Lifetime Prevalence of *DSM-III-R* Psychiatric Disorders Among Urban and Rural Mexican Americans in California

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Background: The Mexican American Prevalence and Services Survey presents lifetime prevalence rates for 12 *DSM-III-R* psychiatric disorders in a sample of 3012 adults of Mexican origin by place of residence and nativity, and compares these results with those of population surveys conducted in the United States and Mexico.

Methods: The stratified random sample included noninstitutionalized persons aged 18 to 59 years of Mexican origin, who were residents of Fresno County, California. Psychiatric disorders were assessed using a modified version of the World Health Organization Composite International Diagnostic Interview in face-to-face interviews.

Results: Mexican immigrants had lifetime rates similar to those of Mexican citizens, while rates for Mexican Americans were similar to those of the national population of the United States. This difference is attributable to a prevalence rate for any disorder among immigrants of 24.9%, compared with 48.1% among US-born respondents. A higher prevalence for any disorder was reported in urban (35.7%) compared with town (32.1%) or rural (29.8%) areas. Multivariate analyses showed an adjusted effect of country of birth, but not of urban residence.

Conclusions: Despite very low education and income levels, Mexican Americans had lower rates of lifetime psychiatric disorders compared with rates reported for the US population by the National Comorbidity Survey. Psychiatric morbidity among Mexican Americans is primarily influenced by cultural variance rather than socioeconomic status or urban vs rural residence.

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MEXICAN AMERICANS are the largest Hispanic ethnic group in the United States, numbering about 7.5 million in California.[1] The profile of the Mexican American population has changed rapidly in the past decade owing to immigration, increasing poverty, and settlement patterns.[2] The Mexican American Prevalence and Services Survey (MAPSS) is the first study to cover *DSM-III-R*[3] disorders in a community sample of Mexican Americans living in urban and nonurban residential settings.

For editorial comment see page 781

More than a decade ago, the Los Angeles Epidemiologic Catchment Area (LAECA) study, as part of the landmark Epidemologic Catchment Area program, used the English- and Spanish-language versions of the Diagnostic Interview Schedule to estimate the prevalence of *DSM-III* disorders among Mexican Americans in Los Angeles, Calif.[4-7] Total *DSM-III* psychiatric disorder lifetime rates for urban Mexican Americans were similar to those for white non-Hispanics, 34.6% and 35.2%, respectively.[8] Mexican Americans had higher rates than white non-Hispanics for alcohol abuse or dependence, and phobia. The LAECA reported that US-born Mexican Americans had higher rates of major depression, dysthymia, phobia, alcohol abuse or dependence, and drug abuse or dependence than did Mexican immigrants in the same sample.[9]

The National Comorbidity Survey (NCS)[10] reported higher prevalence rates of current affective disorders and comorbidity among Hispanics, but did not find higher alcohol disorder rates when compared with white non-Hispanics. An important distinction between the NCS and the LAECA is that the NCS Hispanic

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SUBJECTS AND METHODS

SAMPLING

The 3012 subjects in this study were selected from Fresno County under a fully probabilistic, stratified, multistage cluster sampling design. Fresno County is located in the California Central Valley, midway between Los Angeles and San Francisco, and about 200 miles [320 km] from either city. The population of the county is approximately 764 810, and 463 000 of these are located in the Fresno-Clovis metropolitan area. Fresno is the sixth largest city in California. Hispanics, almost all of whom are of Mexican origin, constitute 38.2% of the county population.[11] The 200 primary sampling units (PSUs) in each stratum were census blocks or block aggregates selected with a probability proportionate to the size of their Hispanic population. In the second sampling stage a quota of 5 households was randomly selected in each PSU. In the final stage, one person per household was randomly selected. To achieve the household stage sample quota of at least 5 Mexican-origin households, low-Hispanic-density blocks were aggregated with contiguous blocks into PSUs with a population of 30 or more Hispanics. Under this design, two thirds of the PSUs remained as single census blocks while the remaining one third represent aggregation ranging from block pairs to entire census tracts. Evaluation of our PSU sample revealed that it closely mirrors the county population. Two thirds of the Hispanic population reside in blocks with 30 or more Hispanics (our PSU definition) and 70% of our sampled PSUs represent single blocks. Further, 3.9% of the population and 4.0% of our PSU sample reside in entire-tract aggregations.

