rodwell, Clinical Epidemiology and Biostatistics Unit, Murdoch Childrens Research Institute, Parkville, VIC, Australia.
(Email: laura.rodw@gmail.com)

58 High rates of common mental disorders (i.e. anxiety
59 and depression), suicide risk, and substance abuse
60 have been observed in young adults who are NEET
61 (Benjet *et al.* 2012; Baggio *et al.* 2015), leading to ques-
62 tions around the extent to which earlier common men-
63 tal disorders contribute to the risk of being NEET in
64 young adulthood. Current evidence suggestive of an
65 association between common mental disorder and
66 NEET status in young adulthood mainly comes from
67 cross-sectional studies with young adults from clinical
68 or disadvantaged settings (Benjet *et al.* 2012; Nardi
69 *et al.* 2013; O’Dea *et al.* 2014). Such cross-sectional
70 profiles are limited in their capacity to identify the di-
71 rectionality in associations, as an episode of depression
72 or anxiety may be either a cause or consequence of
73 being NEET.

74 Several prospective cohort studies have reported a
75 relationship between common mental disorders in ado-
76 lescence and subsequent NEET status. However, these
77 studies have either measured NEET status before 20
78 years of age (Cornaglia *et al.* 2012; Veldman *et al.*
79 2015), used a definition of NEET that included working
80 with a basic level of education (Veldman *et al.* 2015), or
81 only considered a limited set of potential confounders
82 (e.g. socioeconomic status and gender) (Power *et al.*
83 2015). Further research is required to examine the rela-
84 tionship between common mental disorders in adoles-
85 cence and the risk of being NEET in young adulthood,
86 with adequate adjustment for family background and
87 other potential risk factors. The current study includes
88 the behavioural adolescent risk factors of high-risk can-
89 nabis and alcohol use and disruptive behaviour, which
90 have been examined as risk factors for employment
91 and education-related outcomes in previous studies.

92 Although there is strong evidence of an association
93 between cannabis use and educational outcomes
94 (Horwood *et al.* 2010; Silins *et al.* 2014), few studies
95 have considered cannabis use as a potential risk factor
96 for being NEET. Associations between cannabis use
97 and NEET status in young adulthood have been
98 reported in cross-sectional studies (Benjet *et al.* 2012;
99 O’Dea *et al.* 2014; Nardi *et al.* 2015). Baggio *et al.*
100 (2015) also found an association between cannabis
101 use and NEET status for males, but cannabis use was
102 measured around 20 years of age, when some partici-
103 pants were already NEET. Alcohol use has been exam-
104 ined as a risk factor for unemployment and
105 educational outcomes separately, but there has been
106 little examination of potential associations between
107 drinking behaviour in adolescence and later NEET sta-
108 tus. It is therefore important to examine the association
109 between earlier substance use and NEET status using
110 longitudinal data.

111 A final potential risk factor for being NEET in young
112 adulthood is aggressive or disruptive behaviour in

adolescence. Moore *et al.* (2015) examined the relation- 113
ship between experiences with peer aggression (i.e. 114
being a victim, perpetrator, or victim-perpetrator of 115
threatening or nasty behaviour, hitting or kicking, or 116
ostracism) at 14 years of age and employment and educa- 117
tion status at 17 and 20 years (defined as an ordinal 118
outcome of: enrolled in education; employed full-time 119
or part-time; or NEET). Perpetrators and victim- 120
perpetrators of peer aggression were more likely to be 121
in employment or NEET than in education at 17 122
years of age, with perpetrators also more likely to be 123
NEET at 20 years of age. 124

Most published studies have only considered a 125
definition of NEET in which participants with children 126
are classified according to their activities (i.e. they are 127
NEET if not also in employment, education, or train- 128
ing). The inclusion of young adults who have children 129
in the NEET category may capture an important group 130
of vulnerable people who face social and economic dis- 131
advantage. Research on early parenting, focused 132
mainly on teenage pregnancy, has identified several 133
risk factors for becoming a parent in late adolescence 134
that are similar to those for young adults who are 135
NEET (Woodward *et al.* 2001; Nilsen *et al.* 2012). 136
Long-term consequences of early parenting similar to 137
those for unemployment have also been reported, 138
including fewer life opportunities, higher psychosocial 139
disadvantage, and prolonged welfare dependence 140
(Nanchahal *et al.* 2005; Olsson *et al.* 2014). An argument 141
against including young adults with children in the 142
NEET group is that becoming a parent represents a 143
level of responsibility and, particularly for females, 144
may limit a young person’s ability to participate in 145
employment or education. Therefore, it may be import- 146
ant to examine young adults with children separately 147
and not automatically classify them as being NEET. 148

In the current study, we use a prospective 149
population-based longitudinal cohort to examine inde- 150
pendent associations between common mental dis- 151
order, substance (i.e. alcohol and cannabis) use, and 152
disruptive behaviours in adolescence and being 153
NEET in young adulthood. We also introduce a second 154
outcome of ‘not in employment, education, parenting,
155 or training’ (NEEPT), and investigate how results are
156 affected when we include young adults with children
157 in the same category as those in employment, educa-
158 tion, or training. 159

Method 160

Study participants and analysis sample 161

Participants were recruited into the Victorian 162
Adolescent Health Cohort Study (VAHCS) at 14–15 163
years of age through a two-stage cluster random 164

165 sampling procedure. In the first stage, a stratified sam-
 166 ple of 45 government, independent, and Catholic sec-
 167 ondary schools in Victoria, Australia were randomly
 168 selected. One school with 13 participants did not con-
 169 tinue beyond the first wave and was withdrawn from
 170 the study, leaving 44 schools. In the second stage,
 171 two classes from each school were randomly selected
 172 to participate. Within each school, one of the classes
 173 entered the study in 1992, at the end of their ninth
 174 school year (wave 1), and the second class entered
 175 the study 6 months later in 1993 (wave 2).
 176 Participants from both entry waves were followed up
 177 a further four times in adolescence at 6-monthly inter-
 178 vals (waves 3–6), and four times in young to mid-
 179 adulthood at age 20–21 years (wave 7), 24–25 years
 180 (wave 8), 28–29 years (wave 9), and 34–35 years
 181 (wave 10). **Figure 1** shows the flow of participants
 182 through the study.

183 In waves 1–6, participants self-administered the
 184 study questionnaire on laptops in their classrooms,
 185 with telephone follow-up attempted for anyone who
 186 was absent. In waves 7–10, participants were surveyed
 187 over the phone using computer-assisted telephone inter-
 188 views. Participants' parents or guardians provided writ-
 189 ten informed consent at the entry waves. Participants
 190 gave verbal consent at each wave after receiving infor-
 191 mation on the content of the questionnaire.

