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The Epidemiology of Suicide-Related Outcomes in Mexico

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Nationally representative data from the Mexican National Comorbidity Survey are presented on the lifetime prevalence and age-of-onset (AOO) distributions of suicide ideation, plan and attempt and on temporally prior demographic and *DSM-IV* psychiatric risk factors. Lifetime ideation was reported by 8.1% of respondents, while 3.2% reported a lifetime plan and 2.7% a lifetime suicide attempt. Onset of all outcomes was highest in adolescence and early adulthood. The risk of transition from suicide ideation to plan and attempt was highest within the first year of onset of ideation. The presence of one or more temporally prior *DSM-IV*/CIDI (Composite International Diagnostic Instrument) disorder was strongly related to each suicide-related outcome. Suicidal outcomes are prevalent, have an early AOO, and are strongly related to temporally prior mental disorders in Mexico. Given the early AOO, intervention efforts need to focus more than currently on children and adolescents with mental disorders to be effective in prevention.

Nonfatal suicide-related outcomes, including suicide ideation, plans, and attempts, are prevalent around the world. Most available data on these outcomes, though, are from studies conducted in developed, Western countries. Although it has been suggested

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that nonfatal suicide-related outcomes are equally prevalent in developing countries, nationally representative data are lacking (Fleischmann et al., 2005; Vijayakumar, 2004; Vijayakumar, Nagaraj, Pirkis, & Whiteford, 2005). The purpose of the current report is to address this knowledge gap by reporting data on the prevalence, age-of-onset (AOO) distributions, and risk factors for such outcomes in Mexico.

Prior research on adult and student populations in Mexico suggests a high lifetime prevalence of suicide ideation (6.4% to 10.0%) and attempts (1.9% to 3.9%) (Mondragón, Borges, & Gutiérrez, 2001); however, these data are not from representative samples and thus may be biased. In addition, data are unavailable on other important characteristics of nonfatal suicide-related outcomes, including their AOO distribution, in the Mexican population, although prior work suggests that suicidal behavior may be a common problem among Mexican youth (González-Forteza et al., 2002). Moreover, no representative data are available on potentially important risk factors, such as the presence of pre-existing psychiatric disorders, despite the recent increase in suicide and corresponding new proposed programs to address the problem (Borges, Medina-Mora, Zambrano, & Garrido, in press).

The data reported here come from the Mexican National Comorbidity Survey (M-NCS) (Medina-Mora et al., 2005), a nationally representative household survey of adults residing in urban areas in Mexico (roughly 75% of the national population). The focus is on the lifetime prevalence of suicidal ideation, plans, and attempts; the cumulative occurrence of onset throughout the life course; and the strength of association of these outcomes with pre-existing psychiatric and demographic factors.

METHODS

Sample

The M-NCS is part of the World Health Organization's (WHO) World Mental Health (WMH) Survey Initiative (Demyttenaere et al., 2004; Kessler & Ustun, 2004), a series of coordinated community epidemiological surveys of mental disorders carried out in over two dozen countries throughout the world (www.hcp.med.harvard.edu/wmh). The survey was based on a stratified, multistage area probability sample of non-institutionalized persons aged 18 to 65 years living in urban areas (population 2,500+) of Mexico. About 75% of the Mexican population is urban and meets the above definition. Data collection took place in two phases from September 2001 through May 2002. The response rate was 76.6%, within the scope of other surveys from the WMH Survey Initiative (50.6%–87.7% response rate range) (Demyttenaere et al., 2004), for a total of 5,826 interviews, well above the original targeted sample size of 5,000 interviews. Forty-four respondents without information on key survey identification variables were deleted, leaving a final sample of 5,782 respondents. There were 28 interviewers, all trained by licensed Composite International Diagnostic Instrument (CIDI) personnel from the National Institute of Psychiatry in Mexico City and centrally supervised by personnel from the WHO and Harvard University. All respondents were administered a part I interview and a selected subsample of 2,362 received a part II interview, which included questions on risk factors and supplemental mental disorders. The sample receiving part II consisted of all respondents who screened positive for any disorder on part I plus a probability subsample of other part I respondents. There was a random selection process imbedded into a computer algorithm for the selection of those negative in the first phase of the survey. About one third of those who scored negative in the part I interview were randomly assigned to part II interview. All interviews were conducted at the respondent's home after a careful description of the study goals was provided and informed consent was obtained. No financial incentives were given for respondents' participation. All recruitment and consent procedures were approved by the ethics committee of the Na-

tional Institute of Psychiatry. Additional details of this study and sample have been published elsewhere (Medina-Mora et al., 2005).

Measures

Suicidal outcomes and potential risk factors were assessed using Version 3.0 of the WHO-CIDI, a fully structured lay-administered interview (Kessler & Ustun, 2004; Robins et al., 1988). This structured interview was interviewer administered by face-to-face interviews using a lap-top computer version (i.e., CAPI) that yielded *DSM-IV* diagnoses. The CIDI used in Mexico was based on the translation of the instrument into Spanish according to WHO recommendations, utilizing material currently in use in Spanish (*ICD-10*, *DSM-IV*) and previous translations of the Diagnostic Interview Schedule and earlier versions of the CIDI. These earlier instruments showed good performance in validity studies in Mexico (Caraveo, González, & Ramos, 1991; Caraveo, Martínez, & Rivera, 1998) and in other Spanish-speaking countries (reviewed in Wittchen, 1994). The fieldwork was conducted by Berumen and Associates, an established survey research firm in Mexico that employed a group of interviewers who had received training in the CIDI according to the WHO protocol stipulated for participating WMH countries.

