HHS Public Access

Author manuscript

Med Care. Author manuscript; available in PMC 2021 May 01.

Published in final edited form as:

Med Care. 2020 May ; 58(5): 474–482. doi:10.1097/MLR.0000000000001300.

Health Profile and Healthcare Access of Mexican Migration Flows Traversing the Northern Border of Mexico

Ana P. Martinez-Donate, PhD[1], **Niko Verdecias, PhD(abd)**[1], **Xiao Zhang, PhD**[2], **J. Eduardo Gonzalez-Fagoaga, PhD**[3], **Ahmed A. Asadi-Gonzalez, PhD**[4], **Sylvia Guendelman, PhD, MSW**[5], **Catalina Amuedo-Dorantes, JD, PhD**[6], **Maria G. Rangel, MPH, PhD**[7]

[1]Dornsife School of Public Health, Drexel University, Philadelphia, PA

[2]Carbone Cancer Center, University of Wisconsin, Madison, WI

[3]Mel & Enid Zuckerman College of Public Health, University of Arizona, Tucson, AZ

[4]School of Medicine and Psychology, Universidad Autonoma de Baja California, Tijuana, BC, Mexico

[5]School of Public Health, University of California, Berkeley, CA

[6]Department of Economics, San Diego State University, San Diego, CA

[7]Border Health Commission, Mexico Section, Tijuana, BC, Mexico

Abstract

Background: The health of Latino migrants is most often studied with samples of immigrants settled in the United States (US) or returned migrants in Mexico. We examine health outcomes and healthcare access of Mexican migrants traversing the Mexican border region in order to gain a better understanding of migrant health needs as they transition between migration phases.

Methods: We used data from a 2013 probability survey of migrants from Northbound and Southbound migration flows in Tijuana, Mexico (N=2412). Respondents included Northbound migrants with and without US migration experience, Southbound migrants returning home from the US or the Mexican border region, and migrants returning to Mexico via deportation. Descriptive statistics and regression models were estimated to characterize and compare the health status, behavioral health, and healthcare access across migration phases.

Results: Northbound migrants with US migration experience, Southbound migrants from the US, and deported migrants had worse levels of health insurance, healthcare utilization, and diabetes than Northbound migrants without US migration experience. Southbound migrants returning from the border reported worse self-rated health and deportees had higher odds of reported substance use compared to Northbound migrants without US migration experience.

Conclusion: Mexican migrants' health profile and healthcare access vary significantly across migration flows and generally are worse for migrants with US migration experience. The results

Corresponding author: Ana P. Martinez-Donate, Department of Community Health & Prevention, Dornsife School of Public Health, 3215 Market St., Nesbitt Hall 458, Philadelphia, PA, 19104, tel: 267-359-6124, apm78@drexel.edu.

The authors have no conflicts of interest.

add to our understanding of Mexican migrant health along the migration continuum and can inform services in sending, receiving and intermediate communities.

INTRODUCTION

Migration is increasingly recognized as a social determinant of health.[1–3] Violence, poverty, deconstruction of the family unit and social networks, acculturative stress, discrimination, and limited access to health services can negatively affect health outcomes among immigrants before, during, and/or after the migration process.[4–7] At 25%, Mexican-born immigrants represent the largest foreign-born group in the U.S.[8]

Migration is a complex process involving various phases. The health of migrants and the individual, contextual and structural factors that may influence their health can vary across the pre-departure, transit, destination, interception, and return phases.[9] Various studies have examined and compared the health of Mexican immigrants in the US to other populations, including non-Hispanic Whites in the US, US-born Mexican Americans, return migrants in Mexico, and non-migrants in Mexico.[10–13] Despite worse socioeconomic conditions, Mexican immigrants in the US have lower mortality compared to non-Hispanic whites and/or US-born Mexican Americans.[10] The paradoxical immigrant health advantage also includes lower rates of chronic diseases, obesity, diabetes, mental health, and substance use.[14–18] On the other hand, Mexican immigrants have higher rates of work-related fatalities and injuries and self-reported fair-poor health than the other two groups.[19–20]

Researchers examining the health of Mexican immigrants have proposed and tested different hypotheses to explain this phenomenon, including healthy migrant effect[21–24] and salmon bias;[11–13] however, empirical evidence has been mixed.[25–28] On the contrary, data are fairly conclusive on the negative impact of migration and length of residence in the US on Mexican immigrant health outcomes and the decline in health from first to subsequent generations of Mexican Americans in the US.[15,16] Outcomes found to worsen with exposure to the US include substance use,[29,30] mental health,[31,32] HIV risk behaviors,[33,34] and eating disorders.[35,36]

With rare exceptions,[12,37,38] most research on Mexican immigrant health has focused on stationary samples (migrant stocks) in the country of destination and sending communities. Few studies have produced a comprehensive and comparable snapshot of the health status and access to healthcare of Mexican migration flows traveling North from sending communities and South from the US or the Mexican border. The different trajectories and migration experiences represented by these flows can help to illuminate factors associated with the health of migrants in distinct contexts in the US and Mexico. In 2017, an estimated 325,000 migrants arrived to the Mexico–US border from other regions in Mexico, including 44,000 headed to the US, while an estimated 1.2 million Mexicans residing in the US traveled back to Mexico and 155,000 were deported by US immigration authorities.[39,40] The health of these Mexican migration flows has important implications for the health systems of sending, receiving, and transit communities. Monitoring the epidemiological profile and health service utilization of Mexican migrants heading to the US or returning to home communities in Mexico can 1) enable the communities involved in Mexico-US migration to

respond to the needs of this mobile population; and 2) increase our understanding of migrant health variations across different migration stages.

The current study aims to create a health profile of Mexican migrants in transit between Mexico and the US. We draw on data from a bi-national survey of different Mexican migration flows traveling through the Mexico-US border. The study samples represent different phases of the Mexico-US migration continuum. We present estimates of health outcomes and indicators of access to healthcare at five selected migration phases situated before and after migration from Mexico to the US.