192 The study design omitted more than half of the
 193 cohort in wave 1; therefore, waves 2–6 were used to
 194 summarise behaviours in the adolescent period.
 195 Some participants ($n = 56$) completed the questionnaire
 196 at wave 1 and had no further participation in adoles-
 197 cence. As waves 1 and 2 were only 6 months apart,
 198 we considered it reasonable to fill in wave 2 data for
 199 these 56 participants using their responses on the
 200 same measures at wave 1. This method has been
 201 adopted in previous analyses of this cohort (Patton
 202 *et al.* 2014). We restricted the measurement of the out-
 203 come (NEET status) to the young adult period, 20–25
 204 years of age (waves 7 and 8). From the initial intended
 205 sample of 2032 participants, 1943 (96%) took part at
 206 least once across the adolescent waves and hence had
 207 available data on the predictors of interest. Five parti-
 208 cipants had died by wave 8 and were excluded from
 209 the analysis, leaving a total of 1938 participants.

210 Measures

211 NEET status

212 The primary outcome, NEET status, was defined at the
 213 young adult waves 7 and 8 (mean ages 20.7 and 24.1
 214 years) using participant-reported information on
 215 employment, education, and training activities.
 216 Participants were asked whether they were currently
 217 enrolled in: university, private college, or an institute

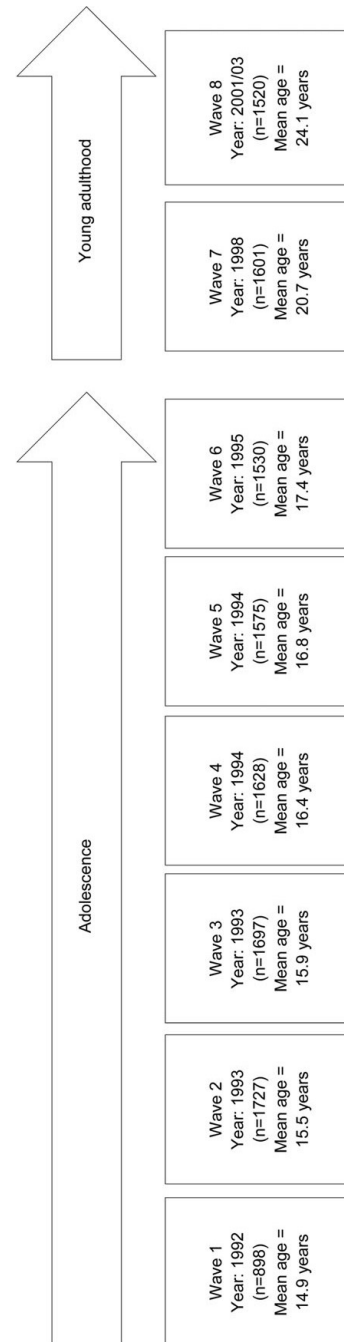


Fig. 1. Recruitment and follow-up of participants in the Victorian Adolescent Health Cohort, 1992–2003. There were two entry points (at wave 1 and wave 2).

218 for vocational education and training. Participants
219 were also asked about their current work status with
220 options of: have a paid job, volunteering, receiving
221 payment in kind (i.e. receiving goods or services in
222 return for work), or unemployed. We classified partici-
223 pants who did not have a paid job and were not cur-
224 rently studying or in training as NEET.

225 Some participants had children by waves 7 and
226 8. For the primary analysis, these participants were
227 classified according to their reported activities (i.e. if
228 they were not in employment, education, or training,
229 they were classified as NEET). For the secondary ana-
230 lysis, participants were classified using the outcome of
231 NEEPT (not in employment, education, *parenting*, or
232 training).

233 *Adolescent risk factors*

234 Information on common mental disorder, disruptive
235 behaviour, cannabis use, and drinking behaviour was
236 collected at each adolescent wave. Information across
237 waves 2–6 was used to create summary measures
238 that represent the severity or persistence of each risk
239 factor during adolescence.

240 *Common mental disorder*

241 Common mental disorder was assessed at each adoles-
242 cent wave using the revised Clinical Interview
243 Schedule (CIS-R), a standardised assessment designed
244 to measure symptoms of depression and anxiety in
245 non-clinical populations (Lewis *et al.* 1992). The total
246 CIS-R score (range 0–57) measures the severity of com-
247 mon mental disorder based on 14 symptoms: depres-
248 sion, anxiety, worry, irritability, compulsiveness,
249 obsessiveness, fatigue, somatic symptoms, concentra-
250 tion, sleep problems, worry over physical health,
251 depressive ideas, phobias, and panic.

252 The CIS-R was designed to be administered by
253 trained interviewers or self-administered using a com-
254 puter. Reliability studies have shown a good level of
255 agreement between CIS-R scores obtained by trained
256 interviewers and psychiatrists [$\kappa = 0.70$, 95% confidence
257 interval (CI) 0.51–0.88] and a moderately strong correla-
258 tion (0.77) between the CIS-R score and a clinical
259 judgement of severity made by a psychiatrist who
260 could ask additional questions (Lewis *et al.* 1992).
261 Further, the correlation between CIS-R scores obtained
262 through self-completed computerised assessments and
263 those obtained from assessments with trained inter-
264 viewers was 0.91 (Lewis, 1994).

265 Persistence of common mental disorders in adoles-
266 cence was categorised as: no waves, one wave, or
267 two or more waves with CIS-R ≥ 12 , the threshold at
268 which clinical intervention by a family doctor would
269 be appropriate (Lewis *et al.* 1992).

