Mental health service use, depression, panic disorder and life events among Swedish young adults in 2000 and 2010: a repeated cross-sectional population study in Stockholm County, Sweden

A. Lundin[1,2]*, Y. Forsell[1] and C. Dalman[1,2]

[1] *Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden*

[2] *Centre for Epidemiology and Community Medicine, Stockholm County Council, Stockholm, Sweden*

Aims. The use of specialised psychiatric services for depression and anxiety has increased steadily among young people in Sweden during recent years. It is not known to what extent this service use is due to an increase in psychiatric morbidity, or whether other adversities explain these trends. The aim of this study is to examine if there is increased use of psychiatric services among young adults in Sweden between 2000 and 2010, and if so, to what extent this increase is associated with differences in depression, anxiety and negative life events.

Methods. This is a repeated cross-sectional study of 20–30-year old men and women in Stockholm County in 2000 and 2010 ($n = 2590$ and $n = 1120$). Log-binomial regression analyses were conducted to compare the prevalence of service use, depression and panic disorder between the two cohorts. Self-reported life events were entered individually and as a summary index, and entered as potential mediators. Different effects of life events on service use were examined through interaction analysis. We report prevalence proportion ratios (PPR) with 95% confidence intervals.

Results. Specialised psychiatric service use, but also depression and panic disorder was more common in the younger cohort (current service use 2.4 and 5.0%). The younger cohort did not report more life events overall or among those with depression or anxiety. Neither depression, panic disorder nor life events could explain the increased use of psychiatric services in the younger cohort (Fully adjusted model PPR = 1.70, 1.20–2.40 95% CI). There was no significant interaction between cohort and life events in predicting psychiatric service use.

Conclusion. This study provides initial support for an increase in service use among young adults compared with 10 years earlier. The increased service use cannot be explained with increasing worse life situations.

Introduction

The use of specialised psychiatric services has increased steadily among young people in Sweden during the last decade. Between year 2000 and 2010 the yearly rate of inpatient care for depression increased from 53 to 98/100 000 in 20–29-year old men, and from 87 to 119/100 000 in women (Jacobsson, 2014). Even more dramatic increase was seen in inpatient care for anxiety disorders, from 25 to 73/100 000 in men and from 46 to 127/100 000 in women (Jacobsson, 2014). It is not known to what extent this increase is, either because of an increase in psychiatric morbidity, or whether other factors explain these trends. Population-based prevalence studies have not uniformly confirmed the obvious increase found in service use registers. General level of common mental disorder as measured by the General Health Questionnaire remain unchanged in the National Public Health Survey 2004–2010 (PHA, 2015), but has increased in the Stockholm Public Health Survey 2002–2010 (SLSO, 2011). Moreover, self-reported anxiety symptoms among 16–24 year olds increased dramatically between the 1998 and 2005 National Living Conditions Survey/SILC, from 4 to 14% in men and from 9 to 30% in women (Lager *et al.* 2012).

The general media and professionals have revealed great concerns over the increase in service use for young people (Cederblad, 2013; SR, 2014; Bremberg, 2015; Hällström, 2015). A reoccurring explanation to

* Address for correspondence: A. Lundin, Public Health Epidemiology, Department of Public Health, Karolinska Institutet, Stockholm, SE-171 76, Sweden.

(Email: andreas.lundin@ki.se)

the increased trend in service use is that young people seek and receive treatment for difficulties that should be better considered as part of life and not disorders. Adverse life events and difficulties, (e.g., interpersonal conflicts, relationship breakdowns, unemployment, problems at work and financial problems) are established risk factors for depression, anxiety disorders and suicide. Hence, secular changes in the chances of employment or deterioration of the schooling system, are potential causes of the general increase in ill health in society (OECD, 2013) and among Swedish youth (Lager & Bremberg, 2009; Bremberg, 2015). Generally however, it is not known if young people experience more or different adverse life events than before, or if the association between life events, disorders and with receiving psychiatric services has changed.

Because there are few population-based studies on mental health status using the same measures of common mental disorder that also has information on life events, we set out to examine potential differences in mental health service use, depression and panic disorder and the role of adverse acute life events in a large repeated population survey conducted in Stockholm 2000–2010.