Measures of Suicide-Related Outcomes. The WHO-CIDI contains a module that assesses several different suicidal outcomes consistent with prior recommendations and definitions (O'Carroll, Berman, Maris, & Moscicki, 1996), such as: suicide ideation ("Have you ever seriously thought about committing suicide?"), suicide plans ("Have you ever made a plan for committing suicide?"), and suicide attempts ("Have you ever attempted suicide?"). Based on evidence that reports of such potentially embarrassing behaviors are higher in self-administered than interviewer-administered surveys (Turner et al., 1998), these questions were printed in a self-administered booklet and referred to by letter. Lifetime presence and age-of-onset of each outcome were assessed by interview.

Risk Factors for Suicide-Related Outcomes. Three sets of risk factors for suicide-related outcomes were examined in the interviews: sociodemographic factors, characteristics of suicide-related outcomes themselves, and prior *DSM-IV* mental disorders. The sociodemographic factors included sex, age/cohort, education, employment history, and marital history. Characteristics of suicide-related outcomes examined included: AOO of ideation, time since onset of ideation, presence of suicide plan, and time since onset of plan. Respondent disorders were assessed using the WHO-CIDI (Robins et al., 1988). The diagnostic assessment included measurement of *DSM-IV* mood (major depressive disorder, dysthymia, and bipolar disorder), anxiety (panic disorder, agoraphobia without panic disorder, specific phobia, social phobia, generalized anxiety disorder, posttraumatic stress disorder, and childhood-adult separation anxiety disorder), impulse-control (oppositional-defiant disorder, conduct disorder, and attention deficit/hyperactivity disorder), and substance use (alcohol abuse, drug abuse, alcohol abuse with dependence, and drug abuse with dependence) disorders. Organic exclusion rules were used in making all respondent diagnoses. Prior studies using clinical reappraisal interviews found CIDI diagnoses to have generally good concordance with blinded diagnoses based on the Structured Clinical Interview for *DSM-IV* (First, Spitzer, Gibbon, & Williams, 2002) in a probability subsample of respondents from the U.S. survey (Kessler, Berglund, Demler, Jin, & Walters, 2005).

Statistical Analysis. Cross-tabulations were used to estimate lifetime prevalence of suicide ideation, plans, and attempts. Discrete-time survival analysis with time-varying covariates (Efron, 1988) was used to study retrospectively assessed sociodemographic and diagnostic correlates of each outcome. Survival coefficients were converted to odd-ratios (*OR*s) for ease of interpretation. The 95% confidence intervals (*CI*s) of the ORs are also reported and have been adjusted for

design effects. Continuous variables were divided into categories to minimize effects of extreme values. Standard errors (*SE*) and significance tests were estimated using the Taylor series method (Wolter, 1985) with SUDAAN (2002) software to adjust for the weighting and clustering of the data. Multivariate significance was evaluated using Wald χ^2 tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was evaluated using two-tailed .05-level tests.

RESULTS

Lifetime Prevalence

The lifetime prevalence of suicide-related outcomes in the M-NCS is 8.1% for lifetime suicidal ideation, 3.2% for lifetime suicide plan, and 2.7% for lifetime suicide attempt (Table 1). Among suicide ideators, 39% report a plan and 33.8% an attempt. The transition from suicide ideation to attempt is much higher among those with a plan (61.3%) than among those without a plan (16.3%). With only one exception (attempt among ideators without a plan), females report higher lifetime prevalence than men.

Sociodemographic Correlates

Being female, from recent cohorts, and with low educational attainment are all associated positively with suicide ideation, plan, and attempts (Table 2). These associations are attenuated or disappear when predicting plans and attempts among ideators. With only one exception—the association between employment status and having a plan among ideators—there is no relationship between employment or marriage and any suicide-related outcome.

Transitions among the Outcomes

Those with suicide ideation and those with a plan were classified into tertiles based on AOO of these outcomes. These variables were used to examine the relation between AOO and risk of transition from ideation to plans and attempts. Ideators with early AOO of ideation were found to be significantly more likely than those with later onsets to make a transition to a plan or to an attempt (statistically significant only for an attempt among ideators). Time since onset of ideation is strongly associated with the transition to a plan and the transition to an attempt, with risk extremely elevated within the first year of onset of ideation (*OR* = 100.7–220.4). Having a suicide plan is associated with a significantly higher risk of a subsequent attempt among ideators (*OR* = 7.7), although it is noteworthy that a substantial proportion of first attempts are described as unplanned. Among attempters with a plan, the transition to suicide attempt is highest within the first year of having a plan (*OR* = 426.2).

AOO Distribution

Hazard curves (Figure 1) show that the highest risk of initial suicide ideation, plans, and attempt occurs during adolescence and early adulthood, with another high risk period around the fifties. Cumulative lifetime risk curves for suicide ideation, plan, and attempt (Figure 2) show that these outcomes are rarely reported prior to age 12. Notably, the ideation curve is steepest from age 15 to 21, while suicide plan and attempt increase most in the age range 12–35. Onset of plans and attempts becomes less common at later ages, while onset of ideation persists throughout the life-course. Conditional AOO curves (Figure 3) show that progression from ideation to a first onset of a plan, from a plan to a first attempt, and from ideation to first attempt in the absence of a plan were all highest in the first year after onset of the earlier stage.