METHODS:

Study Population

We used data from Project Migrante, a bi-national collaboration between the US and Mexico that consisted of a series of cross-sectional surveys of Mexican migration flows conducted from 2007 to 2015 in the border city of Tijuana, Mexico (www.migrante.weebly.com).[41] We used data from the Healthcare Access and Utilization Survey conducted in 2013. Respondents were recruited in key transportation facilities that connect Tijuana with the US and the rest of Mexico, including the Tijuana International Airport, the central bus station, and El Chaparral deportation center. A multistage (venue/time) sampling frame was used to generate probability samples from the migration flows that travel through these facilities. Eligibility criteria varied for each flow but generally they included 1) 18 years of age or older, 2) born in Mexico or other Latin American countries, 3) spoke fluent Spanish, 4) non-resident of Tijuana (except for deportees), and 5) at least one of the following conditions: arriving in Mexico via deportation, their stay in the US or the Mexican border or their traveling North was for work-related reasons; had been away from their place of residence for more than 30 days; did not have plans to return to their original place of residence (i.e., potential migrants); or their place of residence was the US. These criteria are modeled after the Migration Survey on the North Border of Mexico (EMIF, per its Spanish acronym), a long-standing survey of migration flows in the region.[40] Detailed eligibility criteria[42] and overall Migrante methods[43] are described elsewhere. In total, 4,186 eligible individuals were screened and 2,412 agreed to participate (response rate of 57.6%). The study was approved by the investigators' institutional review boards.

Measures

Migrants were classified into five groups representing different migration flows and phases, adapted from Zimmerman's Migration Phases Framework:[9] 1) Northbound migrants *without* previous US migration experience arriving on the border from sending communities; 2) Northbound migrants *with* previous US migration experience engaging in a second or subsequent migration trip; 3) Southbound migrants returning from the US to their home communities in Mexico; 4) Southbound migrants returning from the Mexican border to their home communities in other areas of Mexico; and 5) migrants returning to Mexico due to deportation. For groups 1 and 2, the final destination could be the US (international migrants) or the Mexican border region (internal migrants). Data from these two groups provide insights about the health and healthcare access of migrants in sending communities

before and after migration to the US, respectively. Sending communities may present risks such as poverty and violence, but also protective factors like familiarity with the healthcare system, nearly universal health insurance coverage, and access to a social support system.[43] Protective factors may be reduced for returned migrants, who may also experience cultural and role conflicts and, in the case of previously deported migrants, stigma and shame.[44] Group 3 data sheds light on the health profile of international migrants at the point of return to Mexico and on their access to health services while in the US. These migrants may have experienced unsafe and strenuous jobs, acculturative stress, structural barriers to healthcare, and social isolation while in the US.[45] Group 4 is a heterogeneous mix of international migrants and internal migrants who are returning to their home communities after a stay in the Mexican border. Their health profile and levels of healthcare access reflect that of migrants in the border region (a high-risk environment with high rates of violence, sex work, and drug use).[45] Finally, deportees are an understudied forced migrant population, exposed to unique risk factors prior to and during detention by immigration authorities.[46,47] Their health needs are poorly understood and deserve research attention. Each of these flows represents an active transition from one migration context to another (e.g., from the US to Mexico, from home communities in Mexico to the Mexican border region, etc.). Their study can help to understand variations in health status and healthcare at various migration phases and contexts (Table 1).

Healthcare access indicators included: 1) having health insurance; 2) having gone without needed healthcare; and 3) receiving any healthcare services, including ambulatory, emergency care, and/or hospital services, at least once. All of the access indicators were restricted to the last 12 months while respondents were in the country from which they were traveling (i.e., Mexico for the northbound flows and southbound migrants returning from the border flow, and the US for Southbound migrants from the US and deported migrants). These crude indicators of access are considered “vital signs” of healthcare access and routinely monitored in public health.[48]

Overall health status was based on self-rated health as excellent, very good, good, fair, and poor. Consistent with other health research,[49] this variable was recoded into a binary variable (1=excellent/very good; 0=worse health statuses).

Cardiovascular disease (CVD) risk factors included self-reported last 12-month hypertension, hypercholesterolemia, and diabetes (1=yes/0=No) and overweight (Body Mass Index [BMI] ≥25.0 and <30) and obesity (BMI ≥30) based on measured height and weight.

Mental health indicators included last 12 month self-reported depression and anxiety (1=yes; 0=no); and frequency of stress symptoms during the last 4 weeks (1=all the time/most of the time/some of the time; 0= a few times or never), based on a validated single-item stress measure.[50]

Substance use outcomes included last 12-month “at-risk” or heavy drinking, defined as reporting having had more than four drinks (three for women) on drinking days, or having drunk alcohol daily and consumed two drinks (one for women) daily;[51] and self-reported use of any illicit drugs.

These health and behavioral health outcomes were selected based on availability within the Migrante survey data and their public health relevance. Diabetes, hypertension, high cholesterol, and overweight/obesity are highly prevalent risk factors for CVD.[52] Anxiety is the most common mental health illness in the US and about half of individuals diagnosed with depression also experience anxiety. Depression represents the leading cause of disability in the US for people aged 15–44.[53] Chronic stress can have widespread negative effects on health, including increased vulnerability to infections, heart disease, and mental disorders.[54]

Sociodemographic controls included age, gender, education attainment, indigenous ethnicity, marital status, and measured height. Consistent with other studies, height was used as an indicator of nutrition and health during childhood to attenuate possible confounding due to cohort and selection effects.[12,13,21]

Statistical Analysis

We calculated descriptive statistics of sociodemographics, healthcare access, health and behavioral health outcomes by migration phase using survey weights. The weights adjust for the probability of selection (sample design) and nonresponse rate. Weight computation information can be found elsewhere.[55] We then estimated adjusted logistic and multinomial logistic regressions to compare access to healthcare, health and behavioral health outcomes across migration phases. New migrants were treated as the reference group. Non-overlapping 95% confidence intervals for calculated odds ratios can be used as indicators of significant differences between pairs of migration flows. All regression models used unweighted data and adjusted for age, gender, education level, indigenous ethnicity, and height. The regressions for access to healthcare were further adjusted for self-rated health status, so as to tease out health differences across migration phases. All analyses were performed with STATA/SE 14.1 (StataCorp LP, College Station, TX).