Disruptive behaviour

270 Disruptive behaviour was assessed at each adolescent
271 wave using nine items adapted from the Moffitt and
272 Silva self-report early delinquency scale (Moffitt &
273 Silva, 1988), which covers interpersonal conflict, theft,
274 property damage, and graffiti. At each wave, a variable
275 was derived to identify if a participant had reported
276 multiple disruptive behaviours. This could be the
277 same behaviour more than once, or two or more separ-
278 ate behaviours. For the adolescent summary measure,
279 a dichotomous variable was derived to represent per-
280 sistent disruptive behaviours in adolescence, defined
281 as multiple disruptive behaviours in two or more ado-
282 lescent waves. 283

Cannabis use

284 At each adolescent wave, participants were asked to
285 report their frequency of cannabis use in the previous
286 6 months. The response options were: never; not in
287 past 6 months; a few times a year; monthly; weekly;
288 daily. We derived a dichotomous variable to identify
289 frequent cannabis use, defined as weekly or daily can-
290 nabis use at one or more waves. 291

Drinking behaviour

292 Drinking behaviour was measured at each adolescent
293 wave using a 7-day retrospective alcohol diary. 294
295 Participants reported the type, brand, and amount of
296 alcohol consumed each day in the week before the
297 questionnaire, from which the daily number of (10 g)
298 units of alcohol was calculated. At each wave, partici-
299 pants were classified into one of three levels of drink-
300 ing behaviour: no drinking; at least one occasion of
301 drinking but no occasions of heavy binge drinking;
302 or at least one occasion of heavy binge drinking [20
303 or more units for males, and 11 or more units for
304 females on any day over the diary week (Livingston
305 *et al.* 2008)]. For the adolescent summary measure,
306 we used each participant's highest level of drinking
307 behaviour across the adolescent waves.

Potential confounders

308
309 *Parental education.* Parental education was used as an
310 indicator of socioeconomic status (Hauser, 1994). At
311 each wave, participants were asked to report the edu-
312 cation level of each parent, classified as: did not
313 finish high school; finished high school or a technical
314 college; or obtained a degree from a university or col-
315 lege. We used the information on the parent who
316 had the highest level of education by the end of the
317 adolescent waves to form the parental education
318 variable.

319 *Parental divorce or separation.* Participants were asked
320 about the marital status of their parents at each wave
321 in adolescence, and at waves 7 and 8. We derived a
322 dichotomous variable to indicate whether the partici-
323 pant's parents had divorced or separated prior to
324 their wave 6 interview.

325 *School location.* Finally, we included a dichotomous
326 variable to indicate whether the school that partici-
327 pants were enrolled in at the time of recruitment was
328 located in a metropolitan area (i.e. Melbourne, Victoria)
329 or outside this area.

330 *Analyses*

331 We estimated the prevalence of NEET in young adult-
332 hood and summarised the adolescent and family back-
333 ground characteristics, both overall and by gender.
334 Logistic regression models for being NEET at waves
335 7 and 8 were fitted using generalised estimating equa-
336 tions (Liang & Zeger, 1986), assuming an exchangeable
337 working correlation matrix with robust standard errors
338 to allow for the repeated outcome measure. A series of
339 models were fitted to estimate the association between
340 the adolescent risk factors and the odds of being NEET.
341 We estimated the effect of each adolescent risk factor
342 using univariable models (model a), a multivariable
343 model including the adolescent risk factors only
344 (model b), and a multivariable model including the
345 adolescent risk factors with additional adjustment for
346 gender, parental divorce or separation, level of paren-
347 tal education, school location, and the wave at which
348 the outcome was measured (model c). To examine
349 whether effects were modified by gender or the wave
350 at which the outcome was measured, we assessed the
351 inclusion of interaction terms in model c. Main effects
352 and interactions were assessed using (two-sided)
353 Wald tests. All analyses were repeated for the second-
354 ary outcome, NEEPT.

355 Some participants did not respond at all adolescent
356 and young adult waves. Of the 1938 participants
357 included in this study, 1031 (53%) took part in all
358 waves included in the analysis (i.e. waves 2–8), with
359 349 (18%) not participating in one wave, 216 (11%) in
360 two waves, and 343 (18%) in three or more waves.
361 Missing data were handled using multiple imputation
362 (Rubin, 1987). We generated 100 imputed datasets and
363 imputed at the wave level, separately for males and
364 females, using the method of chained equations (van
365 Buuren, 2007). The adolescent summary variables
366 were derived after imputation. All estimates were
367 obtained by averaging results across the 100 imputed
368 datasets with inferences under multiple imputation
369 obtained using Rubin's rules (Rubin, 1987). Further
370 details on the multiple imputation procedure are

provided in the online Supplementary Materials. We 371
used Stata version 14.1 (StataCorp, 2015) for all 372
analyses. 373

Finally, after considering the results obtained from 374
model c, we used the 'mimrgns' command (Klein, 375
2016) in Stata to compute the average predicted prob- 376
ability of being NEET among young people who had 377
reported all of the adolescent risk factors found to be 378
associated with NEET status. We also computed the 379
predicted probability of being NEET for young people 380
who had none of these risk factors. Predicted probabili- 381
ties were computed using observed values for the 382
remaining variables in the model. 383

Results 384

As shown in Table 1, 6–10% of males and females were 385
NEET at waves 7 and 8, with an apparent divergence 386
between genders at wave 8 due to a slight increase in 387
the prevalence of NEET among females. This differ- 388
ence between the genders resolved when the outcome 389
of NEEPT was used and participants with children 390
were classified into the same category as those in 391
employment, education, or training. The prevalence 392
of common mental disorder in adolescence was higher 393
for females than males, whereas males had higher rates 394
of disruptive behaviour and frequent cannabis use, 395
and tended to report riskier drinking behaviours dur- 396
ing adolescence. 397

Table 2 shows the estimated prevalence of NEET 398
status at each young adult wave for the adolescent risk 399
and background factors and Table 3 presents estimates 400
of the marginal odds ratios (OR) obtained from the 401
series of logistic regression models for being NEET in 402
young adulthood. When modelled separately (model 403
a), there was strong evidence that persistent common 404
mental disorders, frequent cannabis use, and persistent 405
disruptive behaviours in adolescence were each asso- 406
ciated with NEET status in young adulthood. These 407
effects were slightly weaker when the risk factors 408
were mutually adjusted in a multivariable model 409
(model b). Finally, when we included potential con- 410
founders and examined whether there was any evi- 411
dence of effect modification by gender or the wave at 412
which the outcome was measured (model c), there 413
was some evidence that the association between gen- 414
der and NEET status differed by the age at which 415
NEET status was measured; this interaction was 416
retained in the final model. In model c, the persistence 417
of common mental disorders in adolescence was inde- 418
pendently associated with NEET status in young 419
adulthood, with participants who experienced two or 420
more waves of disorder more likely to be NEET than 421
those with no waves of disorder in adolescence 422
[adjusted OR (OR_{adj}) = 1.58, 95% CI 1.08–2.33]. The 423

Table 1. Summary of NEET and NEEPT status and adolescent predictors, by gender and overall