We aim to examine if there are increases in psychiatric services use between young adults in Sweden between 2000 and 2010, and to test to what extent any increase is associated with differences in depression, panic disorder and negative life events. The following research questions are posed:

Is there an increase in psychiatric service use, depression and panic disorders between 2000 and 2010?

Are there differences in the frequency adverse life events between 2000 and 2010?

To what extent can any differences in the prevalence of depression, panic disorders or adverse life events explain any increase in psychiatric service use?

Method

Samples

Data derived from a repeated cross-sectional study of 20–30-year old men and women in Stockholm County in 2000 and 2010, which are part of a longitudinal project called the Mental Health, Work and Relations study (PART by Swedish acronym) designed to study risk and protective factors for mental illness in the general adult population. The 2000 cohort was a random sample of Swedish citizens age 20–64 residing in Stockholm who completed a postal questionnaire ($n = 10\,441$, 53% participation, 20–30-year olds $n = 2590$). These individuals were approached again with similar postal questionnaires in 2003 and 2010. At the 2010 wave a new random sample of Swedish citizens age 20–30 residing in Stockholm was drawn. A total of 4956 individuals received a postal questionnaire similar to the previous, to which 1108 responded (22.4%). The sampling and background to the survey is described in detail elsewhere (Hällström *et al.* 2003).

The ethical review board at the Karolinska Institutet, Stockholm, approved the study and informed consent was obtained from all participants.

Variables

Psychiatric service use information refer to 'psychiatric disorder or anxious discomfort' and was included in a list of 27 diseases or symptoms for which the respondent was asked to indicate present (1) or previous (2) treatment by physician or hospital care (there was no alternative for non-presence of disease or symptom).

Depression was assessed using the Major Depression Inventory (MDI), which refers to depressive symptoms in the last 14 days. The version used was slightly modified to correspond to DSM-IV major depression symptoms, and the external validity has previously been examined in a sub-cohort of the baseline sample where agreement between MDI and SCAN-DSM-IV depressive disorder (major depression or dysthymia) was found to be excellent (Forsell, 2005). We used the DSM-IV scoring algorithm recommended in the MDI manual as criteria for depression/no depression (Bech *et al.* 2001).

Panic disorder was assessed using 20 questions from the Sheehan Patient-Rated Anxiety Scale (SPRAS) modified to cover DSM-IV criteria (Sheehan, 1983; Dahlberg *et al.* 2007). All items refer to amount of distress in the last 30 days with Likert response alternatives ranging from not at all (0) to very much (4), which were dichotomised as present or not. We used the DSM-5 algorithm (which is simpler than DSM-IV), where recurrent unexpected panic attacks together with ≥4 of the 13 panic attack symptoms and worry over recurring attack indicated Panic disorder. Maladaptive behaviour could not be assessed. When compared with SCAN-DSM-IV panic disorder the sensitivity and specificity was 69 and 75% ($n = 1091$).

Life events information was collected by a 22 item checklist in the postal questionnaire asking for 12 month occurrence of potentially stressful events.

We considered differences in living arrangements, education and immigrant status as potential confounders. Cohabitation was measured with a question on living with another adult person, with response categories No, Yes with partner/spouse, Yes with parent(s), Yes, with other. Education was reported as highest completed and initiated level in the Swedish school system and divided into three levels depending

on years of completed studies: compulsory school (≤9 years), uncompleted upper secondary school (10–11 years) and completed upper secondary school or more (≥12 years). Non Swedish origin was being born outside Sweden. These circumstances were considered potential confounders based on their secular trends: Median age of leaving home has increased linearly the last decades, with a stronger increase in large-city regions (Nylin, 2015). There is also a strong secular trend of increasing immigration to Sweden. Level of education has also shifted, partly as a result of a school reform of the upper secondary school in 1991, which have affected the two cohorts differentially.

Post-stratification variables

Frequencies of men and women for each 1-year age group for Stockholm County in 1998 and 2010 (sample year, not participation year) were obtained from Statistics Sweden in order to correct for differential non-response.

