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Suicide ideation, plans and attempts in Ukraine: findings from the Ukraine World Mental Health Survey

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ABSTRACT

Background. Because the suicide rates in Eastern Europe have increased, the epidemiology of suicide behaviors in this part of the world is in urgent need of study. Using data from the Ukraine site of the World Mental Health (WMH) Survey Initiative, we present the first population-based findings from a former Soviet country on the descriptive epidemiology of suicide ideation, plans and attempts, and their links to current functioning and service utilization.

Method. In 2002, a nationally representative sample of 4725 adults in Ukraine was interviewed with the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Risk factors included demographic characteristics, trauma, smoking, and parental and personal psychiatric disorders. Current functional impairments and recent service utilization were assessed.

Results. The lifetime prevalence of suicide ideation was 8·2%. The average age of onset was 31. The key risk factors were female sex, younger age, trauma, parental depression, and prior alcohol, depressive and intermittent explosive disorders, especially the presence of co-morbidity. Ideators had poorer functioning and greater use of health services. One-third of ideators had a plan, and one-fifth made an attempt. Among ideators, young age, smoking and prior psychiatric disorders were risk factors for these behaviors.

Conclusions. Together with the increasing suicide rate, these results suggest that suicide intervention programs in Ukraine should focus on the generation of young adults under 30. The associations with co-morbidity, impairments in current functioning and greater service use indicate that a physician education program on suicidality should be comprehensive in scope and a public health priority in Ukraine.

INTRODUCTION

After the dissolution of the Soviet Union, suicide increased in Eastern Europe (Mäkinen, 2000), particularly among young men (Shkolnikov *et al.* 2001), while remaining relatively stable in most Western European countries (WHO, 2006). In Ukraine, the setting for this report, suicide mortality increased from 20·5 per 100 000 in 1990 to 24·6 in 2002 and currently ranks sixth in the world (Levi *et al.* 2003). Within Ukraine, a lower rate is found in the West (Mokhovikov & Donets, 1996; Kryzhanovskaya & Pilyagina, 1999; Kondrichin & Lester, 2002). Depression, the core feature of suicide (Isacsson, 2006), is also elevated in Ukraine relative to Western Europe (WHO, 2004; Bobak *et al.* 2006). Heavy alcohol

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consumption is a crucial risk factor (Nemtsov, 2003), particularly among men (Wasserman *et al.* 1998).

Little is known about the epidemiology of the major precursors of suicide in Eastern Europe, namely suicide ideation, plans and attempts, because population-based research was rarely undertaken before 1991. Indeed, we located only three population-based studies. In the first, the Diagnostic Interview Schedule was administered in 1995–1996 to a national sample of adults in Hungary selected from the registers of 15 general practitioners (Scádóczky *et al.* 2000). The lifetime prevalence of suicide attempts was 3·2% (4·0% for women and 2·2% for men). Besides sex, the significant risk factors were being previously married or never married, being unemployed or economically inactive, having no children or more than two, and having lifetime DSM-IV anxiety or mood disorder. Age and education were not significant. The second study, undertaken in 2000, was a postal survey of adults in Latvia (response rate 52%) (Rancāns *et al.* 2003). Suicide behaviors were assessed with a five-item questionnaire (Paykel *et al.* 1974). One-quarter of women (25·9%) and one-third of men (33·7%) reported lifetime ideation, plans and/or attempts. Increased risk was associated with being male, younger age, lower education, urban residency, and being Latvian. The third study was an interview survey of 500 residents (aged 14 and older) of Tallinn, Estonia, conducted as part of the World Health Organization (WHO) SUPREMISS in 2002–2004 (Bertolote *et al.* 2005). The lifetime rates for suicide ideation, plans and attempts were 12·4, 5·4 and 3·6% respectively. Overall, 39% of attempters required medical attention.

The lifetime prevalence of suicide ideation and attempts in Western Europe and the USA ranges from 3% to 15% and <1% to 5% respectively (e.g. Hintikka *et al.* 1998; Kessler *et al.* 1999, 2005; Weissman *et al.* 1999; Kjøller & Helweg-Larsen, 2000; Welch, 2001; Bernal *et al.* 2006). Thus although suicide mortality rates are high in Eastern bloc countries, the rates of suicide thoughts and behaviors appear similar to other cultures. However, none of the Eastern European studies combined national probability sampling methodology with reliable structured interviews, and it is difficult to draw firm conclusions from existing results. Furthermore, Western studies suggest that multiple risk factors are associated with suicide behaviors. These include not just demographic characteristics (e.g. Weissman *et al.* 1999) but also (1) psychiatric, substance use and co-morbid disorders (Borges *et al.* 2000; Pirkis *et al.* 2000; Goldney *et al.* 2003; Kessler *et al.* 2005; Sareen *et al.* 2005; Sher, 2005) and related behaviors such as aggression (Verona *et al.* 2004; Brezo *et al.* 2006) and cigarette smoking (Miller *et al.* 2000; Breslau *et al.* 2005); (2) parental psychopathology (e.g. Goodwin *et al.* 2004); and trauma exposure (e.g. Goldney *et al.* 2000). In Western Europe, 50% (Kjøller & Helweg-Larsen, 2000) to >90% (Hintikka *et al.* 1998) of suicide attempters had recent contact with health-care providers although it is unclear whether this association was mediated by the presence of psychiatric disorder. The impact of suicide behavior on service utilization or other indicators of current functioning has not been studied in Eastern Europe.

This paper describes the epidemiology of suicide ideation and non-lethal behaviors in Ukraine. The findings are based on the Ukraine World Mental Health Survey (Ukraine-WMH), carried out in conjunction with the WHO WMH Survey Initiative (Kessler & Üstün, 2004). Specifically, we report (*a*) the lifetime and 12-month prevalence rates of suicide ideation in a national sample of adults aged 18 and older, and rates of plans and attempts among respondents with lifetime ideation; (*b*) the contributions of personal, geographic and familial risk factors; and (*c*) the relationship of suicidality to current functioning and medical treatment.

