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Descriptive Finding

Remittances and risk of major depressive episode and sadness among new legal immigrants to the United States

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Abstract

BACKGROUND
The impact of remittances on health problems like depression among immigrants is understudied. Yet immigrants may be particularly emotionally vulnerable to the strains and benefits of providing remittances.

OBJECTIVE
This study examines the association between sending remittances and major depressive episode (MDE) and sadness among legal immigrants in the United States.

METHODS
Cross-sectional data (N=8,236 adults) come from the New Immigrant Survey (2003–2004), a representative sample of new U.S. permanent residents.

RESULTS
In logistic regression models, immigrants who remitted had a higher risk of MDE and sadness compared to those who did not, net of sociodemographic and health factors. For remitters (N=1,470), the amount of money was not significantly linked to MDE but was associated with a higher risk of sadness among refugees/asylees compared to employment migrants.

CONCLUSIONS
Among socioeconomically vulnerable migrants such as refugees/asylees, sending remittances may threaten mental health by creating financial hardship. Initiatives that encourage economic stability for migrants may protect against depression.

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1. Background

In 2012, international migrants sent over $529 billion abroad (Pew Research Center 2014), a significant portion of which is linked to improved health and well-being for family members who remain behind (Anton 2010; Frank et al. 2009; Lindstrom and Munoz-Franco 2006). However, less attention has been given to the health consequences of sending remittances on immigrants themselves. This paper fills that gap by addressing the link between sending remittances and the mental health of immigrants living in the United States. We focus on mental health because, unlike physical health where immigrants are thought to be advantaged over native-born peers, research suggests a more ambiguous link between migrant status and mental health. Although immigrants at arrival may have better mental health than the native-born, these advantages dissipate over time (Takeuchi et al. 2007). Examining how mental health outcomes are related to remittance sending may offer insights into larger health disparities between immigrants and natives.

Previous literature provides little conclusive evidence that remitting has positive or negative effects on immigrants' mental health. On the one hand, remitting may be beneficial for immigrants' mental health by allowing individuals to feel that they are instrumentally engaged in the lives of family members, and that they 'matter' (Global Commission on International Migration [GCIM] 2005). Both 'mattering' and social engagement are associated with a lower risk of mental illness/psychological distress (Taylor and Turner 2001). In China, a recent study found that internal migrants who remitted reported less psychological distress than those who did not (Akay et al. 2012).

On the other hand, the obligation and act of sending money to family and friends may expose immigrants to economic hardship (Abrego 2009; Schmalzbauer 2005). Weak control over monies that are remitted may also lead to feelings of frustration and exploitation among some immigrants (GCIM 2005). Additionally, remitting can generate stress by diverting time and resources away from other goals (Mossakowski 2011) such as completing school or starting a family (GCIM 2005). Previous research documents the link between economic hardship and psychological distress (Butterworth et al. 2009; Chiao et al. 2011; Kahn and Pearlin 2006) and has shown the ways in which stress leads to depression (Kessler 1997).

In addition, the link between remittances and mental health likely varies across immigrants of different backgrounds. Low-income individuals are less likely to remit overall because they need their resources to subsist (Carling 2008); when they do remit, they may shoulder a greater burden than those with higher incomes. In the U.S., people who entered as humanitarian migrants (e.g., refugees, asylum seekers) report poorer health compared to those who migrated under employment visas

(Akresh and Frank 2008). For humanitarian migrants, stress emanating from providing remittances may exacerbate pre-existing health problems (GCIM 2005). The effect of remittances on health may also vary by gender. Men tend to remit larger sums than women, but women remit more frequently and consistently than men, a pattern aligned with norms about care and cultural obligations within which harmful stress may be embedded (Abrego 2009; Curran and Saguy 2001; Kessler and McLeod 1984).

In this study, we posit that sending remittances to family and friends will be associated with a higher risk of a major depressive episode (MDE) or sadness among immigrants. We argue that even if remittances provide immigrants with a positive sense of 'mattering', the stress that surrounds remittance sending will outweigh any positive psychological benefits. We also posit that this association will be more pronounced among women, low-income persons, and humanitarian migrants.