Temporally Prior DSM-IV/CIDI Disorders as Predictors

Discrete-time survival analyses found that temporally prior lifetime psychiatric dis-

TABLE 1
Lifetime Prevalence of Suicide-Related Outcomes: Mexico

	Total Sample ($n = 5782$)									Plan among ideators ($n = 488$)			Attempt among ideators ($n = 488$)			Attempt among ideators w/o a lifetime plan ($n = 296$)			Attempt among ideators with a lifetime plan ($n = 193$)		
	Ideation			Plan			Attempt														
	%	*SE*	*n*	%	*SE*	*n*	%	*SE*	*n*	%	*SE*	*n*	%	*SE*	*n*	%	*SE*	*n*	%	*SE*	*n*
Male	6	0.7	132	2.2	0.5	48	1.8	0.4	44	36.3	5	48	30.3	4.7	44	18.3	4.4	15	51.2	10.3	29
Female	10	0.6	356	4.1	0.4	144	3.6	0.4	122	40.4	3	144	35.7	3.8	122	15.1	3.5	33	66.2	4.8	89
Total Sample	8.1	0.5	488	3.2	0.3	192	2.7	0.3	166	39	3	192	33.8	2.7	166	16.3	2.6	48	61.3	4.8	118

TABLE 2
Sociodemographic Risk Factors for First Onset of Suicide-Related Outcomes: Mexico

	Part II Sample ($N = 2361$)						Plan among ideators ($n = 415$)		Attempt among ideators ($n = 415$)		Attempt among ideators w/o a lifetime plan ($n = 227$)		Attempt among ideators w/a lifetime plan ($n = 188$)	
	Ideation		Plan		Attempt									
Sociodemographic category	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)
Sex														
Female	1.7*	(1.2–2.3)	1.8*	(1.0–3.1)	1.9*	(1.1–3.4)	1.2	(0.7–2.2)	1.3	(0.7–2.5)	0.7	(0.3–1.7)	2.1	(0.8–5.0)
Male	1	—	1	—	1	—	1	—	1	—	1	—	1	—
X^2, 1 df, [*p*]	9.5**	[0.002]	4.8**	[0.029]	5.1**	[0.024]	0.5	[0.486]	0.8	[0.368]	0.6	[0.434]	2.6	[0.106]
Cohort														
18–29	22.2*	(9.5–51.9)	22.5*	(8.5–59.6)	15.8*	(4.7–52.6)	1.2	(0.5–2.9)	0.9	(0.3–2.9)	0.4	(0.1–1.7)	2.2	(0.6–8.3)
30–44	6.7*	(3.1–14.5)	5.4*	(2.2–13.5)	4.5*	(1.5–13.8)	0.8	(0.4–1.6)	0.9	(0.3–2.6)	0.7	(0.2–2.8)	1.6	(0.5–5.3)
45–54	3.2*	(1.5– 6.6)	3.3*	(1.4– 7.6)	3.1	(0.9–10.5)	1.1	(0.4–2.7)	1.1	(0.4–3.5)	0.5	(0.0–4.3)	2.5	(0.7–8.8)
55+	1	—	1	—	1	—	1	—	1	—	1	—	1	—
X^2, 3 df, [*p*]	99.6**	[0.000]	62.6**	[0.000]	50.1**	[0.000]	3.5	[0.325]	0.2	[0.976]	2.4	[0.486]	2.9	[0.405]
Education														
Student	1	(0.5–2.1)	1.5	(0.5–4.7)	0.7	(0.3–1.9)	1.9	(0.6–5.6)	0.5	(0.2–1.6)	0.7	(0.1–4.7)	0.3*	(0.1–0.8)
Low	2.8*	(1.5–5.0)	3.0*	(1.3–7.0)	2	(0.9–4.1)	1.2	(0.5–2.7)	0.6	(0.3–1.5)	0.6	(0.1–3.9)	0.6	(0.2–1.7)
Low/Medium	1.7	(1.0–2.8)	1.6	(0.7–3.7)	1.4	(0.7–3.0)	0.9	(0.4–2.2)	0.9	(0.4–2.1)	1.5	(0.3–8.5)	0.6	(0.2–1.8)
Medium	1.5	(1.0–2.4)	1.9	(1.0–3.7)	1.2	(0.6–2.4)	1.6	(0.7–3.6)	0.6	(0.2–1.5)	0.7	(0.1–3.9)	0.6	(0.2–1.7)
High	1	—	1	—	1	—	1	—	1	—	1	—	1	—
X^2, 4 df, [*p*]	20.8**	[0.000]	15.0**	[0.005]	12.0**	[0.018]	7.3	[0.123]	2.6	[0.625]	3.8	[0.433]	5.9	[0.210]
Employment														
Before 1st employment	1	(0.7–1.4)	0.6	(0.4–1.1)	0.7	(0.4–1.1)	0.5*	(0.3–0.9)	0.7	(0.4–1.2)	0.9	(0.4–2.1)	0.8	(0.4–1.4)
After 1st employment	1	—	1	—	1	—	1	—	1	—	1	—	1	—
X^2 , 1 df, [*p*]	0	[0.868]	3	[0.083]	2.3	[0.128]	4.8**	[0.029]	1.5	[0.221]	0	[0.858]	0.9	[0.352]