Enumerators were used to locate eligible subjects. Enumeration began at the northwest corner and proceeded counterclockwise. In high-Hispanic-density PSUs, a skip pattern for household selection inversely proportionate to the number of Hispanics was used to minimize selection of immediate neighbors. Within households, enumerators generated a full, numbered list of eligible subjects in age order. Random digits attached to the enumeration form dictated which person on the list would become the study subject. Up to 5 call-back attempts were made to recruit the selected subject into the study interview. After a household was selected, Mexican origin was established using the same ethnicity-nationality indicator used in other large national and regional health studies; potential respondents were asked by enumerators if they or at least 1 parent or grandparent was born in Mexico. The possibility exists that some respondents who were born in Mexico denied it owing to concerns about identification by the US Immigration and Naturalization Service. However, because the research was presented as a health study, we believe Mexican respondents were highly reliable in reporting their national origins. Furthermore, Mexican origin is not a prima facie basis for deportation. Enumerators also asked potential respondents their age at their last birthday, and only those between 18 and 59 years of age were retained for the study. The sample was stratified by sex and place of residence in Fresno County, with total subsample sizes as follows: urban, 1006; town, 1006; rural, 1000; and total, 3012. Urban respondents were selected from the Fresno-Clovis urbanized area, town respondents were drawn from residential areas outside the Fresno-Clovis urbanized area that ranged from 2500 to 25 000 people, and the rural sample was drawn from the remainder of unincorporated areas and isolated residences in the county.

Because within-PSU quotas were, in some instances, either not met or slightly exceeded due to differential interview refusal rates, a system of PSU weights to adjust for the design requirement of equal PSU sizes was developed. In addition, weights to adjust for household size (ie, the number of eligible subjects) were calculated as well as weights to conform the sample to the census age-sex distribution. The combined weights were designed to yield weighted sample sizes equal to the raw sample. Given our multistage sampling design, all SE estimates reported herein are based on first-order Taylor series approximation employed by the SUDAAN statistical software.[12] The response rates were 88% for urban, 91% for town, and 92% for rural strata among screened eligible households, with a 10% refusal and nonresponse rate overall. These were calculated as (refusals $\times$ 100/refusals + completed).

INSTRUMENT

Psychiatric diagnoses were based on face-to-face interviews using a modified version of the Composite International Diagnostic Interview (CIDI)[13] The CIDI is a structured clinical interview that was developed jointly by the World Health Organization and the former US Alcohol, Drug Abuse, and Mental Health Administration as the research instrument of choice for large-scale international psychiatric epidemiologic research. The CIDI incorporated the core diagnostic questions of the Diagnostic Interview Schedule and was designed to be used cross-culturally on populations with diverse levels of education and literacy.[14]

We modified the CIDI to provide prevalence data comparable to the NCS. The main differences between the original CIDI and our version are that we use screeners at the beginning of the interview, including a commitment probe to maximize recall of lifetime episodes, and probe symptoms for severity and for exclusions due to physical illness or the use of alcohol, drugs, or medications at the episode level rather than at the symptom level. The screeners are a series of questions, placed at the beginning of the clinical sections, designed to minimize the tendency of respondents to quickly learn the structure of the diagnostic sections (ie, answering no merely to avoid further probes), then subsample consisted of mixed Latin American nationalities and no Spanish-language interviewing was conducted. The MAPSS was designed to compare psychiatric morbidity for immigrant and native-born adults of Mexican origin with rates for the US national population from the NCS and from a Mexico City, Mexico, survey that used similar diagnostic protocols.

RESULTS

PREVALENCE BY PLACE OF RESIDENCE

The distribution of the sample among residential areas by demographic variables is presented in **Table 1**. Overall educational attainment for the sample was far

to take "shortcuts" by denying experiencing symptoms that would require them to proceed through an additional battery of questions. The commitment probe is a question that serves as an introductory statement to the diagnostic sections with the purpose of encouraging "honest reporting and serious memory search."[15]

Our instrument incorporates culturally and linguistically sensitive elements and includes probes for respondents' idiomatic expressions of psychological distress. Translation into Spanish was done in Puerto Rico at the World Health Organization Training and Reference Center, and refinements to the local idiom were accomplished by the translation and back-translation method in Fresno. A panel of bilingual experts conducted an item-by-item review of the instrument translation, placing special emphasis on cultural and linguistic adaptations appropriate for use with Mexican-origin populations. A computer-assisted personal interview version was developed for instrument administration. Interviewers were trained at the research site, California State University, Fresno. Our staff charged with CIDI training was prepared at the University of Puerto Rico World Health Organization Training and Reference Center training program. The Survey Research Center at the University of Michigan, Ann Arbor, provided further assistance for developing the interviewer training program. Interviewer training and field performance was closely supervised for quality and reliability, and deficient interviewers were eliminated from the study. The interview's average face-to-face administration time was 86 minutes for those respondents without extensive psychiatric histories, with the Spanish version having a longer administration time. Respondents meeting case criteria for multiple psychiatric disorders took 2 hours or longer to complete the interview. To assure interview veracity and internal consistency of responses, several data quality control procedures were implemented. In the first place, the internal architecture of the computer-assisted personal interview CIDI permitted performance checks. Furthermore, interviews were audiotaped, audited by supervisors with incomplete interviews returned for completion, and a random sample of respondents was recontacted by the field supervisor to verify information accuracy. Interviewers reported few differences in the performance characteristics of the English- and Spanish-language computer-assisted personal interview versions or difficulties obtaining permission for interviews for quality control.