Statistical analyses

The first set of analyses addressed the difference in current service use, depression and panic disorders between the two cohorts. Log-binomial regression analyses were conducted to compare the prevalence of service use, depression and panic disorders between the two cohorts. The main independent variable was a dummy variable indicating membership in the 2010 cohort. Sex, age, living arrangements, education and birth place were also included as potential confounders.

The second set of analyses addressed the difference in life events between the two cohorts. The difference in prevalence of individual events and total number of events between the cohorts was examined with χ^2 test for contingency tables.

The third set of analyses addressed the role of life events in cohort differences in psychiatric service use. Log-binomial regression analyses were conducted where current psychiatric service use was the dependent variable, cohort the main independent variable and sex, age, country of birth and education were confounding variables. Individual life events, as well as depression and panic were then entered into the model (mediation analysis). Cohort differences were assessed and the product between the cohort dummy and the life event was entered as an interaction term (moderation analysis). Because constructing a frequency measure might mask the effect of critical events (Cleary, 1981), we also examined the mediating and moderating role of each event separately. We report the antilog of the regression beta-estimates as

prevalence proportion ratios (PPR) together with 95% asymptotic confidence intervals.

All point estimates and regressions were computed using post-stratification weights to correct for non-random missingness. The weights were calculated by dividing the age and sex specific proportion in the population by the equivalent sample proportion. SAS 9.3 was used for all analyses.

Results

Table 1 shows a comparison of the 2000 and 2010 survey samples with data from Statistics Sweden. The use of services increased between 2000 and 2010, with 6.7 and 13.3% ever been in treatment and 2.4 and 5.0 currently in treatment. There was also an increase in depression and panic, from 17.3% in 2000 to 21.4% in 2010.

Table 2 shows adverse life events occurrence in the two cohorts, and in those with psychiatric service use. Of seven event groups for which there were significantly different prevalence between the cohorts, only three (spouse ill, decreased income and abortion) had become more common. Event counts were also similar between the cohorts. Table 3 also shows the prevalence of event among those with current service use and their bivariable association. Strengths of the associations between event and service use is similar, although victim of crime and spouse victim of a crime has become more prevalent. Besides own serious illness, which overlaps conceptually with psychiatric service use, the most common events among those in service were serious conflict with spouse and serious conflict with friend or relative. The accumulated number of events is not different between the cohorts.

Table 3 shows the difference in service use between the two cohorts, as PPR from log-binomial regression. The younger cohort has twice the prevalence of service use (Model 1). Entering life events in the model leave this estimate unchanged (Model 2), while entering depression and panic (Model 3) has slight reducing effect. There was no significant effect of interaction between life events and cohort (interaction term Beta (B) and p for 1 event $B = 0.35$, $p = 0.15$; 2 events $B = 0.39$, $p = 0.19$; ≥3 events $B = -0.12$, $p = 0.74$). Model 4 shows the PPR for service use associated with life events in each cohort. Cohort effects in association between disorder and service use was tested by including an interaction term in Model 3, i.e., without life events (depression only $B = 0.47$ $p = 0.51$, depression with panic $B = -0.60$, $p = 0.19$, panic only $B = -0.44$, $p = 0.36$, not shown in Table 3). Note that the formal test for interaction included main effects, while Model 4 provides estimates of events nested within

Table 1. *Comparison of the two cohorts*

	Sample frequencies		Sample prevalence		
	2000	2010	2000	2010	
	n	*n*	%	%	$Pr > \chi^2$
Sex					
Men	1121	389	49.08	49.96	0.63
Women	1469	731	50.92	50.04	
Age					
20–22	474	222	21.07	25.26	0.034
23–25	743	278	27.09	25.87	
26–28	833	345	31.25	28.36	
29–30	540	264	20.58	20.51	
Birth country					
Sweden	2406	1001	93.07	89.96	0.0013
Foreign	182	112	6.93	10.04	
Education					
1 ≤9 years	138	57	5.32	7.40	0.023
2 10–11 years	1530	621	60.46	57.05	
3 ≥12 years	917	437	34.22	35.56	
Living with other adult					
No	918	322	35.66	28.99	<0.0001
Yes, partner	1257	552	47.39	45.13	
Yes, parents	269	176	11.71	20.50	
Yes, other	135	60	5.24	5.39	
Service use					
Current	63	65	2.38	5.02	<0.0001
Previous	117	104	4.36	8.28	
No	2410	951	93.26	86.70	
Depression or panic disorder					
Depression only	140	64	5.44	5.35	0.0054
Depression with Panic	125	94	4.80	7.32	
Panic only	182	103	7.06	8.68	
No	2073	812	82.70	78.65	
Depression or panic disorder					
Yes	447	261	17.30	21.35	0.0044
No	2073	812	82.70	78.65	