METHOD

Sample and procedure

The Ukraine-WMH is a nationally representative survey of adults aged 18 and older from the 24 oblasts (states) and the republic of Crimea (WHO, 2004; Bromet *et al.* 2005). Sampling followed a four-tier multistage cluster design described in detail previously (Bromet *et al.* 2005). The field work was conducted by the Kiev International Institute of Sociology (KIIS) in collaboration with the Ukrainian Psychiatric Association (UPA) from February to December

2002. Quality assurance procedures established for the WMH consortium were strictly followed. All measures were translated into Russian and Ukrainian using WHO-approved forward and back translation procedures. Recruitment and consent procedures were approved by the Committees on Research Involving Human Subjects of Stony Brook University and by internal review boards at KIIS and UPA, and written informed consent was obtained. The response rate was 78·3%.

All respondents ($n=4725$) completed Part I of the paper–pencil version of the WMH Composite International Diagnostic Interview Version 3.0 (WMH-CIDI), a fully structured, modularized interview for DSM-IV disorders (Kessler & Üstün, 2004). Minor refinements were made to the alcohol, trauma and demographic sections based on a series of focus groups and a pre-test in the Kyiv metropolitan area ($n=50$). Part I respondents with lifetime DSM-IV depressive or anxiety disorder or alcohol dependence plus a probability subsample (16%) of the remainder were also administered Part II ($n=1720$), which included modules focusing on disorders of secondary interest and psychosocial and familial risk factors.

Assessment of suicide thoughts and actions

Part I of the WMH-CIDI contains a module assessing suicide thoughts and behaviors. To improve respondents' comfort about answering potentially embarrassing and highly personal questions, the lead questions about ideation, plans and attempts were contained in a booklet read by the respondent, and the interviewer referred to them only by letter. The first item addressed ideation ('you seriously thought about committing suicide'). Respondents who said yes to this item were asked their age the first time this occurred. They were then asked to read the items about plans ('you made a plan for committing suicide') and attempts ('you attempted suicide'), and ages at first occurrence were determined.

Risk factors

Based on the evidence from Western research, four sets (blocks) of risk factors were examined: demographic characteristics, psychosocial antecedents, parental history of disorder, and personal history of psychiatric and alcohol disorders predating suicide ideation or behavior.

(1) The demographic characteristics were sex, birth cohort (born before 1945; 1945–1964; after 1964), region (West *versus* other), education (less than high school *versus* more), and marital status (separated or divorced *versus* other).
(2) Four antecedent variables were examined: childhood disruptive behaviors (0, 1 or 2+ behaviors involving inattention, hyperactivity, defiance or misconduct); smoking history (smoked at least once a week for 2 months or more); exposure to a traumatic event prior to suicide ideation or behavior [the most common were seeing someone being badly injured or killed or unexpectedly seeing a dead body (23·8% of respondents), being involved in a life-threatening automobile accident (21·1%), being an unarmed civilian in a place where there was a war, revolution, military coup or invasion (11·9%), and being badly beaten up other than by spouse (10·5%)]; and Chornobyl exposure (ever *versus* never lived in an area contaminated by Chornobyl). The latter was included as a separate stressor because of the psychological toll of the 1986 nuclear power plant accident (Havenaar & Bromet, 2005) and the excess mortality from suicide in Chornobyl clean-up workers (Rahu *et al*. 1997, 2006).
(3) The measures of parental history included (*a*) depression (either parent experienced episodes lasting 2+ weeks during all, most, or some of the respondent's childhood), (*b*) anxiety (either parent experienced episodes lasting at least 1 month during all, most, or some of the respondent's childhood or sudden anxiety or panic attacks involving shortness of breath, heart pounding, feeling ill, or feeling fearful of dying during the attack); (*c*) alcoholism (either parent experienced alcohol problems during all, most, or some of the respondent's childhood); and (*d*) antisocial behavior (either parent lied a lot, got into physical fights, was involved in criminal activities, was arrested or sent to prison). Because only 1·3% of respondents reported that a parent attempted or

committed suicide, this variable was not included among the familial risk factors.

(4) Four classes of DSM-IV psychiatric diagnoses were included: depressive disorders (depression or dysthymia); anxiety disorders (social phobia, agoraphobia, generalized anxiety disorder, and panic disorder); alcohol abuse (with or without dependence); and intermittent explosive disorder (IED). Three composite measures of co-morbidity were also created: number of classes of disorder (0, 1, 2+); internalizing disorders (depression only, anxiety only, both, neither); and externalizing disorders (alcoholism only, IED only, both, neither). Each of these variables was treated as a time-varying predictor of suicide ideation and behavior (i.e. the first episode occurred prior to the first onset of suicide ideation or behavior).

Current functioning and use of services

Current functioning was assessed with two subscales of the WHO-Disability Assessment Scale (WHO-DAS) reflecting functioning in the past 30 days: (1) days out of role (number of days respondents were fully or partially unable to carry out their normal activities (e.g. work) because of problems with physical or mental health, or use of alcohol or drugs); and (2) social functioning (difficulties getting along with people, maintaining a normal social life, or participating in social activities) on a scale of 0–100 (0 = no impairment). With regard to out-patient services, psychiatric out-patient care in Ukraine is available only for the most severe cases. Thus, we present findings for medical visits to a general practitioner, other medical specialist, or alternative care provider in the prior 12 months.

Data analysis

To account for non-response and selection bias, the data were weighted to approximate the population distribution of Ukraine on key demographic variables. A Part II weight further adjusted for differential selection of Part I respondents. The weighted sample was 45·0% male and had a median age of 44. The distributions of all relevant independent variables are listed in the Appendix. All analyses were conducted on a person-years database that assigns an observation for each year of a person's life. We examined the risk factors for (*a*) first onset of suicide ideation in the full sample and (*b*) plans and attempts among ideators, using discrete-time survival analysis, adjusted for sex, person-years and all variables within each set (block) of risk factors (co-morbidity variables were only adjusted for sex and person-years) (Efron, 1988). The discrete-time survival analysis was implemented as logistic regression was applied to the person-years file to predict a dichotomous measure of suicide outcomes such that the first year of the ideation/plan/attempt was coded '1', years preceding first suicide behavior were coded '0', and years subsequent to the behavior were censored. The time-varying risk factors (marital status, onset of regular smoking, first trauma exposure; psychiatric disorders; co-morbidity of psychiatric disorders) were coded to test whether first suicide thought/plan/attempt was predicted by the prior occurrence of the risk factor. After inspecting the significant findings for each set of risk factors, a final multivariable model was estimated using a backwards elimination procedure starting with the set of all significant predictors when adjusting for sex, person-years, and the other variables in the block ($\alpha = 0{\cdot}01$). *t* tests and analysis of variance (ANOVA) were used to examine sex differences in age of onset of suicide behaviors and associations of suicidality with current functioning; logistic regression was used to examine associations with medical care. To adjust for the effect of weighting and sample design on standard errors, the analyses were conducted using SUDAAN version 8.0.2 (SUDAAN, 2003), which uses the Taylor series linearization method. Because of the multiple comparisons included in this report for each dependent variable, we emphasize findings with $p < 0{\cdot}01$.