Measures	Male participants (n = 939)		Female participants (n = 999)		Total participants (n = 1938)	
	n (%) ^a	(95% CI)	n (%) ^a	(95% CI)	n (%) ^a	(95% CI)
NEET status						
Wave 7 (mean age 20.7)	77 (8.2)	(6.0–10.4)	88 (8.8)	(6.9–10.8)	165 (8.5)	(7.1–9.9)
Wave 8 (mean age 24.1)	59 (6.3)	(4.3–8.3)	100 (10.0)	(8.0–12.1)	159 (8.2)	(6.8–9.7)
NEEPT status						
Wave 7	75 (8.0)	(5.8–10.2)	66 (6.6)	(4.9–8.4)	141 (7.3)	(5.9–8.7)
Wave 8	54 (5.8)	(3.9–7.8)	52 (5.2)	(3.6–6.8)	106 (5.5)	(4.3–6.8)
<i>Adolescent risk factors</i>						
Persistence of common mental disorder (CIS-R ≥ 12)						
No waves	660 (70.3)	(67.1–73.5)	458 (45.8)	(42.6–49.0)	1118 (57.7)	(55.3–60.0)
1 wave	143 (15.2)	(12.5–18.0)	173 (17.3)	(14.7–19.9)	316 (16.3)	(14.4–18.2)
2+ waves	136 (14.5)	(12.0–16.9)	368 (36.9)	(33.8–40.0)	504 (26.0)	(24.0–28.1)
Any frequent (at least weekly) cannabis use	181 (19.3)	(16.5–22.2)	119 (11.9)	(9.6–14.2)	300 (15.5)	(13.7–17.3)
Drinking behaviour						
No drinking	320 (34.1)	(30.8–37.5)	422 (42.3)	(39.1–45.5)	742 (38.3)	(36.0–40.7)
Any drinking, below heavy binge levels	418 (44.5)	(40.9–48.1)	400 (40.0)	(36.7–43.3)	818 (42.2)	(39.8–44.6)
Any heavy binge drinking	201 (21.4)	(18.4–24.3)	177 (17.7)	(15.2–20.2)	378 (19.5)	(17.6–21.4)
Persistent disruptive behaviour	376 (40.1)	(36.7–43.5)	223 (22.3)	(19.6–25.1)	599 (30.9)	(28.7–33.1)
<i>Background factors</i>						
School located outside metropolitan area	241 (25.7)	(22.9–28.5)	257 (25.7)	(23.1–28.5)	498 (25.7)	(23.8–27.7)
Highest level of education, either parent						
High school not completed	274 (29.2)	(26.2–32.3)	378 (37.8)	(34.8–40.9)	652 (33.7)	(31.5–35.8)
High school completed	338 (36.0)	(32.8–39.2)	323 (32.3)	(29.3–35.2)	661 (34.1)	(31.9–36.3)
University or college degree	326 (34.7)	(31.6–38.0)	299 (29.9)	(27.0–32.8)	625 (32.2)	(30.1–34.4)
Parental divorce or separation	217 (23.1)	(20.4–25.8)	221 (22.1)	(19.6–24.7)	438 (22.6)	(20.8–24.5)

CI, confidence interval; CIS-R, revised Clinical Interview Schedule; NEET, not in employment, education, or training; NEEPT, not in employment, education, parenting or training.

^a Estimated percentage of participants within each category, averaged over 100 imputed datasets.

424 odds of being NEET were also higher for participants
425 who reported persistent disruptive behaviour in ado-
426 lescence compared with those who reported no or
427 low disruptive behaviour ($OR_{adj} = 1.66$, 95% CI 1.13–
428 2.43). Participants who reported frequent cannabis
429 use in adolescence had higher odds of being NEET
430 compared with those who used cannabis infrequently
431 or not at all ($OR_{adj} = 1.71$, 95% CI 1.09–2.69). There
432 was little evidence of an association between drinking
433 behaviour in adolescence and NEET status in young
434 adulthood, particularly after controlling for other ado-
435 lescent risk factors.

436 An estimated 4.1% (95% CI 3.1–5.1%) of young peo-
437 ple had all three adolescent risk factors (i.e. two or
438 more waves of common mental disorder, persistent
439 disruptive behaviour, and frequent cannabis use dur-
440 ing adolescence), while 40.8% (95% CI 38.5–43.1%)
441 had none of these risk factors. The predicted probabili-
442 ty of being NEET for young people with none of the
443 adolescent risk factors was 5.4% (95% CI 4.0–6.8%),

444 whereas young people with all three risk factors had
445 a 20.1% (95% CI 13.5–26.8%) probability of being
446 NEET.

447 The results for the outcome of NEEPT are presented
448 in the online Supplementary Materials (Tables B1 and
449 B2). Around 7–8% and 5–6% of participants were
450 NEEPT at waves 7 and 8, respectively. The associations
451 between the adolescent risk factors and NEEPT status
452 reflected the results for NEET, although the effect of
453 persistent disruptive behaviour was weakened slightly
454 in the model for NEEPT.

455 Discussion

456 The transition from school into employment is crucial
457 to support a young person's development towards a
458 point at which they can make their own decisions,
459 accept responsibility, and be financially independent
460 (Arnett, 2014). Young adults who fail to make this tran-
461 sition are at risk of long-term unemployment, 461

Table 2. Prevalence of NEET status in young adulthood, by adolescent risk and background factors

Measures	n ^a	Per cent NEET			
		Wave 7 (mean age 20.7)		Wave 8 (mean age 24.1)	
		n (%) ^b	(95% CI)	n (%) ^b	(95% CI)
<i>Adolescent risk factors</i>					
Persistence of common mental disorder (CIS-R \geq 12)					
No waves	1118	76 (6.8)	(5.0–8.6)	64 (5.8)	(4.1–7.5)
1 wave	316	30 (9.5)	(5.5–13.5)	27 (8.5)	(4.5–12.6)
2+ waves	504	59 (11.7)	(8.5–15.0)	68 (13.5)	(10.0–16.9)
Cannabis use					
None or infrequent use	1638	113 (6.9)	(5.5–8.4)	121 (7.4)	(5.9–8.9)
Frequent (at least weekly) use	300	52 (17.4)	(11.8–23.0)	38 (12.8)	(8.2–17.3)
Drinking behaviour					
No drinking	742	52 (7.1)	(4.9–9.3)	58 (7.9)	(5.6–10.3)
Any drinking, below heavy binge levels	818	68 (8.3)	(6.0–10.7)	61 (7.4)	(5.3–9.5)
Any heavy binge drinking	378	45 (11.8)	(7.7–15.9)	40 (10.5)	(6.8–14.1)
Persistent disruptive behaviour					
No	1339	84 (6.3)	(4.7–7.8)	92 (6.9)	(5.3–8.5)
Yes	599	81 (13.6)	(10.3–16.8)	67 (11.2)	(8.2–14.2)
<i>Background factors</i>					
Gender					
Male	939	77 (8.2)	(6.0–10.4)	59 (6.3)	(4.3–8.3)
Female	999	88 (8.8)	(6.9–10.8)	100 (10.0)	(7.9–12.1)
School location					
Within metropolitan area	1440	111 (7.7)	(6.1–9.3)	111 (7.7)	(6.1–9.3)
Outside metropolitan area	498	54 (11.0)	(7.8–14.1)	48 (9.7)	(6.8–12.6)
Highest level of parental education					
High school not completed	652	73 (11.3)	(8.5–14.0)	61 (9.4)	(6.8–12.0)
High school completed	661	59 (8.9)	(6.4–11.4)	54 (8.2)	(5.8–10.6)
University or college degree	625	33 (5.3)	(3.2–7.3)	44 (7.0)	(4.7–9.3)
Parental divorce or separation					
No	1500	101 (6.7)	(5.3–8.2)	103 (6.9)	(5.4–8.4)
Yes	438	64 (14.7)	(10.8–18.6)	56 (12.7)	(9.2–16.2)

