Prevalence, service use, and demographic correlates of 12-month DSM-IV psychiatric disorders in Mexico: results from the Mexican National Comorbidity Survey

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ABSTRACT

Background. This paper describes the 12-month prevalence, severity and demographic correlates of 16 DSM-IV psychiatric disorders and service utilization in the Mexican urban population aged 18–65 years of age. This is representative of 75% of the national adult population.

Method. The sample design was a strict probability selection scheme. The response rate was 76·6%. The World Mental Health Survey version of the Composite International Diagnostic Interview was installed on laptops and administered by lay interviewers. An international WHO task force carried out its translation into Spanish.

Results. The 12-month prevalence of any disorder was 12·1%. The most common disorders were specific phobia (4·0%), major depressive disorder (3·7%) and alcohol abuse or dependence (2·2%). The 12-month prevalence of very severe disorders was 3·7% of which only 24% used any services. Age was the only variable associated with any 12-month disorder, with the younger more likely to report any disorder. Income was associated with severity, with low and low–average incomes more likely to report a 12-month disorder. Females were more likely to report a mood and anxiety disorder, but less likely to report a substance disorder. The group of separated/widowed/divorced was more likely to report a mood and an impulse-control disorder.

Conclusions. The results show that while psychiatric disorders are common in the Mexican population, very severe mental disorders are less common and there is extreme under-utilization of mental health services.

INTRODUCTION

This report presents data on the 12-month prevalence, severity, service use and demographic correlates of DSM-IV psychiatric disorders assessed in the Mexican National Comorbidity Survey (M-NCS). This survey coordinated by the National Institute of Psychiatry in Mexico and supported by Mexico's Ministry of Health and National Council for Science and Technology, is the first national epidemiological survey of psychiatric disorders in Mexico. The M-NCS forms part of the World Health Organization's (WHO) World Mental Health Surveys Initiative (WMHSI, 2005), the goal of which is to evaluate the prevalence of psychiatric disorders in countries with different degrees of development, to determine mental health-care needs, and direct public policy on this subject.

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While Mexico has a long tradition of epidemiological research in the area of substance addiction (Medina-Mora, 1978; Mexican Ministry of Health, 1998), the development of psychiatric epidemiology has been slower. The first studies in Mexico used only screening instruments to detect possible mental health disorders (Campillo et al. 1979; Ezbán et al. 1984; Medina-Mora et al. 1985). As in other countries, these first studies sampled patients in general hospital settings (Caraveo et al. 1989; Gómez et al. 1990), community mental health centers (Padilla et al. 1984) and other populations such as college students (Romero & Medina-Mora, 1987). As one of the first approximations to prevalence estimates for the general population in Mexico, a subsample of the National Addictions Survey (Mexican Ministry of Health, 1990) responded to an additional brief questionnaire. This questionnaire was designed ad hoc to provide DSM-III diagnoses (Medina-Mora et al. 1993; Caraveo et al. 1996). A few years later, Caraveo and colleagues validated the Diagnostic Interview Schedule (DIS) (Caraveo et al. 1991) and later conducted a representative survey of Mexico City residents using this fully structured psychiatric interview, a previous version of the instrument used in this present survey (Caraveo et al. 1996) which subsequently allowed for comparisons between Mexico City residents and Mexican Americans in California (Vega et al. 1998).

This present survey extends our current knowledge of psychiatric disorder in specific populations of Mexico to a nationally representative household sample using a fully structured psychiatric interview to determine a broad range of psychiatric disorders, risk factors and service utilization patterns in the general population. Subsequently, these data will allow for comparisons between countries all over the world participating in the WHO World Mental Health Surveys Initiative.