RESULTS

Prevalence and age of onset

The lifetime prevalence of suicide ideation in the total sample was 8·2% (Table1). The rate was significantly higher among women (10·1%) than men (5·8%) [OR 1·8, 95% confidence interval (CI) 1·5–2·2, $p < 0{\cdot}001$]. As shown in Table 1, 32·9% of respondents with suicide ideation had a plan, and 21·6% of those with ideation made a suicide attempt. In the subgroup of

Table 1. *Rates and ages of onset (AOO) of suicidal behaviors in Ukraine: weighted n and percentage*[a]

	Total			Women			Men			Test for sex difference	
										Rate	Age
	n	% (S.E.)	AOO[b]	*n*	% (S.E.)	AOO[b]	*n*	% (S.E.)	AOO[b]	χ^2, *p* value	*t* test, *p* value
Total sample	4719[b]			2599			2120				
Lifetime ideation	386	8·2 (0·5)	30·9 (0·8)	264	10·1 (0·7)	30·0 (1·1)	123	5·8 (0·5)	32·8 (1·7)	37·69, <0·001	1·30, 0·20
Ideators											
Plan	127	32·9 (2·5)	31·1 (1·5)	90	34·3 (2·4)	29·7 (2·1)	37	29·9 (5·5)	34·8 (3·3)	0·64, 0·43	1·17, 0·25
Attempt	83	21·6 (2·7)	27·2 (1·5)	56	21·3 (2·9)	25·3 (1·6)	27	22·2 (4·9)	30·9 (2·8)	0·03, 0·86	1·88, 0·07
Planners											
Attempt	48	38·2 (5·0)	27·7 (2·0)	35	39·0 (5·4)	25·6 (2·1)	13	36·0 (10·2)	32·9 (3·6)	0·07, 0·79	1·94, 0·06

[a] Rates based on Part I sample; six of the 4725 respondents did not answer the suicide ideation question.
[b] Mean (S.E.) for age of onset.

ideators with a plan, 38·2% made an attempt. The mean age at first ideation and first plan was 30–35 years for both women and men. The mean age of first attempt was somewhat younger for women (25·3 years) than for men (30·9 years). Among the subgroup of ideators with a plan, the mean age at first attempt was similar to that for all attempters. For the most part, the first occurrence of a plan and attempt was in the same year as first ideation (90% and 77% respectively).

Fig. 1 shows the age of onset of ideation in more detail in respondents with lifetime plans and/or attempts. The results of a 2 (sex) by 3 (group) ANOVA indicated that age of first ideation was significantly different across these subgroups ($F=5·74$, $p=0·007$), but neither sex ($F=2·63$, $p=0·11$) nor the interaction term ($p=0·77$) was significant. *Post-hoc* analyses showed the 'plan only' subgroup was significantly older than the 'attempt only' subgroup ($p=0·002$) and the combined 'attempt only' and 'attempt + plan' subgroups ($p=0·004$).

The 12-month prevalence of suicide ideation was 1·8% (S.E. = 0·2). Consistent with the lifetime figures, the rate was twice as high among women (2·3%; 0·3) than men (1·2%; 0·3). Among recent ideators, 49·9% (5·1) made a plan and 27·0% (5·9) made an attempt within the past 12 months. These proportions were similar for men and women.

Risk factor findings

Table 2 presents the findings for the four sets of risk factors adjusting for sex and person-years and for the other risk factors in each set. With respect to lifetime ideation in the total sample, women and younger respondents had an elevated risk compared to men and respondents born before 1945 whereas living outside the Western region, low education and separation/divorce were not significant risk factors. Two of the four antecedent variables, childhood disruptive behaviors and trauma exposure, elevated the risk of ideation; history of smoking and living in an area contaminated by Chornobyl did not increase the risk of ideation. Respondents with an alcoholic parent were at increased risk of reporting ideation, whereas parental depression and antisocial behavior had a marginal effect ($p<0·05$), and parental anxiety did not increase the risk. Most strikingly, after adjusting for the set of psychiatric variables, prior depressive, anxiety, and alcohol disorders and IED significantly increased the risk of suicide ideation.

When the significant risk factors from each block were included together in a multivariable model, seven risk factors remained significant: female sex [adjusted odds ratio (aOR) 2·2, 95% CI 1·4–3·5, $p<0·0$ 1], middle (aOR 3·0, 95% CI 1·9–4·7, $p<0·001$) and youngest birth cohorts (aOR 7·2, 95% CI 4·8–10·9, $p<0·001$), trauma exposure (aOR 2·5, 95% CI 1·5–4·2, $p<0·001$), parental alcoholism (aOR 2·0, 95% CI 1·4–2·9, $p<0·001$), depressive disorders (aOR 2·4, 95% CI 1·7–3·6, $p<0·001$), and IED (aOR 3·0, 95% CI 2·0–4·6, $p<0·001$).

In the subgroup with ideation, only three risk factors significantly ($p<0·01$) elevated the risk

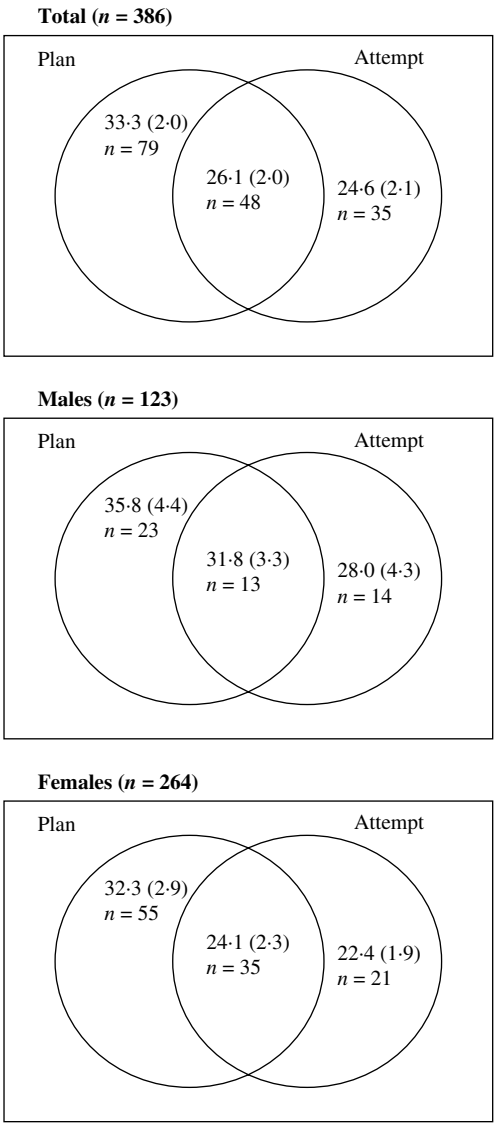

FIG. 1. Mean (S.E.) age of first ideation among planners and attempters in Ukraine.