2. Methods

2.1 Data and sample

Cross-sectional data come from Wave 1 of the New Immigrant Survey, a study of individuals granted legal permanent residence (LPR) to the U.S. in 2003 (Jasso et al. 2006). Interviews were conducted in 2003 and 2004 on a sample of 8,573 adults. The analytic sample (N=8,236) excludes 337 cases with missing values on the outcome measures. Missing data on measures for 31% of respondents was handled via multiple imputation. Weights adjust for the sampling design, which was stratified by pre-LRP visa status and takes into account the geographic distribution of immigrants.

2.2 Measures

The first dependent variable, *major depressive episode* (MDE 12 months: 1=yes, 0=no), was generated using criteria from the WHO Composite International Diagnostic Interview Short Form (Kessler et al. 1998). Respondents who endorsed the stem question – "During the past 12 months, was there ever a time when you felt sad, blue, or depressed for two weeks or more in a row?" – were then asked seven additional questions assessing symptoms of depression (yes/no) such as "loss of interest, appetite, etc". Persons endorsing the stem question and at least three of

the seven additional questions were considered to have MDE. We also examine the stem question as a measure of *sadness*.

The primary independent variable, *remittances*, is defined here as money sent by the respondent's household (respondent/spouse/partner) to family and friends living abroad, or in the U.S. but in separate households, over the past 12 months. Our definition includes monetary transfers to other households in the U.S. because previous research suggests that these transfers may be especially important to newly arrived immigrants (Menjívar 2000; Stewart et al. 2008). Remittances are measured in 2003 purchasing power parity (PPP), are presented in hundreds of U.S. dollars including zero (for non-remitters), and are logged to reduce skew. Remittances are operationalized as: 1) a continuous variable for the dollar amount and 2) a dichotomous variable indicating whether or not the respondent's household remitted.

We included the following potential moderators of the remittance–MDE/sadness relationship: *gender* (1=female, 0=male); immigrant *visa type* e.g., family of U.S. citizen/LPR, employment principal, humanitarian migrant (refugee/asylee), others (entered the U.S. without inspection); and *household income* (12 months, top-coded at $200,000, logged)—but we recognize that immigrants do not always pool household monies when remitting (Menjívar 2000).

We also include several control variables to reduce confounding: age, marital status, race/ethnicity, education, employment status, remittances received by the respondent's household, English proficiency, length of stay in the U.S., region of birth, and religious membership. With respect to health, we also control for health insurance, self-rated health, and seven doctor-diagnosed chronic conditions (e.g., stroke, cancer).

Additionally, we control for immigrants' experiences abroad before migrating to the U.S., including: harm suffered (e.g., threats), work experience, and religious attendance. A more detailed operationalization of these variables is provided in Appendix Table A-1.

2.3 Analysis

Weighted multiple logistic regression analyses were performed in Stata 13 on 25 multiplely imputed data sets. The main effects of remittances on MDE and sadness were estimated net of sociodemographic and health controls for 1) the full sample and 2) the subgroup of respondents whose households remitted. This is important considering that the majority of the sample (80.6%) did not remit. The final set of analyses, which assessed whether the impact of remittances on MDE and sadness

varies by respondent's gender, income, and pre-LPR visa type, was also carried out on the full sample and the sample of remitters.

3. Results

3.1 Characteristics of the analytic sample

Table 1 presents our main outcome variables (Panel A), the explanatory variables of interest (Panel B), and demographic factors that may moderate the remittance—MDE/sadness relationship (Panel C). As shown in Panel A, MDE is less common (4.7% of respondents) than sadness (13.4%) in our sample. In Panel B, approximately 19% of respondents reported remitting in the previous year. The average amount of remittances across respondents' households, including those that did not remit, is $1,028. This rises to $5,274 when restricted to households that remitted. As seen in Panel C, the sample is slightly more biased towards women, with an average income of $32,930. Most immigrants entered as family members of U.S. citizens/LPRs, about one-tenth had employment visas, and somewhat smaller proportions entered on diversity visas or as humanitarian migrants. Remaining characteristics of the sample that we control for in our models are presented in Appendix Table A-1.