METHOD
Sample

The Mexican National Comorbidity Survey is based on a stratified, multistage area probability sample of persons aged 18–65 years in the non-institutionalized population living in urban areas (population $\geqslant 2500$) of Mexico. Approximately 75% of the Mexican population is urban, so defined. The field work was conducted by Berumen and Associates, an established survey firm in Mexico, after training by licensed mental health professionals in the interview instrument. Data collection took place from September 2001 through May 2002. In all strata, the primary sampling units (PSU) were the 1995 census count areas [Area Geografica Estadistica Basica (AGEB) or groups of them], similar to US census tracts, cartographically defined and updated by the Instituto Nacional de Estadística, Geografía e Informática (INEGI, 2000) in 1994 and updated during field work. Secondary sampling units were city blocks (or groups of them). Five city blocks were selected within each PSU with probability proportional to measure of size. All household units within the selected city blocks were listed, and compact segments of approximately 10 households were formed from which one segment was selected with equal probability. Finally, one respondent was randomly selected from among eligible members of each household. Eligible household members are defined as all Spanish-speaking persons who normally eat, sleep, prepare meals, and shelter themselves in the household and who are between the ages of 18 and 65 years.

The response rate was 76·6% of eligible respondents (for a total of 5826 interviews, well above the original targeted sample size of 5000) and within the scope of other surveys from the World Mental Health Initiative (50·6–87·7% response rate range). The main reason for non-participation was 'absent at the time' (7·8% of listed individuals). Direct refusals were also infrequent (6·2% of listed individuals). All 5826 respondents were administered a part 1 interview and a selected subsample of 2362 received a supplemental number of questions on risk factors and supplemental mental disorders. The sample receiving part 2 consisted of all respondents who screened positive for any disorder on part 1 plus a probability subsample of other part 1 respondents. All interviews were conducted at the respondent's home after a careful description of the study goals was given and informed consent was obtained. No financial incentive was given for respondents' participation. All recruitment and consent procedures were approved by the ethics committee of the National Institute of Psychiatry.

Diagnostic assessment

The instrument used was the WHO World Mental Health Survey Initiative version of the CIDI (WMH-CIDI) (WHO, 2001*b*). This structured diagnostic interview was administered by an interviewer in face-to-face interviews using a laptop computer version (i.e. CAPI) and yielded DSM-IV diagnoses (APA, 1994). Adequate inter-rater reliability (Cotler *et al.* 1991; Wittchen *et al.* 1991), test–retest reliability (Wacker *et al.* 1990) and validity (Farmer *et al.* 1987; Janca *et al.* 1992) of earlier CIDI versions has been documented [for a review of studies which report the psychometric properties of the CIDI, see Andrews & Peters (1998)]. These instruments have shown good performance in validity studies in Mexico (Caraveo *et al.* 1991, 1998) and other Spanish speaking countries (Wittchen, 1994). The translation of the WMH-CIDI into Spanish was carried out according to WHO recommendations, utilizing material currently in use in Spanish (ICD-10, DSM-IV, and SF-36) and back-translation of selected items and terms of the clinical sections. An international expert panel, comprised of mental health experts qualified as clinicians and researchers, worked with the disagreements found in the back-translation, and this same panel worked with an international harmonization group. The disagreements found in the back-translation were resolved by consensus. The international expert panel produced a list of problematic terms for translation into Spanish and the agreed-upon translations. Additional minor adaptations to the Mexican context were made by consensus among the Mexican team.

Disorders

For this paper, we report on the 12-month prevalence of psychiatric disorders, defined according to DSM-IV criteria for diagnoses. All disorders used organic exclusion rules as well as hierarchy definitions in order to avoid double counting of disorders, for example to avoid counting twice alcohol dependence and alcohol abuse or major depression and dysthymia in the same person. The disorders are grouped into the following categories:

(1) *Affective disorders*: major depressive episode, bipolar I and II disorder and dysthymia.

(2) *Anxiety disorders*: panic disorder, agoraphobia without panic disorder, social phobia, specific phobia, separation anxiety disorder, generalized anxiety disorder and post-traumatic stress disorder.
(3) *Substance disorders*: alcohol and drug abuse and dependence.
(4) *Impulse-control disorders*: those studied included three disorders typically manifested during childhood and adolescence: oppositional-defiant disorder, conduct disorder and attention deficit hyperactivity disorder.