of plans: being in the youngest cohort, trauma exposure, and prior depressive disorder. Living outside the Western region, 2+ childhood disruptive behaviors (*versus* none), smoking and alcohol use disorders had marginal relationships ($p<0{\cdot}05$). In the full multivariable model, only youngest birth cohort (aOR 6·9, 95% CI 2·8–17·1, $p<0{\cdot}001$) and depressive disorders (aOR 2·9, 95% CI 1·8–4·6, $p<0{\cdot}001$) were significant. Turning to the findings for attempts among ideators, being in the youngest birth cohort, smoking and alcohol abuse were significant risk factors (last column of Table 2), while region, prior depressive disorders and IED had marginal associations. In the full multivariable model, only young birth cohort (aOR 12·6, 95% CI 5·5–28·5, $p<0{\cdot}001$) and prior alcohol abuse (aOR 2·5, 95% CI 1·3–5·0, $p<0{\cdot}01$) had unique independent effects.

Table 3 shows that prior occurrence of co-morbid disorders was strongly associated with subsequent suicidality in Ukraine. Co-morbid alcoholism and IED led to a 10-fold increased risk of ideation; co-morbid depressive and anxiety disorders led to a sevenfold increased risk of ideation; and having two or more classes of disorders led to an eightfold increase. In the subgroup with ideation, having at least two classes of disorders elevated the subsequent risk of both plans and attempts more than fivefold.

Current functioning and service utilization

Respondents with lifetime suicide ideation reported more days lost from work, poorer functioning and greater use of medical services in the 12 months prior to interview than respondents without ideation (Table 4). More than half of the respondents (56·1%) with lifetime suicide ideation met criteria for a lifetime psychiatric or alcohol disorder compared to 29·5% of respondents without ideation. As expected, based on previous reports (e.g. Buist-Bouwman *et al.* 2006), psychiatric history was significantly associated with days out of role, social functioning, and health-care utilization (Table 4). In each case, however, the trend analysis was highly significant, but the interaction of mental health × suicide ideation was not. Thus, the effects of ideation and mental health history were additive rather than synergistic.

In the subgroup with ideation, we also compared days lost from work, social functioning, and use of services for those with and without a suicide attempt (data not shown). The differences were small and non-significant.

DISCUSSION

In Ukraine, as in Western Europe and North America, close to 10% of the population have had serious suicide thoughts and about 2% thought about suicide in the past 12 months.

Table 2. *Risk factors for suicidal thoughts, and for plans and attempts among lifetime ideators in Ukraine*

	Lifetime ideation in total sample aOR (95% CI)[a]	Plans among ideators aOR (95% CI)[a]	Attempts among ideators aOR (95% CI)[a]
Block 1: Demographic factors[b]			
Sex: female	2·0 (1·3–3·1)**	0·8 (0·5–1·3)	0·9 (0·5–1·6)
Birth cohort			
⩽1944	1·0	1·0	1·0
1945–1964	2·9 (1·6–5·1)***	1·4 (0·6–3·3)	3·4 (0·9–13·4)
⩾1965	9·4 (5·6–15·9)***	7·5 (2·9–19·5)***	27·1 (16·5–113·0)***
Region: not West	1·8 (0·9–3·5)	2·7 (1·1–6·5)*	2·8 (1·2–6·2)*
Education: less than high school	1·3 (0·7–2·3)	0·9 (0·3–2·3)	2·2 (0·5–10·4)
Separated/divorced[b]	0·9 (0·4–1·8)	1·5 (0·7–3·0)	0·5 (0·2–1·7)
Block 2: Antecedent factors[b]			
Childhood disruptive behaviors			
Two or more	2·9 (1·9–4·5)***	2·3 (1·1–4·5)*	1·4 (0·7–2·8)
One	2·4 (1·6–3·8)***	1·1 (0·6–2·0)	1·6 (0·8–3·0)
None	1·0	1·0	1·0
Smoking[c]	1·7 (1·0–3·0)	2·3 (1·2–4·3)*	3·6 (1·6–8·0)**
Trauma exposure[c]	2·2 (1·3–3·8)**	2·6 (1·3–5·3)**	2·0 (0·9–4·2)
Lived in Chornobyl contaminated area	0·6 (0·4–1·0)	0·7 (0·2–2·3)	1·4 (0·4–5·1)
Block 3: Parental disorders[b]			
Depression	1·6 (1·0–2·5)*	0·9 (0·5–1·7)	0·6 (0·4–1·1)
Anxiety	1·4 (0·8–2·2)	1·1 (0·6–2·2)	1·1 (0·5–2·4)
Alcoholism	2·0 (1·2–3·4)**	1·2 (0·6–2·5)	1·2 (0·4–3·4)
Antisocial behaviors	1·9 (1·1–3·2)*	1·7 (0·9–3·2)	1·3 (0·5–3·5)
Block 4: Prior psychiatric disorders			
Depressive disorders[c,d]	2·7 (2·0–3·5)***	2·9 (1·9–4·4)***	2·4 (1·1–4·9)*
Anxiety disorders[c]	1·9 (1·3–2·8)***	1·0 (0·6–1·6)	1·4 (0·6–2·9)
Alcohol abuse/dependence[c]	2·8 (1·7–4·7)***	2·4 (1·2–4·9)*	2·8 (1·3–6·0)**
Intermittent explosive disorder[c]	3·8 (2·8–5·1)***	2·1 (0·9–4·8)	2·1 (1·2–3·8)*

aOR, Adjusted odds ratio; CI, confidence interval.