cohort and thus does not include main effects for events. There is no stronger association between life events and service use in the more recent cohort, but unlike the older cohort also having a single event predicted service use (Model 4).

Discussion

Summary of the findings

The findings from this population-based repeated cross-sectional study of young adults provide support for an increased use of psychiatric health services from year 2000 to 2010. There was also a small increase in depression and panic disorders. The later cohort generally reported lower or similar prevalence of negative

life events and their prevalence of negative events among those in care were also similar.

Comparison with previous studies

We found a doubling of care service use, which is similar to findings from official reports of specialised in- and out-patient care statistics for Sweden and Stockholm county in the same period 2010 (SLSO, 2011; Jacobsson, 2014). There was also an increase in panic disorders and depression, which is largely dissimilar to that found in previous Swedish surveys, where self-reported symptoms of anxiety and depression among 16–29 year olds seem to have been relatively stable over the last decade (data on psychological distress and anxiety measured with GHQ and

Table 2. *Occurrence of adverse life events occurrence in the two young adult cohorts and in those with psychiatric service use*

Checklist items	2000 sample			2010 sample			
	All	Service	P for association	All	Service	P for association	P for cohort difference
Serious conflict with spouse	22.9	48.2	<0.0001	20.2	39.9	<0.0001	0.07
Serious conflict with child	1.3	4.3	0.04	1.1	2.6	0.30	0.67
Serious conflict with relative or close friend	22.2	45.6	<0.0001	19.5	39.4	<0.0001	0.07
Physically abused by other adult	3.6	10.6	0.002	4.6	16.7	<0.0001	0.16
Spouse seriously ill	2.3	6.1	0.04	4.7	11.6	0.05	<0.0001
Child seriously ill	1.0	1.5	0.069	0.8	2.5	0.18	0.60
Relative or close friend seriously ill	24.4	26.3	0.74	26.2	28.3	0.72	0.25
Death of a spouse	0.04	0		0.13	1.2	0.03	0.30
Death of a child	0.4	0		0.6	0		0.33
Death of a close friend or relative	20.2	25.0	0.35	18.4	25.8	0.14	0.21
Divorce/separation	13.6	25.1	0.007	8.3	26.2	<0.0001	<0.0001
Serious conflict at work	16.0	18.0	0.66	10.6	14.9	0.30	<0.0001
Much decreased income	15.9	31.6	0.0006	19.3	45.1	<0.0001	0.01
Unemployment	12.9	23.7	0.010	14.5	21.1	0.16	0.18
Homeless	5.2	9.0	0.17	3.6	11.2	0.03	0.04
Abortion (own or spouse's)	2.9	5.0	0.32	4.4	5.0	0.83	0.02
Victim of a serious crime (e.g., burglarised or violent crime)	6.9	5.7	0.70	5.0	16.7	<0.0001	0.03
Spouse was victim of a serious crime (e.g., burglarised or violent crime)	2.4	1.6	0.70	2.9	8.2	0.02	0.33
Child was victim of a serious crime (e.g., burglarised or violent crime)	0.3	0	0.69	0	0	–	–
Child bullied in school	1.0	2.8	0.17	1.1	1.3	0.88	0.81
Child with serious problems (e.g., illicit drug abuse, repeated truancy, crime)	0.6	1.3	0.49	0.7	1.3	0.60	0.73
Number of life events							
0	54.4	25.2	<0.0001	55.9	26.9	<0.0001	0.2058
1	29.5	36.1		28.8	25.0		
2	11.7	20.0		10.5	30.3		
≥3	4.4	18.7		5.7	17.8		

EQ-5D is available only from 2006 through 2014) (PHA, 2015). A longer series from Stockholm County 2002, 2006 and 2010 indicate stability for 21–24 year olds, but at a higher level than in 1991, 1994 and 1998 (SLSO, 2011). However, in a Danish population study with the same measure of depression as in our study, and conducted in the same period, major depression doubled from 2% among men and women to 4.3% among men and 5.4% (the lower prevalence is most likely because 40 and 50 year olds were examined) (Andersen *et al.* 2011). This study adds to the literature by showing negative life events has neither increased nor become more important as a predictor for treatment seeking.