RESULTS

By migration phase, the overall sample (N=2412) included Northbound migrants without U.S. migration experience (n=393), Northbound migrants with U.S. migration experience (N=416), Southbound migrants returning from the border region (n=425), and Southbound migrants returning from the U.S. (n=695), and migrants arriving to the border via deportation (n=466). Survey respondents presented significant differences in average age, gender composition, education level, marital status, and height by migration flow (Table 2). Notably, Northbound migrants without US experience were younger than Northbound migrants with US experience, Southbound migrants from the US, and deported migrants, but similar to Sourthbound migrants returning from the border. These demographic factors were included in all adjusted regression models.

Table 3 shows unadjusted estimates of healthcare and health outcomes by migration flow. Healthcare access estimates varied significantly across migration flows. In general, Northbound migrants without US experience had higher rates of access to healthcare while their counterparts with US experience and deported migrants had lower level of access; Northbound migrants with US experience also had a worse health profile compared to

migrants at other phases, including self-rated health, CVD risk factors, mental health, and use of illicit drugs.

Results from adjusted regression models are shown in Table 4. The adjusted odds ratios indicate that compared to Northbound migrants without US experience, Northbound migrants with US experience, Southbound migrant returning from US, and deported migrants were less likely to have health insurance and healthcare receipt. In contrast, they were more likely to report having been diagnosed with diabetes. Southbound migrants returning from US were more likely to be overweight or obese, but less likely to have stress. Deported migrants were twice as likely to report using illicit drugs.

DISCUSSION

This study sought to produce a snapshot of the health profile and health services access among Mexican migration flows traversing the Mexican border region in different migration phases. Our descriptive analyses provide valuable prevalence rates to understand healthcare needs of migrants heading to receiving/sending communities, which can help health departments and healthcare systems to develop more targeted programs and services to protect the health of these mobile populations. The data show that less than half of Southbound migrants returning from the US, Northbound migrants with US experience, and deported migrants had health insurance, received health services, or rated their health as excellent/very good. Importantly, 72–78% of migrants in the first two flows and about 42% of the deported migrants had established a US residence. For context, about 84.7% and 76.6% the US population aged 18–64 had health insurance or received any health services and 66.3% had excellent/very good health on the year of the Migrante survey was conducted.[49,56,57] Healthcare access levels and health status were generally better and closer to rates estimated for US adults for the Northbound flow without US migration experience and the Southbound flow returning from the border than for the other migration flows. The findings suggest that healthcare access and self-rated health are poorer among migrants who live or are returning from the US (via deportation or otherwise) compared to migrants whose place of residence is Mexico. Intensive efforts are needed in sending, receiving, and border communities to increase access to healthcare among Mexican migrants in order to mitigate discontinuation in health insurance and healthcare utilization.

We also found that risk factors for CVD, including hypertension, hypercholesterolemia, diabetes, and overweight/obesity, were quite elevated among Northbound migrants with US experience compared to other flows. Their cardiovascular risk profile is especially worrisome in the context of the aforementioned low access to healthcare found for this flow. Limited healthcare access and utilization among Latino immigrants has been reported by previous research[37,58] and may result in lack of awareness, as well as impede appropriate treatment and exacerbate the consequences of health conditions among Mexican migrants on both sides of the border. Receiving communities, especially those who are destination to circular and seasonal migrants, must emphasize screening for, and treatment of, obesity, overweight, diabetes, and other CVD risk factors, as our data shows these issues affect this incoming populations to a significant extent.

Our unadjusted estimates also indicate that Northbound migrants, both with and without US migration experience, present elevated rates of psychological distress and in the case of migrants without US experience, they also show excessive alcohol consumption levels. This may reflect migrants' worrying about separation from loved ones, the journey to and across the Mexico-US border, and what awaits them at their destination. It could also be the result of exposures to "push" factors, such as poverty and violence in their home communities. Our study underscores the need for mental health and substance use services for migrants returned from the US in sending communities and for internal migrants and especially deported migrants in the border region. Consistent with previous studies, deportees presented poorer mental health and higher rates of illicit substance use than new migrants.[46] This finding calls for mental and behavioral health services in the Mexican border region, where most Mexican migrants are deported to. This region is characterized by greater access to and higher risk of engaging in the consumption of illegal drugs compared to non-border regions.[59,60]

Adjusted comparisons of healthcare access and health profiles can advance our understanding of variations in health across migration phases. Our findings support the notion that, beyond population composition, health status and health services access of Mexican migrants varies significantly across differing migration flows traveling through the Mexican border region. Specifically, these comparisons suggest worse health profile and lower levels of access to healthcare among Southbound migrants returning from the US, deported migrants, and Northbound migrants with US experience compared to Northbound migrants without US migration experience. These findings are consistent with previous research showing Mexican immigrants' increased risk for diabetes with longer residence in the US[61–64] and worse health and healthcare access among migrants returning from the US relative to those who remain in the US and non-migrants in Mexico.[12,25,65,] Our estimates contrast with previous research that found no differences in diabetes rates between return migrants and non-migrants in Mexico.[11] This could be due to lack of differentiation between never migrants and new migrants in previous research. Diabetes treatment requires lifelong self-management and adequate medical treatment of the disease and its potential complications but accessing treatment can be challenging for this population given low levels of health insurance. Unfortunately, this means that for many Mexican migrants their search for better economic and social conditions may come at the cost of acquiring a chronic disease that can have severe consequences, including disability and death. This issue calls for the attention of public health leaders and healthcare providers in both Mexico and the US in order to mitigate these health impacts on a population that plays a vital role for the economies and the social fabric of these two countries.[66] The worse healthcare and health status profile of migration flows with US experience compared to the Northbound flow without US migration experience could indicate that migration disrupts access to care for Mexican migrants and limits prevention and treatment of health problems for Mexicans in the US and later, upon return to their home country. The findings could also be a reflection of healthy migrant selection, deleterious acculturation effects, and/or selective return of migrants in worse health.[13]

