Published in final edited form as:

J Trauma Stress. 2012 December ; 25(6): 705–712. doi:10.1002/jts.21763.

Onset of Posttraumatic Stress Disorder and Major Depression Among Refugees and Voluntary Migrants to the United States

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Abstract

Although refugees are generally thought to be at increased risk for posttraumatic stress disorder (PTSD) and major depressive episode (MDE), few studies have compared onset of PTSD and MDE between refugees and voluntary migrants. Given differences in migration histories, onset should differ pre- and postmigration. The National Latino and Asian American Survey (NLAAS) is a national representative, complex dataset measuring psychiatric morbidity, mental health service use, and migration history among Latino and Asian immigrants to the United States. Of the 3,260 foreign-born participants, 660 were refugees (a weighted proportion of 9.52%). Refugees were more likely to report a history of war-related trauma, but reports of other traumatic events were similar. Premigration onset of PTSD was statistically higher for refugees than voluntary migrants, odds ratio (*OR*) = 4.86, 95% confidence interval (CI) [2.01, 11.76], where postmigration onset for PTSD was not, *OR* = 0.61, 95% CI [0.29, 1.28]; a similar pattern was found for MDE, *OR* = 1.98, 95% CI [1.11, 3.51]; and *OR* = 1.02, 95% CI [0.65, 1.62], respectively. Although refugees arrive in host countries with more pressing psychiatric needs, onset is comparable over time, suggesting that postmigration refugees and voluntary migrants may be best served by similar programs.

Victims of violence and civil conflict often flee countries of their persecution to seek refuge in safer locales, or, in clinical terms, to reduce the likelihood of encountering distress. There is data to suggest that these hopes are realized; despite the voluminous work reporting high rates of trauma exposure and distress among refugees in resettlement contexts (e.g., Jaranson et al., 2004; Keller et al., 2006), meta-analytic findings suggest that refugees who resettle further from their homelands report decreased psychiatric symptoms relative to those who resettle closer to home (Porter & Haslam, 2005). Refugees' postmigration relief is in marked contrast with increased psychiatric and physical problems associated with voluntary migration (Beiser, Hou, Hyman, & Tousignant, 2002; Farley, Galves, Dickinson, & Perez, 2004). The contrast between healthier refugees and at-risk voluntary migrants suggests

contrasting patterns of onset of psychiatric disorders between the two populations. Whether and when in the course of their migration history these immigrant groups are more likely to develop posttraumatic stress disorder (PTSD) and depression is of direct public health significance, and may inform organizations that serve refugees and voluntary migrants alike.

Comparing refugees and voluntary migrants is limited by a lack of datasets that include both. Although refugees may suffer higher rates of a number of mental health problems, PTSD and depression are thought to be the defining disorders within the population (Mollica, 2004). Although it is generally accepted that refugees have higher premigration risk for trauma, and subsequent PTSD and depression than voluntary migrants (Bhui et al., 2003; Mollica et al., 2001), adequate comparison studies are rare. Most studies fail to compare refugees to voluntary migrant samples from the same ethnocultural groups, resulting in potential variance due to differing culturally-proscribed response biases (Dudley et al., 2005; Iwata & Buka, 2002; Iwata, Turner, & Lloyd, 2002). The heavy reliance in the refugee literature on clinical and other forms of nonrepresentative samples likely results in inflated distress rates. In addition, most studies using refugee samples do not account for time since migration, thus ignoring how distress rates might be confounded with postmigration adjustment. Moreover, few studies of voluntary migrants include investigation of exposure to political violence despite evidence that suggests that in some populations it may be considerable (Eisenman, Gelberg, Liu, & Shapiro, 2003).

The current study examined trauma history and onset of PTSD and depression in pre- and postmigration periods using a secondary analysis of a national representative survey of Asian American and Latino immigrants to the United States. Broadly speaking, the central questions concerned the rates of traumatic events, and the development of PTSD and depression vis-à-vis migration. As migration is a central defining event for both populations, risk of onset was examined categorically in premigration and postmigration periods and continuously in terms of years before or after migration. Hypotheses were as follows: (a) refugees would report higher rates of war- and persecution-related traumatic events than voluntary migrants, and (b) refugees would have higher premigration rates of onset of PTSD and depression than voluntary migrants, and comparable postmigration rates.