Disorder severity

WMH-CIDI disorders were classified as serious, moderate or mild (WHO-WMHSC, 2004). The criteria used here for a serious disorder was presence of a bipolar I disorder, substance dependence with a physiological dependence syndrome, a suicide attempt in conjunction with any other WMH-CIDI disorder, reporting at least two areas of role functioning with severe role impairment due to a mental disorder as measured by the disorder-specific Sheehan Disability Scales (SDS; Sheehan *et al.* 1996), or reporting overall functioning impairment at a level consistent with a Global Assessment of Functioning (GAF; Endicott *et al.* 1976) score of $\leqslant 50$ in conjunction with any other WMH-CIDI disorder. Respondents not classified as having a serious disorder were classified as moderate if interference was rated as at least moderate in any SDS domain or if the respondent had substance dependence without a physiological dependence syndrome. All other disorders were classified as mild.

Interviewers, interviewer training and quality control

The M-NCS field work was conducted by 34 interviewers experienced in systematic data collection. The interviewers went through an initial 5 days' training, provided by certified trainers from the Mexican research team. Following the first month of field work an additional day of training was provided by field supervisors to strengthen weaknesses observed in the field. A day of retraining was also provided prior to the second and third stages of field work. A number of actions were taken for quality assurance, such as elaboration of field manuals,

continuous feedback to supervisors and field managers, independent supervision of both supervisors and interviewers, and continuous monitoring of special situations. Throughout the duration of field work, the research team continuously monitored the proportion of respondents who endorsed screening items for the most prevalent disorders and calculated periodically the mean number of screening items endorsed in the interviews of each interviewer in order to monitor the interviewers' performance individually and to detect possible problems. Finally, SAS quality control programs designed by the team led by R. C. Kessler were used to identify possible errors regarding dating of events (onset and recency, age consistency, first service utilization, last service utilization), as well as possible missing patterns, and to introduce corrected values when possible (WMHSI, 2005).

Analysis

The data analyzed in this report were obtained from a stratified multistage sample and were subsequently weighted to adjust for differential probabilities of selection and non-response. Post-stratification to the total Mexican population according to the 2000 Census in the target age and sex range was also performed.

Two set of weights were developed for the survey. The first set of weights – 'part 1 weight' – was calculated for the total number of respondents, based on three factors. First, a factor that took into consideration the inverse probability of selection of a respondent from a given household; second, a factor based on the inverse probability of selection of a person from a re-interview process, and third, a factor that was the result of post-stratification so that the weighted distribution of sex, age and the survey stratum matched the distribution in the total Mexican population in the target age groups based on 2000 Census data.

A probability subsample of the M-NCS survey sample completed a long form of the interview that included a larger series of risk factors scales and the impulse-control disorders. In order to run analyses in this subsample we calculated a second set of weights – 'part 2 weight'. This weight started with the weight generated previously and next adjusted 'part 1 weight' by the inverse probability of selection to this long

form interview. This complex probability of selection was generated through an algorithm embedded into the computer-based interview. This probability varied based on the presence or absence of symptoms as defined in the screening portion of the interview schedule. The group of people where such symptoms were present (threshold group) were selected into the part 2 sample with a probability of 1·0. People from a second group (called the subthreshold group) who met only partial diagnostic criteria were randomly drawn into the part 2 sample based on the number of people living in their household. People with no disorder symptoms were randomly drawn into the part 2 sample with a set of probabilities related to household size. Finally, this weight was normalized to the effective sample size of the long form interview. For the purposes of this paper, the data reported here were based on part 2 weights that included all disorders assessed in the M-NCS, for a total of 2362 interviews.

As a result of this complex sample design and weighting, estimates of standard errors for proportions were obtained by the Taylor series linearization method using the SUDAAN software (Research Triangle Institute, 2002). Logistic regression analysis (Hosmer & Lemeshow, 2000) was performed to study demographic correlates. Estimates of standard errors of odds ratios (ORs) from logistic regression coefficients were also obtained by SUDAAN, and 95% confidence intervals (CIs) have been adjusted to design effects. Statistical significance was evaluated using two-sided design-based tests and the 0·05 level of significance.