Marriage														
Before ever married	1.1	(0.7–1.5)	1.1	(0.7–1.6)	1.3	(0.8–2.0)	0.8	(0.5–1.5)	1.6	(0.9–2.9)	1.5	(0.4–5.0)	1.7	(0.8–3.4)
After ever married	1	—	1	—	1	—	1	—	1	—	1	—	1	—
X^2 , 1 df, [*p*]	0.1	[0.758]	0.1	[0.764]	1.2	[0.272]	0.4	[0.533]	2.2	[0.136]	0.4	[0.541]	2	[0.154]
Age of onset of Ideation														
Early	—	—	—	—	—	—	1.4	(0.7–2.9)	2.4*	(1.1–5.6)	4.5	(1.0–21.2)	1.2	(0.4–3.9)
Middle	—	—	—	—	—	—	1.7	(0.9–2.9)	1.3	(0.6–2.8)	2.1	(0.5– 9.4)	1	(0.3–3.2)
Late	—	—	—	—	—	—	1	—	1	—	1	—	1	—
X^2, 2 df, [*p*]	—	—	—	—	—	—	3.2	[0.199]	4.9	[0.085]	4.9	[0.088]	0.2	[0.909]
Time since onset of ideation														
zero	—	—	—	—	—	—	100.7*	(41.2–245.9)	152.7*	(35.3–660.4)	220.4*	(24.4–1991.9)	—	—
1–5	—	—	—	—	—	—	2.7	(0.9– 8.1)	6.1*	(1.4– 27.1)	13.7*	(1.5– 123.7)	—	—
6–10	—	—	—	—	—	—	2.7	(0.8– 8.7)	4.1	(0.8– 21.6)	0.0*	(0.0– 0.0)	—	—
11+	—	—	—	—	—	—	1	—	1	—	1	—	—	—
X^2, 3 df, [*p*]	—	—	—	—	—	—	154.9**	[0.000]	244.7**	[0.000]	1651.4**	[0.000]	—	—
Having Plan														
Yes	—	—	—	—	—	—	—	—	7.7*	(4.2–14.2)	—	—	—	—
No	—	—	—	—	—	—	—	—	1	—	—	—	—	—
X^2, 1 df, [*p*]	—	—	—	—	—	—	—	—	45.1**	[0.000]	—	—	—	—
Time since onset of plan														
zero	—	—	—	—	—	—	—	—	—	—	—	—	426.2*	(43.1–4210.1)
1–5	—	—	—	—	—	—	—	—	—	—	—	—	15.8*	(1.4– 183.0)
6–10	—	—	—	—	—	—	—	—	—	—	—	—	7.5	(0.7– 85.6)
11+	—	—	—	—	—	—	—	—	—	—	—	—	1	—
X^2, 3 df, [*p*]	—	—	—	—	—	—	—	—	—	—	—	—	113.8**	[0.000]

*OR significant at the 0.05 level, 2-sided test

**Significant at the 0.05 level, 2-sided test

—indicates that it is not used as a predictor in the model

df = degrees of freedom

Results are based on multivariate discrete-time survival model with person-year as the unit of analysis.

Time intervals (INT) are used as a control, but in different form for the 1st 3 columns and the last 4 columns.

