Moving Beyond Salmon-Bias:
Mexican Return Migration and Health Status

Christina Diaz
Stephanie Koning
Anna Martinez-Donate

University of Wisconsin – Madison

The extremely low access to health care services among Mexican immigrants in the U.S. (Bustamante et al. 2012; Ortega et al. 2007) and the disproportionately high representation of second-generation Mexican immigrants among patients with chronic health conditions (Van Hook 2013) raise serious concerns about persistent social stratification and related health inequalities. However, the severity of health stratification among immigrants, and the mechanisms through which it occurs, remains unclear and is likely even greater than current estimates suggest. Immigrants who return to their native countries are more likely to be censored from health and mortality records and, especially if they are emigrating *because* of health declines, this censoring has likely biased immigrant health risk estimates toward the null (Palloni and Arias 2004). Other studies have tried to account for this by comparing Mexican immigrants in the U.S. to returned immigrants residing in Mexico, but this requires assumptions regarding sample comparability and timing of health declines among returned migrants. This study not only elucidates the relationship between health status and migration decisions, but also provides useful considerations and tools when adjusting for health selection bias in immigrant health studies—a valuable contribution to public health and health stratification research in the U.S.

BACKGROUND

A great deal of the research examining health differentials between the foreign-born and the U.S.-born population has primarily focused on Hispanic migrants. Despite having lower levels of education and less access to health care services, Mexicans have comparably positive health outcomes than native-born whites and blacks (Buttenheim et al. 2010; Kimbro et al. 2008). This “Hispanic Paradox” suggests that not only do the *levels* of health differ among natives and Mexicans (Palloni and Arias 2004), but that foreign-born Mexicans fare better than expected given their socioeconomic status (Goldman et al. 2006). For instance, Mexican

immigrants are less likely to be afflicted with asthma, low birthweight offspring, and also exhibit lower mortality than U.S. born residents (Hummer and Rogers 2000; Singh and Barry 2004).

However, this advantaged health status may be driven by selective migration patterns (Abraido-Lanza et al. 1999; Chiswick and Miller 2008). The "healthy migrant" hypothesis suggests that Mexican immigrants are self-selected in their health outcomes and behaviors before leaving their country of origin; these migrants tend to be healthier than native-born residents as well as non-migrants in Mexico. Alternately, the "salmon bias" hypothesis suggests that Mexican migrants return to their country of origin due to health declines. As a result of these selective migration patterns, it is likely that mortality and morbidity estimates of Hispanics are downwardly biased (Palloni and Arias 2004).

A nascent body of work argues that return migrants are more likely to suffer from heart problems, psychological issues, activity limitations, and are more likely to be obese and smoke (Bostean 2013; Ullmann et al. 2011). Tura and Elo (2008) also document that older Hispanic emigrants exhibit higher mortality than those who remain in the U.S. Despite important gains and patterns identified in health and mortality scholarship, data limitations have largely precluded observations of highly mobile populations. Further, the mechanisms driving these potential health-related migration remains unexplored.

Our project asks the following questions:

1. How does the health of Mexican emigrants compare to the health of Mexican immigrants currently living in the U.S.?
2. If migrants are more likely to return to Mexico when they experience poor health, we test several hypotheses that may be driving this migration decision.

At least two processes may explain why migrants return to Mexico. First, it is possible that upon falling ill in the U.S., Mexicans are unable to seek proper medical care. Prior work suggests that undocumented immigrants are less likely to visit a physician or have a usual source of medical care than native-born Mexicans (e.g. Ortega et al. 2007). In the event that U.S. health care or insurance is unavailable, we might expect health selection to be driven by migrants seeking medical attention in their country of origin. Alternatively, we know that individuals in poor health subsequently experience declines in income and labor supply (Smith 2004). If labor

migrants in comparably worse health work for fewer hours (or no hours at all), the incentives for remaining in the U.S. are likely to decline. As such, they may return to Mexico to find other employment or income.

To look for evidence of these pathways, we analyze data from two surveys—the first draws on adults returning to Mexico and the second draws on Mexican immigrants residing in the U.S. We believe that by shedding light on this vulnerable and mobile population, the results will also inform our understanding of health and stratification across borders.

Data and Method

We employ two data sources: (1) the Migrante Project, which includes three waves of cross-sectional surveys spanning from 2009 to 2013, and (2) the California Health Interview Survey (CHIS), where we use cross-sectional surveys in 2007, 2009, and 2011-2012.

The Migrante Project comprises three cross-sectional surveys that sampled Mexican migrants traveling through the Tijuana-San Diego border region; the first of which focused on HIV and migration (2009-10) and the latter two focused on health care access and utilization (2011; 2013). The study was designed with collaboration from the University of Wisconsin – Madison, the Center for Behavioral Epidemiology and Community Health at San Diego State University, and the Colegio de la Frontera Norte and Mexico Section of the US-Mexico Border Health Commission in Tijuana, Mexico.

Migrante data were deliberately collected from adults born in Mexico, representing four migrant flows: 1) those returning to Mexico from the United States, 2) migrants traveling north from Mexican regions, 3) individuals arriving to the Tijuana area from other border regions, and 4) unauthorized migrants who were deported by the U.S. Border Patrol. Respondents were sampled in such venues as the Tijuana International Airport, bus stations, and the main deportation center. For the purposes of this project, we focus on *return migrants*, which we define as individuals surveyed at the border who were voluntarily returning to Mexico after residing in the U.S. In 2013, the Tijuana-San Diego area concentrated about 40% of the Mexican migrant southbound flow, making this area a major point of return. Detailed information pertaining to migration history, socioeconomic characteristics, as well as health and health care utilization are collected.

The CHIS comprises a series of cross-sectional surveys of individuals in California, collected every two years since 2001 and representative of the entire state, including a large sample of Mexican immigrants. We use the three most recent waves available, from 2007 through 2012. The CHIS data is collected using a probability sampling frame, based on landline and cell phone directories through which a single adult in a household is interviewed concerning individual, family, and health characteristics.

Our first analysis measures differences in health status between Mexican migrants who remain in the U.S. (CHIS) and those who leave (Migrante). In Table 1, we summarize the differences in age distribution, health insurance, and self-reported health between Mexican immigrant residents in the US (CHIS 2013) and emigrants returning to Mexico while in transit (Migrante 2013). These figures suggest that immigrants that ultimately return back to Mexico are possibly older, less likely to be insured, and more likely to report being in worse health. In our analysis, we specifically predict the probability of leaving the U.S. by health conditions, controlling for duration of stay as well as other factors correlated with both health and mobility. In this way, our study replicates analyses examining the salmon-bias hypothesis (e.g. Bostean et al. 2013). Unlike past scholarship—where emigrants are sampled long after their return journey—we identify Mexican migrants the moment they cross the border. This approach reduces the bias associated with observing health status after return migration, particularly if the consequences of emigration later affect health. Thus, observing the health of return migrants *before* settlement is ideal.

We then consider evidence for mechanisms driving this pattern of return migration. We focus on two potential pathways: (1) health care availability/access and (2) unemployment or other socioeconomic limitations.

Table 1. Demographic and health characteristics for Mexican immigrant residents in the US and emigrants returning to Mexico.

	CHIS (2011)	**Migrante (2013)**
	Mexican immigrants, living in California	**Mexican immigrants returning to Mexico**
n	4,372	676
Age (%)		
18-64	92.8	91.4
65+	7.2	8.6

Healthcare Access and Utilization in US (%)		
Uninsured all or part year (age 18-64)	46.1	55.1
Health Outcomes (%)		
Fair or poor health	36	57.4

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