RESULTS

Table 1 presents the distribution of the sample, according to unweighted and weighted results. The most relevant variable for post-stratification was sex, since the actual participants were more likely to be females. The age and regional distribution of actual participants was more similar to the census count. The demographic distribution of the sample after stratification and weighting (both in part 1 and part 2 samples) is similar to the targeted population. After weighting the data, $\sim$52% of the sample was female and $\sim$25% in the youngest age group (18–24 years). Approximately 28% of the

Table 1. *Demographic distribution of the sample compared to the population on post-stratification variables*

	Part 1			Part 2		
	Unweighted ($n=5826$) %	Weighted %	Census %	Unweighted ($n=2362$) %	Weighted %	Census %
Sex						
Male	39·4	47·6	47·7	36·1	47·7	47·7
Female	60·6	52·4	52·3	63·9	52·3	52·3
Age (years)						
18–24	21·4	24·5	24·7	24·3	25·4	24·7
25–29	14·2	15·5	15·6	13·6	15·9	15·6
30–34	14·0	13·6	13·6	12·2	12·5	13·6
35–39	13·7	12·3	12·1	13·1	11·5	12·1
40–44	11·0	10·1	9·9	10·3	10·6	9·9
45–49	8·0	7·7	7·8	8·3	7·8	7·8
50–54	6·5	6·3	6·4	6·9	6·3	6·4
55–59	4·8	4·7	4·9	5·6	4·9	4·9
60–65	6·4	5·3	5·1	5·7	5·2	5·1
Region						
Metropolitan	31·5	28·0	27·6	32·6	27·6	27·6
Northwest	9·8	7·9	8·0	10·9	8·0	8·0
North	14·5	15·3	15·1	13·7	15·1	15·1
Central West	12·7	12·3	12·4	13·4	12·4	12·4
Central East	15·1	17·1	17·5	14·9	17·5	17·5
South East	16·4	19·4	19·3	14·6	19·3	19·3

sample lived in our three main metropolitan areas. The average time for completing the short form of the interview was 25 minutes and for the long form 2·5 hours.

The prevalence and severity of psychiatric disorders

The individual disorders with the highest 12-month prevalences were specific phobia (4·0%), major depressive disorder (3·7%) and alcohol abuse or dependence (2·2%). The most common group of disorders was the group of anxiety disorders (6·5%), followed by mood disorders (4·8%), substance disorders (2·5%) and the impulse-control disorders (1·6%). An estimated 12·1% of Mexicans reported having a WMH-CIDI psychiatric disorder in the last 12 months (Table 2).

Regarding the severity of these disorders, ~40% were mild disorders and about one third were moderate and another third were serious disorders. The 12-month prevalence of any serious disorder in the Mexican population was 3·7%. The distribution of disorder severity was different from the distribution of overall prevalence of different groups of disorders: substance use disorders was the one with the most severe disorders (55·8%), followed by mood (43·9%),

impulse-control (34·6%) and lastly anxiety disorders (22·9%). The individual disorders with the most severity were drug dependence (100%), bipolar (98·6%) and alcohol dependence (96·1%).

Disorder severity and treatment

In Table 3 we present the association of WMH-CIDI disorder severity and treatment. The CIDI assessed treatment by asking respondents if they ever saw any of a long list of professionals (non-exclusive choices) for problems with their emotions, nerves, mental health or use of substances (WHO-WMHSC, 2004). For the purposes of this paper, we grouped the providers as general medical (general practitioners), mental health (such as psychiatrists, psychologists), health care (combination of general medical and mental health) and non-health care (such as spiritualist, self-help groups).

There was a clear relationship between having any treatment and disorder severity: respondents with a severe disorder reported a prevalence of service use of 23·8%, dropping to 20·8% among moderate cases, and 12·6% among mild cases. Respondents with no WMH-CIDI disorder reported a prevalence of 3·3% of any treatment utilization. Also, as cases become more severe,

Table 2. *Mexico 12-month and severity prevalence of WMH-CIDI/DSM-IV disorders[a]*