Method

Participants and Procedure

The National Latino and Asian American Survey (NLAAS) is a national representative, household-based complex survey carried out to estimate mental health burden and service use among Latino and Asian American immigrants in the United States. It is publically available through the Interuniversity Consortium for Political and Social Research, and has been used in over 40 peer-reviewed publications. NLAAS design, training, and data collection have been reported in detail elsewhere (Alegria et al., 2004, 2006; Heeringa et al., 2004; Pennell et al., 2004). NLAAS fieldwork was conducted at 68 sites across the United States. Measures were translated into Spanish, Chinese, Vietnamese, and Tagalog, then back-translated and checked for cultural relevance by multinational experts and focus groups at two study sites (Alegria et al., 2004). Interviewers were matched with respondents on respondents' language preferences.

Multistage area probability sampling was used to select 27,026 households. Interviews were conducted with a randomly selected adult from each household at respondents' homes. Interviews lasted approximately 2½ hours and included questions on demographics, mental and physical health and functioning, health services utilization, and migration history. History included the following question: "Were you ever a refugee—that is, did you ever

flee from your home to a foreign country or place to escape danger or persecution?” Refugees were those who responded positively.

Of the 4,649 respondents in NLAAS, 3,260 were foreign born. Only foreign born were included in analyses. Of foreign born, 54% ($n = 1,769$) were female and 46% ($n = 1,491$) were male, between the ages of 18 and 97. Ancestries were Vietnamese ($n = 502$, 15.40%), Filipino ($n = 348$, 10.67%), Chinese ($n = 473$, 14.51%), other Asian ($n = 314$, 9.69%), Cuban ($n = 500$, 15.34%), Puerto Rican ($n = 216$, 6.63%), Mexican ($n = 483$, 14.82%) or other Latino ($n = 420$, 12.96%). Country of origin information was not included in NLAAS. Almost three quarters (71.00%) had immigrated after the age of 18 years. Six-hundred sixty (20.25%) self-identified as refugees, a weighted percentage of 9.52% ($SE = .86$). Refugees were older than voluntary migrants at the time of interviews, refugee $M = 47.30$, 95% confidence interval (CI) [45.01, 49.58], voluntary $M = 39.31$, 95% CI [38.31, 40.40]; $t(df = 69) = 76.71$, $p < .001$, and at the reported time of migration, refugee $M = 27.21$, 95% CI [25.50, 28.91], voluntary $M = 21.97$, 95% CI [21.17, 22.78]; $t(df = 69) = 4.86$, $p < .001$. Demographics across refugees and voluntary categories are presented in Table 1. Association statistics (Rao-Scott χ^2) indicated that refugees were more likely to be male, Vietnamese or Cuban, and in the United States for longer than 21 years.

Measures

Study outcomes were traumatic events, PTSD, and major depressive episode (MDE) onset. Traumatic events were self-reported in response to a battery of items included in the NLAAS protocol. NLAAS used the World Mental Health Composite International Diagnostic Interview (WMH-CIDI) for assessment of mental illnesses, adapted to take into account response styles and other culturally relevant factors (Alegria et al., 2004; Kessler et al., 2004). The WMH-CIDI is a fully structured diagnostic instrument based on criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; DSM-IV; American Psychiatric Association, 1994). For a subsample within NLAAS, the WMH-CIDI was followed up with the Structured Clinical Interview for DSM-IV (WMH-SCID; First, Spitzer, Gibbons, & Williams, 2000), and published reports note that CIDI-SCID diagnostic concordance was adequate, with kappa values of .56 for any mood disorder and .42 for any anxiety disorder (Alegria et al., 2009). For more information on reliability and validity of NLAAS measures, see Alegria and colleagues (2004); for reliability and validity of the WMH-CIDI, see Kessler and colleagues (2004).

