

Lifetime prevalence of mental health disorders and delay in treatment following initial onset: evidence from the Northern Ireland Study of Health and Stress

B. P. Bunting*, S. D. Murphy, S. M. O'Neill and F. R. Ferry

Psychology Research Institute, University of Ulster, Magee Campus, Northland Road, Londonderry BT48 7JL, UK

Background. The current study provides the first epidemiological estimates of lifetime mental disorders across NI based on DSM-IV criteria. Risk factors, delays in treatment and the experience of conflict are also examined.

Method. Nationally representative face-to-face household survey of 4340 individuals aged ≥ 18 years in NI using the Composite International Diagnostic Interview. Analyses were implemented using SAS and STATA software.

Results. Lifetime prevalence of any disorder was 39.1% while projected lifetime risk was 48.6%. Individuals who experienced conflict were more likely to have had an anxiety, mood or impulse-control disorder. Treatment delays were substantial for anxiety and substance disorders.

Conclusions. Results from this study show that mental disorders are highly prevalent in Northern Ireland. The elevated rates of post-traumatic stress disorder in relation to other countries and the association of living 'in a region of terror' disorders suggests that civil conflict has had an additional impact on mental health. Given substantial delays in treatment, further research is required to investigate the factors associated with failure and delay in treatment seeking.

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Introduction

While there have been studies of mental disorders in community settings (McConnell *et al.* 2002) and representative studies of general mental well-being in Northern Ireland (NI) (Department of Health and Social Services and Public Safety, 2007), we are aware of no previous report providing representative estimates of mental disorders in NI based on validated diagnostic criteria.

One of the most significant advancements in the epidemiology of mental disorders was the development of the Composite International Diagnostic Interview (CIDI) (Kessler *et al.* 2008) and establishment of the World Mental Health (WMH) Survey Initiative in 1998. This initiative was established to coordinate a series of epidemiological studies using standardized methods in 28 countries. The aim was to obtain valid information about: (a) the prevalence and correlates of mental disorders; (b) levels of unmet

need; (c) treatment adequacy; (d) the societal burden of mental disorders. These surveys reveal that anxiety disorders was the most prevalent disorder category in 10 of 17 countries, with lifetime prevalence estimates ranging from 4.8% in China to 31% in the US. Mood disorders were the most prevalent in all other but one of the remaining countries with overall estimates ranging from 3.3% in Nigeria to 21.4% in the US (Kessler *et al.* 2008).

Examination of age-at-onset distributions for disorders may inform the timing of service provision and interventions. Estimates of age-at-onset distributions from WMH studies show broadly consistent results. Impulse control disorders had the earliest median age at onset and a narrow range of onset risk. For anxiety disorders, the pattern varied with disorder type while mood disorders displayed a later age-at-onset range (29–43 years). While the onset of substance use generally increased from adolescence to early adulthood, the rate of this increase varied substantially across countries (Kessler *et al.* 2008).

Given the impairment associated with mental disorders, early treatment-seeking following disorder onset is desirable. The National Institute of Clinical Excellence highlights the key role of the general

* Address for correspondence: Professor B. P. Bunting, Psychology Research Institute, University of Ulster, Magee Campus, Northland Road, Londonderry BT48 7JL, UK.
(Email: bp.bunting@ulster.ac.uk)

practitioner, as the initial point of contact for the majority of individuals with mental health problems, in the identification, assessment and subsequent treatment management of individuals with mental health disorders (National Collaborating Centre for Mental Health, 2010). NI, as part of the UK, benefits from free access to primary care services under the National Health Service (NHS) and we may therefore expect minimal delays in treatment seeking. A number of epidemiological studies have investigated delays in treatment following disorder onset (Olfson *et al.* 1998; Wang *et al.* 2004, 2005; Borges *et al.* 2007; Bruffaerts *et al.* 2007; Lee *et al.* 2007; Sareen *et al.* 2007) and show substantial delays from onset to initial service contact (e.g. 6–8 years for mood disorders and 9–23 years for anxiety disorders (Wang *et al.* 2005). Despite significant delays, many studies also found that most individuals eventually seek treatment [94%, mood disorders; 85%, anxiety disorders; 61%, substance disorders (Bruffaerts *et al.* 2007)].

NI has experienced 30–40 years of civil conflict in its recent history, giving rise to particular questions in relation to mental health. In the ‘Good Friday Agreement’, which came into effect in 1999, NI politicians, together with leaders in the UK and Ireland, set out a strategy to achieve a peaceful resolution. This paper reports on findings from the NI Study of Health and Stress (NISHS), which was conducted between 2004 and 2008 during which time the population lived in relative peace.

Method

Sample

The NISHS is a representative survey of English-speaking household residents aged ≥ 18 years in NI. The sample was selected under a multi-stage area sample design based on a probability proportional to size selection strategy. To achieve an equal probability sample of households, a three-stage area probability sample design was used. In the primary stage, Wards were selected from within each local government district. Within each of the respective Wards two census output areas (COAs) were selected. Finally, a sample of 10 dwellings was selected from within each sample COA. The selection of individuals within each household was achieved using Kish tables on household listings (Kish, 1965).

Face-to-face interviews were undertaken by professional interviewers between February 2004 and August 2008. The response rate was 68.4%. The survey was administered in two parts. Part 1 included a core diagnostic assessment of all respondents ($n = 4340$). Part 2 included questions about risk factors, correlates, treatment and additional disorders and was

administered to all part 1 respondents with a lifetime disorder plus a probability subsample of other respondents ($n = 1986$).

Sample weights

Based on the sample design and information from the NI census, case-specific weights were computed to minimize the effects of bias. These weights included information relating to sample selection, non-response and post-stratification factors such as age, sex and geographical region. An additional weight was applied to adjust for differential selection into part 2 of the survey. Information on weights and stratification was incorporated into all analyses included in the current paper.

Assessment of disorders

Assessment of disorders was based on the CIDI version 3.0, a fully structured lay-administered diagnostic interview first developed by Robins *et al.* (1988). This is the same instrument utilized by all WMH Survey Initiative countries (Kessler *et al.* 2008). Results presented in this paper are based on DSM-IV criteria (APA, 1994) and the following disorders were examined: anxiety disorders [panic disorder, generalized anxiety disorder (GAD), social phobia, specific phobia, agoraphobia without panic, post-traumatic stress disorder (PTSD), obsessive compulsive disorder (OCD) and separation anxiety disorder/adult separation anxiety (SAD/ASA)]; mood disorders [major depressive disorder (MDD), dysthymia and bipolar disorder]; impulse control disorders [oppositional-defiant disorder (ODD), conduct disorder, attention-deficit/hyperactivity disorder (ADHD) and intermittent explosive disorder (IED)]; substance use disorders (alcohol abuse, drug abuse, alcohol dependence, drug dependence). PTSD, OCD, alcohol/drug abuse, alcohol/drug dependence, SAD/ASA, ODD, conduct disorder and ADHD were assessed in part 2 of the interview. All other disorders were assessed in part 1. Hierarchy rules were used to determine diagnoses of GAD, MDD, dysthymia and ODD and IED.