Reports of adverse life events were found to be similar between the two cohorts and we could not confirm the hypothesis that young adults increasingly seek treatment after adverse life events. Generally the event occurrence agrees with those found in other sources, with a high prevalence of interpersonal conflict – especially among those with mental health problems. The reported prevalence and increase of physical abuse and poor income is similar to those found in the national Living Conditions Survey 2000–2010 (SCB, 2015), and the prevalence of abortion is similar to those in official statistics for 2000 and 2010 (Lundqvist & Gottvall, 2012). The prevalence of unemployment, which is higher than that registered for 18–24 year olds in Stockholm County (increased from 2.2 to 3.2% for women and 2.4 to 4.0% for men between 2000 and 2010), possibly reflects that many do not register with the National Employment Agency despite that it is a prerequisite for benefits. The much higher youth unemployment rates of

Table 3. *Current service use regression estimates, prevalence proportion ratios with 95% confidence intervals*

Predictors	Model 1 Without life events	Model 2 With life events	Model 3 With disorder	Model 4 Full model*
Cohort (ref = 2000)	2.22 (1.54–3.20)	2.32 (1.62–3.34)	1.70 (1.21–2.40)	1.11 (0.77–1.61)
Sex (ref = male)	1.61 (1.11–2.37)	1.44 (1.00–2.08)	0.95 (0.66–1.37)	1.00 (0.81–1.23)
Age (per year)	1.09 (1.02–1.16)	1.08 (1.01–1.15)	1.10 (1.03–1.17)	1.06 (1.03–1.10)
Depression only (ref = no)	NA	NA	4.77 (2.40–9.49)	2.05 (1.36–3.08)
Depression with panic (ref = no)	NA	NA	15.60 (9.60–23.36)	3.24 (4.00–6.86)
Panic disorder only (ref = no)	NA	NA	11.14 (6.84–18.12)	4.03 (3.10–5.25)
Events 1 (ref = 0)	NA	2.58 (1.61–4.14)	NA	NA
Events 2- (ref = 0)	NA	2.99 (1.70–5.19)	NA	NA
Events ≥3 (ref = 0)	NA	4.96 (2.79–8.83)	NA	NA
Events 1 in cohort 2000 (ref = 0)	NA	NA	NA	1.11 (0.81–1.52)
Events 2 in cohort 2000 (ref = 0)	NA	NA	NA	1.03 (0.70–1.51)
Events ≥3 in cohort 2000 (ref = 0)	NA	NA	NA	1.58 (1.01–2.46)
Events 1 in cohort 2010 (ref = 0)	NA	NA	NA	1.58 (1.09–2.28)
Events 2 in cohort 2010 (ref = 0)	NA	NA	NA	1.51 (0.95–2.43)
Events ≥3 in cohort 2010 (ref = 0)	NA	NA	NA	1.40 (0.80–2.48)
Born in Sweden (ref = born abroad)	0.63 (0.39–1.05)	0.69 (0.42–1.13)	0.78 (0.49–1.25)	0.86 (0.64–1.17)
Education, low (ref = high)	7.19 (4.21–12.30)	5.81 (3.38–9.99)	3.50 (2.11–5.80)	2.10 (1.55–7.85)
Education, medium (ref = high)	1.59 (1.00–2.52)	1.45 (0.91–2.30)	1.47 (0.94–2.28)	1.19 (0.94–1.51)
Living with partner (ref = living alone)	0.54 (0.36–0.81)	0.51 (0.34–0.77)	0.66 (0.45–0.96)	0.77 (0.62–0.96)
Living with parents (ref = living alone)	0.57 (0.30–1.07)	0.55 (0.29–1.03)	0.74 (0.40–1.40)	0.88 (0.62–1.69)
Other (ref = living alone)	1.56 (0.80–3.08)	1.51 (0.77–2.97)	1.47 (0.79–2.73)	1.11 (0.73–1.69)

*The final model shows the effect of events on service use within each cohort.

about 15–20% for 15–24 year olds is the prevalence of unemployed among those in the labour force, not the population.