[a] Adjusted for person-years, sex and variables within block.

[b] Part II sample.

[c] Time-varying covariate occurring prior to suicidal outcomes.

[d] A similar analysis was conducted using a modified depression variable that excluded suicidal ideation as a criterion symptom. Nearly identical ORs and patterns of significance were obtained.

* $p \leqslant 0{\cdot}05$, ** $p \leqslant 0{\cdot}01$, *** $p \leqslant 0{\cdot}001$.

The average age when suicide ideation and suicide plan first occurred was about 30, and the average age of onset for attempt was a few years earlier. One-third of ideators had made a plan and one-fifth had made an attempt. Consistent with Western research, the most important risk factors for suicide ideation were female sex, younger age, prior exposure to a traumatic event, parental history of disorder, and prior history of psychiatric and alcohol disorders. Comorbidity had an even more pronounced association. Respondents who seriously thought about suicide, especially those who also had a psychiatric or alcohol history, were more likely to report diminished role and social functioning and to utilize medical services than respondents with no lifetime suicide ideation. In the subgroup with suicide ideation, younger age and prior psychiatric disorders, especially co-morbid disorders, increased the risk of plans and attempts. These results are consistent with those reported by Kessler *et al.* (1999). In addition, ideators who had made an attempt had similar current functioning to those with no history of attempts.

Although the Ukraine-WMH has a number of obvious strengths, it is important at the outset to note its limitations. First, the WMH-CIDI asked about suicide plans and attempts only if respondents first acknowledged ideation. The assumption that ideation is a prerequisite for plans and attempts has never been evaluated in Ukraine. Hence, unlike other WMH reports (Kessler *et al.* 2005; Bernal *et al.* 2006), we

Table 3. *Associations of prior co-morbidity*[a] *with subsequent suicide ideation, and with plans and attempts among lifetime ideators in Ukraine*

	Lifetime ideation in total sample aOR (95% CI)[b]	Plans among ideators aOR (95% CI)[b]	Attempts among ideators aOR (95% CI)[b]
Number of classes of disorder[a]			
0	1·0	1·0	1·0
1	2·7 (2·0–3·6)***	2·5 (1·6–3·9)***	3·0 (1·7–5·3)***
2 or more	8·1 (5·9–11·2)***	5·4 (3·0–9·9)***	5·5 (3·1–9·9)***
Internalizing disorders[a]			
Neither	1·0	1·0	1·0
Depressive disorders only	2·8 (2·0–3·8)***	3·5 (2·2–5·4)***	2·9 (1·3–6·2)**
Anxiety disorders only	2·0 (1·2–3·5)*	1·7 (0·8–3·2)	1·9 (0·8–4·3)
Both	6·9 (4·4–10·7)***	3·3 (1·7–6·2)***	4·1 (2·1–7·9)***
Externalizing disorders[a]			
Neither	1·0	1·0	1·0
Alcohol use disorders only	3·4 (2·0–5·6)***	3·6 (1·8–7·2)***	3·6 (1·7–7·9)**
Intermittent explosive disorder only	5·7 (3·9–8·5)***	4·8 (2·3–9·9)***	4·0 (2·1–7·3)***
Both	10·7 (4·9–23·0)***	2·4 (0·7–8·4)	6·0 (2·0–17·9)**

aOR, Adjusted odds ratio; CI, confidence interval.
[a] Time-varying covariate occurring prior to suicidal events.
[b] Adjusted for person-years and sex.
* $p \leqslant 0{\cdot}05$, ** $p \leqslant 0{\cdot}01$, *** $p \leqslant 0{\cdot}001$.

Table 4. *Treatment in past 12 months and psychosocial functioning by lifetime suicide ideation and psychiatric/alcohol disorder*[a]

	Mental health history		No mental health history				
	Ideation ($n=86$)	No ideation ($n=505$)	Ideation ($n=71$)	No ideation ($n=1057$)	Overall test[b] F_3 or χ^2_3	Main effects[b] F_1 or χ^2_1	Trend test[b] F_1 or χ^2_1
30-day functioning[c,d]							
Days out of role, mean (S.D.)	9·0 (7·5)	5·4 (6·6)	5·7 (8·0)	3·3 (9·3)	5·94***	Ideation: 22·08***	38·53***
						Mental health: 15·97***	
Social functioning, mean (S.D.)	2·6 (5·0)	0·6 (3·0)	2·1 (8·2)	0·2 (2·8)	8·60***	Ideation: 6·14*	23·89***
						Mental health: 9·06**	
12-month medical care,[e] % (S.E.)	20·4 (3·6)	9·0 (1·2)	8·4 (3·9)	3·6 (0·9)	35·57***	Ideation: 19·32***	24·4***
						Mental health: 12·95***	

[a] Part II sample; *n*'s are weighted.
[b] Adjusted for sex and age.
[c] The four-level comparisons for days out of role and social functioning were also significant ($p<0{\cdot}001$) based on the Kruskal–Wallis test performed in SPSS (not design adjusted).
[d] A 2×2 analysis of variance found no significant interactions between ideation and mental health history for days out of role or social functioning.
[e] 12-month medical care was analyzed using logistic regression with suicide ideation, mental health history, and their interaction as predictors. The interaction term was not significant.
* $p \leqslant 0{\cdot}05$, ** $p \leqslant 0{\cdot}01$, *** $p \leqslant 0{\cdot}001$.

restricted our analysis of plans and attempts to the subgroup with ideation. However, the lowest possible lifetime rates of plans and attempts in Ukraine were 7·0% and 1·8% respectively. The attempt rate is congruent with that found in Europe (Bernal *et al.* 2006). Second, the data are based on retrospective accounts of age of onset although special probes were included in the WMH-CIDI in an attempt to minimize recall problems as much as possible. Third, and perhaps most importantly, the sample excluded people in the military or other

institutional settings, where suicide ideation might well be more common. Thus, the overall prevalence estimates, especially for young men, are no doubt conservative. Finally, although the WMH-CIDI has been used in several different cultures, Haro *et al.* (2006) reported acceptable levels of reliability.