Age at onset

The risk of developing lifetime disorders was examined in relation to age at onset. Retrospective age-at-onset information was obtained by asking a series of questions designed to elicit the most accurate estimates and maximum response rates.

Sociodemographic correlates and the experience of civil conflict

Predictor variables included sex, age at interview (18–34, 35–49, 50–64 and 65+ years), marital status

(married, separated/widowed/divorced and never married), highest education level (primary, GCSE/O-level, A-level, higher level) and household income (low, low-average, high-average and high). Household income was calculated as the sum of pre-tax income in the previous 12 months, including salaries earned by all members of the household plus all sources of other income. A four-category income scale was created based on the *per capita* income of the respondent's household divided by the median income for the country. The household was in the low, low-average, high-average or high categories if this ratio (x) was ≤ 0.5 , $0.5 < x \leq 1.0$, $1.0 < x \leq 2.0$, or > 2.0 , respectively. Given NI's history of conflict and its mental health impact (Fay *et al.* 1999; O'Reilly & Stevenson, 2003; Ferry *et al.* 2008), the experience of conflict was also included as a predictor variable. This information was obtained from the PTSD section of the CIDI ($n=1986$), in which individuals indicated specific traumatic events they experienced during their lifetime. The experience of civil conflict was determined from the question 'Did you ever live as a civilian in a place where there was ongoing terror of civilians for political, ethnic, religious or other reasons?'

Treatment seeking

Information on treatment seeking was elicited in the 'services' section of the CIDI, where participants were asked if they had ever seen a professional for 'problems with emotions, nerves, or use of alcohol or drugs'. Individuals who said that they had seen a professional were provided with a list of professionals and asked which they had spoken to. This list included mental health specialists such as psychiatrists and psychologists, general practitioners, counsellors, social workers, other medical professionals, religious and spiritual advisors and complementary and alternative therapists. Participants who endorsed seeking help were subsequently asked questions about their visits, including their age when they first talked to that professional.

Analysis

Age at onset and projected lifetime risk were estimated using the two-part actuarial method implemented in SAS version 8.2 (SAS Institute, 2001). This method has been shown to provide accurate estimates of onset to within 1 year (Halli & Rao, 1992). The association of sociodemographic predictors and the experience of civil conflict with mental disorders was examined using logistic regression analyses (Pampel, 2000) with multiple predictors. The effect of a change in a specific independent variable on the lifetime prevalence of a disorder category was

represented by an odds ratio controlling for all other variables. Logistic regression analyses were implemented using Stata version 10.0 (StataCorp, 2007).

The estimated cumulative lifetime probability of treatment seeking from year of onset was obtained from survival analysis using the actuarial method, implemented in the Statistical Analysis System version 8.2 (SAS Institute, 2001). The median duration of treatment delay was defined as the median number of years between disorder onset and the first time an individual sought treatment. In these survival analyses, censoring occurred at the respondent's age at interview or age of recovery.

Results

Lifetime prevalence of DSM-IV disorders

The lifetime prevalence of disorders among different age groups is presented in Table 1. The most prevalent disorder category was anxiety disorders (22.6%) followed by mood disorders (18.8%), substance disorders (14.1%) and impulse-control disorders (8.6%). The most prevalent disorder types were MDD (16.3%), alcohol abuse (13.2%), specific phobia (9.6%) and PTSD (8.8%). Overall, 39.1% of the sample met the criteria for any lifetime disorder.

Lifetime prevalence rates for mood and anxiety disorders increased with age, dropping substantially for the 65+ year group. The overall pattern for impulse-control and substance disorders was more varied, although disorders in these categories were more prevalent among the youngest age cohort (18–34 years). For all disorders, the lifetime prevalence was lowest among the 65+ year age group.

Age-at-onset distributions and projected lifetime risk

Table 2 presents cumulative lifetime risk estimates at selected age-at-onset percentiles. Age at onset was earlier for anxiety disorders (14 years) and impulse-control disorders (13 years) compared with mood disorders (32 years) and substance use disorders (21 years).

Specific phobia and ADHD had the earliest median age at onset (8 years), followed by ODD and conduct disorder (13 years). Disorders generally had similar distribution characteristics to other disorders in their category. For example, the median age at onset for all mood, impulse-control and substance disorders occurred within a narrow range (31–36 years for mood disorders, 8–17 for impulse control disorders and 19–28 for substance disorders). Anxiety disorders, on the other hand, displayed a more varied distribution.

Table 2 also presents projected lifetime risk by the age of 75 years based on the aforementioned

Table 1. Lifetime prevalence for part 1 and part 2 samples of DSM-IV disorders

Disorder	n	Age group (years)									
		Total		18–34		35–49		50–64		65+	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
Anxiety disorders											
Panic disorder	164	3.3	0.3	3.1	0.6	3.7	0.6	4.3	0.6	1.8	0.6
GAD without hierarchy	221	4.1	0.4	3.2	0.5	4.2	0.6	6.3	0.7	2.8	0.6
Social phobia	283	6.0	0.4	6.2	0.8	6.9	0.8	7.8	0.8	2.1	0.5
Specific phobia	451	9.6	0.6	10.4	1.0	9.8	1.1	11.7	1.2	5.6	1.0
Agoraphobia without panic	96	1.8	0.2	1.6	0.5	1.9	0.4	3.0	0.5	0.9	0.3
Post-traumatic stress disorder ^a	238	8.8	0.7	8.3	1.5	10.3	1.4	9.7	1.5	6.0	1.1
Obsessive compulsive disorder ^a	15	0.5	0.2	0.9	0.4	0.4	0.2	0.6	0.3	0	0
SAD/ASA ^a	148	5.1	0.5	5.0	0.8	5.7	1.0	6.9	1.4	2.0	0.6
Any anxiety ^a	604	22.6	1.2	23.5	2.5	23.8	2.1	24.6	2.0	16.1	2.5
Mood disorders											
MDD with hierarchy	778	16.3	0.8	16	1.3	20	1.4	18.5	1.4	8.1	1.1
Dysthymia with hierarchy	87	1.8	0.2	1.3	0.4	2.1	0.4	3.0	0.6	0.9	0.4
Bipolar-broad	121	2.5	0.3	3.4	0.7	2.7	0.3	2.5	0.5	0.4	0.2
Any mood	900	18.8	0.8	19.3	1.5	22.7	1.5	20.9	1.4	9.0	1.2
Impulse-control disorders											
ODD with hierarchy ^a	72	2.7	0.4	3.5	0.7	2.8	0.6	3.2	1.3	0.5	0.2
Conduct disorder ^a	49	2.0	0.3	3.3	0.9	2.1	0.6	1.7	0.4	0.2	0.1
ADHD ^a	47	2.4	0.4	3.0	0.8	3.4	1.2	1.6	0.6	0.4	0.2
IED with hierarchy	144	3.5	0.4	4.6	0.8	4.2	0.8	2.8	0.6	1.2	0.4
Any impulse	196	8.6	0.7	11.3	1.4	10.7	2.0	7.0	1.5	1.9	0.8
Substance disorders											
Alcohol abuse w/without dependence ^a	276	13.2	1.0	19.1	2.7	12.4	1.6	13.5	1.9	3.6	1.0
Alcohol dependence with abuse ^a	68	2.5	0.4	2.7	0.8	2.6	0.7	3.1	0.8	1.2	0.6
Drug abuse w/without dependence ^a	67	3.3	0.5	8.7	1.3	1.5	0.5	0.9	0.4	0	0
Drug dependence with abuse ^a	19	0.6	0.2	1.6	0.5	0.5	0.2	0.1	0.1	0	0
Any substance ^a	295	14.1	1.0	21.5	2.8	12.8	1.7	13.7	1.9	3.6	1.0
Any disorder											
Any disorder ^a	951	39.1	1.7	43.8	3.6	43.6	3.1	39.6	2.3	22.2	3.0
2+ disorders ^a	570	22	1.2	25.9	2.3	23.7	2.0	23.6	2.0	9.7	1.7
3+ disorders ^a	338	12.5	0.8	14.5	1.5	13.9	1.6	14.3	1.7	4.1	1.1