CI, confidence interval; CIS-R, revised Clinical Interview Schedule.

^a Calculated using imputed percentage estimates and total number of participants.

^b Estimated number and percentage of participants who are NEET (not in employment, education, or training), averaged over 100 imputed datasets.

462 economic disadvantage, and social exclusion (Hale
463 *et al.* 2015; ILO, 2015).

464 A range of social and contextual factors, particularly
465 high unemployment rates, affect a young person's abil-
466 ity to obtain employment (ILO, 2015). The current
467 study has also identified important adolescent risk fac-
468 tors associated with a failure to make a smooth transi-
469 tion from school into employment, or further
470 education or training in young adulthood. Persistent
471 common mental disorders (i.e. reported in two or
472 more adolescent waves), persistent disruptive beha-
473 viours, and frequent cannabis use were each independ-
474 ently associated with being NEET in young adulthood.
475 Although adolescents with all three risk factors

represent a small percentage of the population, their
476 risk of being NEET is around 20%, compared with
477 only a 5% risk for those with no reported episodes of
478 common mental disorder, and little or no disruptive
479 behaviour and cannabis use in adolescence. There
480 was little evidence that drinking behaviour was an
481 independent predictor of NEET status. This result is
482 consistent with studies on unemployment or educa-
483 tional underachievement, which suggest that there is
484 only weak, if any, evidence that alcohol is a risk factor
485 for these separate outcomes (Wells *et al.* 2004; Patton
486 *et al.* 2007).
487

The percentage of young adults who were NEET in
488 this population ranged from 6% to 10%, depending on
489

Table 3. Association between adolescent risk factors and NEET status in young adulthood (waves 7 and 8)

Measures	Model a Risk factors fitted separately		Model b Risk factors mutually adjusted		Model c Adjusted for potential confounders ^a	
	OR (95% CI)	<i>p</i> value	OR _{adj} (95% CI)	<i>p</i> value	OR _{adj} (95% CI)	<i>p</i> value
<i>Adolescent risk factors</i>						
Persistence of common mental disorder (CIS-R ≥ 12)		0.0002 ^b		0.003 ^b		0.07 ^b
No waves	1.00		1.00		1.00	
1 wave	1.47 (0.92–2.36)		1.35 (0.83–2.18)		1.30 (0.79–2.13)	
2+ waves	2.15 (1.50–3.08)		1.86 (1.30–2.71)		1.60 (1.08–2.40)	
Frequent (at least weekly) cannabis use	2.30 (1.58–3.36)	<0.0001	1.81 (1.15–2.85)	0.01	1.74 (1.10–2.75)	0.02
Drinking behaviour		0.09 ^b		0.75 ^b		0.60 ^b
No drinking	1.00		1.00		1.00	
Any drinking, below heavy binge levels	1.05 (0.74–1.51)		0.87 (0.59–1.26)		0.84 (0.58–1.23)	
Any heavy binge drinking	1.54 (1.03–2.31)		0.87 (0.53–1.44)		0.80 (0.48–1.34)	
Persistent disruptive behaviour	2.01 (1.46–2.76)	<0.0001	1.58 (1.08–2.31)	0.02	1.71 (1.15–2.43)	0.01
<i>Potential confounding factors</i>						
School located outside metropolitan area					1.42 (1.02,1.97)	0.04
Highest level of parental education						0.03 ^b
High school not completed					1.00	
High school completed					0.91 (0.64–1.28)	
University or college degree					0.59 (0.40–0.87)	
Parental divorce or separation					1.75 (1.26–2.43)	0.009
Female					1.09 (0.71–1.68)	0.81
Outcome at wave 8 (<i>v.</i> wave 7)					0.75 (0.50–1.11)	0.12
Female × wave 8 interaction					1.54 (0.95–2.49)	0.08

OR, odds ratio; OR_{adj}, adjusted odds ratio; CI, confidence interval; CIS-R, revised Clinical Interview Schedule; NEET, not in employment, education, or training.

Note: ORs were obtained using generalised estimating equations assuming an exchangeable working correlation matrix with robust standard errors to allow for the repeated outcome measure.

^a Also adjusted for wave at which outcome was measured.

^b *p* value from joint test of significance.

490 age and gender. While this result is consistent with the
491 OECD estimate for Australians aged 20–24 years,
492 which has been reported to average around 10% over
493 the past decade, it is lower than the average global
494 NEET rate of 18% (OECD, 2015). The rate of young
495 people who are NEET is influenced by country-specific
496 unemployment rates, as well as cultural factors.
497 However, we consider it reasonable to assume that
498 individual risk factors for being NEET may be similar
499 in their relative effects across countries.