The overall consistency of our risk factor findings with epidemiologic research in Europe and North America supports the merit of the Ukraine-WMH. However, we expected that the lifetime rate of ideation would approach that for Tallinn (14%; Bertolote *et al.* 2005) because the questions were worded similarly, and the rates of completed suicide in 2002, when our field work was conducted, were similar (25·0/100 000 in Estonia; 23·1/100 000 in Ukraine) (WHO, 2006). The rate for Kyiv, the capitol of Ukraine, was closer (11·1%), although still lower. It is possible that, because Estonia is more westernized, respondents in Tallinn were more comfortable answering affirmatively than respondents in Ukraine, for whom such an admission may be less culturally acceptable.

The average age of onset of ideation was almost a decade older in Ukraine compared to estimates in the USA (Kessler *et al.* 1999). If we restrict our sample to respondents under age 55 to better match the National Comorbidity Survey (NCS) distribution, the average age of onset was 24·7 (males 25·6, females 24·3), roughly 5 years older than in the NCS. Only age of onset of attempts among women with ideation approximated to the US findings. In Ukraine, most people are married well before the average age of onset of suicide behaviors. Thus the finding that separation/divorce was not significantly associated with ideation in our sample, as it is in most other studies, suggests that young adults in their prime, married, raising young families and building their careers, are the highest risk group for suicide behaviors. This cohort mainly grew up in the post-Soviet era and was exposed through the media to Western lifestyles and greater material choices. However, for the average citizen of Ukraine, life is bleak, and the disparity between the promise of a better future and the harsh realities of daily life may be taking their toll. In general, the age of onset finding for ideation in Ukraine suggests that intervention efforts should be workplace based rather than school-based as has been advocated in Europe, Israel and the USA.

The current analysis showed that alcohol use disorders increased the risk of attempts among ideators, and when combined with IED, led to a 10-fold increase in the rate of ideation. Nemtsov (2003) has explored the connection between alcohol consumption and completed suicide in Russia and showed that successful alcohol prevention programs implemented during the perestroika years were paralleled by an equally significant reduction in the rates of completed suicide. Our findings extend this risk factor to suicide behaviors in a neighboring country and underscore its relevance for primary prevention. In addition, smoking, which is highly prevalent among men in Ukraine (Gilmore *et al.* 2001), significantly predicted plans and attempts, as has been found in Western countries (e.g. Breslau *et al.* 2005), but did not confer additional risk above and beyond other significant risk factors, including alcohol use disorders and depressive disorders. Thus, future studies, especially in Eastern Europe where smoking is epidemic, need to consider the inter-relationships of smoking and nicotine dependence, alcoholism and suicide ideation.

Lifetime co-morbidity of depression and anxiety was also a stronger risk factor for suicide behaviors than when either type of disorder occurred in the absence of the other. Sareen *et al.* (2005) also found the presence of these co-morbid conditions to be a stronger correlate of suicide behaviors than individual disorders. In our analysis, we attempted to disentangle the temporal sequence by examining onset of psychiatric events prior to first onset of suicide ideation. In a similar vein, the combination of suicide ideation and lifetime psychiatric or alcohol disorder bore the strongest relationship to current impairment and service utilization. These findings underscore the need to introduce a comprehensive suicide prevention program similar to that adopted in many other European countries (WHO, 2002). In addition to interventions in schools and workplaces, these should be targeted at mental health providers, general practitioners, and medical students in Ukraine.

Even though the rate of completed suicide is much lower in Western Ukraine (13·7/100 000 in 2002) compared to other parts of the country

(30·5 in the north-central and 36·8 in the south-east regions), living in the western region did not have a protective effect on ideation although it had a marginal relationship to plans and attempts. Exposure to Chornobyl, a macro-environmental traumatic event, was also not related to suicidality. However, personal traumas were significantly associated with ideation even after controlling for all other significant risk factors, including mental health history. Relatively few general population studies have evaluated the relationship of trauma history to suicide ideation even though studies of trauma-exposed groups, such as rape and disaster victims, clearly demonstrate that suicide behavior can arise in the aftermath of these events, especially in individuals with post-traumatic stress disorder (Ferrada-Noli, 1998).

The negative impact of suicide ideation on current functioning and use of services was striking. Although several studies addressed the impact of lifetime mental disorders on current functioning (e.g. Buist-Bouwman *et al.* 2006), our findings in Ukraine suggest that there is an additive burden associated with having a history of both psychiatric disorders and suicide ideation. For example, 20% of respondents with a history of ideation and mental disorder utilized medical care in the prior 12 months compared with 8–9% with only one condition and 4% with neither. It is possible that, in Ukraine, endorsing serious thoughts about suicide is a grave admission representing a significant vulnerability marker. In a country where suicide fatalities have increased and medical providers are not trained to recognize and treat emotional problems, this finding reinforces the urgency of adapting western concepts of diagnosis and treatment (Gluzman & Kostyuchenko, 2006).

CONCLUSIONS

In Ukraine, close to one in 10 adults have thought seriously about suicide, and one-fifth of ideators have made an attempt. The risk was higher in younger people, women, respondents exposed to traumatic events, respondents with an alcoholic parent, and those with a history of psychiatric and alcohol problems, especially co-morbid conditions. Individuals who had thought about suicide, especially respondents who also had a history of psychiatric or alcohol disorders, had more impaired current functioning and were more likely to be recent users of medical services. Although the factors driving completed suicide are not necessarily the same as those driving non-lethal suicide behaviors, our findings suggest that socio-economic burden can stem from non-lethal as well as lethal suicide behaviors. This study represents a first step in understanding suicidality in Ukraine. There is a need for prospective investigations, similar to those conducted in Finland (Hintikka *et al.* 2001), to address the incidence and persistence of suicide thoughts and behaviors, their risk factors, and the extent to which medical interventions are sought, are appropriate, and are effective. The overall rate of service utilization in Ukraine is low, but a comprehensive physician education program on suicidality might improve both community awareness and treatment adequacy.

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DECLARATION OF INTEREST

None.

REFERENCES

Bernal, M., Haro, J. M., Bernert, S., Brugha, T., de Graaf, R., Bruffaerts, R., Lepine, J. P., de Girolamo, G., Vilagut, G., Gasquet, I., Torres, J. V., Kovess, V., Heidere, D., Neeleman, J., Kessler, R. & Alonso, J.; the ESEMED/MHEDEA Investigators (2006). Risk factors for suicidality in Europe: results from the ESEMED study. *Journal of Affective Disorders*. Published online: 27 October 2006. PMID: 17074395.