GAD, Generalized anxiety disorder; SAD/ASA, separation anxiety disorder/adult separation anxiety; MDD, major depressive disorder; ODD, oppositional-defiant disorder; ADHD, attention-deficit hyperactivity disorder; IED, intermittent explosive disorder.

Part 1 sample size = 4340.

Part 2 sample size = 1986.

^a Assessed in the part 2 sample.

age-at-onset distributions. Comparing these percentage estimates with previous lifetime prevalence estimates gives an indication of how lifetime prevalence may change when participants reach age 75 years. Mood disorders represented the highest projected risk (28.4%). The risk of anxiety disorders was 28.3%, followed by substance disorders (17.8%) and impulse-control disorders (9.4%). The projected lifetime risk of any disorder by age 75 was 48.6%. Lifetime risk by age 75 was 25% higher than lifetime prevalence for anxiety

disorders, 51% higher for mood disorders, 9% higher for impulse-control disorders and 26% higher for substance use disorders.

Association of sociodemographic characteristics and the experience of civil conflict with DSM-IV disorders

Table 3 presents the results of logistic regression analyses with multiple predictors examining the

Table 2. Age at selected percentiles on the standardized age-at-onset distributions of DSM-IV disorders with projected lifetime risk at age 75 years

Disorder	Age at selected age-at-onset percentiles (years)								Projected lifetime risk age 75 (%)	Projected lifetime risk age 75 (s.e.)
	5	10	25	50	75	90	95	99		
Anxiety disorders										
Panic disorder	13	14	20	33	45	63	68	68	5.5	0.8
GAD with hierarchy	11	13	19	35	48	56	61	68	6.3	0.6
Social phobia	5	6	10	14	20	40	49	54	7.1	0.5
Specific phobia	5	5	5	8	13	22	31	63	10.3	0.6
Agoraphobia without panic	6	8	13	21	41	50	53	74	2.8	0.5
Post-traumatic stress disorder	11	14	20	33	49	68	70	75	15.9	2.6
Obsessive compulsive disorder ^a	–	–	–	–	–	–	–	–	–	–
SAD/ASA	5	6	9	19	28	45	49	64	6.4	0.7
Any anxiety	5	5	8	14	33	54	61	70	28.3	1.6
Mood disorders										
MDD with hierarchy	13	17	22	33	46	59	65	71	25.5	1.3
Dysthymia with hierarchy	11	14	24	36	54	74	74	74	2.7	0.3
Bipolar-Broad	13	14	18	31	41	50	51	58	3.5	0.4
Any mood	13	16	21	32	45	59	67	74	28.4	1.3
Impulse-control disorders										
ODD with hierarchy	5	5	8	13	15	16	17	19	2.9	0.4
Conduct disorder	8	9	11	13	15	16	16	16	2.2	0.3
ADHD	5	5	7	8	13	14	14	26	2.5	0.4
IED with hierarchy	8	9	13	17	23	31	40	59	4.1	0.5
Any impulse	5	6	8	13	16	24	29	41	9.4	0.8
Substance disorders										
Alcohol abuse w/without dependence	16	17	19	21	31	44	51	69	17	1.5
Alcohol dependence with abuse	18	19	20	28	41	45	50	54	3.4	0.5
Drug abuse w/without dependence	16	16	17	19	21	29	47	51	3.8	0.6
Drug dependence with abuse ^a	–	–	–	–	–	–	–	–	–	–
Any substance	16	17	18	21	29	43	50	69	17.8	1.5
Any disorder										
Any disorder	5	5	11	18	32	50	57	67	48.6	1.9

GAD, Generalized anxiety disorder; SAD/ASA, separation anxiety disorder/adult separation anxiety; MDD, major depressive disorder; ODD, oppositional-defiant disorder; ADHD, attention-deficit hyperactivity disorder; IED, intermittent explosive disorder.

^a Cell size <30 cases, too small to estimate.

association of sociodemographic variables and the experience of civil conflict with the lifetime prevalence of disorders. While women were significantly more likely to have anxiety and mood disorders, men had significantly greater odds of having impulse-control and substance disorders. Age at interview was significantly associated with having a disorder in each category, with an overall trend of decreasing odds as age increased. Individuals who were previously married were more than twice as likely to have anxiety, mood and substance disorders. Those with lower income levels were significantly more likely to have impulse-control and substance disorders compared with those in the highest income bracket. Individuals

who stated that they had ever lived 'as a civilian in a place where there was ongoing terror of civilians for political, ethnic, religious or other reasons' were significantly more likely to have all disorder types.

Cumulative lifetime probabilities of treatment seeking

Survival analysis was used to predict the percentage of individuals with lifetime disorders who eventually seek treatment. Estimates for selected anxiety, mood and substance disorders and any disorder in these subcategories are illustrated in a series of survival

Table 3. Logistic regression analyses of sociodemographic and conflict related correlates of DSM-IV disorders