Disorder	12-month		Severe		Moderate		Mild	
	%	(S.E.)	%	(S.E.)	%	(S.E.)	%	(S.E.)
I. Anxiety disorders								
Panic disorder	0·6	(0·1)	28·0	(8·9)	45·5	(8·5)	26·5	(7·2)
Generalized anxiety disorder	0·4	(0·1)	34·5	(11·0)	46·9	(11·7)	18·6	(8·3)
Specific phobia	4·0	(0·5)	21·4	(3·4)	30·1	(4·2)	48·6	(4·6)
Social phobia	1·7	(0·2)	34·7	(4·8)	43·7	(5·4)	21·6	(4·4)
Agoraphobia without panic	0·7	(0·1)	34·6	(8·5)	29·7	(7·6)	35·7	(10·0)
Post-traumatic stress disorder	0·6	(0·1)	33·5	(10·5)	34·1	(12·9)	32·4	(14·8)
Any anxiety disorder	6·6	(0·6)	22·9	(2·8)	34·2	(3·1)	42·9	(3·4)
II. Mood disorders								
Major depressive disorder	3·7	(0·3)	27·8	(3·5)	49·2	(4·5)	23·0	(3·2)
Dysthymia	0·4	(0·1)	42·3	(11·6)	46·5	(12·0)	11·2	(7·9)
Bipolar I–II disorders	1·1	(0·1)	98·6	(1·4)	1·4	(1·4)	0·0	(0·0)
Any mood disorder	4·8	(0·4)	43·9	(3·3)	38·5	(3·7)	17·6	(2·5)
III. Impulse-control disorders								
Oppositional-defiant disorder[b]	0·6	(0·2)	63·0	(17·1)	4·5	(5·2)	32·5	(15·7)
Conduct disorder[b]	0·2	(0·1)	31·5	(25·9)	0·0	(0·0)	68·5	(25·9)
Attention-deficit/hyperactivity disorder[b]	1·0	(0·2)	27·3	(7·7)	23·3	(6·5)	49·5	(9·3)
Any impulse-control disorder[b]	1·6	(0·3)	34·6	(8·7)	15·8	(5·1)	49·6	(8·6)
IV. Substance use disorders								
Alcohol abuse or dependence	2·2	(0·4)	59·9	(7·0)	7·2	(3·4)	32·9	(6·5)
Alcohol dependence	1·2	(0·3)	96·1	(3·8)	3·9	(3·8)	0·0	(0·0)
Drug abuse or dependence	0·5	(0·2)	28·1	(12·9)	0·0	(0·0)	71·9	(12·9)
Drug dependence	0·1	(0·1)	100·0	(0·0)	0·0	(0·0)	0·0	(0·0)
Any substance use disorder	2·5	(0·4)	55·8	(7·4)	6·3	(3·0)	37·9	(7·0)
V. Any disorder								
Any	12·1	(0·8)	30·4	(2·8)	29·4	(2·2)	40·2	(2·7)
Total sample	—	—	3·7	(0·4)	3·6	(0·3)	4·9	(0·5)

[a] Part 2 sample (*n* = 2362).
[b] Assessed only for part 2 sample with the age ranging from 18 to 44 years.

Table 3. *Severity by treatment*

Treatment	Severe		Moderate		Mild		None		Any	
	%	(S.E.)	%	(S.E.)	%	(S.E.)	%	(S.E.)	%	(S.E.)
General medical	8·1	(2·0)	6·8	(1·6)	4·9	(1·6)	1·0	(0·2)	1·7	(0·3)
Mental health	13·7	(3·3)	12·4	(2·6)	6·0	(1·9)	1·7	(0·3)	2·8	(0·3)
Health care	20·4	(3·8)	18·6	(3·1)	10·2	(2·3)	2·7	(0·4)	4·2	(0·4)
Non-health care	3·6	(1·4)	4·1	(2·0)	3·5	(1·8)	0·9	(0·2)	1·2	(0·2)
Any treatment	23·8	(3·9)	20·8	(3·3)	12·6	(2·7)	3·3	(0·4)	5·1	(0·5)
No treatment	76·2	(3·9)	79·2	(3·3)	87·4	(2·7)	96·7	(0·4)	94·5	(0·5)

Non-health care includes human services and complementary alternative medicine.

treatment by the health sector (as compared to non-health care) becomes more common. Among all M-NCS participants, 5·1% used any form of treatment during the last 12 months, most of it in the health care sector (4·2%).