This protocol included age of first onset of symptoms, and therefore a retrospective assessment of diagnostic incidence. Matching these data with age of migration allowed the authors to determine whether onset of PTSD and MDE occurred pre- or postmigration. Subtracting age of migration from age of onset resulted in the difference (in years) between onset and migration (this figure was negative premigration and positive postmigration). Gender, ancestry, years in United States (categorized for analyses because of skew in the continuous measure), and use of mental health services (which included psychotherapy, psychopharmacology, and substance abuse counseling) were included as confounders in predicting onset pre- and postmigration because of their theoretical association with PTSD and depression. Vietnamese was chosen as the reference category (i.e., the category to which other values are compared) for ancestry because of the large number of refugees within the U.S. Vietnamese population. To avoid skewed statistical parameters, ancestry categories with small proportions of refugees—Filipinos, Mexicans, and Puerto Ricans (see Table 1)—were collapsed into “all other” categories within their respective panethnic designations (i.e., Asian and Latino). For Years in United States, 0–5 years was chosen as the reference category to describe findings in terms of length of since migration.

Data Analyses

Analyses involved comparing refugees and voluntary migrants with respect to their reports of exposure to traumatic events and their reports of PTSD and MDE onset with respect to migration. Comparing refugees and voluntary migrants with respect to migration was done categorically within pre- and postmigration periods, and continuously, examining the difference in years between onset and migration. These two perspectives represented two conceptual views of migration's effect on onset: the first as an immediate result of a simple transfer from one setting to another, the second as an evolving result of such a transfer.

NLAAS used a stratified area sampling design, with weights adjusting for region of the country (strata), local area (clusters), and ancestry. These weights (included in the NLAAS dataset) were applied to make the data representative of U.S. Latino and Asian American groups. Consistent with conventions for reporting complex survey data, we report raw frequencies (i.e., n within the sample), weighted percentages (i.e., weighted to indicate population percentages) and standard deviations, and weighted difference statistics (using Rao-Scott χ^2 to account for weights). Weighted percentages and categorical differences were calculated using the Proc Surveyfreq package in SAS 9.2 (SAS Institute Inc, Cary, NC). We then examined whether or not these differences could be accounted for by confounding factors (gender, ancestry, and the use of mental health services) by fitting multivariable log-binomial models predicting prevalence. In the latter, refugee designation was entered in the last block (i.e., following potential confounding variables). Covariate-adjusted prevalence ratios were estimated by fitting multivariable log-binomial models using the Survey package in R version 2.14.1 (R Development Core Team, R Foundation for Statistical Computing, Vienna, Austria; the Survey package was developed by Lumley, 2011).

The authors' use of NLAAS data was approved by the Interuniversity Consortium for Political and Social Research and the Institutional Review Board of NYU School of Medicine.

Results

Table 2 presents traumatic events reported by migration history. Odds ratios indicated that refugees were more likely to report 13 of the 27 types of events inquired about. When the Bonferroni correction was applied to account for the chance of statistical significance due to multiple comparisons ($p = .0018$), the number of types of events that refugees were more likely to report was reduced to eight (these were the same as those with $p < .001$ in Table 2). Stressors endorsed more frequently by refugees included those related to being a victim (e.g., "Ever kidnapped or held hostage") and those related to active involvement in war (e.g., "Ever participate in combat"), but not to other assaults (e.g., beaten by spouse or partner) or events that participants reported to actively avoid (i.e., "Ever have traumatic event that don't want to talk about [one not reported already]").

For the full sample, the prevalence of PTSD at the time of interview was 2.92% ($SE = 0.44$), and MDE 11.96% ($SE = 0.79$). There were no significant differences between refugees and voluntary migrants in prevalence of current PTSD, for refugees, 4.75%, $SE = 0.16$; voluntary migrants, 2.72%, $SE = 0.42$; $OR = 1.78$, 95% CI [0.82, 3.85], or current MDE, for refugees, 14.74%, $SE = 0.20$; voluntary migrants, 11.67%, $SE = 0.82$; $OR = 1.31$, 95% CI [0.91, 1.89]. For the full sample, the premigration onset for PTSD was 0.99% ($SE = 0.26$), and postmigration onset was 1.93% ($SE = 0.39$), and onset for MDE was 3.80% ($SE = 0.49$) premigration and 8.48% ($SE = 0.77$) postmigration. Pre- and postmigration PTSD and MDE onset are presented in Table 3; onset was markedly different between groups premigration, whereas in postmigration it was not.