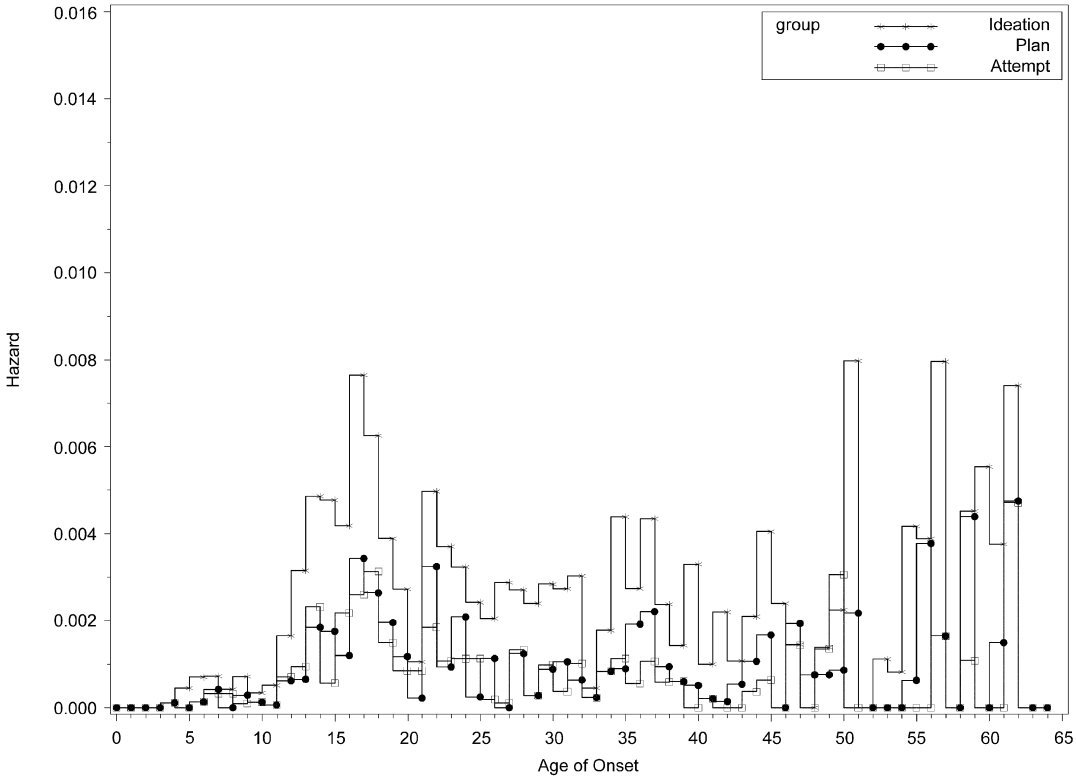

Figure 1. Hazard of first suicide ideation, plan, and attempt for MEXICO

orders significantly predict first onset of lifetime suicide ideation, plan, and attempt (Table 3). Several points are worth mentioning. First, any lifetime psychiatric disorder is a strong risk factor for suicidal ideation, a plan, and an attempt, with odds ratios of 4.7, 7.9, and 9.3, respectively. Any disorder is also associated with transitions from ideation to a plan and to an attempt, though the *OR*s are much smaller. The presence of most individual disorders is positively associated with ideation, plan, and attempts. The disorder (in parenthesis) with the strongest association with the outcome varied for ideation (drug abuse), plan (conduct disorder), and attempt (conduct disorder). As a group, impulse-control and substance use disorders showed larger *OR*s than mood or anxiety disorders. Among ideators, substance use disorders had the strongest and most consistent associations with transitions to a plan and to an attempt (*OR*s 2.7–2.2).

The risk associated with the number of lifetime disorders increased from ideation, to plan, to attempt, and increasing comorbidity was associated with larger odds ratios. Three or more disorders were associated with a 26.2 increase in the odds of suicide attempt compared to people with no disorders. Comparable increases for plan and ideation are 19.7 and 10.8 Among ideators, high and significant *OR*s were found only among those with the highest levels of comorbidity.

DISCUSSION

In this nationally representative urban sample of respondents from Mexico, we found that an 8.1% lifetime prevalence of suicide ideation, 3.2% prevalence of suicide plan, and 2.7% prevalence of suicide attempt. About one third of ideators made a transition to a plan and an attempt. Approximately two

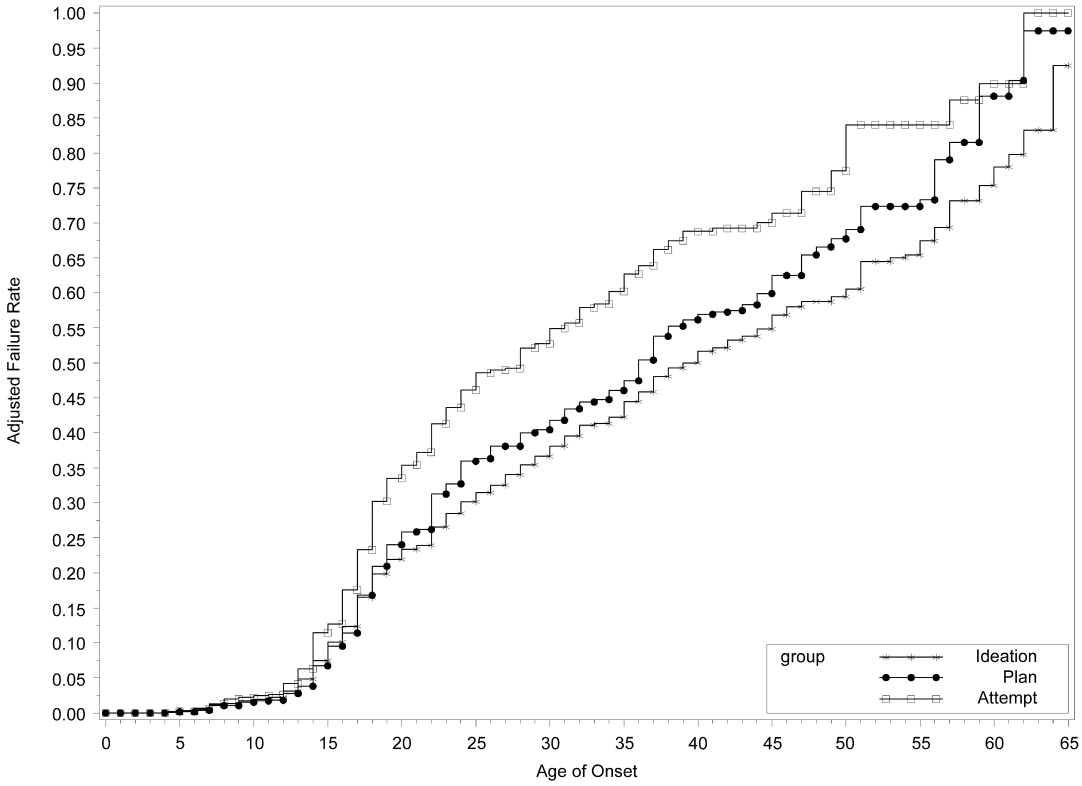

Figure 2. Failure rate of first suicide ideation, plan, and attempt for MEXICO

thirds of those with a suicide plan made an attempt. Suicidal outcomes were found to occur more often in adolescence and early adulthood than in other parts of the life course, with risk becoming considerably smaller after the middle thirties, with the exception of suicidal ideation, which has an onset that continues into older ages. Females, youths, and those with low educational attainment were found to have the highest risk of ideation, plan, and attempt, but these factors were found not to be related to the transition from ideation to plan or attempt. These transitions are, however, related to a plan, to an early AOO of ideation, and are most likely to start within the first year of developing ideation and a plan. Having met criteria for one or more *DSM-IV* disorder is a strong predictor of the subsequent onset of all the suicide-related outcomes considered here. Number of lifetime disorders is an especially strong predictor of the outcomes.