Our instrument provides lifetime, 12-month, 6-month, and 1-month prevalence estimates for 14 specific *DSM-III-R* diagnoses: mood disorders (major depressive episode, manic episode, dysthymia); anxiety disorders (panic disorder, agoraphobia, social phobia, simple phobia); substance use disorders (alcohol abuse, alcohol dependence, drug abuse, drug dependence); nonaffective psychosis; somatization; and antisocial personality disorder. Neither nonaffective psychoses or somatization disorder are reported

in this article. Generalized anxiety is reported only for the cross-study comparisons because no cases were ascertained in our sample. The criteria and diagnostic algorithms for generalized anxiety were equivalent to those for the NCS. Interviewers reported that some questions required for a diagnosis were inadequately comprehended by both English- and Spanish-speaking respondents. Therefore, it is possible that underreporting occurred for this disorder, and we are continuing our review. Diagnoses from the modified CIDI are generated by diagnostic algorithms based on the *DSM-III-R* and *International Statistical Classification of Diseases, 10th Revision* (*ICD-10*) diagnostic criteria and the CIDI version 1.1 format.[16]

ANALYSIS PROCEDURE

Analysis of the data was conducted using the SUDAAN statistical package. Lifetime CIDI disorder prevalence rates and SEs by place of residence and nativity were calculated. Prevalence rates were age adjusted to the sex-specific Mexican American age distribution of Fresno County. The age adjustment incorporated 5-year intervals used by the US Census. All SE estimates were adjusted for sampling design through a first-order Taylor series approximation. Prevalence rates were compared with 2 other large-field surveys that used the CIDI for ascertainment of *DSM-III-R* disorders: the NCS, which represents US national rates, and a field survey conducted in Mexico City by the Mexican Institute of Psychiatry. Because the 3 studies examined different age ranges, for comparison purposes the age range was converted to 18 to 54 years. Further, because the age distributions differ among the 3 studies, the Fresno nativity categories, the Mexico City data, and the NCS Hispanic subsample were adjusted to the sex-specific age distribution of the NCS. As with the Fresno sample, the total Mexico City and NCS prevalence rates incorporate sampling design weights and SE adjustments.

Logistic regression models were constructed to examine the independent effects of sociodemographic covariates on 4 outcomes of interest: any affective disorder, any anxiety disorder, alcohol abuse and/or dependence, and drug abuse and/or dependence. Standard errors of odds ratios (ORs) were adjusted for weighting and sampling design. The categorical covariates included in the model were sex, age, education, annual family income, employment and marital status, language of interview, and place of residence and nativity. To enable examination of the effects of length of time in the United States among immigrants, years in the United States was dichotomized at the median of 13 years and incorporated into a now trichotomous nativity variable: immigrant with less than 13 years in the United States, immigrant with 13 or more years, and native born. Because effect nonlinearities were observed for age, education, and income, these continuous covariates were collapsed into categories.

below US norms: one third of the sample had completed up to 6 years, and only about one third had 12 or more years of school. Also noteworthy were the low overall family income levels in all residential strata, with almost 43% of the total sample reporting less than $12 000 of annual family income. Rural residents were somewhat more likely to be married, and the urban

residents were somewhat more likely to have disrupted marital statuses.

Table 2 presents lifetime rates of *DSM-III-R* disorders by place of residence. County rates for any *DSM-III-R* disorder were highest in urban areas (35.7%) and lowest in rural areas (29.8%); small towns were intermediate (32.1%). Rates for any affective, anxiety, sub-

stance abuse or dependence, and antisocial personality disorders were higher in urban areas, but rates for individual disorders were not uniformly higher in urban ar-

eas. Reviewing variations by sex, women had higher rates than men for affective and anxiety disorders, whereas males had higher rates of any substance abuse or dependence in all 3 residential areas. However, rates of any *DSM-III-R* disorder by sex were similar within rural and urban areas, but somewhat higher for men living in small towns.

The distribution of demographic characteristics by birthplace is shown in **Table 3**. The most remarkable differences were educational attainment, marital status, and family income. Language use was an excellent proxy for birthplace, with more than four fifths of immigrants preferring to be interviewed in Spanish as contrasted with less than 10% of the native-born sample.

The native-born lifetime rate for any disorder (48.1%) in **Table 4** was twice that of immigrants (24.9%). Comparing nativity groups, any substance abuse or dependence rates were almost 7 times higher among native-born than for immigrant women; for men the ratio was only 2:1. Similar differences, albeit smaller in magnitude, were found for any affective or anxiety disorders. Men born in the United States had the highest lifetime rates of antisocial personality disorder. For the total sample, any affective and any anxiety disorders were highest for women, and substance abuse or dependence disorders were 3 times higher among men. The total prevalence was slightly higher for men than for women, 34.8% vs 32.7%.