Variable (n)	Any anxiety disorder		Any mood disorder		Any impulse-control disorder		Any substance disorder	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sex								
Female (2441)	2.1*	1.6–2.7	1.8*	1.4–2.4	0.5*	0.3–0.7	0.2*	0.2–0.3
Male (1899)	1.0		1.0		1.0		1.0	
Age group, years								
18–34 (1115)	2.8*	1.6–4.7	4.5*	2.7–7.5	7.9*	3.2–19.4	10.0*	4.8–21.2
35–49 (1289)	2.5*	1.6–4.0	4.9*	3.2–7.7	6.9*	3.0–16.2	5.6*	2.8–11.2
50–64 (1072)	2.5*	1.6–4.0	3.6*	2.3–5.7	4.1*	1.7–10.2	5.7*	2.9–11.3
65+ (864)	1.0		1.0		1.0		1.0	
Marital status								
SWD (763)	2.1*	1.5–3.0	2.4*	1.7–3.3	1.5	0.9–2.6	2.6*	1.6–4.1
Never married (1024)	1.2	0.8–1.7	1.1	0.8–1.6	1.5	0.9–2.5	1.5	0.9–2.3
Married (2553)	1.0		1.0		1.0		1.0	
Education								
Primary (316)	1.6	0.8–3.1	1.3	0.7–2.6	0.8	0.3–2.5	1.2	0.5–3.0
GCSE/O-level (2286)	1.0	0.7–1.5	0.8	0.6–1.2	1.1	0.6–1.9	0.7	0.5–1.2
A-level (1212)	0.8	0.5–1.3	0.7	0.5–1.1	0.7	0.3–1.3	0.8	0.4–1.3
Higher level (526)	1.0		1.0		1.0		1.0	
Income^a								
Low (470)	1.3	0.9–2.0	1.0	0.7–1.5	1.7	0.9–3.2	2.0*	1.1–3.4
Low-average (494)	1.2	0.8–1.8	0.8	0.6–1.2	2.1*	1.1–4.2	2.1*	1.2–3.6
High-average (572)	1.1	0.8–1.7	1.0	0.7–1.4	1.9*	1.0–3.6	1.6	1.0–2.6
High (450)	1.0		1.0		1.0		1.0	
Conflict-related trauma^a								
Yes (441)	2.5*	1.8–3.5	1.9*	1.4–2.5	2.5*	1.6–4.0	1.5*	1.0–2.3
No (1545)	1.0		1.0		1.0		1.0	

OR, Odds ratio; CI, confidence interval; SWD, separated/widowed/divorced.

^a Assessed in the part 2 sample.

* Significant difference compared to base category at the 0.05 level.

curves in Figs 1–4 respectively[†]. Estimates for anxiety disorders (Fig. 1) reveal a varied pattern. For example, while a substantial proportion of individuals with panic disorder seek treatment within 10 years of onset (approximately 70%), a lower percentage of those with specific phobia seek treatment in the same period (approximately 10%). Results indicate that for each anxiety disorder, the majority of individuals take considerable time before seeking treatment.

In contrast, the projected percentages of treatment seeking among those with specific mood disorders were relatively similar (Fig. 2). At least 50% of those with major depressive episode, dysthymia or bipolar disorder sought treatment in the first 2 years following onset. The projected cumulative probabilities then follow a fairly steep trajectory.

Treatment-seeking curves for substance disorders again reveal a more varied pattern (Fig. 3). While the majority of individuals with drug dependence seek help within the first 2–3 years (approximately 84%), a much smaller percentage of those with alcohol abuse seek treatment in the same time period (approximately 12%).

Overall lifetime treatment patterns for anxiety, mood and substance disorders are shown in Fig. 4. While a relatively high percentage of those with mood disorders seek treatment in the first year following onset (approximately 50%), a much lower percentage of those with anxiety and substance disorders seek treatment in the same time period (approximately 16% and 4% respectively).

Duration of delays in first treatment seeking

Survival analysis was also used to estimate the percentage of individuals with a disorder who seek

[†] The notes appear after the main text.

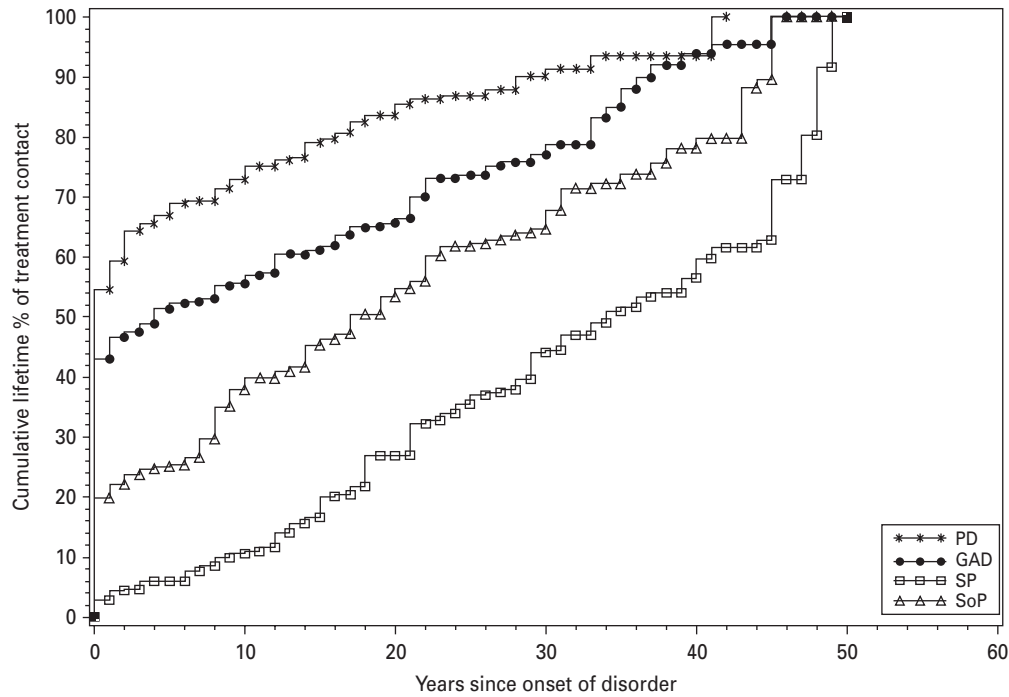


Fig. 1. Cumulative lifetime percentage of treatment seeking for anxiety disorders from year of onset. PD, panic disorder; GAD, generalized anxiety disorder; SP, specific phobia; SoP, social phobia.

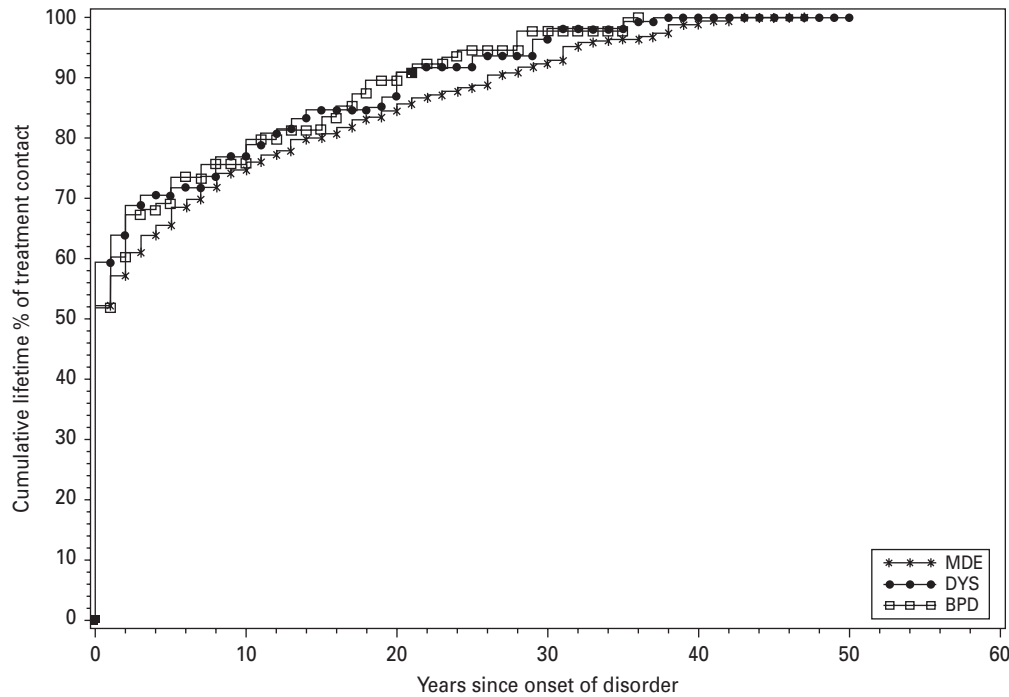


Fig. 2. Cumulative lifetime percentage of treatment seeking for mood disorders from year of onset. MDE, major depressive episode; DYS, dysthymia; BPD, bipolar disorder.

treatment within 1 year of first onset, the percentage who seek treatment within 50 years of first onset and the medium duration of treatment delays (Table 4).