Our study findings have some limitations. Notably, the cross-sectional nature of the surveys limits our ability to establish causal inferences regarding associations between migration

phase and health-related outcomes. Data are (with the exception of BMI) based on self-report and, thus subject to recall and social desirability bias. Misclassification of health status and health conditions is also possible due to undiagnosed disease in a population with low levels of healthcare access. The study relies on crude measures of healthcare access (e.g., insurance plans' coverage variability, services received and reasons to seek care were not factored in, etc.). The survey was conducted in just one Mexico-US border location and limited to Spanish-speaking migrants. Mexican migrants traveling through other points along the border and those who do not speak Spanish may present a different health and healthcare profile. There was substantial heterogeneity within each of the flows in factors like gender, legal status, length of US residence, and final destination that we did not explore in this study. Future studies should look into the association between these factors and the health and healthcare access of migrants within these migration flows. The moderate response rate, while within the range recommended for policy development and resource allocation, may have resulted in selection bias.[67] Findings are based on 2013 data. Since then, there have been substantial changes in sociopolitical conditions in both the US and Mexico. In the US, under the Trump administration, detentions and deportations of undocumented immigrants have intensified and the climate has become increasingly hostile towards immigrants in the US. Immigrants' fear of deportation and of negative consequences for seeking health or other services has grown.[68–70] In Mexico, drug-related violence has escalated consistently since 2013, reaching an all-time high in 2018.[71,72] These changes are likely to have worsened physical, behavioral, and mental health and healthcare access in these migration flows. Finally, any comparisons between estimates based on our survey and national surveys presented in this discussion need to be taken with caution because of differences in methods and sample composition.

Shortcomings notwithstanding, the data presented provide a snapshot of the health status and healthcare access of Mexican migration flows representing different trajectories and points of the migration process. The results add to a larger body of research that has focused more often on migrant stocks and their comparison to non-migrant populations in the US and Mexico. Our findings provide evidence of worse health profiles and less healthcare access among Southbound, deported, and Northbound migrants with US migration experience compared to Northbound migrants without US migration experience. The data that can be used as evidence for the development and/or strengthening of local programs and services focused on the health issues identified for each particular migration phase. Finally, these estimates may serve as a baseline considering the heightened anti-immigration rhetoric, policies, and enforcement practices, to evaluate the negative impacts that these social determinants will have on the health of Mexican migrants.

REFERENCES

1. Davies A, Basten A, Frattini C. Migration: A Social Determinant of the Health of Migrants. 2006 https://migrationhealthresearch.iom.int/migration-social-determinant-health-migrants. Accessed on November 25, 2019.
2. Marmot M, Allen J, Bell R, Bloomer E, Goldblatt P. Consortium for the European Review of Social Determinants of Health and the Health Divide. WHO European review of social determinants of health and the health divide. Lancet. 2012;380(9846):1011–1029. doi:10.1016/S0140-6736(12)61228-8 [PubMed: 22964159]

3. Castañeda H, Holmes SM, Madrigal DS, Young M-ED, Beyeler N, Quesada J. Immigration as a Social Determinant of Health. Annu Rev Public Heal. 2015;36(1):375–392. doi:10.1146/annurev-publhealth-032013-182419
4. Ehlers CL, Gilder DA, Criado JR, Caetano R. Acculturation Stress, Anxiety Disorders, and Alcohol Dependence in a Select Population of Young Adult Mexican Americans. J Addict Med. 2009;3(4):227–233. doi:10.1097/ADM.0b013e3181ab6db7 [PubMed: 20161543]
5. Lee J, Donlan W, Cardoso EEO, Paz JJ. Cultural and Social Determinants of Health among Indigenous Mexican Migrants in the United States. Soc Work Public Health. 2013;28(6):607–618. doi:10.1080/19371918.2011.619457 [PubMed: 23944171]
6. Pérez MC & Fortuna LR. Psychosocial Stressors, Psychiatric Diagnoses and Utilization of Mental Health Services Among Undocumented Immigrant Latinos. J Immigr Refug Serv. 2005;3(1–2):107–123.
7. Sullivan MM & Rehm R. Mental health of undocumented Mexican immigrants: a review of the literature. ANS Adv Nurs Sci. 2005;28(3):240–251. [PubMed: 16106153]
8. Zong J, Batalova J. Mexican Immigrants in the United States. Published 2018. Retrieved from https://www.migrationpolicy.org/article/mexican-immigrants-united-states. Accessed on November 25, 2019
9. Zimmerman C, Kiss L, Hossain M. Migration and Health: A Framework for 21st Century Policy-Making. PLoS Med. 2011;8(5):e1001034. doi:10.1371/journal.pmed.1001034 [PubMed: 21629681]
10. Markides KS & Coreil J. The health of Hispanics in the southwestern United States: an epidemiologic paradox. Public Health Rep. 1986;101(3):253–265. [PubMed: 3086917]
11. Ullmann SH, Goldman N, Massey DS. Healthier before they migrate, less healthy when they return? The health of returned migrants in Mexico. Soc Sci Med. 2011;73(3):421–428. doi:10.1016/j.socscimed.2011.05.037 [PubMed: 21729820]
12. Diaz CJ, Koning SM, Martinez-Donate AP. Moving Beyond Salmon Bias: Mexican Return Migration and Health Selection. Demography. 2016;53(6):2005–2030. doi:10.1007/s13524-016-0526-2 [PubMed: 27848222]
13. Riosmena F, Wong R, Palloni A. Migration Selection, Protection, and Acculturation in Health: A Binational Perspective on Older Adults. Demography. 2013;50(3):1039–1064. doi:10.1007/s13524-012-0178-9 [PubMed: 23192395]
14. Bostean G Does selective migration explain the Hispanic paradox? A comparative analysis of Mexicans in the US and Mexico. J Immigr Minor Heal. 2013;15(3):624–635. doi:10.1007/s10903-012-9646-y
15. Guendelman S, Ritterman-Weintraub ML, Fernald LCH, Kaufer-Horwitz M. A population-based comparison of weight and weight perceptions among overweight and obese Mexican and Mexican-American men. Salud Publica Mex. 2013;55 Suppl 4:S451–8. [PubMed: 25153184]
16. Afable-Munsuz A, Mayeda ER, Pérez-Stable EJ, Haan MN. Immigrant Generation and Diabetes Risk Among Mexican Americans: The Sacramento Area Latino Study on Aging. Am J Public Health. 2014;104(S2):S243–S250. doi:10.2105/AJPH.2012.300969r
17. Escobar JI, Hoyos Nervi C, Gara MA. Immigration and mental health: Mexican Americans in the United States. Harv Rev Psychiatry. 2000;8(2):64–72. [PubMed: 10902095]
18. Borges G, Breslau J, Orozco R, Tancredi DJ, Anderson H, Aguilar-Gaxiola S, Mora ME. A cross-national study on Mexico-US migration, substance use and substance use disorders. Drug Alcohol Depend. 2011;117(1):16–23. doi:10.1016/J.DRUGALCDEP.2010.12.022 [PubMed: 21296509]
19. Gany F, Novo P, Dobslaw R, Leng J. Urban Occupational Health in the Mexican and Latino/Latina Immigrant Population: A Literature Review. J Immigr Minor Heal. 2014;16(5):846–855. doi:10.1007/s10903-013-9806-8
20. Benjamins MR, Hirschman J, Hirschtick J, Whitman S. Exploring differences in self-rated health among Blacks, Whites, Mexicans, and Puerto Ricans. Ethn Health. 2012;17(5):463–476. doi:10.1080/13557858.2012.654769 [PubMed: 22288772]
21. Crimmins EM, Soldo BJ, Ki Kim J, Alley DE. Using anthropometric indicators for Mexicans in the United States and Mexico to understand the selection of migrants and the “Hispanic Paradox.” Biodemography Soc Biol. 2005;52(3–4):164–177. doi:10.1080/19485565.2005.9989107