To examine whether these findings might have been the result of demographic covariates or the effects of using mental health services, we statistically controlled for these factors in four multivariable log-binomial models (predicting pre- and postmigration prevalence of each disorder). As presented in Table 4, premigration difference and postmigration similarity between refugees and voluntary migrants remained after accounting for each of the covariates.

Mean years between onset of PTSD and MDE and migration were examined continuously as well as categorically. Refugees' PTSD onset was on average over 9 years premigration, $M = -9.41$, 95% CI $[-10.77, -8.05]$, whereas for voluntary migrants it was 7 years postmigration, $M = 7.00$, 95% CI $[3.86, 10.15]$, a large and statistically significant difference, $t(df = 47) = 17.40$, $p < .001$. Differences in MDE onset between refugees and voluntary migrants were also statistically significant, but both occurred following migration, with refugees' MDE onset earlier than voluntary migrants', refugee $M = 1.00$, 95% CI $[-1.81, 3.80]$, voluntary $M = 5.72$, 95% CI $[2.79, 8.65]$; $t(df = 64) = 2.74$, $p < .001$.

Discussion

This study is the first published study of which we are aware to compare trauma exposure and psychological sequelae between refugees and voluntary migrants using a nationally representative household-based sample of the major groups immigrating to the United States in the last half century. Using such samples rules out potential selection biases that afflict the help-seeking or convenience samples that are standard in the refugee literature. Refugees were more likely to report many traumatic events, although it should be noted that proportions of several traumatic events were high among voluntary migrants by any standards (e.g., 21.14% reported seeing someone badly injured or killed). Our hypothesis that greater trauma exposure would be related primarily to war-related victimization was supported, but refugees were also more likely to report participating in combat and, if statistical trends are taken into account (i.e., the Bonferroni correction relaxed), more likely to report exposure to natural disasters and stalking as well. These findings may support contentions that refugees are subject to a general breakdown in social ecology and are thus more likely to experience subsequent stressors (Miller & Rasco, 2004; Miller & Rasmussen, 2010), or may reflect the common finding that traumatic events are the best predictors of subsequent traumatic events (Nemeroff et al., 2006). We would caution, however, against drawing these differences too broadly. Most traumatic events not directly related to war were reported equally, including several that have been supposed to be higher among refugees in the literature (e.g., intimate partner violence; Nilsson, Brown, Russell, & Khamphakdy-Brown, 2008).

Findings also suggest that there may be important differences between refugees and voluntary migrants concerning the onset of psychological sequelae. Comparing these groups across preand postmigration periods—i.e., categorically—we found that our hypothesis that refugees' higher likelihood of developing PTSD and depression before migration would be erased following migration was confirmed. When examined continuously, we found that the most striking differences were for PTSD. For refugees, PTSD is (on average) a premigration problem, whereas for voluntary migrants it is a postmigration problem. The robustness of these findings was strengthened by the use of standard diagnostic interviews and methods to achieve semantic equivalence across cultures.

That refugees' premigration onset of PTSD and MDE was different from voluntary migrants' supports previous findings (Steel, Silove, Bird, & McGorry, 1999) and is consistent with the assumption that refugees flee their homelands in part to reduce their risk of distress. That postmigration onset was comparable between refugees and voluntary

migrants is similarly consistent, but should not be interpreted as a shared decrease in risk of onset. Indeed, although our data was not longitudinal our findings seem to suggest that voluntary migrants' onset increases. High postmigration parity is best interpreted in light of data showing that immigrants' well-being generally gets worse with increasing time in host countries (Beiser et al., 2002; Farley et al., 2005). The same forces to which voluntary migrant populations are subject likely affect refugees in the postmigration period as well.