MULTIVARIATE ANALYSES OF DEMOGRAPHIC FACTORS

In the logistic regression models presented in **Table 5**, long-term residence substantially increased risk of experiencing lifetime *DSM-III-R* disorders. Although length of residence increased rates in all disorder categories, it is particularly accelerated for drug abuse or dependence, as indicated by an OR of 6.5 for immigrants with

Table 1. Sample Characteristics by Place of Residence (N = 3012)

	Urban	Town	Rural	Total*
No. of subjects	1006	1006	1000	3012
Sex, % male	53.3	52.7	54.1	53.4
Age, y				
18-24	25.8	25.6	24.2	25.4
25-34	34.3	34.6	35.8	34.7
35-44	22.7	23.0	23.1	22.9
45-49	17.2	16.9	16.9	17.1
Years of education				
0-6	26.5	34.9	44.0	32.0
7-11	38.3	30.3	26.1	34.2
12	17.9	20.5	17.5	18.2
≥13	17.3	14.3	12.4	15.7
Marital status				
Married	65.9	66.2	71.6	67.3
Divorced/separated/widowed	12.5	9.6	5.8	10.5
Never married	21.6	24.2	22.6	22.2
Family income, $				
<6000	12.6	11.9	8.9	11.6
6000-11 999	30.0	36.0	31.0	31.1
12 000-17 999	24.2	25.8	31.2	26.2
18 000-35 999	19.8	15.7	16.1	18.3
≥36 000	13.4	10.6	12.8	12.9
Employment status				
Employed	50.6	47.3	55.5	51.3
Unemployed	11.2	13.3	7.8	10.7
Student	4.6	5.1	1.8	4.0
Homemaker	19.7	18.9	21.8	20.1
Disabled/injured/ill	9.6	8.6	6.4	8.2
Other	4.4	6.8	6.7	5.3
Born in United States, %	44.0	36.1	31.8	39.9
Interviewed in English, %	55.4	40.9	33.4	48.0

*Total weighted to Fresno County, California, distribution.

Table 2. Lifetime Prevalence of CIDI Disorders by Place of Residence and Sex (N = 3012)*

	Urban			Town			Rural		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
Observed sample	505	501	**1006**	512	494	**1006**	499	501	**1000**
Weighted sample	505	501	**1006**	512	494	**1006**	499	501	**1000**
Major depressive episode	14.0 (2.2)	7.9 (1.5)	10.2 (1.3)	11.8 (1.7)	5.2 (1.2)	8.1 (1.0)	10.1 (1.8)	4.1 (1.7)	6.3 (1.1)
Manic episode	1.0 (0.5)	3.7 (1.2)	2.0 (0.5)	1.7 (0.6)	2.7 (1.1)	2.3 (0.7)	0.4 (0.3)	0.4 (0.3)	0.4 (0.2)
Dysthymia	4.2 (1.8)	3.2 (1.0)	3.5 (1.0)	3.5 (1.2)	1.4 (0.6)	2.2 (0.6)	4.1 (1.1)	3.9 (1.8)	4.0 (0.9)
Any affective disorder	16.4 (2.3)	12.7 (1.9)	13.8 (1.4)	14.1 (1.8)	8.5 (1.6)	11.0 (1.2)	13.0 (1.9)	5.9 (2.0)	8.4 (1.2)
Panic disorder	2.0 (0.9)	1.5 (0.6)	1.6 (0.5)	3.7 (1.0)	2.2 (0.8)	2.7 (0.6)	2.4 (0.9)	0.6 (0.4)	1.5 (0.5)
Agoraphobia without panic	8.7 (1.7)	5.1 (1.1)	6.9 (1.0)	9.4 (2.0)	8.8 (1.9)	9.1 (1.4)	13.2 (2.0)	6.1 (1.8)	9.2 (1.3)
Social phobia	9.6 (1.5)	6.7 (1.1)	7.8 (0.9)	7.5 (1.5)	6.5 (1.4)	6.6 (1.0)	9.0 (1.8)	6.6 (1.9)	6.8 (1.1)
Simple phobia	9.3 (1.5)	5.5 (1.0)	7.7 (1.0)	8.0 (1.5)	8.9 (1.7)	7.8 (1.1)	7.9 (1.8)	5.9 (1.9)	6.5 (1.2)
Any anxiety disorder†	22.1 (2.3)	12.6 (1.7)	17.3 (1.5)	18.0 (2.3)	16.7 (2.7)	16.8 (1.7)	20.5 (2.4)	11.8 (2.2)	15.4 (1.5)
Alcohol abuse	2.4 (0.8)	3.8 (0.8)	3.2 (0.6)	1.5 (0.9)	6.2 (1.4)	3.8 (0.8)	1.7 (1.1)	4.6 (1.1)	3.5 (0.8)
Alcohol dependence	6.9 (1.6)	19.2 (2.1)	12.4 (1.2)	3.8 (1.0)	15.3 (1.8)	9.7 (1.1)	2.3 (0.9)	14.5 (1.9)	9.0 (1.1)
Drug abuse	2.7 (0.9)	2.7 (0.8)	2.7 (0.6)	0.7 (0.5)	1.6 (0.5)	1.1 (0.4)	0.0 (0.0)	0.7 (0.3)	0.3 (0.1)
Drug dependence	5.9 (1.1)	10.8 (1.5)	8.3 (1.0)	2.6 (0.8)	6.6 (1.4)	5.0 (1.0)	3.1 (1.3)	4.1 (0.9)	3.5 (0.7)
Any substance abuse/dependence	12.2 (1.8)	26.3 (2.3)	18.6 (1.4)	7.4 (1.5)	23.8 (2.3)	15.8 (1.4)	5.7 (1.5)	20.8 (2.2)	14.1 (1.4)
Antisocial personality disorder	0.4 (0.4)	2.6 (1.2)	1.2 (0.5)	0.2 (0.2)	0.5 (0.3)	0.4 (0.2)	0.2 (0.1)	0.5 (0.3)	0.4 (0.2)
Any disorder	36.0 (2.9)	36.6 (2.6)	35.7 (1.9)	28.2 (2.7)	36.6 (2.9)	32.1 (2.0)	29.4 (2.7)	30.3 (2.9)	29.8 (2.0)