500 The current study involved a large prospective
501 community-based cohort, frequent measurement
502 points, and high rates of participation. It also examined
503 a range of well-measured adolescent risk factors and
504 controlled for an appropriate set of potential confoun-
505 ders. Nevertheless, this study also had some limita-
506 tions. Data on adolescent risk factors were based on
507 self-report and may have been subject to measurement
508 error. However, the use of laptops for self-administered

509 health surveys, as done in the current study, has been
510 shown to enhance adolescents' perceptions of privacy
511 and confidentiality, which may reduce the potential
512 for reporting bias and improve response on individual
513 items (Watson *et al.* 2001). NEET status in the young
514 adult waves was based on employment and education
515 activities at the time of the questionnaire and possibly
516 reflected a temporary situation. Counting participants
517 who had only been NEET for a short time would pro-
518 duce more conservative estimates of associations, and
519 it is likely that we correctly classified participants
520 who had been NEET over a longer period. Not all par-
521 ticipants responded at every wave in adolescence and
522 young adulthood, which meant we were faced with
523 the problem of missing data. Multiple imputation
524 was used to reduce the potential bias caused by miss-
525 ing data, and the imputation models were carefully
526 built to include predictors of response and predictors
527 of the incomplete variables (Collins *et al.* 2001). 527

528 Finally, although we considered the sensitivity of
529 results to how participants with children were clas-
530 sified, there may have been other reasons for being
531 NEET that were not considered, such as being in a full-
532 time carer's role, having a physical disability or illness,
533 or choosing to take time off for a holiday (Eurofound,
534 2016).

535 Very few studies on NEET have considered how the
536 classification of participants in a full-time parenting
537 role may affect results. We specified a second outcome
538 measure, NEEPT status, in which we classified young
539 adults who had children into the same category as
540 those in education, employment, or training. The
541 prevalence of NEEPT was slightly lower than that of
542 NEET, particularly for females at 24–25 years of age,
543 whereas the results for the adolescent risk factors
544 were reasonably consistent between the two outcomes.
545 While it did not appear to affect the conclusions for our
546 study, it is possible that the classification of partici-
547 pants with children as NEET (if they are not in employ-
548 ment, education, or training) may begin to introduce
549 unwanted heterogeneity as people move into their
550 late 20s. It is therefore recommended that researchers
551 who examine predictors and consequences of being
552 NEET in adulthood, and policymakers who seek to
553 reduce the NEET rate, carefully consider the composi-
554 tion of the group they define as NEET, provide details
555 on how they have defined this group, and consider
556 similar sensitivity analyses to those conducted for the
557 current study.

558 The association between persistent common mental
559 disorders in adolescence and being NEET in young
560 adulthood may reflect a continuation of disorder into
561 young adulthood. Indeed, although around 50% of
562 adolescents who experience common mental disorders
563 do not have further episodes in young adulthood,
564 those exhibiting longer lasting or recurrent episodes
565 are most at risk of experiencing persisting disorder
566 into young adulthood (Patton *et al.* 2014). The contin-
567 uation of common mental disorder into young adult-
568 hood can directly limit a person's ability to gain
569 employment, for example, by reducing the ability to
570 maintain motivation or cope with stress during the
571 job application process (Secker *et al.* 2001). The relation-
572 ship between common mental disorder and later NEET
573 status might also be mediated by school-related factors
574 including absenteeism due to anxious school refusal
575 (Heyne *et al.* 2001; Egger *et al.* 2003), although this is
576 beyond the scope of the current manuscript. Further
577 research examining the separate contributions of
578 depression and anxiety may also help to explain the
579 relationship between common mental disorders in
580 adolescence and later NEET status.

581 Disengagement from school is also likely to be par-
582 tially mediating the associations between cannabis

583 use, disruptive behaviour, and NEET status. Previous
584 studies have shown that heavy cannabis use in adoles-
585 cence reduces the odds of high school completion
586 (Horwood *et al.* 2010; Lynskey *et al.* 2003; Silins *et al.*
587 2014) and is associated with lower degree attainment
588 (Silins *et al.* 2014). In their study focused on peer
589 aggression, Moore *et al.* (2015) found that non-
590 completion of high school explained the relationship
591 between being a perpetrator of peer aggression and
592 being NEET at 20 years of age.

593 Frequent cannabis use and disruptive behaviours in
594 adolescence may also be indicative of a personality
595 type, or peer group affiliations that reject the social
596 norms associated with the levels of compliance,
597 responsibility, and commitment required to engage
598 with study or work (Fergusson & Horwood, 1997).
599 High levels of disruptive, particularly aggressive,
600 behaviour may also reflect problems with managing
601 emotions that are likely to affect one's ability to gain
602 and maintain employment.

603 An increasing amount of evidence suggests that
604 heavy cannabis use impairs cognitive performance
605 (Hall, 2015). Although impairment in cognitive per-
606 formance has mainly been acute, some research has
607 suggested that heavy cannabis use impairs decision-
608 making and planning, even after a period of abstinence
609 (Crean *et al.* 2011). The ability to plan and make deci-
610 sions has an important role in tasks relating to job-
611 seeking and other activities relating to employment
612 and education. Adolescent cannabis users have also
613 reported reduced interest in activities and lower
614 energy levels (Palamar *et al.* 2014). Such reductions in
615 interest and energy have been identified as possible
616 symptoms of cannabis induced 'amotivational syn-
617 drome' (Tennant & Groesbeck, 1972).

618 To the extent that these associations reflect causal
619 pathways, our study reinforces the importance of pre-
620 vention and early clinical intervention for common
621 mental disorders, cannabis use, and disruptive beha-
622 viours in adolescence. A particularly concerning statis-
623 tic from a survey of youth who had presented at a
624 primary mental health service was that only 10% of
625 respondents who were NEET had received any specific
626 vocational support in the previous year (O'Dea *et al.*
627 2016). To reduce the potential for long-term disadvan-
628 tage among young people who are, or at risk of,
629 becoming NEET it is important that evidence-based
630 programmes focused on vocational support be imple-
631 mented. For example, a recent meta-analysis demon-
632 strated that individual placement and support, which
633 adopts a 'place then train' approach to vocational sup-
634 port for people with severe mental illness, was more
635 than twice as likely to lead to competitive employment
636 compared with traditional vocational rehabilitation
637 methods that essentially adopt a 'train then place'

638 model (Modini *et al.* 2016). To target the disruptive
639 behaviours, it is recommended that early interventions
640 be aimed towards improving adolescents' interpersonal
641 skills and their ability to manage emotions
642 (Obsuth *et al.* 2014).

643 The association between frequent cannabis use in
644 adolescence and the increased risk of being NEET in
645 young adulthood is particularly relevant given trends
646 towards the legalisation of cannabis use in some coun-
647 tries. With the potential for increased availability and
648 ease of access to cannabis, as well as a possible reduc-
649 tion in adolescents' perception of the potential harms,
650 there is a risk that a change in the legal status of canna-
651 bis may increase the rates of adolescent use (Ammerman
652 *et al.* 2015). In this context, it is important that any
653 legislation be accompanied by regulatory measures
654 that minimise recreational adolescent cannabis use.