Several aspects of these findings warrant further elaboration. The lifetime prevalence estimates are consistent with two prior studies of suicidal behavior in Mexico City (Mondragón et al., 2001), but lower than the estimates for the United States found in the U.S. National Comorbidity Survey (13.5%, 3.5%, and 4.6% for ideation, plan, and attempt, respectively; Kessler, Borges, & Walters, 1999). Our estimates are also lower than those reported in a population survey in Australia (16.0% and 3.6% for ideation and attempt, respectively; Pirkis, Burgess, & Dunt, 2000). The Mexican prevalence estimates of lifetime suicide ideation and attempts are low in comparison to those found in a series of countries in a previous cross-national study (Weissman et al., 1999), although the word-

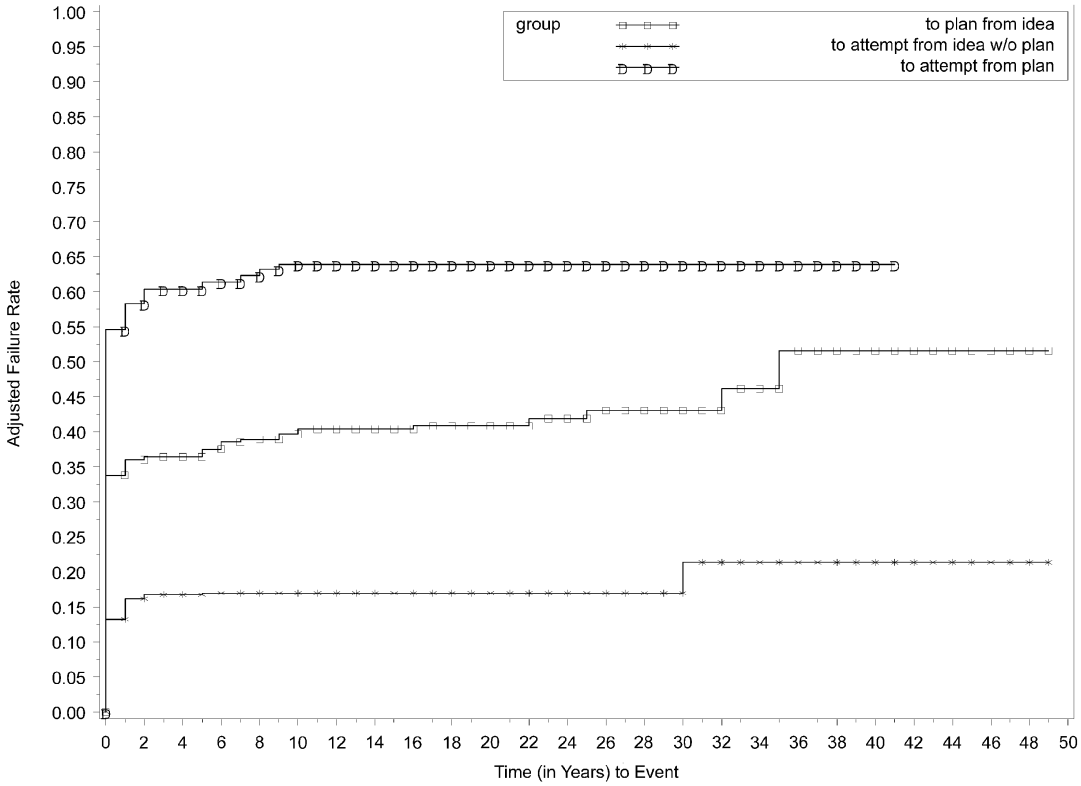

Figure 3. Failure rates for transitions for MEXICO

ing of the question about ideation in that earlier study was stated in such a way that a higher proportion of people would be expected to endorse it than would endorse the CIDI question, as the latter but not the former referred to *seriously* thinking about suicide. Despite this difference in wording, these findings taken together suggest that there may be important differences in the epidemiology of suicidal outcomes between developed and developing countries—although a detailed analysis of this question requires data from many more countries. Future cross-national studies using the WMH data are planned to address this issue directly.

Even though a number of previous surveys prior to the WMH initiative have collected data on the prevalence of suicide ideation and attempts, few collected information on AOO. The current results are consequently noteworthy in this regard. The AOO results are very similar to those reported in the U.S., showing that the onset of suicidal outcomes is concentrated during the early teens through the middle thirties (Kessler et al., 1999). Our findings that females, youth, and those with low educational attainment have high risks of ideation, plan, and attempt are consistent with previous research on risk factors for these outcomes (Kessler et al., 1999; Moscicki, 1999), although we failed to replicate the finding in previous studies that these outcomes are more prevalent among people who are unmarried than among the married (Petronis, Samuels, Moscicki, & Anthony, 1990). Moreover, while most prior studies examining risk factors for suicide-related outcomes have relied on cross-sectional or retrospective data, the results reported here are of considerable interest in that we used retrospective AOO reports to identify temporally prior risk factors and found that

TABLE 3
DSM-IV Disorders as Risk Factors for First Onset of Suicide-Related Outcomes: Mexico