The highest percentage seeking treatment within the first year of onset was among those with mood disorders, with 48.1% seeking treatment in the first

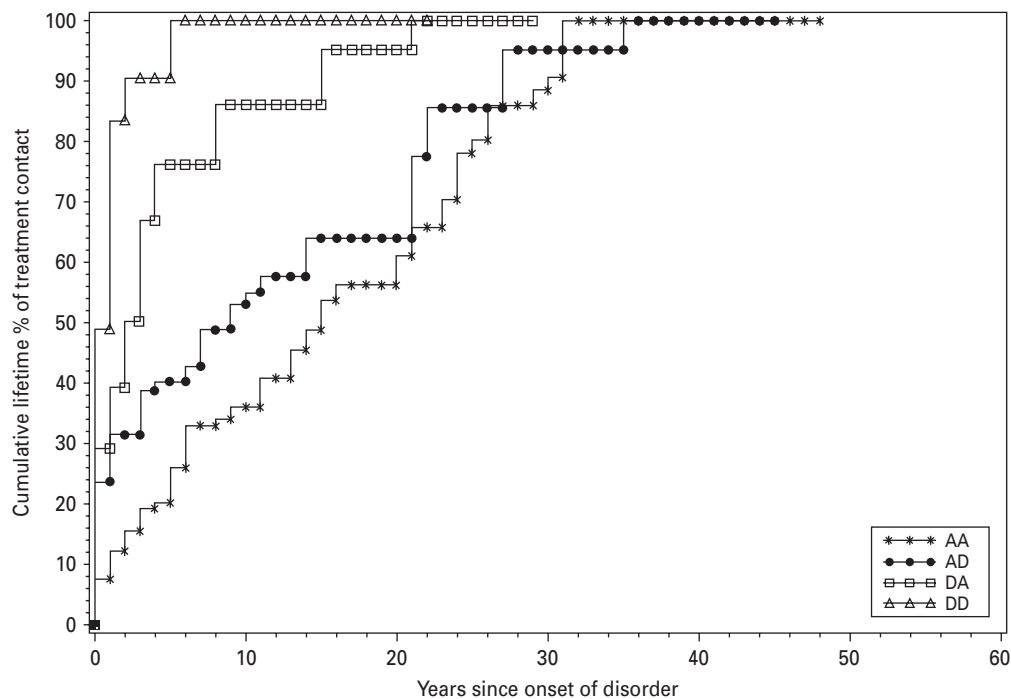


Fig. 3. Cumulative lifetime percentage of treatment seeking for substance disorders from year of onset. AA, alcohol abuse; AD, alcohol dependence; DA, drug abuse; DD, drug dependence.

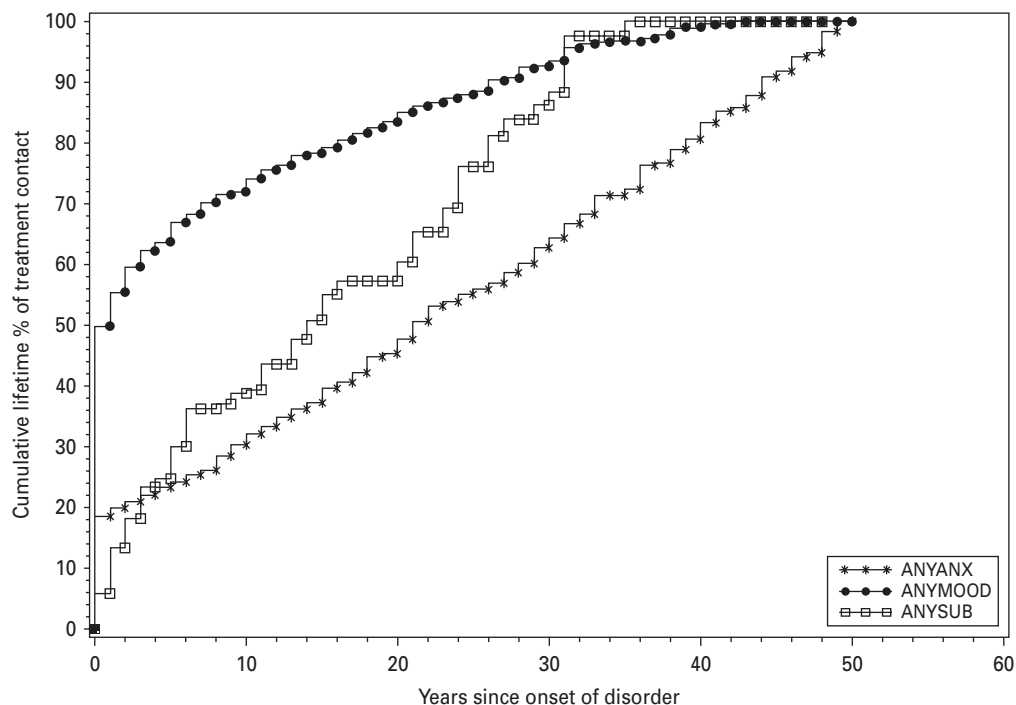


Fig. 4. Cumulative lifetime percentage of treatment seeking for any disorder group from year of onset. ANYANX, any anxiety disorder; ANYMOOD, any mood disorder; ANYSUB, any substance disorder.

year following onset. The corresponding figures for anxiety and substance disorders were 16% and 4.1%. In terms of specific disorders, the highest percentage

of treatment seeking within 1 year of onset was among those with dysthymia (56.6%) and panic disorder (52%). Estimates also suggest that the majority of

Table 4. Proportion seeking treatment in the year of disorder onset and median duration of delay among cases that subsequently sought treatment

	% Seeking treatment in year of onset	% Seeking treatment by 50 years	Median duration of delay (years)	<i>n</i>
Anxiety disorders				
Panic disorder	52.0	95.4	1	164
Generalized anxiety disorder	37.4	86.9	5	330
Specific phobia	1.5	53.8	35	445
Social phobia	13.5	67.8	18	282
Any anxiety disorder	16.0	86.4	22	849
Mood disorders				
Major depressive episode	50.9	97.6	1	849
Dysthymia	56.6	95.5	1	135
Bipolar disorder	50.4	97.1	1	121
Any mood disorder	48.1	96.7	2 ^b	889
Substance disorders				
Alcohol abuse ^a	5.5	74.6	16	269
Alcohol abuse with dependence ^a	21.0	88.8	10	67
Drug abuse ^a	17.1	58.8	3	65
Drug abuse with dependence ^a	– ^c	– ^c	– ^c	– ^c
Any substance disorder ^a	4.1	72.5	15	292

^a Assessed in the part 2 sample.