*CIDI indicates Composite International Diagnostic Interviews. Prevalence rates are age adjusted. Data are reported as percentage (SE) unless otherwise indicated.
†Generalized anxiety not reported.

longer residence compared with those with less than 13 years in the country. Lower educational attainment or income did not increase risk of lifetime disorders, with the exception for those with 7 to 11 years of schooling being twice as likely to have lifetime drug abuse or dependence. The currently unemployed had higher odds of lifetime anxiety disorders, and the disabled, ill, or injured had higher ORs for all disorder categories compared with the employed. Disrupted marital status doubled the risk for any mood disorder, and English-language interview more than doubled the OR for lifetime drug abuse or dependence.

COMPARISON OF RATES FOR FRESNO COUNTY, THE UNITED STATES, AND MEXICO CITY

Table 6 compares rates from the MAPSS with lifetime prevalence estimates from the NCS (Hispanics and total), and a survey of Mexico City residents. To provide a finer level of detail in these comparisons, rates for immigrants in Fresno are presented separately for those with less than 13 years or more than 13 years of residence in the United States. Although there is a wide range in the estimates for anxiety disorders, the overall pattern was consistent. The immigrant rates of major disorders for MAPSS categories were similar to those in Mexico City, with short-stay immigrants having somewhat lower rates and long-stay immigrants having higher rates. The native-born Mexican Americans in the MAPSS sample had rates for individual disorders or any disorder that were virtually identical to the NCS estimates, and were within the SEs of those for Hispanics in the NCS.

COMMENT

DISTRIBUTION OF DISORDERS AMONG MEXICAN AMERICANS

The MAPSS results reveal 2 key findings: rates of lifetime disorders were highest in urban areas but, after controlling for demographic factors, only substance abuse or dependence disorders were clearly more frequent in urban centers, and immigrants had only one half the total *DSM-III-R* disorders as the US-born. The total lifetime *DSM-III-R* prevalence rate of any disorder in the MAPSS survey is lower than reported for Hispanics or white non-Hispanics in the NCS. The MAPSS diagnostic criteria were modeled after the NCS, and we believe the differences in lifetime rates for Hispanics between these 2 studies is explained by the fact that the NCS did not include Spanish-speaking respondents, thereby eliminating the component of the Hispanic population with the lowest rates of *DSM-III-R* disorders. Moreover, the NCS interviewed Hispanic respondents of diverse nationalities throughout the United States, whereas the present study pertains only to adults of Mexican descent. The MAPSS disorder rates are similar to the LAECA rates for both Mexican Americans and non-Hispanic whites. As pointed out by Regier et al,[17] given the differences in structure and criteria between the Diagnostic Interview Schedule and CIDI, comparisons of specific disorder rates across these 2 studies must be made with caution.

Table 3. Sample Characteristics by Nativity (N = 3012)	Immigrant	Native-Born
No. of subjects	1810	1202
Sex, % male	55.2	50.6
Age, y		
18-24	21.3	31.5
25-34	39.3	27.6
35-44	22.6	23.3
45-49	16.7	17.6
Years of education		
0-6	50.8	3.6
7-11	30.6	39.5
12	10.0	30.5
≥13	8.6	26.3
Marital status		
Married	73.1	58.6
Divorced/separated/widowed	8.1	14.0
Never married	18.8	27.3
Family income, $		
<6000	14.4	7.2
6000-11 999	36.7	22.6
12 000-17 999	27.8	23.7
18 000-35 999	14.2	24.7
≥36 000	7.0	21.9
Employment status		
Employed	50.4	52.6
Unemployed	10.6	10.8
Student	3.6	4.6
Homemaker	23.7	14.5
Disabled/injured/ill	7.0	11.2
Other	4.7	6.2
Interviewed in English, %	18.2	92.7
Place of residence		
Urban	56.9	67.3
Town	15.8	13.5
Rural	27.2	19.2

The differences we report in lifetime prevalence estimates suggest that Mexican Americans are differentially exposed to risk and protective factors. Hispanics are not all alike. Other Hispanic ethnic groups residing in the United States may have similar internal variances based on ratios in native- vs foreign-born, ethnic nationality differences, or regional-environmental characteristics. For example, it would be of extreme interest to compare the MAPSS to Mexican Americans residing in the Southwest and Midwest, places with very different social conditions, histories, and immigrant settlement patterns.