3.2 Sociodemographic and health correlates of MDE and sadness

The estimated effects (on MDE and sadness) of all the sociodemographic and health factors adjusted for in our models are provided in Appendix Table A-2. In brief, factors linked to a higher risk of MDE and/or sadness include being female or unemployed, reporting average/poor self-rated health, and having suffered harm abroad. Older age is slightly protective, whereas education, income, and pre-migration experiences like religious attendance are not significantly associated with MDE and sadness.

Table 1: Select weighted sample characteristics: New legal immigrants to the U.S. ages 18+ (N = 8,236)

Characteristic	Percent/Mean	SD
Panel A: Outcome variables		
Major depressive episode (/no)	4.68	
Sadness (/no)	13.40	
Panel B: Main explanatory variables		
Remittances given (/no)	19.40	
Remittances given (hundreds $)	10.28	95.92
Panel C: Other demographic traits		
Female (/men)	56.31	
Household income (thousands of dollars)	32.93	39.78
Visa Type		
Immediate family	40.77	
Extended family	17.11	
Employment principal	9.84	
Diversity visa principal	7.98	
Humanitarian	6.77	
Legalization	8.26	
Other	9.26	

Notes: Estimates obtained from the multiple imputation (MI) of 25 datasets; SD = standard deviation
Source: The New Immigrant Survey 2003-2004 (Wave 1)

3.3 Main effects of remittances

The models in Table 2 present the main effects of remittances net of respondents' sociodemographic and health characteristics. In Model 1 (full sample, including immigrants whose households did not remit), a one-unit increase in remittances is associated with a 15.2% and 11% increase in the odds of MDE and sadness respectively. In Model 2, immigrants whose households remitted have over 40% higher odds of MDE and sadness compared to immigrants whose households did not remit. Focusing on immigrants whose households remitted (Model 3), the amount remitted is not significantly related to MDE or sadness. Considered together, the findings across Models 1–3 point to the absence of a significant dose-response relationship between the amount remitted and risk of MDE/sadness. In these main effects models the detrimental impact of sending remittances emerges when remitters are compared to non-remitters.

Table 2: Weighted logistic regression of MDE and sadness on remittances: New legal immigrants to the U.S. ages 18+

	MDE		Sadness	
	OR	**95% CI**	**OR**	**95% CI**
Model 1 (Full sample N=8,236)				
Remittances ($, log)	1.152**	(1.050, 1.265)	1.110***	(1.042, 1.182)
Intercept	.023***	(0.005, 0.106)	.104***	(0.038, 0.283)
Model 2 (Full sample N=8,236)				
Remitted (/did not remit)	1.586**	(1.157, 2.172)	1.424***	(1.160, 1.748)
Intercept	.022***	(0.005, 0.104)	.102***	(0.038, 0.277)
Model 3 (Remitters N=1,470)				
Remittances ($, log)	1.091	(0.902, 1.321)	1.091	(0.932, 1.278)
Intercept	.020*	(0.001, 0.407)	.130	(0.014, 1.245)