	Part II Sample ($N = 2361$)						Plan among ideators ($n = 415$)		Attempt among ideators ($n = 415$)		Attempt among ideators w/o a lifetime plan ($n = 227$)		Attempt among ideators w/a lifetime plan ($n = 188$)	
	Ideation		Plan		Attempt									
Disorder category	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)	*OR*	(95% *CI*)
Anxiety														
Panic disorder	3.5*	(1.6– 7.9)	3.9*	(1.0–14.3)	4.2*	(1.6–11.2)	1.6	(0.4– 6.8)	0.8	(0.2– 3.3)	0.4	(0.0– 5.5)	1.4	(0.2– 9.5)
Generalized anxiety disorder	2.1	(0.8– 5.0)	3.7*	(1.1–12.7)	5.0*	(1.6–15.6)	2.6	(0.6–12.2)	3.9	(0.6–24.5)	5.7	(0.5–66.0)	1.5	(0.2– 12.6)
Specific phobia	3.4*	(2.5– 4.5)	4.2*	(2.6– 6.9)	5.1*	(3.1– 8.4)	1.5	(0.8– 2.7)	1.8*	(1.0– 3.3)	2.0	(0.9– 4.6)	1.7	(0.7– 4.1)
Social phobia	4.4*	(2.9– 6.5)	5.5*	(3.2– 9.2)	6.0*	(3.7– 9.7)	1.6	(0.8– 3.1)	1.5	(0.6– 3.5)	1.7	(0.6– 4.7)	1.2	(0.4– 3.0)
Posttraumatic stress disorder	6.3*	(2.9–13.7)	6.6*	(3.1–14.0)	9.0*	(4.2–19.4)	1.3	(0.4– 4.4)	2.2	(0.9– 5.1)	1.1	(0.2– 7.1)	2.9*	(1.2– 6.8)
Childhood/adult separation anxiety	3.9*	(2.4– 6.4)	4.7*	(2.6– 8.3)	6.6*	(3.6–11.9)	1.5	(0.7– 3.3)	2.5*	(1.1– 5.6)	5.4*	(2.2–13.2)	1.3	(0.5– 3.1)
Any anxiety disorders	3.9*	(3.0– 5.1)	5.2*	(3.4– 7.8)	6.2*	(3.8–10.0)	1.7*	(1.0– 2.8)	1.9*	(1.1– 3.3)	1.9	(0.9– 3.9)	1.5	(0.7– 3.2)
Mood														
Major depressive episode	4.6*	(3.2– 6.5)	5.3*	(3.1– 9.2)	6.2*	(3.9– 9.8)	1.3	(0.7– 2.4)	1.0	(0.6– 1.7)	0.9	(0.3– 2.6)	1.1	(0.6– 2.3)
Dysthymia	6.1*	(3.3 11.1)	7.3*	(3.5–15.3)	8.4*	(4.0–17.4)	1.6	(0.6– 4.4)	1.8	(0.7– 4.7)	1.0	(0.1– 9.7)	1.7	(0.7– 4.1)
Bipolar disorder (broad)	5.6*	(2.8–11.0)	9.5*	(4.1–22.2)	7.4*	(3.2–16.9)	3.2*	(1.1– 9.5)	1.0	(0.3– 3.7)	0.4	(0.0– 4.0)	1.4	(0.3– 6.2)
Any mood disorders	4.5*	(3.2– 6.4)	6.6*	(4.1–10.5)	6.4*	(4.2– 9.9)	1.9*	(1.1– 3.1)	1.0	(0.6– 1.7)	0.8	(0.3– 2.4)	1.1	(0.6– 2.2)
Impulse-control														
Oppositional-defiant disorder[1]	6.3*	(3.6–11.0)	13.3*	(6.9–25.8)	8.9*	(4.7–16.8)	5.8*	(2.5–13.4)	1.4	(0.6– 3.6)	0.8	(0.1– 6.4)	1.9	(0.6– 6.3)
Conduct disorder[1]	10.2*	(3.6–29.4)	13.4*	(3.2–55.8)	22.1*	(6.7–72.7)	2.2	(0.5– 9.7)	4.3*	(1.5–12.3)	1.4	(0.3– 7.1)	35.9*	(7.2–180.1)
Attention-deficit/hyperactivity disorder[1]	3.3*	(2.0– 5.5)	4.1*	(2.2– 7.6)	5.3*	(2.8– 9.9)	1.4	(0.6– 3.0)	2.1	(1.0– 4.5)	1.6	(0.5– 5.5)	2.2	(0.9– 5.6)
Intermittent explosive disorder[3]	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Any impulse-control disorders[1]	5.1*	(3.3– 7.9)	9.9*	(5.1–19.0)	8.5*	(4.2–17.3)	3.6*	(1.8– 7.2)	1.8	(0.8– 3.7)	1.2	(0.3– 4.3)	2.4	(0.9– 6.5)
Substance Use														
Alcohol abuse	4.4*	(2.7– 7.2)	8.7*	(4.4–17.2)	11.8*	(6.7–21.0)	3.1*	(1.5– 6.6)	2.8*	(1.3– 5.7)	4.4*	(1.1–17.2)	1.7	(0.7– 4.0)
Alcohol abuse with dependence	2.5*	(1.1– 5.6)	6.0*	(2.1–17.4)	5.0*	(1.7–14.3)	4.3*	(1.6–11.9)	1.6	(0.5– 5.7)	1.8	(0.2–16.6)	1.0	(0.2– 4.5)
Drug abuse	13.5*	(6.7–27.2)	6.7*	(2.3–19.3)	15.7*	(6.2–39.6)	0.6	(0.2– 2.0)	2.3	(0.8– 6.7)	1.4	(0.3– 7.6)	4.0	(0.5– 30.3)
Drug abuse with dependence[2]	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Any substance use disorders	4.9*	(3.0– 8.1)	8.6*	(4.5–16.3)	12.1*	(6.9–21.2)	2.7*	(1.3– 5.6)	2.5*	(1.2– 5.3)	2.4	(0.5–11.6)	2.2	(0.8– 6.1)
Any														
Any disorders	4.7*	(3.6– 6.1)	7.9*	(5.0–12.4)	9.3*	(5.7–15.1)	2.3*	(1.4– 3.6)	2.1*	(1.2– 3.7)	2.2	(0.9– 5.1)	1.8	(0.9– 3.7)
Exactly 1 disorder	2.4*	(1.6– 3.5)	3.6*	(2.0– 6.4)	3.0*	(1.4– 6.4)	1.8	(1.0– 3.3)	1.0	(0.4– 2.6)	1.4	(0.5– 4.3)	0.6	(0.2– 2.0)
Exactly 2 disorders	4.7*	(3.1– 7.2)	6.4*	(3.1–13.4)	7.1*	(3.4–14.7)	1.6	(0.7– 3.8)	1.5	(0.7– 3.3)	1.0	(0.2– 4.1)	1.9	(0.6– 5.8)
3+ disorders	10.8*	(8.0–14.6)	19.7*	(12.0–32.2)	26.2*	(16.7–40.9)	3.2*	(2.0– 5.3)	3.4*	(1.9– 6.3)	4.3*	(1.4–12.9)	2.8*	(1.3– 5.9)