METHODS ISSUES

More research is needed to be fully confident about the validity of case-finding techniques in psychiatric epidemiology. Culture and linguistic issues abound. A series of international studies, coordinated through the auspices of the World Health Organization and the International Consortium of Psychiatric Epidemiology, are under way to address various reliability and validity issues, including whether CIDI diagnostic interviews with Hispanics or other ethnic groups are biased toward or away from specific diagnostic criteria, or whether English or Spanish language use creates differential response patterns, both of which could influence accurate case ascertainment. Our instrument was designed as a

Table 4. Lifetime Prevalence of CIDI Disorders by Nativity and Sex (N = 3012)*

	Immigrants			Native-Born			Total		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
Observed sample	912	922	**1834**	604	574	**1178**	1516	1496	**3012**
Weighted sample	875	930	**1810**	642	565	**1201**	1404	1608	**3012**
Major depressive episode	8.4 (1.4)	2.7 (0.7)	5.2 (0.8)	17.5 (2.4)	12.1 (2.3)	14.8 (1.7)	12.3 (1.4)	6.1 (1.0)	9.0 (0.8)
Manic episode	0.1 (0.1)	2.0 (0.8)	1.1 (0.5)	2.0 (0.7)	3.5 (1.0)	2.8 (0.6)	0.9 (0.3)	2.4 (0.6)	1.7 (0.3)
Dysthymia	1.6 (0.4)	2.2 (0.9)	1.9 (0.5)	5.7 (1.8)	4.7 (1.8)	5.2 (1.3)	3.7 (1.0)	3.1 (0.9)	3.3 (0.6)
Any affective disorder	9.6 (1.4)	6.7 (1.4)	8.0 (1.0)	21.5 (2.5)	16.0 (2.5)	18.7 (1.8)	14.7 (1.5)	10.0 (1.2)	12.1 (0.9)
Panic disorder	3.2 (0.9)	1.0 (0.4)	2.0 (0.5)	1.2 (0.5)	1.7 (0.7)	1.4 (0.4)	2.3 (0.6)	1.3 (0.4)	1.7 (0.3)
Agoraphobia without panic disorder	8.0 (1.5)	3.4 (0.7)	5.5 (0.8)	14.0 (2.2)	9.5 (1.8)	11.8 (1.4)	10.1 (1.2)	5.6 (0.8)	7.8 (0.7)
Social phobia	6.1 (1.2)	4.6 (0.9)	5.3 (0.7)	12.2 (1.7)	9.5 (1.7)	10.9 (1.2)	8.8 (1.0)	6.1 (0.8)	7.4 (0.6)
Simple phobia	7.0 (1.6)	4.1 (0.8)	5.4 (0.8)	11.2 (1.7)	10.0 (1.8)	10.6 (1.2)	8.8 (1.1)	6.2 (0.8)	7.4 (0.7)
Any anxiety disorder†	18.0 (2.1)	9.0 (1.3)	13.0 (1.2)	26.7 (2.7)	19.7 (2.4)	23.2 (1.8)	21.4 (1.7)	12.7 (1.2)	16.8 (1.0)
Alcohol abuse	0.0 (0.0)	3.1 (0.6)	1.7 (0.4)	5.0 (1.3)	6.2 (1.2)	5.6 (0.9)	2.1 (0.6)	4.4 (0.6)	3.3 (0.4)
Alcohol dependence	1.9 (0.9)	12.2 (1.4)	7.6 (0.9)	9.0 (1.8)	24.0 (2.5)	16.6 (1.5)	4.6 (0.8)	16.9 (1.3)	11.1 (0.8)
Drug abuse	0.9 (0.7)	0.6 (0.5)	0.8 (0.4)	2.7 (0.8)	4.2 (1.1)	3.5 (0.7)	1.6 (0.5)	2.2 (0.6)	1.9 (0.4)
Drug dependence	1.5 (0.8)	4.4 (1.1)	3.1 (0.7)	7.7 (1.3)	17.5 (2.3)	12.7 (1.3)	3.9 (0.6)	9.1 (1.1)	6.7 (0.6)
Any substance abuse/dependence	2.6 (0.9)	16.9 (1.6)	10.5 (1.0)	18.1 (2.2)	37.1 (2.8)	27.7 (1.8)	8.8 (1.0)	24.4 (1.5)	17.1 (0.9)
Antisocial personality disorder	0.5 (0.5)	1.1 (0.7)	0.8 (0.5)	0.2 (0.1)	2.2 (0.9)	1.2 (0.5)	0.3 (0.2)	1.4 (0.5)	0.9 (0.3)
Any disorder	23.4 (2.2)	26.2 (2.1)	24.9 (1.5)	46.2 (3.0)	49.9 (3.0)	48.1 (2.1)	32.7 (1.9)	34.8 (1.8)	33.8 (1.3)

*CIDI indicates Composite International Diagnostic Interviews. Prevalence rates are age adjusted. Data are reported as percentage (SE) unless otherwise indicated.
†Generalized anxiety not reported.