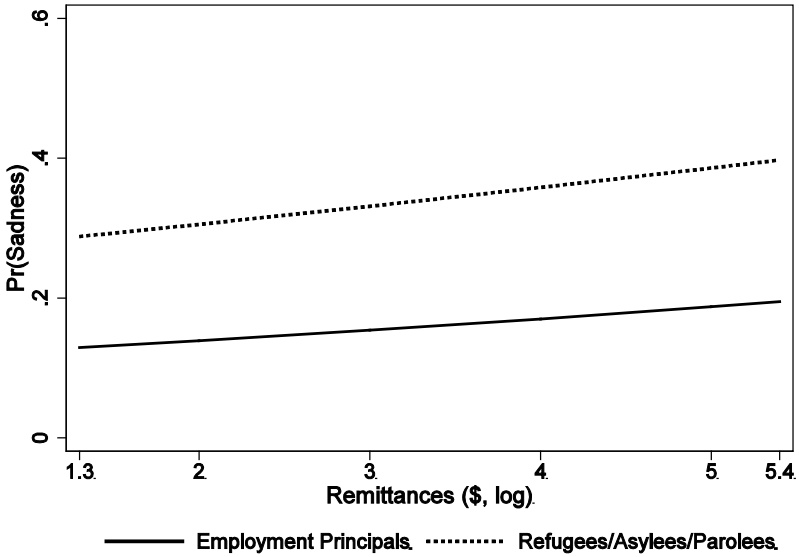
Notes: Estimates obtained from the multiple imputation of 25 datasets; OR = odds ratio; *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$; CI = confidence interval; Each model controls for remittances received and all sociodemographic and health characteristics in Table 1 and Appendix Table A-1.

Source: The New Immigrant Survey 2003-2004 (Wave 1)

3.4 Conditional effects of remittances

We also examined whether the impact of remittances on MDE and sadness depends on the immigrant's gender, pre-LPR visa type, or income, net of controls. We have not tabulated the findings, but we discuss them here. In the full sample (N=8,236) and among remitters (N=1,470) the effects do not vary by gender or income for both MDE and sadness, nor by visa type for MDE. However, among immigrants whose households remitted, the effect of the amount remitted on sadness varies by visa type (humanitarian migrants versus employment principals: OR=1.601; p=.048). As seen in Figure 1, remittances are significantly associated with greater odds of sadness among humanitarian migrants (OR=1.713, p=0.007), but not among employment principals (OR=1.070; p=0.587), the comparison group.

Figure 1: Association between remittances and sadness by pre-LPR status



Predicted Probabilities (Pr) of Sadness as a Function of Remittances and Type of Immigrant (Refugees/Asylees/Parolees versus Employment Principals): Immigrants who Remitted (N = 1,470).

3.5 Supplementary findings

We supplement our main analysis (cross-sectional) with preliminary longitudinal findings by investigating the association between remittance sending at Wave 1 (2003-04) and MDE/sadness at Wave 2 (2007-09), net of sociodemographic and health factors (Wave 1). The Wave 2 sampling weights are not yet publicly available. Therefore we only briefly describe the unweighted longitudinal findings. We find that in the full sample (N=4,003 adult remitters and non-remitters) the amount remitted is associated with a higher risk of MDE (OR=1.131, p=.051) and sadness (OR=1.100, p=.014). However, when remitters are compared to non-remitters there is no significant difference between them in the risk of sadness; but for MDE, men who remitted face a higher odds of MDE than men who did not (OR=2.320, p=.009). Among women, whether or not one remitted is not significantly linked to MDE (OR=0.793, p=0.440). Turning to remitters (N=811), sending larger amounts is associated with a higher risk of MDE (OR=1.597,

p=.001), and also a higher risk of sadness among immigrants who entered the U.S. without inspection (OR=2.334, *p*=.012) but not among employment principals (OR=1.046, *p*>.05). Although these unweighted longitudinal findings should be viewed with caution, they too suggest that sending remittances has consequences for immigrants' mental health.

4. Discussion and conclusion

We investigated the relationship between remittance sending and MDE and sadness among U.S. legal immigrants. Our findings for the full sample confirm that immigrants who remitted had a higher risk of MDE and sadness compared to those who did not. However, contrary to our expectations, the effect did not vary by gender, income, or pre-LPR visa type. Among immigrants whose households remitted, the amount sent was not significantly linked to MDE. Consistent with our expectations, however, the amount remitted was significantly associated with a higher risk of sadness among humanitarian migrants compared to employment principals. Financial strain is a known risk factor for depression and it likely underlies some of the deleterious effects of remittances on mental health suggested by this study, although we lack data to test its mediating effect. In the stratified systems of inequality that exist in U.S. society, women, humanitarian migrants, and low-income persons generally occupy disadvantaged positions that generate stress across multiple dimensions of life (McLeod 2013). Our findings suggest that, for humanitarian migrants, such stress can in turn heighten emotional reactivity to the obligation to remit.