^b This figure reflects rounding errors and also the fact that an individual may have multiple mood disorders.

^c Disorder was omitted due to insufficient $n < 30$, but it will be included as one of the disorders in 'Any' category.

individuals with mood disorders seek treatment by 50 years following onset (96.7%), while 86.4% of those with anxiety disorders and 72.5% of those with substance disorders seek treatment in the same period. The median duration of delay in treatment varied substantially with respect to specific disorders, ranging from 1 year to 35 years.

Discussion

Results may be viewed as conservative given the following limitations. Individuals with mental disorders are more likely to decline participation and less likely to report stigmatizing symptoms, leading to an underestimation of prevalence and treatment figures (Cannell *et al.* 1977). While the impact of non-response bias has not been specifically examined in the NISHS, a non-response survey carried out alongside the NCS-R found no evidence of such bias (Kessler *et al.* 2004). In addition, the NISHS did not include individuals living in institutions, a population with a high prevalence of mental disorders (Gunn *et al.* 1991; Lamb & Weinberger, 1998; Brown *et al.* 2002). Despite the possibility of underestimation, previous studies suggest that results produced from lay-administered survey instruments such as the CIDI and Diagnostic Interview Schedule overestimate prevalence compared

with clinician-administered interviews (Anthony *et al.* 1985; Brugha *et al.* 2001). Finally, although strategies were used to increase the accuracy of self-report, it may be difficult for respondents to recall correctly their age at disorder onset.

A further limitation relates to the experience of civil conflict. The PTSD section includes a question 'Did you ever live as a civilian in a place where there was ongoing terror of civilians for political, ethnic, religious or other reasons?'. Due to the standardized format of the CIDI, this particular question did not elicit specific information about an individual's personal experience of this event type or relate to a specific place or location within NI. While we assume that endorsements of this item relate mainly to the experience of civil conflict in NI, we do not have data on how this item was interpreted.

Despite these limitations, results reveal the extent of the burden of mental disorders, with almost two-fifths of the population meeting the criteria for any disorder in their lifetime. Furthermore, projections suggest that almost one half of the population will eventually develop a disorder. These results lie at the upper end of the range of estimates from completed WMH studies with the figures for lifetime prevalence higher than any other Western European country. Prevalence rates of specific disorder categories again reveal that

estimates from NI are among the highest of all comparable figures (Kessler *et al.* 2008).

Anxiety disorders were the most prevalent category, while MDD, alcohol abuse, specific phobia and PTSD were the most common disorders. The lifetime prevalence of PTSD was higher in NI (8.8%) than in the US (Kessler *et al.* 2005) and all of the other WMH countries including other countries that have experienced civil conflict in their recent history, such as Israel and the Lebanon (Alonso & Kessler, 2008; Bromet *et al.* 2008; Gureje *et al.* 2008; Herman *et al.* 2008; Huang *et al.* 2008; Karam *et al.* 2008; Levinson *et al.* 2008; Medina-Mora *et al.* 2008; Posada-Villa *et al.* 2008). Further investigation is required to disentangle the factors associated with this finding; however, the impact of the 'Troubles' (Fay *et al.* 1999; Muldoon *et al.* 2003; O'Reilly & Stevenson, 2003; Ferry *et al.* 2008) is evident. The current study found that those who reported that they had lived 'as a civilian in a place where there was ongoing terror of civilians for political, ethnic, religious or other reasons' were significantly more likely to have each disorder category. Factors explaining the association of civil conflict with these disorder groupings remain unclear. It may reflect the direct adverse impact of civil conflict in NI on mental health outcomes. In another WMH initiative study, Karam *et al.* (2008) found similar associations in their examination of the mental health impact of war-related events in the Lebanon. Their study found that exposure to war-related events increased the risk of first onset anxiety, mood and impulse-control disorders. Alternatively, the findings may reflect the fact that individuals with these disorders are more likely to have been exposed to civil conflict. One key factor may be the high levels of social deprivation in the areas where much of the violence in NI was concentrated (Fay *et al.* 1999). This interaction has been highlighted by McConnell *et al.* (2002) in their examination of mental disorders in the District of Derry. They concluded that high levels of social deprivation have undoubtedly contributed to rates of psychiatric morbidity. McConnell *et al.* (2002) also allude to the adverse impact of civil conflict. While their study is not directly comparable to the present study, given its focus on 1-month and 12-month prevalence rates, they reported elevated rates of mental disorders, which were higher than those reported in a similar survey of inner-city London.

Age-at-onset distributions are consistent with those reported in previous epidemiological studies showing that impulse-control disorders had the earliest onset followed by substance, anxiety and mood disorders. Similar to the NCS-R (Kessler *et al.* 2005), the NISHS data show the upper bounds of the interquartile range of onset are among the relatively young for each

disorder category, indicating that mental disorders develop within a relatively narrow age range.

A number of sociodemographic variables were related to lifetime risk. Women had a significantly higher risk of anxiety and mood disorders and men had a higher risk of impulse control and substance disorders. These results are consistent with the findings of the NCS-R (Kessler *et al.* 2005) and point to a need for sex-specific mental health promotion and targeting of services. Younger people were at higher risk of all disorder categories, highlighting the need for research into the mental health needs of young people and mental health promotion initiatives targeting young people. Those who were previously married were also more likely to have anxiety, mood and substance disorders and lower income levels were significantly associated with impulse control and substance disorders. Findings in relation to income level concur with results from other similar studies (Gresenz *et al.* 2001; Jenkins *et al.* 2008).

On a positive note, the majority of individuals with disorders eventually seek treatment. These results compare favourably with figures from other WMH studies. Figures are similar to estimates from Europe, the US and New Zealand and are considerably higher than estimates from developing countries (Wang *et al.* 2008). The lower level of treatment seeking among those with substance disorders also mirrors findings from previous studies (Bruffaerts *et al.* 2007; de Graaf *et al.* 2008; Haro *et al.* 2008; Kessler *et al.* 2008; Wang *et al.* 2008) and may reflect lower levels of perceived need or lack of awareness of substance problems as mental disorders (Cunningham *et al.* 1993). Failure to seek help, however, was also prevalent among individuals with phobias (46% and 32% for specific phobia and social phobia respectively) and those with lifetime drug abuse (41%). These findings again are consistent with previous studies (Wang *et al.* 2005; Bruffaerts *et al.* 2007; Arababzadeh-Bouchez *et al.* 2008; de Graaf *et al.* 2008; Haro *et al.* 2008).