Table 5. Logistic Regressions of Disorder Types on Model Variables (N = 3012)*

	Any Mood Disorder	Any Anxiety Disorder	Alcohol Abuse or Dependence	Drug Abuse or Dependence
Place of residence				
Rural	1.0	1.0	1.0	1.0
Town	1.1 (0.8-1.7)	1.0 (0.7-1.4)	1.0 (0.7-1.5)	1.2 (0.7-2.1)
Urban	1.2 (0.8-1.9)	0.9 (0.6-1.2)	1.1 (0.8-1.6)	1.7 (1.0-2.8)
Nativity				
Immigrant <13 y	1.0	1.0	1.0	1.0
Immigrant ≥13 y	1.6 (1.0-2.5)	1.4 (0.9-2.1)	3.4 (2.2-5.5)	6.5 (2.4-17.1)
Native-born	2.0 (1.1-3.6)	1.3 (0.8-2.2)	4.6 (2.8-7.8)	9.3 (3.2-26.9)
Sex				
Male	1.0	1.0	1.0	1.0
Female	1.8 (1.2-2.6)	1.8 (1.3-2.4)	0.2 (0.1-0.3)	0.4 (0.2-0.6)
Age, y				
18-24	1.0	1.0	1.0	1.0
25-34	0.8 (0.5-1.4)	0.9 (0.7-1.4)	1.6 (1.1-2.6)	0.9 (0.6-1.5)
35-44	0.9 (0.6-1.6)	0.9 (0.6-1.3)	1.2 (0.8-2.0)	0.7 (0.4-1.3)
45-59	0.9 (0.5-1.7)	0.9 (0.6-1.4)	0.7 (0.4-1.2)	0.3 (0.1-0.6)
Years of education				
0-6	1.0	1.0	1.0	1.0
7-11	1.2 (0.8-1.8)	1.3 (0.9-1.9)	1.1 (0.7-1.7)	2.2 (1.1-4.5)
12	0.8 (0.4-1.3)	1.3 (0.8-2.0)	1.1 (0.6-1.8)	1.6 (0.7-3.6)
≥13	1.1 (0.6-2.1)	0.8 (0.5-1.3)	0.9 (0.5-1.4)	1.1 (0.5-2.7)
Family income, $				
0-11 999	1.0	1.0	1.0	1.0
12 000-17 999	0.9 (0.6-1.3)	0.9 (0.7-1.3)	1.4 (0.9-1.9)	1.1 (0.7-1.8)
≥18 000	1.2 (0.8-1.8)	1.2 (0.9-1.7)	0.8 (0.6-1.1)	1.0 (0.6-1.6)
Employment				
Employed	1.0	1.0	1.0	1.0
Unemployed	1.2 (0.8-2.0)	1.6 (1.1-2.4)	1.3 (0.9-2.0)	1.4 (0.8-2.4)
Disabled/injured/ill	1.8 (1.1-3.1)	2.0 (1.3-3.2)	1.8 (1.1-2.8)	2.3 (1.3-4.0)
Other	0.9 (0.6-1.4)	0.8 (0.6-1.1)	1.1 (0.7-1.6)	1.6 (1.0-2.7)
Marital status				
Married	1.0	1.0	1.0	1.0
Divorced/separated/widowed	2.0 (1.3-3.3)	1.2 (0.8-1.8)	1.4 (0.9-2.4)	1.3 (0.7-2.4)
Never married	1.0 (0.7-1.7)	1.3 (0.9-1.7)	1.1 (0.7-1.6)	0.7 (0.4-1.1)
Language of interview				
Spanish	1.0	1.0	1.0	1.0
English	1.3 (0.8-2.0)	1.4 (0.9-2.3)	1.6 (1.1-2.5)	2.4 (1.2-4.9)

*Data are reported as odds ratio (95% confidence interval). The first category is given as the reference standard.