22. Ro A, Fleischer N. Changes in health selection of obesity among Mexican immigrants: A binational examination. Soc Sci Med. 2014;123:114–124. doi:10.1016/j.socscimed.2014.10.047 [PubMed: 25462612]
23. Fleischer NL, Ro A, Bostean G. Smoking selectivity among Mexican immigrants to the United States using binational data, 1999–2012. Prev Med (Baltim). 2017;97:26–32. doi:10.1016/j.ypmed.2017.01.004
24. Rubalcava LN, Teruel GM, Thomas D, Goldman N. The healthy migrant effect: new findings from the Mexican Family Life Survey. Am J Public Health. 2008;98(1):78–84. doi:10.2105/AJPH.2006.098418 [PubMed: 18048791]
25. Arenas E, Goldman N, Pebley AR, Teruel G. Return Migration to Mexico: Does Health Matter? Demography. 2015;52(6):1853–1868. doi:10.1007/s13524-015-0429-7 [PubMed: 26385111]
26. Aguila E, Escarce J, Leng M, Morales L. Health status and behavioral risk factors in older adult Mexicans and Mexican immigrants to the United States. J Aging Health. 2013;25(1):136–158. doi:10.1177/0898264312468155 [PubMed: 23264441]
27. Palloni A & Arias E. Paradox Lost: Explaining the Hispanic Adult Mortality Advantage. Demography. 2004;41(3):385–415. doi:10.1353/dem.2004.0024 [PubMed: 15461007]
28. Brown HS, Wilson KJ, Angel JL. Mexican Immigrant Health: Health Insurance Coverage Implications. J Healthcare Poor Underserved. 2015;26(3):990–1004. doi:10.1353/hpu.2015.0102
29. Borges G, Medina-Mora ME, Breslau J, Aguilar-Gaxiola S. The effect of migration to the United States on substance use disorders among returned Mexican migrants and families of migrants. Am J Public Health. 2007;97(10):1847–1851. doi:10.2105/AJPH.2006.097915 [PubMed: 17761563]
30. Borges G, Cherpitel CJ, Orozco R, Zemore SE, Wallisch L, Medina-Mora ME, Breslau J. Substance Use and Cumulative Exposure to American Society: Findings From Both Sides of the US-Mexico Border Region. Am J Public Health. 2016;106(1):119–127. doi:10.2105/AJPH.2015.302871 [PubMed: 26562124]
31. Breslau J, Borges G, Tancredi D, Saito N, Kravitz R, Hinton L, Vega W, Medina-Mora ME, Aguilar-Gaxiola S. Migration from Mexico to the United States and subsequent risk for depressive and anxiety disorders: a cross-national study. Arch Gen Psychiatry. 2011;68(4):428–433. doi:10.1001/archgenpsychiatry.2011.21 [PubMed: 21464367]
32. Borges G, Zamora B, García J, Orozco R, Cherpitel CJ, Zemore SE, Breslau J. Symptoms of anxiety on both sides of the US–Mexico border: The role of immigration. J Psychiatr Res. 2015;61:46–51. doi:10.1016/j.jpsychires.2014.12.004 [PubMed: 25543519]
33. Magis-Rodríguez C, Lemp G, Hernandez MT, Sanchez MA, Estrada F, Bravo-García E. Going North: Mexican Migrants and Their Vulnerability to HIV. JAIDS J Acquir Immune Defic Syndr. 2009;51:S21–S25. doi:10.1097/QAI.0b013e3181a26433 [PubMed: 19384097]
34. Strathdee SA, Lozada R, Ojeda VD, et al. Differential Effects of Migration and Deportation on HIV Infection among Male and Female Injection Drug Users in Tijuana, Mexico Grinsztejn B, ed. PLoS One. 2008;3(7):e2690. doi:10.1371/journal.pone.0002690 [PubMed: 18665250]
35. Swanson SA, Saito N, Borges G, Benjet C, Aguilar-Gaxiola S, Medina-Mora ME, Breslau J. Change in binge eating and binge eating disorder associated with migration from Mexico to the US. J Psychiatr Res. 2012;46(1):31–37. doi:10.1016/j.jpsychires.2011.10.008 [PubMed: 22070904]
36. Goldman N Will the Latino Mortality Advantage Endure? Res Aging. 2016;38(3):263–282. doi:10.1177/0164027515620242 [PubMed: 26966251]
37. Martinez-Donate AP, Ejebe I, Zhang X, et al. Access to Healthcare among Mexican Migrants and Immigrants: A Comparison across Migration Phases. J Healthcare Poor Underserved. 2017;28(4):1314–1326. doi:10.1353/hpu.2017.0116
38. Fernández-Niño JA, Ramírez-Valdés CJ, Cerecero-Garcia D, Bojorquez-Chapela I. Deported Mexican migrants: health status and access to care. Rev Saude Publica. 2014;48(3):478–485. [PubMed: 25119943]
39. EMIF. Total de Migrantes Laborales Procedentes Del Sur Por Destino (Miles de Desplazamientos). Published 2017. Retrieved from https://www.colef.mx/emif/resultados/indicadores/indicadores/Norte/2017/Anual/NORTE-Indicadores-ANUALES2017.pdf. Accessed on November 25, 2019