This study is limited by the use of cross-sectional data and the lack of information from undocumented immigrants. Ideally, future studies should include the weighted second wave of the New Immigrant Survey (NIS) and much longer panel data to fully assess the effects of remittance-sending on migrants' health. Our supplementary analysis of unweighted longitudinal NIS data, however, confirms our cross-sectional findings. Additionally, our conceptualization of remittances as encompassing monies sent to family members/friends irrespective of the beneficiary's country of residence captures more realistically the breadth of immigrants' remitting activities. Thus, our results provide an important basis for future research on the relationship between remittances and health.

Immigrants, unlike the beneficiaries of support, are seldom targeted in studies of the remittance–health relationship, yet they may be especially vulnerable to the deleterious effects of stress associated with remittance activities, considering that they often face many challenges in their host countries. This study begins to fill an

important research gap by examining how the sending, rather than the receiving, of remittances impacts immigrants' health. Our finding that remittances are linked to poor mental health among some immigrants calls for more research into the mechanisms (e.g., financial strain) that underlie the remittance–health relationship. Efforts aimed at reducing unemployment and promoting financial stability among immigrants may help lower their risk of depression.

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Appendix

Table A-1: Select weighted sample characteristics: New legal immigrants to the U.S. ages 18+ (N = 8,236)

Characteristic	Percent/Mean	SD
Age (years)	48.51	13.60
Marital Status		
Married/cohabiting	76.37	
Separated/divorced/widowed	7.98	
Never married	15.65	
Employment Status		
Employed	56.04	
Unemployed	17.19	
Homemaker	17.08	
Other	9.69	
Worked abroad (/no)	56.77	
Race/Ethnicity		
Non-Hispanic White	20.17	
Non-Hispanic Black	11.28	
Hispanic	38.66	
Non-Hispanic Asian/others	29.89	
Education (years)	11.88	4.50
Remittances received (hundreds $)	5.23	56.29
Spoken English (1-4; 1 = *very well*)	2.42	1.07
Length of Stay (U.S.)		
Less than 2 years	38.17	
2-5 years	19.33	
6-10 years	15.56	
11+ years	26.94	
Region of Birth		
Latin America/Caribbean	44.19	
Asia	29.09	
Africa	6.61	
Eastern Europe/former USSR	12.78	
Other regions	7.33	
Attended religious services abroad		
Never	18.09	
At least once/year	17.21	
At least once/month	17.01	
At least once/week	47.68	
Member of a church/synagogue/mosque etc (/no)	20.86	
Suffered harm abroad (/no)[a]	6.94	
Have health insurance (/no)	42.16	
Self-rated Health		
Excellent	34.53	
Very good	28.58	
Good	27.23	
Fair/poor	9.65	
1+ chronic condition (/zero)	16.49	

Notes: Estimates obtained from 25 multiplely imputed (MI) datasets; SD = standard deviation;
[a] the respondent and/or the respondent's family
Source: The New Immigrant Survey 2003-2004 (Wave 1)

Table A-2: Weighted logistic regression of MDE and sadness on sociodemographic and health characteristics: New legal immigrants to the U.S. ages 18+ (N = 8,236)