*OR significant at the 0.05 level, 2-sided test
[1]Assessed within age range 18–44
[2]Disorder was omitted due to insufficient lifetime cases ($n < 30$), but it will be included as one of the disorders in ANY category
[3]Disorder was not accessed
Results are based on multivariate discrete-time survival model.
Each model controls for person-year and the sociodemographic variables from Table 2.

temporally primary disorders are consistently significant predictors of these suicide-related outcomes.

In Mexico, as in many other countries, mental disorders have an important impact on suicidal behaviors. Consistent with prior reports, each mental disorder assessed here was associated with an increased risk of suicidal outcomes, and diagnostic comorbidity further increased this risk. In addition, our findings provide more detailed information about the relationship between psychiatric disorders and suicidal outcomes than has been reported in prior studies, and this new information may help inform scientific, clinical, and policy efforts aimed at predicting and preventing suicidal outcomes. Our results show that the relation between psychiatric disorders and suicidal outcomes is largely accounted for by the relation between disorders and suicide ideation. We can see this by noting that conditional risk of onset of plan and attempt among ideators is dramatically lower than the unconditional risk of these same outcomes in the total sample. This pattern of findings suggests that additional factors are needed to explain the transition from ideation to plans and attempts. It might be that severity of mental disorders is more important than the mere presence of these disorders in predicting these transitions, a possibility that we could not consider in our analysis of lifetime risk.

It is noteworthy that although mood disorders are most often thought of as the strongest predictor of suicidal outcomes, the current data suggest that substance use and impulse-control disorders are actually stronger predictors in Mexico. This pattern of findings is in contrast to prior studies in developed countries where mood disorders have the strongest association with suicide-related outcomes (e.g., Kessler et al., 1999; Nock & Kazdin, 2002). The exact reason for this pattern of findings is not clear, and it will be important to determine if it exists across other developing countries in future cross-national WMH analyses.

The rapid transition from ideation to plans and attempts is perhaps the most striking finding of the study. Indeed, the fact that the majority of those with suicide ideation who will subsequently make a plan and attempt do so within the first year of the onset of ideation suggests that the window of opportunity for preventive interventions after the onset of ideation is quite narrow. In essence, intervention efforts need to focus on prevention of ideation rather than prevention of the transition from ideation to more serious outcomes. This finding is consistent with data from the U.S. (Kessler et al., 1999) and suggests cross-national consistency in this very important pattern of rapid transition from onset of ideation to onset of plan and attempt.

In 2002 Mexico had a suicide rate of 5.0 per 100,000 inhabitants, higher among males (8.3) than females (1.8) (Borges & Mondragón, 2003). Although completed suicide in Mexico is not as high as in other countries, it has been increasing steadily during the last 30 years. In fact, Mexico was the leading country in showing increasing rates of suicide in the periods of 1981–83 and 1993–95 (WHO, 2001). In our study we found that several risk factors for suicide-related outcomes are similar in Mexico compared to other countries, and that our rates are already a matter of great concern that require immediate measures. In Mexico, suicidal outcomes are prevalent, have an early AOO, and are strongly related to temporally prior mental disorders. Given the early AOO, intervention efforts need to focus more than currently on children and adolescents with mental disorders to be effective in prevention.

Our study findings must be evaluated in the context of several study limitations. First, the M-NCS is a household survey that excluded homeless and institutionalized people, both populations known to have high prevalence of suicidal behavior (Desai, Liu-Mares, Dausey, & Rosenheck, 2003). Second, the diagnostic instrument used in the M-NCS did not include an assessment of all *DSM-IV* disorders, some of which have been linked to increased risk of suicidal behavior, such as schizophrenia and other non-affective

psychoses (Harkavy-Friedman, Nelson, Venarde, & Mann, 2004; Kessler et al., 1999). Third, validity and reliability data were not obtained on the measures of ideation, plans, and attempts. Fourth, although we examined suicide ideation, plans, and attempts, we did not measure other important self-injurious behaviors such as suicide gestures (e.g., Nock & Kessler, 2006) and nonsuicidal self-injury (e.g., Nock & Prinstein, 2004, 2005), and so the epidemiology of these outcomes awaits further study. A related limitation is that we have not included in the present report data on personality disorders or stressful life events, among other potential factors associated with suicide-related outcomes. Future analyses from our group will focus on a comprehensive model of predictors for these outcomes. Finally, these analyses used data on retrospectively reported ages of onset that are subject to recall errors, which likely lead the results reported here to be conservative with regard to the magnitude of the problem of nonfatal suicide-related outcomes in Mexico.

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