Bertolote, J. M., Fleischmann, A., De Leo, D., Bolhari, J., Botega, N., DeSilva, D., Thanh, H. T. T., Phillips, M., Schlebusch, L., Varnik, A., Vijayakumar, L. & Wasserman, D. (2005). Suicide attempts, plans, and ideation in culturally diverse sites: the WHO SUPRE-MISS community survey. *Psychological Medicine* **35**, 1457–1465.

Bobak, M., Pikhart, H., Pajak, A., Kuvinova, R., Malyutina, S., Sebakova, H., Topor-Madry, R., Nikitin, Y. & Marmot, M. (2006). Depressive symptoms in urban population samples in Russia, Poland, and the Czech Republic. *British Journal of Psychiatry* **188**, 359–365.

Borges, G., Walters, E. E. & Kessler, R. C. (2000). Associations of substance use, abuse, and dependence with subsequent suicidal behavior. *American Journal of Epidemiology* **151**, 781–789.

Breslau, N., Schultz, L. R., Johnson, E. O., Peterson, E. L. & Davis, G. C. (2005). Smoking and the risk of suicidal behavior: a prospective study of a community sample. *Archives of General Psychiatry* **62**, 328–334.

Brezo, J., Paris, J. & Turecki, G. (2006). Personality traits as correlates of suicidal ideation, suicide attempts, and suicide completions: a systematic review. *Acta Psychiatrica Scandinavica* **113**, 180–206.

Bromet, E. J., Gluzman, S. F., Paniotto, V. I., Webb, C. P. M., Tintle, M. L., Zakhozha, V., Havenaar, J. M., Gutkovich, Z., Kostyuchenko, S. & Schwartz, J. E. (2005). Epidemiology of psychiatric and alcohol disorders in Ukraine. *Social Psychiatry and Psychiatric Epidemiology* **40**, 681–690.

Buist-Bouwman, M. A., De Graaf, R., Vollebergh, W. A. M., Alonso, J., Buffaerts, R., Ormel, J. & the ESEMeD/MHEDEA 2000 investigators (2006). Functional disability of mental disorders and comparison with physical disorders: a study among the general population of six European countries. *Acta Psychiatrica Scandinavica* **113**, 492–500.

Efron, B. (1988). Logistic regression: survival analysis and the Kaplan–Meier curve. *Journal of the American Statistical Association* **83**, 414–425.

Ferrada-Noli, M., Asberg, M., Ormstad, K., Lundin, T. & Sundbom, E. (1998). Suicidal behavior after severe trauma. Part 1: PTSD diagnoses, psychiatric comorbidity, and assessments of suicidal behavior. *Journal of Traumatic Stress* **11**, 103–112.

Gilmore, A. B., McKee, M., Telishevska, M. & Rose, R. (2001). Epidemiology of smoking in Ukraine, 2000. *Preventive Medicine* **33**, 453–461.

Gluzman, S. & Kostyuchenko, S. (2006). Psychiatry in Ukraine. *Bulletin of the Board of International Affairs of the Royal College of Psychiatrists* **3**, 12–14.

Goldney, R. D., Dal Grande, E., Fisher, L. J. & Wilson, D. (2003). Population attributable risk of major depression for suicidal ideation in a random and representative community sample. *Journal of Affective Disorders* **74**, 267–272.

Goldney, R. D., Wilson, D., Dal Grande, E., Fisher, L. J. & McFarlane, A. C. (2000). Suicidal ideation in a random community sample: attributable risk due to depression and psychosocial and traumatic events. *Australian and New Zealand Journal of Psychiatry* **34**, 98–106.

Goodwin, R. D., Beautrais, A. L. & Fergusson, D. M. (2004). Familial transmission of suicidal ideation and suicide attempts: evidence from a general population sample. *Psychiatry Research* **126**, 159–165.

Haro, J. M., Arbabzadeh-Couchez, S., Brugha, T. S., de Girolamo, G., Guyer, M. E., Jin, R., Lepine, J.-P., Mazzi, F., Reneses, B., Vilagut, G., Sampson, N. A. & Kessler, R. C. (2006). Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health Surveys. *International Journal of Methods in Psychiatric Research* **15**, 167–180.

Havenaar, J. M. & Bromet, E. J. (2005). The experience of the Chornobyl nuclear disaster. In *Disasters and Mental Health* (ed. J. J. Lopez-Ibor, G. Christodoulou, M. Maj, N. Sartorius and A. Okasha), pp. 179–192. John Wiley: London.

Hintikka, J., Pesonen, T., Saarinen, P., Tanskanen, A., Lehtonen, J. & Viinamaki, H. (2001). Suicidal ideation in the Finnish general population: a 12-month follow-up study. *Social Psychiatry and Psychiatric Epidemiology* **36**, 590–594.

Hintikka, J., Viinamaki, H., Tanskanen, A., Kontula, O. & Koskela, K. (1998). Suicidal ideation and parasuicide in the Finnish general population. *Acta Psychiatrica Scandinavica* **98**, 23–27.

Isacsson, G. (2006). Depression is the core of suicidality – its treatment is the cure. *Acta Psychiatrica Scandinavica* **114**, 149–150.

Kessler, R. C., Berglund, P., Borges, G., Nock, M. & Wang, P. S. (2005). Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. *Journal of the American Medical Association* **293**, 2487–2495.

Kessler, R. C., Borges, G. & Walters, E. E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry* **56**, 617–626.

Kessler, R. C. & Üstün, T. B. (2004). The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research* **13**, 93–121.

Kjøller, M. & Helweg-Larsen, M. (2000). Suicidal ideation and suicide attempts among adult Danes. *Scandinavian Journal of Public Health* **28**, 54–61.

Kondrichin, S. V. & Lester, D. (2002). Suicide in the Ukraine. *Crisis* **23**, 32–33.

Kryzhanovskaya, L. & Pilyagina, G. (1999). Suicidal behavior in the Ukraine, 1988–1998. *Crisis* **20**, 184–190.

Levi, F., La Vecchia, C., Lucchini, F., Negri, E., Saxena, N., Maulik, P. K. & Saraceno, B. (2003). Trends in mortality from suicide, 1965–99. *Acta Psychiatrica Scandinavica* **108**, 341–349.

Mäkinen, I. H. (2000). Eastern European transition and suicide mortality. *Social Science and Medicine* **51**, 1405–1420.

Miller, M., Hemenway, D., Bell, N. S., Yore, M. M. & Amoroso, P. J. (2000). A prospective study of 300,000 male active-duty Army soldiers. *American Journal of Epidemiology* **151**, 1060–1063.