That postmigration onset is similar for refugees and voluntary migrants does not suggest that recent refugees do not need special services to address trauma-related symptoms. Examining pre- and postmigration periods categorically may present a poor representation of risk of onset. Findings that PTSD onset took place on average over 9 years prior to migration to the United States among refugees and 7 years after migration for voluntary migrants (and a less radical difference for MDE) suggests very different patterns. As refugees arrive with a history of higher onset services that attend to this history must be available to them.

Converging postmigration onset is best explained by focusing on commonalities between populations: (a) common stressors of resettlement may have severe consequences for mental health in both populations; (b) like voluntary migrants (Berger & Weiss, 2009), many refugees may show considerable resilience in the long term (Hooberman, Rosenfeld, Rasmussen, & Keller, 2010); and (c) many voluntary migrants have been exposed to considerable trauma themselves (Eisenman et al., 2003). The triumphs and trials of immigrants are not limited to one type of migration history, and providers need to be aware that both refugees and voluntary migrants may need the attention of mental health specialists. We should note, however, that our findings about onset say nothing about the persistence of PTSD and MDE postmigration. Whether one group retains diagnoses longer than the other is an important empirical clinical question, and research should be undertaken to answer it. Findings here suggest only that onset among refugees a few years following their arrival does not seem to be subject to factors that are unique to refugees.

To our knowledge, this study is the first to use a representative sample to compare refugees and voluntary migrants to the United States. Like all studies, however, there are potential limitations. The study design relies on retrospective reports of ages of onset and migration, and unreliable recall may lead to errors in classification of pre- and postmigration onset. We recognize this as a major limitation, and call on researchers to undertake longitudinal designs that begin tracking mental health problems upon arrival or even prior to migration. Although the challenges to collecting this type of data are considerable, it may be possible to work with government agencies involved in voluntary migration or with international nongovernmental bodies that promote refugee resettlement. A related limitation concerns the reliance of self-report to define forced migration; it is likely that several of those identifying themselves as refugees did not enter with refugee status, but may have entered under other protective statutes (e.g., seeking asylum) and some may have even entered under voluntary policies (e.g., the Diversity Visa program, or "Green Card lottery").

Another limitation concerns national origin. NLAAS did not include information on countries of origin, making comparisons between refugees and voluntary migrants within ethnic groups somewhat tentative. For instance, Chinese refugees from Vietnam may have a different premigration experience than Chinese refugees from China. Future datasets should always include country of origin information. Although the NLAAS protocol did make efforts to adjust measures to particular cultural groups, it may be that PTSD and MDE are not culturally valid diagnoses within all Asian and Latino ethnic groups in the United States. Furthermore, currently the largest refugee groups globally (Afghanis and Iraqis) are from the Middle East. Findings from Asian and Latino immigrants may not be applicable to these newer arrivals. Moreover, findings are applicable to resettled refugees only, and not to the

majority of refugees that live in displacement camps or other such settings near conflict regions (United Nations High Commissioner for Refugees, 2010).

Although refugees arrive in host countries with a higher likelihood of exposure to war trauma, PTSD, and depression than their voluntary compatriots, over time the risk of first onset of these problems within the population is equalized. Preventive strategies for mental health in host countries following resettlement should thus focus on entire immigrant communities, and not specifically those migrants with histories of forced migration.

Acknowledgments

This work was supported in part by a K23 Career Development Award (K23HD059075) from the Eunice Kennedy Shriver National Institute of Child & Human Development (NICHD).