Explaining the findings

The increase in service use might reflect (1) a rise in morbidity, (2) that a higher proportion of those with morbidity seek and receive treatment, or (3) that more individuals seek treatment for hardships and difficulties that does not qualify as psychiatric morbidity. We found that the increase in service use could not be explained by either increase in depression or panic disorder nor adverse life events. The PART questionnaires include extensive information on symptoms of depression and anxiety but no questions on inattention or hyperactive-impulsive behaviour, and such information could potentially contribute to explaining the increased use in psychiatric service use. ADHD (Attention deficit hyperactivity disorder) has increased dramatically during the study period, not only in children but also in adults – between 2006 and 2010 the prescription of ADHD medicine, increased from 272 to 993 per 100 000 for men and 145 to 740 per 100 000 in women aged 18–24 (Social Board of Health and Welfare, 2015). There is also a general trend in Stockholm County of a more consumer driven, choice-based outpatient system

that seem to coincide with increased service use overall as well as for psychiatric care (Janlöv *et al.* 2013). This could at least in part explain the observed increase in service use in our study.

Although we have adjusted for some potential stressful life events we cannot rule out that there are other unmeasured secular changes in young adults' life stress, which may cause them to seek psychiatric care. The event checklist that we used is not only restricted to 22 categories but also to acute adversities, which took place during the last 12 months, and it may be that long-term adversities could explain the increased service use. However, the life events included a wide variety of events that repeatedly have been shown to predict psychiatric morbidity, and although they do predict psychiatric service use (above the effect of depression and panic disorder) there has not been any in overall prevalence or nor a strengthening of the effect on service use.

Methodological considerations

The response rate in PART was low and although we constructed weights to correct for the obvious non-participation in men and those of younger ages, it is possible that non-random participation has introduced bias. Non-random missing data could bias

estimates in any direction (under or overestimations). Non-response has been analysed extensively for the first wave in PART and showed that men, younger persons, unmarried persons, those with lower education and income and born in non-Nordic countries were less inclined to participate in the questionnaire (Lundberg *et al.* 2005; Bergman *et al.* 2010). However, that and other studies (Rindfuss *et al.* 2015) have shown that non-response bias is mainly distributional (mean and prevalence), whereas relational (correlation) analyses remain unbiased. Also, including control variables, which has been shown to predict non-participation in the regression models most likely increased the likelihood that results are unbiased (Rindfuss *et al.* 2015).

The study was conducted in Stockholm County and the findings may not apply to other parts of Sweden. Comparisons between the baseline survey and an identical study conducted in a predominantly rural county in Western Sweden found similar prevalence of depression and anxiety, but that contacts with health services overall and in those with symptoms were more common in Stockholm (Dahlberg *et al.* 2007).

Moreover, we have controlled only for criteria-based diagnoses, which is not directly translatable to service need. In a previous study based on a sub-cohort of PART where psychiatric diagnoses were set after psychiatric interview, 73% of those with a DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th revision) disorder were judged to have a meetable need of care due to mental problems, but also 21% of those without disorder (which includes sub-clinical cases) (Forsell, 2004). Also, the anxiety scale used to define panic disorder does not include generalised anxiety, social phobia or other specific types of phobia. Measuring disorders with symptom scales is also suboptimal to clinical disorders, and self-reports of symptoms but also service use, might be prone to misclassification and underestimation due to social desirability. We do not have detailed information on what kind of service the respondents received and cannot answer if the increase refers to specialised psychiatric service use or to primary care. In the above mentioned previous study of a sub cohort in PART those who requested care were more often female, older, unemployed, educated, born outside Sweden but also notably less feeling of shame (Forsell, 2004, 2006). Future studies should examine to what extent the increase in psychiatric care seeking comes from a reduced stigmatisation in acknowledging mental health problems and seeking psychiatric care. We are not aware of any studies examining the changes in self-stigma, perceptions of psychiatric disorders or health literacy in Sweden. A clinical implication is that the findings point toward that physicians will evaluate young patients that may be more prone to seek care, but not because they have a different perception of common life events.