655 Supplementary Material

656 The supplementary material for this article can be
657 found at <https://doi.org/10.1017/S0033291717002434>.

658 Acknowledgements

659 Data collection for this study was supported by the
660 National Health and Medical Research Council of
661 Australia (NHMRC) and the Victorian Government's
662 Operational Infrastructure Program. GCP is supported
663 by an NHMRC senior principal research fellowship
664 (APP1019877). KJL is supported by an NHMRC career
665 development fellowship (APP1053609). WN is sup-
666 ported by The Research Council of Norway (218373).

667 Declaration of Interest

668 None.

669 Ethics Statement

670 Ethical approval for the study was obtained from the
671 Human Research Ethics Committee of the Royal
672 Children's Hospital (Victoria, Australia). The authors
673 assert that all procedures contributing to this work
674 comply with the ethical standards of the relevant
675 national and institutional committees on human
676 experimentation and with the Helsinki Declaration of
677 1975, as revised in 2008.

678 References

679 Ammerman S, Ryan S, Adelman WP, Levy S, Ammerman
680 SD, Gonzalez PK, Ryan SA, Siqueira LM, Smith VC,
681 Braverman PK (2015). The impact of marijuana policies on

youth: clinical, research, and legal update. *Pediatrics* 135, 682
e769–e785. 683
Arnett JJ (2014). *Emerging Adulthood: The Winding Road From* 684
the Late Teens Through the Twenties. Oxford University Press: 685
New York. 686
Baggio S, Iglesias K, Deline S, Studer J, Henchoz Y,
Mohler-Kuo M, Gmel G (2015). Not in education,
employment, or training status among young Swiss men.
Longitudinal associations with mental health and substance
use. *Journal of Adolescent Health* 56, 238–243. 691
Benjet C, Hernández-Montoya D, Borges G, Méndez E,
Medina-Mora ME, Aguilar-Gaxiola S (2012). Youth who
neither study nor work: mental health, education and
employment. *Salud Publica de México* 54, 410–417. 695
Coles B, Hutton S, Bradshaw J, Craig G (2002). *Literature*
Review of the Costs of Being 'Not in Education, Employment, or
Training' at Age 16–18. University of York: Norwich, UK. 698
Collins LM, Schafer JL, Kam CM (2001). A comparison of
inclusive and restrictive strategies in modern missing data
procedures. *Psychological Methods* 6, 330. 701
Cornaglia F, Crivellaro E, McNally S (2012). *Mental Health and*
Education Decisions. London School of Economics: London. 703
Crean RDP, Crane NABA, Mason BJP (2011). An
evidence-based review of acute and long-term effects of
cannabis use on executive cognitive functions. *Journal of*
Addiction Medicine 5, 1–8. 707
Egger HLMD, Costello JEPD, Angold AMRCP (2003). 708
School refusal and psychiatric disorders: a community
study. *Journal of the American Academy of Child and*
Adolescent Psychiatry 42, 797–807. 711
Eurofound (2012). *NEETs – Young People not in Employment,*
Education or Training: Characteristics, Costs and Policy
Responses in Europe. Publications Office of the European
Union: Luxembourg. 715
Eurofound (2016). *Exploring the Diversity of NEETs*.
Publications Office of the European Union: Luxembourg. 717
European Union Committee (2014). *Youth Unemployment in*
the EU: A Scarred Generation? House of Lords: Great Britain. 719
Fergusson DM, Horwood L (1997). Early onset cannabis use
and psychosocial adjustment in young adults. *Addiction* 92,
279–296. 722
Hale DR, Bevilacqua L, Viner RM (2015). Adolescent health
and adult education and employment: a systematic review.
Pediatrics 136, 128–140. 725
Hall W (2015). What has research over the past two decades
revealed about the adverse health effects of recreational
cannabis use? *Addiction* 110, 19–35. 728
Hauser RM (1994). Measuring socioeconomic status in studies
of child development. *Child Development* 65, 1541–1545. 730
Heyne D, King NJ, Tonge BJ, Cooper H (2001). School
refusal: epidemiology and management. *Pediatric Drugs* 3,
719–732. 733
Horwood LJ, Fergusson DM, Hayatbakhsh MR, Najman
JM, Coffey C, Patton GC, Silins E, Hutchinson DM (2010).
Cannabis use and educational achievement: findings from
three Australasian cohort studies. *Drug and Alcohol*
Dependence 110, 247–253. 738
International Labour Office (2015). *World Employment and*
Social Outlook: Trends 2015. International Labour Office:
Geneva. 741