Table 6. Lifetime Prevalence of CIDI Disorders in MAPSS, Mexico City, and NCS*

	MAPSS				NCS	
	Immigrant <13 y	Immigrant ≥13 y	Native-Born	Mexico City Study	Hispanic	Total
No. of subjects	884	851	1145	1733	305	5384
Major depressive episode	3.2 (0.7)	7.9 (1.7)	14.4 (1.6)	7.8 (1.0)	18.3 (2.6)	17.2 (0.6)
Manic episode	1.3 (1.1)	1.6 (1.1)	2.7 (0.7)	1.3 (0.4)	0.5 (0.5)	0.4 (0.1)
Dysthymia	1.6 (0.7)	1.6 (0.4)	5.2 (1.2)	1.5 (0.4)	8.6 (1.9)	6.8 (0.6)
Any affective disorder	5.9 (1.4)	10.8 (2.0)	18.5 (1.7)	9.0 (1.1)	20.4 (2.8)	19.5 (0.6)
Panic disorder	1.0 (0.4)	2.6 (0.9)	1.8 (0.6)	0.4 (0.2)	1.8 (0.6)	3.5 (0.2)
Agoraphobia without panic	3.0 (0.6)	7.5 (1.7)	11.8 (1.4)	3.8 (0.6)	6.8 (1.9)	5.0 (0.4)
Social phobia	3.8 (0.8)	5.7 (1.2)	11.8 (1.4)	2.2 (0.5)	19.0 (1.9)	13.4 (0.6)
Simple phobia	2.6 (0.7)	7.9 (1.6)	12.0 (1.5)	3.0 (0.4)	16.4 (2.1)	11.1 (0.5)
Generalized anxiety	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	1.1 (0.4)	6.2 (1.8)	5.4 (0.3)
Any anxiety disorder	7.6 (1.2)	17.1 (2.1)	24.1 (2.0)	8.3 (0.8)	28.0 (2.5)	25.0 (0.8)
Alcohol abuse	0.5 (0.2)	2.2 (0.6)	5.2 (0.8)	3.1 (0.6)	6.6 (1.0)	9.9 (0.5)
Alcohol dependence	8.6 (2.6)	10.4 (1.7)	18.0 (1.8)	8.2 (0.7)	14.2 (1.9)	15.1 (0.6)
Drug abuse	0.0 (0.0)	1.8 (1.0)	3.4 (0.7)	0.3 (0.2)	3.3 (1.2)	4.7 (0.4)
Drug dependence	3.0 (1.7)	5.3 (1.5)	13.8 (1.5)	0.8 (0.2)	7.0 (1.7)	7.9 (0.4)
Any substance abuse/dependence	9.7 (2.6)	14.3 (1.9)	29.3 (2.0)	11.8 (0.8)	24.7 (2.7)	28.2 (1.0)
Any disorder	18.4 (2.7)	32.3 (2.6)	48.7 (2.3)	23.4 (1.5)	51.4 (2.7)	48.6 (1.0)

*MAPSS indicates Mexican American Prevalence and Service Survey; NCS, National Comorbidity Survey; and CIDI, Composite International Diagnostic Interviews. All prevalence rates are adjusted to NCS total sex-age distribution and are for ages 18 to 54 years. Data are reported as percentage (SE) unless otherwise indicated.

cross-cultural research tool, and we have studies under way to address cultural influences on the expression of symptoms and the assessment of psychiatric disorders using CIDI diagnostic criteria in subsequent papers. Nevertheless, available evidence from the research literature suggests the tentative conclusion that these are real differences in population morbidity. The substance abuse or dependence diagnoses are the strongest example because they are based on behaviors that have been measured in other studies, thus providing an independent point of reference. Several studies, including those using anonymous urine toxicology screening and self-report, have shown conclusively that the risk of illicit drug use is much higher among US-born Mexican Americans than among immigrants.[18-21] Moreover, numerous epidemiologic surveys conducted in Mexico indicate that rates of drug experimentation and abuse in Mexico are consistently much lower than those reported in the United States,[22,23] and our findings confirm similar ones reported by the LAECA regarding lower substance abuse or dependence rates among immigrants.

Another limitation of this study is that we can not demonstrate to what extent immigrants may have misrepresented their birthplace or underreported symptoms in this survey because of concerns about their residency status in the United States. The problem of accurate self-report for birthplace seems to be insignificant as a threat to validity because of the high correspondence between language of interview and birthplace, and the match of our sample to county demographics. Although we can not discount the possibility of underreporting foreign birthplace, this is not likely to have an important effect on our estimates because such a bias would tend to narrow the differences in nativity group prevalence.

Rates of psychiatric disorders among Hispanics may actually be decreasing as a result of a continuing influx of immigrants, resulting in a less acculturated popula-tion. The finding that rates for immigrants in MAPSS approximate rates reported in Mexico City weakens the likelihood that lower psychiatric morbidity is primarily a "robust immigrant" effect.[7] An alternative explanation seems more likely. Mexican immigrants share the lower risk status of their national origin, but acculturation has deleterious effects on many aspects of their health at the population level.[24,25] Recently, other studies have documented excellent health outcomes for immigrants, suggesting that there remains much to be learned about the effects of culture and culture change on health or mental health.[26-29]

We did not find the inverse relationship between socioeconomic status and psychiatric disorder that has often been reported in the psychiatric epidemiology literature.[30] We are, however, somewhat constrained in explaining this relationship because of the low socioeconomic level of our sample. The association between length of residence and psychiatric disorder among immigrants provokes important research questions. Why does socialization into American culture and society increase susceptibility to psychiatric disorders so markedly, what are the risk factors, and is this process generalizable to other ethnic groups? Are some people more biologically predisposed toward psychiatric disorders in the context of immigrant acculturative stress and adaptation? What components of Mexican culture are protective against mental health problems, and can these be conserved? These are intriguing questions for future study.

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