Demographic correlates of 12-month psychiatric disorder

Table 4 shows the demographic correlates of any disorder, disorder severity and our four groups of disorders. Few variables were consistently associated with these outcomes. Age was the only variable associated with any 12-month disorder, with the younger more likely to report any disorder. Income was associated with severity, with low and low–average incomes more likely to report a 12-month disorder. Females were more likely to report a mood and anxiety disorder, but less likely to report a substance disorder. The younger were more likely to

Table 4. *Demographic correlates of 12-month DSM-IV disorders using part 2 weights after stratification*

Risk factor	Any 12-month disorder		Severe disorder		Mood		Anxiety		Impulse-control		Substance	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sex												
Male	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—
Female	1·2	0·8–1·7	1·0	0·6–1·7	1·6	1·1–2·4	2·6	1·7–3·9	0·6	0·3–1·3	0·0	0·0–0·1
χ^2	1·1		0·0		6·4*		22·8*		2·0		26·7*	
Age (years)												
18–29	1·8	1·2–2·7	0·5	0·2–1·2	1·1	0·7–1·8	1·8	1·1–3·1	1·9	0·9–4·0	13·2	2·9–59·6
30–44	1·5	1·0–2·4	0·4	0·2–1·0	1·0	0·7–1·5	1·3	0·7–2·4	1·0	—	8·6	1·8–40·5
45–54	1·1	0·6–2·0	0·6	0·2–1·7	0·9	0·5–1·7	1·0	0·5–2·3	—	—	4·3	0·7–25·8
⩾55	1·0	—	1·0	—	1·0	—	1·0	—	—	—	1·0	—
χ^2	12·0*		4·3		0·8		8·6*		2·9		13·5*	
Income												
Low	0·9	0·6–1·3	2·7	1·3–5·4	1·2	0·8–1·8	0·9	0·6–1·5	0·7	0·3–1·7	1·8	0·8–4·0
Low–Average	0·9	0·6–1·3	2·0	1·0–4·0	0·7	0·5–1·2	0·9	0·6–1·5	0·7	0·2–2·4	1·1	0·5–2·5
High–Average	0·8	0·5–1·1	1·3	0·7–2·6	0·9	0·5–1·4	0·8	0·5–1·5	0·9	0·3–2·7	0·9	0·4–1·9
High	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—
χ^2	2·1		11·6*		3·8		0·5		0·7		2·5	
Marital status												
Married/Cohabiting	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—
Sep./Widowed/Divorced	1·6	1·1–2·5	1·2	0·7–2·3	1·9	1·2–3·1	1·3	0·7–2·2	3·8	1·3–10·5	1·3	0·5–3·5
Never married	1·2	0·8–1·6	0·8	0·4–1·4	1·0	0·6–1·5	1·2	0·8–1·8	1·6	0·8–3·3	0·6	0·3–1·3
χ^2	5·5		1·4		7·3*		1·6		7·6*		2·3	
Education (years)												
0–5	1·3	0·9–1·8	0·7	0·4–1·5	1·1	0·7–1·8	0·9	0·5–1·7	1·3	0·4–4·0	1·8	0·8–3·9
6–8	1·2	0·8–1·7	0·9	0·5–1·6	1·0	0·6–1·5	1·0	0·7–1·5	1·9	0·8–4·8	1·4	0·5–3·9
9–11	1·3	0·9–1·9	0·9	0·6–1·6	1·0	0·7–1·6	1·3	0·8–2·2	0·8	0·3–2·1	1·2	0·6–2·5
⩾12	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—	1·0	—
χ^2	2·3		0·8		0·4		1·9		4·3		2·2	

OR, Odds ratio; CI, confidence interval.
* Significant at the 0·05 level, two-sided test.

report an anxiety and a substance disorder. The group of separated/widowed/divorced was more likely to report a mood and an impulse-control disorder.

Demographic correlates of 12 months treatment
After controlling for disorder severity, logistic regression analyses documented the ORs of receiving any treatment among all M-NCS respondents. Females and respondents with low levels of education (0–5 years) were more likely to report seeking any treatment (Table 5).

DISCUSSION
Limitations
Before discussing the findings of this report in detail, it is necessary to acknowledge several limitations of studies of this type. First, diagnosis is based solely on a single structured interview administered by lay interviewers. In order to survey such a large and geographically disperse sample some diagnostic precision is sacrificed that might otherwise have been obtained by clinical interviewers, multiple interviews, or additional sources of information.