While the majority of individuals with disorders eventually seek treatment, a major area of concern is the delay from initial disorder onset to first seeking treatment, particularly for anxiety and substance disorders. This finding may be viewed as surprising given that NI has open and free access to primary care services through the NHS. This raises the question of whether provision is adequate in addressing need, as those with needs may simply choose to ignore available services. Previous studies have reported similar findings and together provide an account of the features of treatment seeking for these disorders across countries and cultures. Bruffaerts *et al.* (2008) estimated treatment-seeking delays of 16 and 18 years for these disorder groups, while the corresponding

estimates from the German WMH study were 23 and 9 years respectively (Alonso & Kessler, 2008). Results for anxiety may reflect specific symptoms, such as avoidance, that characterize these disorders (APA, 1994). Delays in seeking treatment for substance disorders, particularly alcohol disorders, may be associated with cultural norms of heavy drinking (Cunningham *et al.* 1993). The minimal delays found for mood disorders coincides with previous European studies (Bruffaerts *et al.* 2007; de Girolamo *et al.* 2008; de Graaf *et al.* 2008; Haro *et al.* 2008) and may reflect greater public awareness of depression and the treatments available. It may also be a reflection of the greater impairment associated with depression and the impact on family and loved ones, who may influence an individual's decision to seek help.

In summary, this first study of its kind in NI provides policy makers with evidence regarding the prevalence of mental disorders and the socio-demographic groups most at risk that would benefit from effective treatments. The study also enhances the evidence base regarding the features of mental disorders and treatment seeking and, as such, is relevant to an international audience. Results reveal that mental disorders are highly prevalent and that different disorders first occur within narrow age ranges. Age-at-onset information suggests that young children and adolescents should be the main priority for policy and interventions. The elevated prevalence of PTSD and the importance of living 'in a region of ongoing terror' in predicting lifetime disorders suggests that the civil conflict has had an additional impact on mental health and has implications for the targeting of mental health services. Furthermore, interventions should target the substantial delays in treatment seeking for anxiety and substance use disorders.

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Declaration of Interest

None.

Notes

- ¹ All treatment survival curves continue to 100% to enable comparison of the shapes of the curves. They do not reflect the percentage of the respondents who are expected to get treatment.

References

- Alonso J, Kessler RC (2008). Prevalence and treatment of mental disorders in Germany: results from the European study of the epidemiology of mental disorders (ESEMeD) survey. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 331–345. Cambridge University Press: New York.
- APA (1994). *Diagnostic and Statistical Manual of Mental Disorders*. 4th edn. American Psychiatric Association: Washington DC.
- Anthony AJ, Folstein M, Romanoski AJ, Vonkorff MR, Nestadt GR, Chahal R, Merchant A, Brown CH, Shapiro S, Kramer M, Gruenberg EM (1985). Comparison of the lay Diagnostic Interview Schedule and a standardized psychiatric diagnosis – experience in Eastern Baltimore. *Archives of General Psychiatry* **42**, 667–675.
- Arababzadeh-Bouchez S, Gasquet I, Kovess-Masfety V, Negres-Pages L, Lépine J-P (2008). The prevalence of mental disorders and service use in France: results from a national survey 2001–2002. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 305–330. Cambridge University Press: New York.
- Borges G, Wang PS, Medina-Mora ME, Lara C, Chiu WT (2007). Delay of first treatment of mental and substance use disorders in Mexico. *American Journal Public Health* **97**, 1638–1643.
- Bromet EJ, Gluzman SF, Tintle NL, Paniotto VI, Webb CPM, Zakhosha V, Havenaar JM, Gutkovich Z, Kostyuchenko S, Schwartz JE (2008). The state of mental health and alcoholism in Ukraine. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), p. 431–445. Cambridge University Press: New York.

- Brown MN, Lapane KL, Luisi AF** (2002). The management of depression in older nursing home residents. *Journal of the American Geriatrics Society* **50**, 69–76.
- Bruffaerts R, Bonnewyn A, Demyttenaere K** (2007). Delays in seeking treatment for mental disorders in the Belgian general population. *Social Psychiatry Psychiatric Epidemiology* **42**, 937–944.
- Bruffaerts R, Bonnewyn A, Demyttenaere K** (2008). Mental health in Belgium: current situation and future perspectives. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 279–304. Cambridge University Press: New York.
- Brugha T, Jenkins R, Taub N, Meltzer H, Bebbington P** (2001). A general population comparison of the Composite International Diagnostic Interview (CIDI) and the Schedules for Clinical Assessment in Neuropsychiatry (SCAN). *Psychological Medicine* **31**, 1001–1013.
- Cannell CF, Marquis KH, Laurent A** (1977). A summary of studies of interviewing methodology. *Vital Health Statistics* **2** **69**, 1–78.
- Cunningham JA, Sobell LC, Sobell MB, Agrawal S, Toneatto T** (1993). Barriers to treatment: why alcohol and drug abusers delay or never seek treatment. *Addictive Behaviors* **18**, 347–353.
- de Girolamo G, Morosini P, Gigantesco A, Delmonte S, Kessler RC** (2008). The prevalence of mental disorders and service use in Italy: results from the national health survey 2001–2003. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 364–387. Cambridge University Press: New York.
- de Graaf R, Ormel J, ten Have M, Burger H, Buist-Bouwman M** (2008). Mental disorders and service use in the Netherlands: results from the European study of the epidemiology of mental disorders (ESEMeD). In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 388–405. Cambridge University Press: New York.
- Department of Health and Social Services and Public Safety** (2007). NI Health and Social Wellbeing Survey 2005/6 (<http://archive.nics.gov.uk/dfp/070129b-dfp.htm>). Accessed February 2010.
- Fay MT, Morrissey M, Smyth M, Wong T** (1999). *The Cost of the Troubles Study: Report on the NI Survey. The Experience and Impact of the Troubles*. INCORE: Derry/Londonderry.
- Ferry F, Bolton D, Bunting B, Devine B, McCann S, Murphy S** (2008). *Trauma, Health and Conflict in Northern Ireland. A Study of the Epidemiology of Trauma Related Disorders and Qualitative Investigation of the Impact of Trauma on the Individual*. NI Centre for Trauma and Transformation and University of Ulster Psychology Research Institute: Londonderry.
- Gresenz CR, Sturm R, Tang L** (2001). Income and mental health: unraveling community and individual level relationships. *Journal of Mental Health Policy and Economics* **4**, 197–203.
- Gureje O, Adeyemi O, Enyidah N, Ekpo M, Udofia O, Uwakwe R, Wakil A** (2008). Mental disorders among adult Nigerians: risks, prevalence and treatment. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 211–237. Cambridge University Press: New York.
- Gunn J, Maden A, Swinton M** (1991). Treatment needs of prisoners with psychiatric disorders. *British Medical Journal* **303**, 338–341.
- Halli SS, Rao KV** (1992). *Advanced Techniques of Population Analysis*. Plenum: New York.
- Haro JM, Alonso J, Pinto-Meza A, Vilagut Saiz G, Fernandez A, Codony M, Martinez M, Domingo A, Torres JV, Almansa J, Ochoa S, Autonell J** (2008). The epidemiology of mental disorders in the general population of Spain. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 406–430. Cambridge University Press: New York.
- Herman AA, Williams D, Stein DJ, Seedat S, Heeringa SG, Moomal H** (2008). The South African health and stress study (SASH): a foundation for improving mental health care in South Africa. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 238–264. Cambridge University Press: New York.
- Huang Y, Liu Z, Zhang M, Shen Y, Tsang CHA, He Y, Lee S** (2008). Mental disorder and service use in China. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 447–473. Cambridge University Press: New York.
- Jenkins R, Bhugra D, Bebbington P, Brugha TS, Farrell M, Coid J, Fryers T, Weich S, Singleton N, Meltzer H** (2008). Debt income and mental disorder in the general population. *Psychological Medicine* **38**, 1485–1493.
- Karam EG, Mneimneh ZN, Karam AN, Fayyad JA, Nasser SC, Dimassi H, Salamoun MM** (2008). Mental disorders and war in Lebanon. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 265–278. Cambridge University Press: New York.
- Kessler RC, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, Anthony JC, Berglund P, Chatterji S, de Girolamo G, de Graaf R, Demyttenaere K, Gasquet I, Gluzman SF, Gruber MJ, Gureje O, Haro JM, Heeringa SG, Karam AN, Kawakami N, Lee S, Levinson D, Medina-Mora ME, Oakley-Browne MA, Pennell B-E, Petukhova M, Posada-Villa J, Ruscio A, Stein DJ, Tsang CHA, Üstün TB** (2008). Lifetime prevalence and age of onset distributions of mental disorders in the world mental health survey initiative. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 511–521. Cambridge University Press: New York.
- Kessler RC, Berglund PA, Chiu WT, Demlar O, Glantz M, Lane MC, Jin R, Merikangas KR, Nock M, Olfson M, Pincus HA, Walters EE, Wang PS, Wells KB** (2008). The national comorbidity survey replication (NCS-R): the cornerstone in improving mental health and mental health care in the United States. In *The WHO World Mental Health*

- Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 165–210. Cambridge University Press: New York.
- Kessler RC, Berglund P, Chiu WT, Demler O, Heeringa S, Hiripi E, Jin R, Pennell BE, Walters EE, Zaslavsky A, Zheng H** (2004). The US national comorbidity survey replication (NCS-R): design and field procedures. *International Journal of Methods in Psychiatric Research* **13**, 69–92.
- Kessler RC, Berglund P, Demler O, Jin R, Walters EE** (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry* **62**, 593–602.
- Kessler RC, Üstün TB** (2008). The world health organization composite international diagnostic interview. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 58–90. Cambridge University Press: New York.
- Kish L** (1965). *Survey Sampling*. John Wiley and Sons, Inc.: New York.
- Lamb HR, Weinberger LE** (1998). Persons with severe mental illness in jails and prisons: a review. *Psychiatric Services* **49**, 483–492.
- Lee S, Zhang MY, Shen YC, Huang YQ, Fung SC, Tsang A, Liu ZR, Shen YC, Kessler RC** (2007). Delay in initial treatment contact after first onset of mental disorders in metropolitan China. *Acta Psychiatrica Scandinavica* **37**, 61–71.
- Levinson D, Lerner Y, Zilber N, Levav I, Polakiewicz J** (2008). The prevalence of mental disorders and service use in Israel: results from the national health survey, 2003–2004. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 346–363. Cambridge University Press: New York.
- McConnell P, Bebbington P, McClelland R, Gillespie K, Houghton S** (2002). Prevalence of psychiatric disorder and the need for psychiatric care in Northern Ireland: population study in the district of Derry. *British Journal of Psychiatry* **181**, 214–219.
- Medina-Mora ME, Borges G, Lara C, Benjet C, Fleiz C, Rojas E, Zambrano J, Villatoro JB, Aguilar-Gaxiola S, Kessler RC** (2008). The Mexican national comorbidity survey (M-NCS): overview and results. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 144–164. Cambridge University Press: New York.
- Muldoon O, Schmid K, Downes C, Kremer J, Trew K** (2003). *The Legacy of the Troubles: Experience of the Troubles, Mental Health and Social Attitudes*. Queen's University: Belfast.
- National Collaborating Centre for Mental Health** (2010). *Depression: The Treatment and Management of Depression in Adults* (updated edition). The British Psychological Society and The Royal College of Psychiatrists: London.
- Olfson M, Kessler RC, Berglund PA, Lin E** (1998). Psychiatric disorder onset and first treatment contact in the United States and Ontario. *American Journal of Psychiatry* **155**, 1415–1422.
- O'Reilly D, Stevenson M** (2003). Mental health in Northern Ireland: have the 'troubles' made it worse? *Journal Epidemiology Community Health* **57**, 488–492.
- Pampel FC** (2000). *Logistic Regression: A Primer*. Sage university papers series on quantitative applications in the social science, 07–132. Sage: Thousand Oaks, CA.
- Posada-Villa J, Rodríguez M, Duque P, Garzón A, Aguilar-Gaxiola S, Breslau J** (2008). Mental disorders in Columbia: results from the world mental health survey. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 131–143. Cambridge University Press: New York.
- Robins LN, Wing J, Wittchen HU, Helzer JE, Babor TF, Burke J, Farmer A, Jablenski A, Pickens R, Regier DA, Sartorius N, Towle LH** (1988). The Composite International Diagnostic Interview: an epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Archives of General Psychiatry* **45**, 1069–1077.
- Sareen J, Jagdeo A, Cox BJ, ten-Have M, Clara IP, Belik S-L, de Graaf R, Stein MB** (2007). Perceived barriers toward mental health service utilization: a comparison of the United States, Ontario and the Netherlands. *Psychiatric Services* **58**, 357–364.
- SAS Institute** (2001). *SAS/STAT Software: Changes and Enhancements, Release 8.2*. SAS Publishing: Cary, NC.
- StataCorp** (2007). *Statistical Software, Release 10.0*. Stata: College Station, TX.
- Wang PS, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, Borges G, Bruffaerts R, Chatterji S, Chiu W-T, de Girolamo G, Fayyas JA, Gureje O, Haro JM, Heeringa SG, Huang Y, Kessler RC, Kovess-Masfety V, Levinson D, Nakane Y, Oakley-Browne MA, Ormel J, Pennell, B-E, Posada-Villa J, Üstün TB** (2008). Delay and failure in treatment seeking after first onset of mental disorders in the world mental health survey initiative. In *The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders* (ed. R. C. Kessler and T. B. Üstün), pp. 522–533. Cambridge University Press: New York.
- Wang PS, Berglund PA, Olfson M, Kessler RC** (2004). Delays in initial treatment contact after first onset of a mental disorder. *Health Services Research* **39**, 393–415.
- Wang PS, Berglund PA, Olfson M, Pincus, HA, Wells KB, Kessler RC** (2005). Failure and delay in initial treatment contact after first onset of mental disorders in the national comorbidity replication survey. *Archives of General Psychiatry* **62**, 603–613.