Mokhovikov, A. & Donets, O. (1996). Suicide in the Ukraine: epidemiology, knowledge, and attitudes of the population. *Crisis* **17**, 128–134.

Nemtsov, A. (2003). Suicides and alcohol consumption in Russia, 1965–1999. *Drug and Alcohol Dependence* **71**, 161–168.

Paykel, E. S., Myers, J. K., Lindenthal, J. J. & Tanner, J. (1974). Suicidal feelings in the general population: a prevalence study. *British Journal of Psychiatry* **124**, 460–469.

Pirkis, J., Burgess, P. & Dunt, D. (2000). Suicidal ideation and suicide attempts among Australian adults. *Crisis* **21**, 16–25.

Rahu, K., Rahu, M., Tekkel, M. & Bromet, E. (2006). Suicide risk among Chernobyl cleanup workers in Estonia still increased: an updated cohort study. *Annals of Epidemiology* **16**, 917–919.

Rahu, M., Tekkel, M., Veidebaum, T., Pukkala, T., Hakulinen, A., Auvinen, A., Rytomaa, T., Inskip, P. D. & Boice Jr., J. D. (1997). The Estonian study of Chernobyl clean-up workers: II. Incidence of cancer and mortality. *Radiation Research* **147**, 653–657.

Rancāns, E., Lapiņš, J., Renberg, E. S. & Jacobsson, L. (2003). Self-reported suicidal and help seeking behaviours in the general population in Latvia. *Social Psychiatry and Psychiatric Epidemiology* **38**, 18–26.

Sareen, J., Cox, B. J., Afifi, T. O., de Graaf, R., Asmundson, G. J. G., ten Have, M. & Stein, M. B. (2005). Anxiety disorders and risk for suicidal ideation and suicide attempts: a population-based longitudinal study of adults. *Archives of General Psychiatry* **62**, 1249–1257.

Scádóczky, E., Vitrai, J., Rihmer, Z. & Füredi, J. (2000). Suicide attempts in the Hungarian adult population: their relation with DIS/DSM-III-R affective and anxiety disorders. *European Psychiatry* **15**, 343–347.

Sher, L. (2005). Alcoholism and suicidal behavior: a clinical overview. *Acta Psychiatrica Scandinavica* **113**, 13–22.

Shkolnikov, V., McKee, M. & Leon, D. A. (2001). Changes in life expectancy in Russia in the mid-1990s. *Lancet* **357**, 917–921.

SUDAN (2003). SUDAAN version 8.0.2. Research Triangle Institute: Research Triangle Park, NC, USA.

Verona, E., Sachs-Ericsson, N. & Joiner, T. E. (2004). Suicide attempts associated with externalizing psychopathology in an epidemiological sample. *American Journal of Psychiatry* **161**, 444–451.

Wasserman, D., Värnik, A. & Eklund, G. (1998). Female suicides and alcohol consumption during perestroika in the former USSR. *Acta Psychiatrica Scandinavica* **98** (Suppl. 394), 26–33.

Weissman, M. M., Bland, R. C., Canino, G. J., Greenwald, S., Hwu, H.-G., Joyce, P. R., Karam, E. G., Lee, C. K., Lellouch, J., Lepine, J.-P., Newman, S. C., Rubio-Stipec, M., Wells, J. E., Wickramaratne, P. J., Wittchen, H.-U. & Yeh, E.-K. (1999). Prevalence of suicide ideation and suicide attempts in nine countries. *Psychological Medicine* **29**, 9–17.

Welch, S. S. (2001). A review of the literature on the epidemiology of parasuicide in the general population. *Psychiatric Services* **52**, 368–375.

WHO (2002). *Suicide Prevention in Europe. The WHO European Monitoring Survey on National Suicide Prevention Programmes and Strategies*. World Health Organization: Copenhagen.

WHO (2004). Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health surveys. The WHO World Mental Health Survey Consortium. *Journal of the American Medical Association* **291**, 2581–2590.

WHO (2006). World Health Organization European health for all database (www.euro.who.int/hfadb). Accessed 31 July 2006.

Appendix. *Distribution and age of onset (AOO) of variables*

Risk factors	*n*	% with characteristic	AOO mean (S.E.)
Demographic[a]			
Sex: Female	946	55.0	N.A.
Birth cohort			
⩽1944	507	29·5	N.A.
1945–1964	615	35·7	N.A.
⩾1965	598	34·8	N.A.
Region: not West	1361	79·1	N.A.
Education: less than high school	160	9·3	N.A.
Separated/divorced	360	21·0	29·8 (0·4)
Antecedent[a]			
Childhood externalizing behaviors			
Two or more	223	13·0	N.A.
One	333	19·3	N.A.
None	1164	67·7	N.A.
Smoking	804	46·7	18·1 (0·3)
Trauma exposure	1172	68·5	19·1 (0·5)
Lived in Chornobyl contaminated area	160	9·3	N.A.
Parental disorders[a]			
Depression	283	16·5	N.A.
Anxiety	260	15·1	N.A.
Alcoholism	218	12·7	N.A.
Antisocial behaviors	202	11·7	N.A.
Psychiatric history (DSM-IV)			
Depressive disorders	747	15·8	31·2 (0·6)
Anxiety disorders	298	6·3	20·9 (0·8)
Alcohol abuse/dependence	637	13·5	26·0 (0·5)
Intermittent explosive disorder	196	4·2	20·3 (0·9)
Co-morbidity			
Number of disorder classes			
2+	318	6·7	27·7 (0·8)
1	1499	31·7	26·4 (0·4)
0	2908	61·5	N.A.
Internalizing disorders			
Depressive disorders only	628	13·8	32·0 (0·6)
Anxiety disorders only	178	3·8	20·2 (1·1)
Both	119	2·5	29·2 (1·0)
Neither	3800	80·4	N.A.
Externalizing disorders			
Alcoholism only	563	11·9	26·4 (0·5)
Intermittent explosive disorder only	122	2·6	21·9 (1·0)
Both	74	1·6	24·8 (1·3)
Neither	3966	83·9	N.A.
Medical treatment in past 12 months[a]	108	6·3	N.A.
Current functioning[a]		Mean (S.E.)	
Days out of role	1720	4·3 (0·3)	N.A.
Social functioning	1720	0·5 (0·1)	N.A.

[a] Part II sample.