Second, the diagnoses obtained by the CIDI are determined by criteria based on US/European definitions of psychopathology. Although it is true that some culturally bound syndromes such as 'nervios' (nerves) have been described, mainly among rural and indigenous groups, it is also true that DSM-IV and ICD-10 criteria are extensively used in clinical practice in Mexico. While evidence of reliability and validity of different versions of the CIDI is documented in different countries (Farmer *et al.* 1987; Wacker *et al.* 1990; Janca *et al.* 1992) and previous versions of the CIDI have been validated in Mexico and other Spanish-speaking countries (Caraveo *et al.* 1991), the reliability

Table 5. *Socio-demographic predictors of 12-month treatment*

Risk factor	Treatment	
	OR	95% CI
Sex		
Male	1·0	—
Female	2·2	1·3–3·7
χ^2	9·9*	
Age (years)		
18–29	0·7	0·4–1·4
30–44	0·8	0·4–1·6
45–54	0·8	0·4–1·6
⩾55	1·0	—
χ^2	0·9	
Income		
Low	0·9	0·5–1·6
Low–average	0·8	0·5–1·3
High–average	1·3	0·7–2·4
High	1·0	—
χ^2	3·0	
Marital status		
Married/Cohabiting	1·0	—
Sep./Widowed/Divorced	1·1	0·6–1·9
Never married	1·3	0·7–2·4
χ^2	0·8	
Education (years)		
0–5	2·1	1·2–3·7
6–8	1·1	0·6–1·9
9–11	1·0	0·6–1·6
⩾12	1·0	—
χ^2	10·6*	

OR, Odds ratio; CI, confidence interval.
* Significant at the 0·05 level, two-sided test.

and validity of the version used in this survey had not been established in Mexico.

Third, being a cross-sectional survey, relying solely on retrospective self-report, the data are subject to recall bias and willingness to disclose information truthfully. Longitudinal studies would partially allow us to evaluate the magnitude of recall bias and adjust the prevalence estimates accordingly, but even longitudinal studies cannot resolve the problem of unwillingness to report truthfully. As none of the mental disorders studied here, with the partial exception of current drug abuse (which can be indirectly assessed with hair samples to evaluate recent use), can be assessed with independent biological tests, there is no option other than to rely upon respondent reports. Given the generally stigmatizing nature of these disorders, it is likely that reporting bias of this sort leads to an under-estimation of prevalence.

Finally, our sample does not include people without a fixed residence, those who are institutionalized, those without sufficient proficiency in Spanish and those from rural areas. Local surveys conducted among these populations have documented lower prevalence rates of mental disorders in the rural population, with the exception of alcohol abuse and dependence which is higher. Rates of service utilization are also considerably lower in rural areas (Medina-Mora *et al.* 1993; Salgado de Snyder & Díaz-Pérez, 1999). While homeless and institutionalized individuals may be assumed to have a higher prevalence of mental disorder, we do not expect that this greatly influences our prevalence estimates. Taking this limitation into consideration, however, we may consider our prevalence estimates to be minimum prevalences.

Prevalence and severity

The M-NCS findings show that psychiatric disorders are not uncommon in the general Mexican population. Slightly more than 1 in 10 individuals reported having experienced one or more disorders at some time during the prior 12 months. While the overall prevalence estimates of psychiatric disorders in this national survey were similar to those estimated for Mexico City residents, this represents only half of the prevalence documented for more developed nations in a previous cross-national comparison of mental disorders (WHO International Consortium of Psychiatric Epidemiology, 2000) and falls in the middle of the 9·1–16·9% inter-quartile range (in other words the range after eliminating the countries with the four lowest and highest prevalences) of the 14 countries thus far included in the WHO World Mental Health Survey Consortium (2004). This may suggest important protective factors in Mexican culture and society which will be addressed in future analyses of these data. Although it remains to be tested, among those protective factors could possibly be greater perceived social support offered by 'familism', that has been characterized in the literature as a Mexican cultural trait (Ramirez *et al.* 2004) and lower rates of the use of illegal drugs (Medina-Mora *et al.* 2003; Villatoro *et al.* 2005).