40. EMIF Surveys of Migration at Mexico's Northern and Southern Borders. Indicators. Published 2018. Retrieved from https://www.colef.mx/emif/eng/indicadores.php. Accessed on November 25, 2019
41. Migrante Project. Home page (not dated). Retrieved from http://migrante.weebly.com/. Accessed on November 25, 2019
42. Migrante Project. Study Design. (not dated) Retrieved from https://tinyurl.com/migrante-eligibility. Accessed on November 25, 2019
43. Martinez-Donate AP, Hovell MF, Rangel MG, et al. Migrants in Transit: The Importance of Monitoring HIV Risk Among Migrant Flows at the Mexico–US Border. Am J Public Health. 2015;105(3):497–509. doi:10.2105/AJPH.2014.302336 [PubMed: 25602882]
44. Bovenkerk F The Sociology of Return Migration: A Bibliographic Essay. Volume 20 Research Group for European Migration Problems; 1974. doi:10.1007/978-94-015-1037-0
45. Zhang X, Martinez-Donate Ana P, Simon NJE, Hovell MF, Rangel MG, Magis-Rodriguez C, Sipan CL. Risk behaviors for HIV infection among traveling Mexican migrants: The Mexico-U.S. border as a contextual risk factor. Global Public Health 2017;12(1):65–83. [PubMed: 26878494]
46. Ojeda VD, Robertson AM, Hiller SP, et al. A Qualitative View of Drug Use Behaviors of Mexican Male Injection Drug Users Deported from the United States. J Urban Heal. 2011;88(1):104–117. doi:10.1007/s11524-010-9508-7
47. Rangel MG, Martinez-Donate AP, Hovell MF, Sipan CL, Zellner JA, Gonzalez-Fagoaga JE, Kelley NJ, Asadi-Gonzalez A, Amuedo-Dorantes C, Magis-Rodriguez C. A two-way road: Rates of HIV infection and behavioral risk factors among deported Mexican labor migrants. 2012;16(6):1630–1640.
48. Center for Disease Control and Prevention. Vital Signs: Health Insurance Coverage and Healthcare Utilization - United States, 2006--2009 and January--March 2010. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm59e1109a1.htm. Published 2010. Accessed on November 25, 2019
49. Center for Disease Control and Prevention. Early Release of Selected Estimates Based on Data From the 2015 National Health Interview Survey. Retrieved from https://www.cdc.gov/nchs/nhis/releases/released201605.htm. Published 2016. Accessed on November 25, 2019
50. Elo A-L, Leppänen A, Jahkola A. Validity of a single-item measure of stress symptoms. Scand J Work Environ Health. 2003;29(6):444–451. [PubMed: 14712852]
51. National Institute on Alcohol Abuse and Alcoholism. Understanding the impact of alcohol on human health and well-being (2019). Retrieved from https://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/moderate-binge-drinking. Accessed on November 25, 2019
52. Center for Disease Control and Prevention. Heart Disease Facts. Published 2017. Retrieved from https://www.cdc.gov/heartdisease/facts.htm. Accessed on November 25, 2019
53. Anxiety and Depression Association of America. Facts and Statistics. Published 2018. Retrieved from https://adaa.org/about-adaa/press-room/facts-statistics. Accessed on November 25, 2019
54. National Institute of Mental Health. 5 Things You Should Know About Stress. NIH Publication No. 19-MH-8109 (not dated). Retrieved from https://www.nimh.nih.gov/health/publications/stress/index.shtml. Accessed on November 25, 2019
55. Amuedo-Dorantes C, Puttitanun T, Martinez-Donate AP. How do tougher immigration measures affect unauthorized immigrants? Demography. 2013;50(3):1067–1091. doi:10.1007/s13524-013-0200-x [PubMed: 23532619]
56. Smith JC & Medalia C. Health Insurance in the United States: 2013 Current Population Reports Health Insurance Coverage in the United States: 2013 Current Population Reports; 2014. Retrieved from https://www.nber.org/cps/hi/2014redesign/p60-250.pdf. Accessed on November 25, 2019
57. Jackson H Health Status and Medical Services Utilization: 2013; 2018 Retrieved from www.census.gov/sipp.
58. Ortega AN, McKenna RM, Kemmick Pintor J, et al. Healthcare Access and Physical and Behavioral Health among Undocumented Latinos in California. Med Care. 2018;56(11):919–926. doi:10.1097/MLR.0000000000000985 [PubMed: 30216201]