The life event checklist used is another possible source of bias, since several studies have shown that life checklists and more narrative events schedules have different merits (Duggal *et al.* 2000; Lewinsohn *et al.* 2003; Dohrenwend, 2006). While life event checklist risk including events, which from the point of stressfulness is trivial, subjective retrospective appraisals of the stressfulness is likely to be confounded by current psychiatric status. Interviews with non-participants of the psychiatric interview in PART also revealed that the main reason for non-participation was that the questions were too private (Forsell, 2004).

Conclusion

This study provides initial support for an increase in service use among young adults compared with 10 years earlier. The increased service use cannot be explained with increasing worse life situations, and may reflect increased morbidity or that the services meet more of the needs at present.

Conflict of interest

None

Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Availability of Data and Materials

Data access is regulated by Swedish secrecy legislation (The Personal Data Act, 1998: 204, and the Public Access to Information and Secrecy Act 2009:400). The research material can be accessed by anyone with a legitimate interest in it provided that the project is compatible with the Act Concerning Ethical Review of Research Involving Humans (EPL, SFS 2003:460). Such compatibility is examined by an Ethical Review Board (EPN, www.epn.se/en). Requests should be addressed to the Principal Investigator Yvonne Forsell. Contact information and more information about PART and its availability is available at the Swedish National Data Service (SND): https://snd.gu.se/en/catalogue/study/SND0784.

References

Andersen I, Thielen K, Bech P, Nygaard E, Diderichsen F (2011). Increasing prevalence of depression from 2000 to 2006. *Scandinavian Journal of Public Health* **39**, 857–863.

Bech P, Rasmussen NA, Olsen LR, Noerholm V, Abildgaard W (2001). The sensitivity and specificity of the major depression inventory, using the present state examination as the index of diagnostic validity. *Journal of Affective Disorders* **66**, 159–164.

Bergman P, Ahlberg G, Forsell Y, Lundberg I (2010). Non-participation in the second wave of the part study on mental disorder and its effects on risk estimates. *International Journal of Social Psychiatry* **56**, 119–132.

Bremberg S (2015). Mental health problems are rising more in Swedish adolescents than in other Nordic countries and the Netherlands. *Acta Paediatrica* **104**, 997–1004.

Cederblad M (2013). Young people's mental health baffles researchers. *Lakartidningen* **110**, 1532–1535.

Cleary PJ (1981). Problems of internal consistency and scaling in life event schedules. *Journal of Psychosomatic Research* **25**, 309–320.

Dahlberg K, Forsell Y, Damström-Thakker K, Runeson B (2007). Mental health problems and healthcare contacts in an urban and a rural area. Comparisons of two Swedish counties. *Nordic Journal of Psychiatry* **61**, 40–46.

Dohrenwend BP (2006). Inventorying stressful life events as risk factors for psychopathology: toward resolution of the problem of intracategory variability. *Psychological Bulletin* **132**, 477–495.

Duggal S, Malkoff-Schwartz S, Birmaher B, Anderson BP, Matty MK, Houck PR, Bailey-Orr M, Williamson DE, Frank E (2000). Assessment of life stress in adolescents: self-report versus interview methods. *Journal of the American Academy of Child and Adolescent Psychiatry* **39**, 445–452.

Forsell Y (2004). Psychiatric symptoms, social disability, low wellbeing and need for treatment: data from a population-based study. *International Journal of Social Psychiatry* **50**, 195–203.

Forsell Y (2005). The major depression inventory versus schedules for clinical assessment in neuropsychiatry in a population sample. *Social Psychiatry and Psychiatric Epidemiology* **40**, 209–213.

Forsell Y (2006). The pathway to meeting need for mental health services in Sweden. *Psychiatric Services* **57**, 114–119.

Hällström C (2015). Normala livskriser förvrids till sjukdom (Normal life crises distorted to disease). Debate article published 4 May 2015. *Svenska dagbladet*.