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Table 1

Sample Demographics Presented by Group

Demographics	Refugee			Voluntary			Rao-Scott χ^2
	<i>n</i>	Weighted%	SE	<i>n</i>	Weighted%	SE	
Female gender	315	47.73	0.42	1,454	55.92	1.46	3.82*
Ancestry							602.46**
Puerto Rican	3	0.45	0.03	213	8.19	0.53	
Mexican	2	0.30	0.18	481	18.50	3.90	
Cuban	273	41.36	0.29	227	8.73	0.31	
All other Latino	28	4.24	0.35	395	15.19	1.91	
Filipino	1	0.15	0.03	347	13.35	0.86	
Chinese	40	6.06	0.20	433	16.65	1.09	
Vietnamese	291	44.09	0.44	211	8.12	0.51	
All other Asian	22	3.33	0.33	293	11.27	1.11	
Years in U.S.							25.26**
0–5	41	6.21	0.21	511	19.65	0.90	
6–10	105	15.91	0.89	440	16.92	0.74	
11–20	162	24.55	1.01	781	30.04	0.95	
21+	352	53.33	0.46	868	33.38	0.49	
Ever used MH	152	23.03	0.33	482	18.54	1.04	2.24
Refugee	660	9.52	0.00	0	0.00	0.00	

Note. Number of participants reported are unweighted frequencies, and percentages are weighted according to strata, clusters, and ancestry. MH = mental health services, including self-reported primary care use for mental health problems, psychiatric, psychological, and social work services, measured bivariate.

* $p < .05$.

** $p < .01$.

Table 2

Raw Frequency and Weighted Percentage of Traumatic Events by Group

Event	Refugee (n = 660)			Voluntary (n = 2,600)			OR	95% CI	χ^2
	n	%	SE	n	%	SE			
In combat	68	7.57	1.02	59	1.70	0.37	4.74	[2.72, 8.29]	29.38***
Peacekeeper or relief worker in war	24	4.59	1.42	20	0.57	0.14	8.39	[3.63, 19.49]	28.05***
Unarmed civilian in war zone	209	32.08	3.11	147	5.04	0.63	11.19	[5.92, 13.39]	187.94***
Civilian exposed to ongoing terror	190	28.21	3.00	175	6.06	0.76	6.09	[4.10, 9.04]	125.95***
Kidnapped or held hostage	90	11.64	1.89	30	0.97	0.24	13.45	[8.24, 22.02]	90.21***
Exposed to a toxic chemical	19	2.70	0.77	62	3.23	0.42	0.83	[0.42, 1.65]	0.27
Life-threatening MVA	102	17.46	2.46	394	16.42	0.90	1.08	[0.76, 1.52]	0.22
Other life-threatening accident	50	6.77	1.16	135	5.87	0.78	1.16	[0.71, 1.92]	0.39
Major natural disaster	205	26.17	2.08	542	19.07	1.05	1.50	[1.19, 1.90]	8.38**
Man-made disaster	46	8.87	1.92	83	2.95	0.48	3.20	[1.80, 5.69]	21.55***
Life-threatening illness	70	11.21	1.87	189	6.69	0.68	1.76	[1.13, 2.74]	7.62*
Badly beaten by parents	50	9.49	2.31	239	11.42	0.78	0.81	[0.46, 1.44]	1.09
Badly beaten by spouse/partner	13	2.03	0.72	97	4.43	0.64	0.45	[0.20, 1.01]	4.83
Badly beaten by other	43	6.04	1.36	125	5.71	0.66	1.06	[0.61, 1.84]	0.05
Mugged or threatened with weapon	107	19.50	3.41	356	15.89	1.22	1.28	[0.79, 2.08]	2.57
Raped	29	7.47	2.31	100	4.01	0.47	1.93	[1.02, 3.65]	6.83*
Nonrape sexual assault	32	5.88	1.54	166	6.31	0.71	0.93	[0.52, 1.65]	0.09
Stalked	80	12.61	1.99	153	5.82	0.71	2.34	[1.48, 3.68]	17.46***
Someone close die unexpectedly	188	31.85	2.55	663	25.83	1.30	1.34	[1.02, 1.77]	5.05*
Offspring had life-threatening illness or injury	54	7.67	1.43	147	5.47	0.59	1.44	[0.90, 2.28]	2.31
Someone close exposed to trauma	30	9.49	2.51	90	4.37	0.58	2.29	[1.20, 4.38]	12.97*
See bad injury or dead body	202	35.33	3.09	554	21.14	1.40	2.04	[1.50, 2.76]	29.44***
Cause serious injury/death accidentally	6	0.66	0.32	20	0.96	0.23	0.69	[0.24, 1.98]	0.31
Purposefully seriously injure, torture, or kill	8	0.86	0.34	11	0.39	0.14	2.22	[0.80, 6.11]	1.15