- 742 **Klein D** (2016). MIMRGENS: Stata module to run margins after
 Q4 743 mi estimate. *Statistical Software Components*.
 744 **Lewis G** (1994). Assessing psychiatric disorder with a human
 745 interviewer or a computer. *Journal of Epidemiology and*
 746 *Community Health* **48**, 207–210.
 747 **Lewis G, Pelosi AJ, Araya R, Dunn G** (1992). Measuring
 748 psychiatric disorder in the community: a standardized
 749 assessment for use by lay interviewers. *Psychological*
 750 *Medicine* **22**, 465–486.
 751 **Liang K-Y, Zeger SL** (1986). Longitudinal data analysis using
 752 generalized linear models. *Biometrika* **73**, 13–22.
 753 **Livingston M, Laslett A-M, Dietze P** (2008). Individual and
 754 community correlates of young people's high-risk drinking
 755 in Victoria, Australia. *Drug and Alcohol Dependence* **98**,
 756 241–248.
 757 **Lloyd CB** (2005). *The Changing Transitions to Adulthood in*
 758 *Developing Countries: Selected Studies*. National Academies
 759 Press: Washington, DC.
 760 **Lynskey MT, Coffey C, Degenhardt L, Carlin JB, Patton G**
 761 (2003). A longitudinal study of the effects of adolescent
 762 cannabis use on high school completion. *Addiction* **98**,
 763 685–692.
 764 **Modini M, Tan L, Brinchmann B, Wang M-J, Killackey E,**
 765 **Glozier N, Mykletun A, Harvey SB** (2016). Supported
 766 employment for people with severe mental illness:
 767 systematic review and meta-analysis of the international
 768 evidence. *The British Journal of Psychiatry* *bjp*.
 Q5 769 bp. 115.165092.
 770 **Moffitt TE, Silva PA** (1988). Self-reported delinquency:
 771 results from an instrument for New Zealand. *Australian and*
 772 *New Zealand Journal of Criminology* **21**, 227–240.
 773 **Moore SE, Scott JG, Thomas HJ, Sly PD, Whitehouse AJ,**
 774 **Zubrick SR, Norman RE** (2015). Impact of adolescent peer
 775 aggression on later educational and employment outcomes
 776 in an Australian cohort. *Journal of Adolescence* **43**, 39–49.
 777 **Nanchahal K, Wellings K, Barrett G, Copas AJ, Mercer CH,**
 778 **Macmanus S, Macdowall W, Fenton KA, Erens B, Johnson**
 779 **AM** (2005). Changes in the circumstances of young mothers
 780 in Britain: 1990 to 2000. *Journal of Epidemiology and*
 781 *Community Health* **59**, 828–833.
 782 **Nardi B, Arimatea E, Giunto P, Lucarelli C, Nocella S,**
 783 **Bellantuono C** (2013). Not employed in education or
 784 training (NEET) adolescents with unlawful behaviour: an
 785 observational study. *Journal of Psychopathology* **19**, 42–48.
 786 **Nardi B, Lucarelli C, Talamonti M, Arimatea E, Fiori V,**
 787 **Moltedo-Perfetti A** (2015). NEETs versus EETs: an
 788 observational study in Italy on the framework of the
 789 HEALTH25 European project. *Research in Post-Compulsory*
 790 *Education* **20**, 377–399.
 791 **Nilsen W, Olsson CA, Karevold E, O'Loughlin C, McKenzie**
 792 **M, Patton GC** (2012). Adolescent depressive symptoms and
 793 subsequent pregnancy, pregnancy completion and
 794 pregnancy termination in young adulthood: findings from
 795 the Victorian adolescent health cohort study. *Journal of*
 796 *Pediatric and Adolescent Gynecology* **25**, 6–11.
 797 **Obsuth I, Sutherland A, Pilbeam L, Scott S, Valdebenito S,**
 798 **Carr R, Eisner M** (2014). London education and inclusion
 799 project (LEIP): a cluster-randomised controlled trial
 800 protocol of an intervention to reduce antisocial behaviour
 and improve educational/occupational attainment for
 pupils at risk of school exclusion. *BMC Psychology* **2**, 24.
O'Dea B, Glozier N, Purcell R, McGorry PD, Scott J, Feilds
K-L, Hermens DF, Buchanan J, Scott EM, Yung AR,
Killackey E, Guastella AJ, Hickie IB (2014). A
 cross-sectional exploration of the clinical characteristics of
 disengaged (NEET) young people in primary mental
 healthcare. *BMJ Open* **4**. doi: 10.1136/bmjopen-2014-006378.
O'Dea B, Lee RS, McGorry PD, Hickie IB, Scott J, Hermens
DF, Mykletun A, Purcell R, Killackey E, Pantelis C (2016).
 A prospective cohort study of depression course, functional
 disability, and NEET status in help-seeking young adults.
Social Psychiatry and Psychiatric Epidemiology **51**, 1395–1404.
OECD (2015). *OECD Employment Outlook 2015*. OECD
 Publishing: Paris.
Olsson CA, Horwill E, Moore E, Eisenberg ME, Venn A,
O'Loughlin C, Patton GC (2014). Social and emotional
 adjustment following early pregnancy in young Australian
 women: a comparison of those who terminate, miscarry, or
 complete pregnancy. *Journal of Adolescent Health* **54**,
 698–703.
Palamar JJ, Fenstermaker M, Kamboukos D, Ompad DC,
Cleland CM, Weitzman M (2014). Adverse psychosocial
 outcomes associated with drug use among US high school
 seniors: a comparison of alcohol and marijuana. *The*
American Journal of Drug and Alcohol Abuse **40**, 438–446.
Patton GC, Coffey C, Lynskey MT, Reid S, Hemphill S,
Carlin JB, Hall W (2007). Trajectories of adolescent alcohol
 and cannabis use into young adulthood. *Addiction* **102**,
 607–615.
Patton GC, Coffey C, Romaniuk H, Mackinnon A, Carlin JB,
Degenhardt L, Olsson CA, Moran P (2014). The
 prognosis of common mental disorders in adolescents:
 a 14-year prospective cohort study. *The Lancet* **383**,
 1404–1411.
Power E, Clarke M, Kelleher I, Coughlan H, Lynch F,
Connor D, Fitzpatrick C, Harley M, Cannon M (2015). The
 association between economic inactivity and mental health
 among young people: a longitudinal study of young adults
 who are not in employment, education or training. *Irish*
Journal of Psychological Medicine **32**, 155–160.
Rubin DB (1987). *Multiple Imputation for Nonresponse in*
Surveys. Wiley: New York.
Secker J, Grove B, Seeböhm J (2001). Challenging barriers to
 employment, training and education for mental health
 service users: the service user's perspective. *Journal of*
Mental Health **10**, 395–404.
Silins E, Horwood LJ, Patton GC, Fergusson DM, Olsson
CA, Hutchinson DM, Spry E, Toumbourou JW,
Degenhardt L, Swift W (2014). Young adult sequelae of
 adolescent cannabis use: an integrative analysis. *The Lancet*
Psychiatry **1**, 286–293.
StataCorp (2015). *Stata Statistical Software: Release 14*.
 StataCorp LP: College Station, TX.
Tennant FS, Groesbeck CJ (1972). Psychiatric effects of
 hashish. *Archives of General Psychiatry* **27**, 133–136.
van Buuren S (2007). Multiple imputation of discrete and
 continuous data by fully conditional specification. *Statistical*
Methods in Medical Research **16**, 219–242.

- 860 **Veldman K, Reijneveld SA, Almansa Ortiz J, Verhulst FC,**
861 **Bültmann U** (2015). Mental health trajectories from
862 childhood to young adulthood affect the educational and
863 employment status of young adults: results from the
864 TRAILS study. *Journal of Epidemiology and Community Health*
865 **69**, 588–593.
- 866 **Watson PD, Denny SJ, Adair V, Ameratunga SN, Clark TC,**
867 **Crengle SM, Dixon RS, Fa'asisila M, Merry SN, Robinson**
868 **EM, Sporle AA** (2001). Adolescents' perceptions of a health
869 survey using multimedia computer-assisted self-
administered interview. *Australian and New Zealand Journal
of Public Health* **25**, 520–524. 870 871
- Wells JE, Horwood LJ, Fergusson DM** (2004). Drinking
872 patterns in mid-adolescence and psychosocial outcomes
873 in late adolescence and early adulthood. *Addiction* **99**,
874 1529–1541. 875
- Woodward L, Fergusson DM, Horwood LJ** (2001). Risk
876 factors and life processes associated with teenage
877 pregnancy: results of a prospective study from birth to 20
878 years. *Journal of Marriage and Family* **63**, 1170–1184. 879