Hällström T, Thakker KD, Forsell Y, Lundberg I, Tinghög P (2003). The PART Study. A Population Based Study of Mental Health in the Stockholm County: Study Design. Phase l (1998–2000). http://www.folkhalsoguiden.se/sv/Publikationer/515/509/Ovriga/PART-studien-Teknisk-rapport/.

Jacoksson A (2014). Inpatient diseases in Sweden 1989–2013. In *Offical Statistics of Sweden. Statistics – Health and Medical Care* (ed. L Grönvik). The National Board of health and Welfare: Stockholm. 1–30 http://www.socialstyrelsen.se/register/halsodataregister/patientregistret.

Janlöv N, Andersson A, Beckman A, Sveréus S, Wiréhn A-B, Rehnberg C (2013). *Vem har vårdvalet gynnat? En jämförande studie mellan tre landsting före och efter vårdvalets införande i primärvården.* (Rapport). Myndigheten för vårdanalys. Swedish Agency for Health and Care Services Analysis: Stockholm.

Lager A, Berlin M, Heimerson I, Danielsson M (2012). Young people's health: health in Sweden: the national public health report 2012. Chapter 3. *Scandinavian Journal of Public Health* **40**, 42–71.

Lager ACJ, Bremberg SG (2009). Association between labour market trends and trends in young people's mental health in ten European countries 1983–2005. *Bmc Public Health* **9**, 1–6.

Lewinsohn PM, Rohde P, Gau JM (2003). Comparability of self-report checklist and interview data in the assessment of stressful life events in young adults. *Psychological Reports* **93**, 459–471.

Lundberg I, Damström Thakker K, Hällström T, Forsell Y (2005). Determinants of non-participation, and the effects of non-participation on potential cause-effect relationships, in the PART study on mental disorders. *Social Psychiatry and Psychiatric Epidemiology* **40**, 475–483.

Lundqvist E, Gottvall K (2012). Induced abortions 2011. In *Official Statistics of Sweden. Statistics – Health and Medical Care* (ed. A Åberg). The National Board of health and Welfare: Stockholm. http://www.socialstyrelsen.se/Lists/Artikelkatalog/Attachments/18877/2012-11-6.pdf.

Nylin A-K (2015). *Leaving the Nest. A Description of Young People Moving from Home* (Demographic Reports). Statistics Sweden: Örebro.

Oecd (2013). *Mental Health and Work Sweden*. OECD Publishing, Paris.

Pha (2015). Swedish National Public Health Survey 2004–2014 database. Public Health Agency of Sweden. Retrieved 13 July 2015 from http://www.folkhalsomyndigheten.se/amnesomraden/statistik-och-undersokningar/enkater-och-undersokningar/nationella-folkhalsoenkaten/psykisk-halsa/sjukdomar-och-besvar.

Rindfuss RR, Choe MK, Tsuya NO, Bumpass LL, Tamaki E (2015). Do low survey response rates bias results? Evidence from Japan. *Demographic Research* **32**, 797–828.

SCB (2015). Living Conditions Surveys (ULF/SILC). Statistics Sweden. Retrieved 15 October 2015 from http://www.scb. se/en_/Finding-statistics/Statistics-by-subject-area/Living-conditions/Living-conditions/Living-Conditions-Surveys-ULFSILC.

Sheehan DV (1983). *The Anxiety Disease*. Charles Scribners Sons: New York.

SLSO (2011). *Folkhälsorapport 2011. Folkhälsan i Stockholm – I dag och i morgon* (Stockholm Public Health Report 2011) In (ed. B Forsberg). Stockholm County Council: Stockholm.

Social Board of Health and Welfare (2015). Förskrivning av adhd-läkemedel 2015 - Trender och prognos av utvecklingen [Prescription of adhd-mecicine 2015 - Trends and prognosis]. Social Board of Health and Welfare report 2016-6-12, *SOS* 1-35.

Sr (2014). Unga flickor mår allt sämre (Deteriorating health in girls). Retrieved 4 July 2014 from http://sverigesradio.se/sida/artikel.aspx?programid=1650&artikel=5906095 (Swedish state radio SR P1. 4 July 2014).