Event	Refugee (n = 660)			Voluntary (n = 2,600)			OR	95% CI	χ^2
	n	%	SE	n	%	SE			
See atrocities or carnage	40	9.60	2.15	49	1.80	0.43	5.79	[2.95, 11.41]	44.34***
Other traumatic or life threatening event	25	3.50	0.88	67	2.41	0.41	1.47	[0.84, 2.59]	1.25
Other event don't want to talk about	40	10.25	2.74	148	6.50	0.74	1.64	[0.89, 3.04]	5.51

Note. Percentages are weighted according to strata, clusters, and ancestry. OR = odds ratio; CI = confidence interval; MVA = motor vehicle accident.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 3

Rate of Onset of PTSD and MDE as a Function of Time and Group

Variable	Refugee (<i>n</i> = 660)		Voluntary (<i>n</i> = 2,600)		OR	95% CI
	Weighted %	SE	Weighted %	SE		
Premigration rate						
PTSD	3.47	0.15	0.73	0.17	4.86	[2.01, 11.76]**
MDE	6.69	0.14	3.50	0.52	1.98	[1.11, 3.51]*
Postmigration rate						
PTSD	1.24	0.04	2.00	0.38	0.61	[0.29, 1.28]
MDE	8.63	0.13	7.68	0.77	1.02	[0.65, 1.62]

Note. PTSD = Posttraumatic stress disorder; MDE = major depressive disorder; CI = confidence interval.

Table 4
Prevalence Ratios from Log-Binomial Regression Models for Premigration and Postmigration Onset of PTSD and MDE

Demographics	PTSD				MDE			
	Premigration		Postmigration		Premigration		Postmigration	
	PR	95% CIs	PR	95% CIs	PR	95% CIs	PR	95% CIs
Female gender	0.96	0.39, 2.34	1.64	0.80, 3.33	1.66	1.04, 2.66	1.34*	1.05, 1.70
Ancestry								
Vietnamese	–	–	–	–	–	–	–	–
Chinese	0.83	0.09, 7.92	4.75	0.43, 52.62	1.56	0.65, 3.74	0.92	0.44, 1.92
Other Asian	1.00	0.17, 6.08	3.58	0.41, 31.47	0.89	0.34, 2.31	1.06	0.58, 1.95
Cuban	1.70	0.54, 5.26	6.53	0.88, 48.77	1.43	0.86, 2.41	1.58	0.98, 2.56
Other Latino	3.49	0.68, 17.79	5.48	0.71, 42.44	1.64	0.91, 2.94	1.55	0.91, 2.64
Years in U.S.								
0–5	–	–	–	–	–	–	–	–
6–10	1.18	0.34, 4.01	3.77	0.66, 21.58	1.19	0.72, 1.96	3.00**	1.35, 6.68
11–20	1.90	0.86, 4.20	2.77	0.68, 11.22	0.47*	0.23, 0.94	3.80**	1.91, 7.56
21+	0.81	0.25, 2.63	4.44*	1.16, 16.95	0.24**	0.14, 0.43	4.05**	2.16, 7.60
Ever used MH	4.24*	1.40, 12.87	5.25**	3.26, 8.44	4.02**	2.30, 7.02	6.42**	4.48, 9.20
Refugee	7.04**	2.01, 24.68	0.58	0.29, 1.14	2.35**	1.37, 4.02	0.97	0.55, 1.71

Note. PTSD = Posttraumatic stress disorder; MDE = major depressive disorder; PR = prevalence ratio; CI = confidence interval; MH = mental health services, including self-reported primary care use for mental health problems, psychiatric, psychological, and social work services, measured bivariately. Dashes for “Vietnamese” and “0–5 Years in US” indicate reference categories for prevalence ratios.

* $p < .05$.

** $p < .01$.