These results acknowledge the need to incorporate a measure of severity into the epidemiological classification of psychiatric disorders.

We found that a minor proportion of the respondents (3·7%) had a 12-month psychiatric disorder classified as serious. These results are in agreement with other recent surveys that have classified their cases into a continuum of severity (Bijl *et al.* 2003; Kessler *et al.* 2003), and with prior research that used the presence of co-morbid disorders as a proxy for case severity (Kessler *et al.* 1994; Bijl *et al.* 1998). In comparison to the other countries in the WHO World Mental Health Consortium (2004) for which the prevalence of serious mental disorders ranges between 0·9% (for Shanghai, China) and 7·7% (United States), Mexico yet again falls in the middle. The disclosure of the patterns of co-morbidity and disorder severity will be an important focus of future reports.

Utilization of services

These findings suggest extreme under-utilization of mental health services and unmet need in Mexico. Only 24% of those most in need, defined for our purposes as those with the greatest disorder severity in the last 12 months, have received any treatment for their disorders in the same time period. Perhaps this is not surprising given the dearth of mental health resources in Mexico. This data confirms other findings that the majority of people with a recent psychiatric disorder have not received recent treatment (Medina-Mora *et al.* 1997; Caraveo *et al.* 1998). A report compiled for the WHO (2001*b*) gives an estimate of only 6000 psychiatric beds nationally; 2500 psychiatrists graduated as of the year 2000, of which only 890 are certified and the majority concentrated in Mexico City; 1500 psychiatric nurses and under 400 psychiatric social workers who have graduated. While almost 46 000 psychologists (in all areas of psychology, not just clinical) had graduated nationally as of 1990, only 73% were working as such. According to the WHO Atlas on Mental Health Resources in the World (WHO, 2001*a*), Mexico is in second to last place in the world distribution with regards to the number of psychiatrists per 100 000 inhabitants, similar to countries like Chile, Colombia, Peru or Brazil (with a median between 1 and 5 per 100 000 inhabitants). The Mexican rate is just above that of the poorest countries in the world such as those in Africa, Southeast Asia or Bolivia in the Americas. It is much lower than that observed for Europe with a median rate of 9/100 000 inhabitants, or Canada and the United States with a median over 10/100 000 inhabitants. Hopefully, epidemiological surveys of this nature will help raise awareness of the need for mental health services in Mexico and stimulate a greater allocation of resources to mental health. These data will be particularly helpful for determining how to allocate resources most efficiently, where the greatest needs lie and how best to get services to those most in need.

Sociodemographic correlates

The relation between age and any disorder may be indicative of the growing prevalence of mental disorders in more recent cohorts. Lower income was related to disorder severity and being widowed/separated/divorced was related to having any mood or impulse disorder. Whether this is due to being a risk factor for developing these disorders or is a result of social selection in which those who have more severe psychiatric disorders are less able to maintain higher paying jobs and those with a mood or impulse disorder are more likely to have a marriage which ends in separation or divorce cannot be determined from this study. Women were more likely than men to have an affective or anxiety disorder and less likely to have a substance disorder. These correlates of psychiatric disorder are similar to the ones reported in previous studies in other countries (Kessler *et al.* 1998; Abou-Saleh *et al.* 2001; Andrade *et al.* 2003).

Future directions

In this report of the M-NCS, we have only touched upon the general patterns of prevalence, severity, service utilization, and demographic correlates of 12-month psychiatric disorders in Mexico. Future reports are planned to address each of these areas in greater depth, as well as to report on the individual core disorders included here and other disorders not addressed in this report but included in the M-NCS such as childhood disorders, personality disorders, eating disorders, premenstrual syndrome, neurasthenia, irritable depression, suicide attempts, and family violence. As part of the WHO World Mental Health Surveys Initiative, the M-NCS data will be included to evaluate cross-cultural, cross-national similarities and differences in the prevalence, predictors, course and consequences

of mental disorders, and the disability and burden incurred by these disorders in different regions of the world. The findings generated from the M-NCS should be valuable not only for increasing our scientific knowledge as to the causes, course, and consequences of mental illnesses, but also for helping to guide public policy and allocation of resources.

DECLARATION OF INTEREST

None.

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