59. Molzahn C, Ríos V, Shirk DA. Drug Violence in Mexico. Trans-Border Institute Special Report; 2012 Retrieved from http://offnews.info/downloads/2012-tbi-drugviolence.pdf. Accessed on January 16, 2020.
60. Fleiz-Bautista C, Domínguez-García M, Villatoro-Velázquez JA., Vázquez-Quiroz F, Zafra-Mora E, Sánchez-Ramos R, Resendiz-Escobar E, Bustos-Gamiño M, Medina-Mora ME. Cuqueando la Chiva: Contextos del consumo de heroína en la frontera norte de México. Ciudad de México, México: INPRFM; 2019 Available at: https://www.researchgate.net/publication/331907471_Cuqueando_la_Chiva_Contextos_del_consumo_de_heroina_en_la_frontera_norte_de_Mexico.Accessed Janaury 16, 2020
61. Anderson C, Zhao H, Daniel CR, et al. Acculturation and Diabetes Risk in the Mexican American Mano a Mano Cohort. Am J Public Health. 2016;106(3):547–549. doi:10.2105/AJPH.2015.303008 [PubMed: 26794174]
62. Colby SE, Morrison S, Haldeman L. What Changes When We Move? A Transnational Exploration of Dietary Acculturation. Ecol Food Nutr. 2009;48(4):327–343. doi:10.1080/03670240903022379 [PubMed: 21883072]
63. Guendelman S, Abrams B. Dietary intake among Mexican-American women: generational differences and a comparison with white non-Hispanic women. Am J Public Health. 1995;85(1):20–25. [PubMed: 7832256]
64. Leite Paula, Angoa Adela, Castaneda Xochitl, Felt Emily, Marc Schenker TR. Health Outcomes of Mexican Immigrant Women in the United States | migrationpolicy.org Published 2013. Retrieved from https://www.migrationpolicy.org/article/health-outcomes-mexican-immigrant-women-united-states. Accessed on November 25, 2019
65. Wassink JT. Implications of Mexican Healthcare Reform on the Health Coverage of Nonmigrants and Returning Migrants. Am J Public Health. 2016;106(5):848–850. doi:10.2105/AJPH.2016.303094 [PubMed: 26985598]
66. Aguila E, Akhmedjonov A, Basurto-Davila R, Kumar KB, Kups S, Shatz HJ. United States and Mexico: Ties That Bind, Issues That Divide. Santa Monica, CA: RAND Corporation, 2012 Retrieved from https://www.rand.org/pubs/monographs/MG985-1.html. Accessed on November 25, 2019
67. Advisory Panel on Telephone Public Opinion Survey Quality - Public Opinion Research in the Government of Canada - PWGSC. Standards and Guidelines for: Response Rate. Published 2014. Retrieved from https://www.tpsgc-pwgsc.gc.ca/rop-por/rapports-reports/comitephone-panelphone/page-06-eng.html. Accessed on November 25, 2019
68. Garcini LM, Peña JM, Gutierrez AP, et al. “One Scar Too Many:” The Associations Between Traumatic Events and Psychological Distress Among Undocumented Mexican Immigrants. J Trauma Stress. 2017;30(5):453–462. doi:10.1002/jts.22216 [PubMed: 29077997]
69. Swetlitz Ike. Immigrants, fearing Trump’s deportation policies, avoid doctor visits. Published 2017. Retrieved from https://www.pbs.org/newshour/health/immigrants-trump-deportation-doctor. Accessed on November 25, 2019
70. Immigrant Legal Resource Center. Public Charge. Published 2018. Retrieved from https://www.ilrc.org/public-charge.
71. Niall McCarthy. Drug Violence Drives Mexico Murders to Record High. Published 2018. Retrieved from https://www.statista.com/chart/12635/drug-violence-drives-mexico-murders-to-record-high/. Accessed on November 25, 2019
72. Associated Press in Mexico City. Mexico: homicides up 16% in 2018, breaking own records for violence. Published 2018. Retrieved from https://www.theguardian.com/world/2018/jul/23/mexico-crime-homicides-violence-up-report. Accessed on November 25, 2019.

TABLE 1.

Migration flows: Trajectories, Phases and Contexts Represented

	Trajectory			
Migration Flow	**From**	**To**	**Migration Phase**	**Migration Context**
Northbound migrants *without* U.S. migration experience	Sending communities in Mexico	Border region or the U.S.	Traveling North, not yet exposed to U.S. (potential U.S. migrants or domestic migrants)	Mexico: Sending communities and journey North prior to migration to U.S.
Northbound migrants *with* U.S. migration experience	Sending communities in Mexico	Border region or the U.S.	Traveling North after previous exposure to U.S. (repeat U.S. migrants and immigrants)	Mexico: Sending communities and journey North after exposure to the U.S.
Southbound migrants returning from the U.S.	Receiving communities in the U.S.	Sending communities in Mexico	Returning from receiving communities in the U.S. to sending communities in Mexico (U.S. migrants and immigrants)	The U.S.: Before re-exposure to sending communities.
Southbound migrants returning from the border	Mexican border region	Sending communities in Mexico	Returning from the Mexican border to sending communities in Mexico (international and domestic migrants).	The Mexican border: Before re-exposure to sending communities.
Deported migrants arriving in Mexico	Receiving communities in the U.S., detention centers	Mexican border or sending communities in Mexico	Migrants arriving into Mexico via deportation from the U.S.	The U.S.: Before, during, and after detention and deportation to Mexico, and before re-exposure to border or sending communities in Mexico.

Med Care. Author manuscript; available in PMC 2021 May 01.

TABLE 2.

Sociodemographic Characteristics of Mexican Migrants at Different Migration Phases, Tijuana, 2013

	All (weighted n=554,266)	Northboundmigrants *without* U.S. experience (weighted n=114,730)	Northboundmigrants *with* U.S. experience (weighted n=138,890)	Southbound migrants returning from U.S. (weighted n=162,540)	Southbound migrants returning from the border (weighted n=104,847)	Deported migrants (weighted n=33,259)	p*
Age in years (Mean, SD)	42.5 (13.9)	39.0 (13.7)	48.1 (13.7)	44.6 (14.0)	38.0 (11.9)	36.7 (10.1)	**<0.001**
Male, %	73.9	71.7	68.1	75.1	78.8	88.7	**0.009**
Education attainment, %							**<0.001**
• Less than high school	49.6	25.3	61.4	64.4	29.0	79.9	
• High school	17.1	15.9	16.9	17.9	17.6	17.4	
• College and above	33.3	58.8	21.7	17.7	53.4	2.8	
Indigenous ethnicity, %	2.9	2.1	2.2	4.9	1.7	3.3	0.172
Marital status, %							**<0.001**
• Unmarried	39.2	42.6	33.1	38.3	41.4	51.6	
• Married, not living together	29.7	7.8	41.1	25.1	49.9	22.6	
• Married, living together	31.0	49.7	25.9	36.7	8.7	25.8	
Height in cms. (Mean, SD)	168 (10.5)	169 (11.1)	166 (13.4)	167 (9.3)	169 (11.3)	168 (8.2)	**0.008**
Length of residence in U.S.							**<0.001**
• No migration history	38.0	100.0	0.0	0.0	83.2	0.0	
• Less than 5 years	12.7		19.4	18.7	8.8	16.7	
• 5–9 years	6.9		10.0	9.9	2.5	19.5	
• 10 or more years	42.4		70.6	71.5	5.6	63.8	
U.S. is country of residence, %	43.3	0	78.3	72.4	0	41.5	**<0.001**
Last crossing was unauthorized, %**	26.2	NA	6.9	21.3	69.9	91.4	**<0.001**

*Based on unadjusted comparisons between the 5 migration phases using Chi-square (categorical variables) or univariate ANOVA (age and height).