	MDE		Sadness	
Characteristics	**OR**	**95% CI**	**OR**	**95% CI**
Female (/male)	1.634***	(1.225, 2.179)	1.470***	(1.232, 1.755)
Age (years)	.984*	(0.971, 0.998)	.986***	(0.974, 0.992)
Marital Status[a]				
Sep/div/widowed	1.204	(0.775, 1.872)	1.534**	(1.163, 2.023)
Never married	1.287	(0.903, 1.835)	1.264*	(1.013, 1.577)
Employment Status[b]				
Unemployed	1.389	(0.938, 2.055)	1.482***	(1.178, 1.865)
Homemaker	1.156	(0.779, 1.716)	1.142	(0.889, 1.467)
Other	1.225	(0.794, 1.890)	1.003	(0.739, 1.363)
Worked abroad (/no)	1.184	(0.902, 1.554)	1.294	(1.087, 1.540)
Race/Ethnicity[c]				
Non-Hispanic Black	.444	(0.164, 1.204)	.454**	(0.252, 0.820)
Hispanic	.731	(0.282, 1.896)	.816	(0.476, 1.402)
Non-Hispanic Asian/Other	.536	(0.221, 1.300)	.550*	(0.306, 0.991)
Education (years)	1.012	(0.974, 1.051)	.994	(0.972, 1.017)
Household income (log)	.972	(0.858, 1.100)	1.005	(0.932, 1.083)
Spoken English (1-4; 1 = *very well*)	1.066	(0.901, 1.261)	1.067	(0.964, 1.180)
Length of Stay (U.S.)[d]				
Less than 2 years	.654	(0.424, 1.008)	.839	(0.644, 1.094)
2-5 years	.872	(0.579, 1.312)	.970	(0.745, 1.264)
6-10 years	.658	(0.426, 1.016)	.846	(0.644, 1.110)
Visa Type[e]				
Immediate family	1.415	(0.896, 2.234)	1.384*	(1.037, 1.848)
Extended family	.922	(0.503, 1.689)	1.257	(0.869, 1.818)
Diversity visa principal	1.194	(0.648, 2.198)	1.265	(0.852, 1.879)
Humanitarian	1.607	(0.892, 2.894)	1.678**	(1.130, 2.491)
Legalization	1.483	(0.850, 2.590)	1.155	(0.797, 1.673)
Other	1.248	(0.715, 2.180)	1.498*	(1.059, 2.121)
Region of Birth[f]				
Latin America/Caribbean	1.393	(0.352, 5.522)	1.470	(0.784, 2.757)
Africa	1.832	(0.499, 6.733)	1.657	(0.832, 3.298)
Eastern Europe/former USSR	.616	(0.230, 1.650)	.562	(0.291, 1.084)
Other	1.492	(0.613, 3.631)	1.078	(0.586, 1.981)
Attended religious services abroad[g]				
At least once/year	1.287	(0.847, 1.956)	1.073	(0.811, 1.420)
At least once/month	.848	(0.531, 1.353)	.992	(0.745, 1.320)
At least once/week	1.086	(0.741, 1.590)	1.018	(0.798, 1.297)
Member of a church/mosque etc (/no)	.992	(0.741, 1.327)	.999	(0.817, 1.220)
Suffered harm abroad (/no)[h]	1.549*	(1.032, 2.325)	1.214	(0.882, 1.671)
Have health insurance (/no)	1.209	(0.904, 1.617)	1.107	(0.924, 1.327)
Self-Rated Health[i]				
Very good	1.532*	(1.052, 2.230)	1.083	(0.869, 1.350)
Good	2.391***	(1.644, 3.477)	1.572***	(1.263, 1.958)
Fair/poor	3.866***	(2.416, 6.190)	2.554***	(1.918, 3.401)
1+ chronic conditions (/none)	1.542*	(1.096, 2.170)	1.833***	(1.485, 2.264)
Intercept	.024***	(0.005, 0.108)	.110***	(0.041, 0.293)

Notes: Estimates obtained from 25 multiplely imputed datasets; OR = odds ratio; CI = confidence interval; *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$; *Reference groups*: [a] Married, [b] Employed, [c] Non-Hispanic White, [d] 11+ years, [e] Employment principals, [f] Asia, [g] Never, [h] the respondent and/or the respondent's family, [i] Excellent.

Source: The New Immigrant Survey 2003-2004 (Wave 1)