**Among those with U.S. migration experience.

TABLE 3.

Access to Health Care, Health Status and Health Behaviors among Mexican Migrants at Different Migration Phases, Tijuana, 2013

	All (weighted n=554,266)	Northboundmigrants *without* U.S. experience (weighted n=114,730)	Northboundmigrants *with* U.S. experience (weighted n=138,890)	Southbound migrants returning from U.S. (weighted n=162,540)	Southbound migrants returning from the border (weighted n=104,847)	Deported migrants (weighted n=33,259)	P
Access to Health Care during the last 12 months in key country							
Health insurance	57.3	83.4	31.0	47.2	84.3	21.1	<0.001
Forgone care	7.5	5.5	4.6	8.5	9.6	13.3	0.228
Healthcare receipt	47.0	58.8	32.3	44.1	56.3	42.3	<0.001
Self-Rated Health Status							
Excellent/very good	47.8	58.3	45.3	38.3	55.3	43.0	<0.001
Risk Factors for CVD							
Hypertension	13.5	9.9	23.7	12.7	8.9	8.5	<0.001
Hypercholesterolemia	10.8	9.8	14.7	10.9	8.5	8.3	0.217
Diabetes	8.2	4.1	14.4	10.5	3.2	4.9	<0.001
Measured BMI							
• Normal	25.4	34.0	18.8	23.1	24.8	32.5	0.043
• Overweight	42.8	37.6	46.0	43.6	43.3	43.0	
• Obese	31.8	28.4	35.3	33.4	31.9	24.5	
Mental Health Indicators							
Depression	8.5	6.8	13.3	8.4	4.4	10.4	0.026
Anxiety	8.9	8.5	10.6	9.5	7.0	8.2	0.735
Stress	44.5	52.3	38.6	38.9	49.2	51.4	<0.001
Substance Use							
At-risk drinking	26.3	30.1	15.4	22.7	37.8	32.9	<0.001
Use of illicit drug	5.2	6.4	5.9	4.0	2.7	12.3	0.029

Data shown represent percentages.

P-values are based on unadjusted comparisons between the 5 migration phases using Chi-square tests.

Health care access, health status, health conditions and behavioral health outcomes are for the last 12 months, except for stress, which is for the past 4 weeks.

Source: Project MIGRANTE, www.migrante.weebly.com

TABLE 4.

Multivariable Analysis of Health Care Access, Health Status and Health Behaviors Among Mexican Migrants at Different Migration Phases, Tijuana, 2013

	Model	Northboundmigrants *without* U.S. experience	Northbound migrants *with* U.S. experience	Southbound migrants returning from U.S.	Southbound migrants returning from the border	Deported migrants
Health Care Access & Utilization						
Health insurance	Logistic (OR, 95% CI)	Ref	0.11 (0.07–0.16) ***	0.25 (0.17–0.35) ***	0.94 (0.63–1.42)	0.10 (0.06–0.16) ***
Forgone care	Logistic (OR, 95% CI)	Ref	0.74 (0.38–1.42)	0.62 (0.32–1.19)	1.06 (0.56–2.00)	1.19 (0.57–2.48)
Healthcare receipt	Logistic (OR, 95% CI)	Ref	0.30 (0.21–0.44) ***	0.64 (0.47–0.87) ***	0.86 (0.62–1.19)	0.56 (0.38–0.82) ***
Self-Rated Health Status						
Excellent/very good	Logistic (OR, 95% CI)	Ref	1.07 (0.75–1.52)	0.73 (0.53–1.02)	0.64 (0.46–0.90) *	0.77 (0.53–1.10)
Risk Factors for CVD						
Hypertension	Logistic (OR, 95% CI)	Ref	1.52 (0.94–2.45)	1.20 (0.73–1.99)	0.95 (0.57–1.59)	1.05 (0.55–2.03)
Hypercholesterolemia	Logistic (OR, 95% CI)	Ref	0.84 (0.50–1.39)	0.97 (0.64–1.47)	0.66 (0.40–1.10)	0.71 (0.39–1.47)
Diabetes	Logistic (OR, 95% CI)	Ref	1.99 (1.03–3.83) *	2.08 (1.12–3.87) *	1.29 (0.66–2.52)	2.53 (1.21–5.30) *
Measured BMI	Multinomial (OR, 95%CI)					
• Normal		Ref	Ref	Ref	Ref	Ref
• Overweight			1.27 (0.84–1.91)	1.50 (1.06–2.12) *	1.12 (0.80–1.59)	1.17 (0.79–1.73)
•Obese			1.23 (0.85–1.79)	1.58 (1.09–2.29) *	1.30 (0.92–1.84)	0.94 (0.62–1.42)
Mental Health Indicators						
Depression	Logistic (OR, 95% CI)	Ref	1.15 (0.59–2.25)	1.08 (0.58–2.02)	0.94 (0.49–1.82)	1.32 (0.72–2.41)
Anxiety	Logistic (OR, 95% CI)	Ref	0.74 (0.41–1.32)	0.86 (0.51–1.47)	0.86 (0.51–1.44)	0.81 (0.47–1.37)
Stress	Logistic (OR, 95% CI)	Ref	0.68 (0.51–0.90) **	0.73 (0.54–0.99) *	0.91 (0.67–1.24)	1.20 (0.84–1.70)
Substance Use						
At-risk drinking	Logistic (OR, 95% CI)	Ref	0.53 (0.34–0.82) **	0.72 (0.50–1.03)	1.11 (0.77–1.59)	0.69 (0.44–1.06)
Use of illicit drug	Logistic (OR, 95% CI)	Ref	1.53 (0.60–3.90)	1.59 (0.78–3.27)	0.97 (0.45–2.09)	2.45 (1.16–5.18) *

Odds ratios (OR) and 95% confidence intervals (CI) are based on unweighted logistic or multinomial regression models. All models were adjusted for age, gender, education attainment, indigenous ethnicity, and height (an indicator of childhood health and nutrition). The regressions for access to health care indicators were further adjusted for self-rated health status.

Ref: Reference

* P<.05

** P<.01

*** P<.005

Health conditions and health behaviors are for the last 12 months, except for stress, which is for the past 4 weeks.

Source: Project MIGRANTE, www.migrante.weebly.com