



Smoking selectivity among Mexican immigrants to the United States using binational data, 1999–2012



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ABSTRACT

Mexican immigrants have lower smoking rates than US-born Mexicans, which some scholars attribute to health selection—that individuals who migrate are healthier and have better health behaviors than their non-migrant counterparts. Few studies have examined smoking selectivity using binational data and none have assessed whether selectivity remains constant over time. This study combined binational data from the US and Mexico to examine: 1) the extent to which recent Mexican immigrants (<10 years) in the US are selected with regard to cigarette smoking compared to non-migrants in Mexico, and 2) whether smoking selectivity varied between 2000 and 2012—a period of declining tobacco use in Mexico and the US. We combined repeated cross-sectional US data ($n = 10,901$) on adult (ages 20–64) Mexican immigrants and US-born Mexicans from the 1999/2000 and 2011/2012 National Health Interview Survey, and repeated cross-sectional Mexican data on non-migrants ($n = 67,188$) from the 2000 Encuesta Nacional de Salud and 2012 Encuesta Nacional de Salud y Nutrición. Multinomial logistic regressions, stratified by gender, predicted smoking status (current, former, never) by migration status. At both time points, we found lower overall smoking prevalence among recent US immigrants compared to non-migrants for both genders. Moreover, from the regression analyses, smoking selectivity remained constant between 2000 and 2012 among men, but increased among women. These findings suggest that Mexican immigrants are indeed selected on smoking compared to their non-migrating counterparts, but that selectivity is subject to smoking conditions in the sending countries and may not remain constant over time.

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1. Introduction

Latinos in the United States, particularly immigrants, have lower mortality rates and better health outcomes than more socioeconomically advantaged groups—a finding called the “Hispanic Paradox” (Markides and Coreil, 1986). Evidence for the paradox has been strongest among Mexican immigrants (Palloni and Arias, 2004), who comprise the majority of Latino immigrants to the US (Stepler and Brown, 2015). Recent research suggests that the lower smoking prevalence among Mexican immigrants compared to other groups may account for this mortality advantage (Fenelon, 2013). A major explanation for these smoking behaviors is the health selection hypothesis, which posits that individuals who migrate are healthier and have better health behaviors compared to those who do not migrate (Riosmena et al., 2013). Health selection is most accurately tested using binational data to compare recent immigrants to non-migrants in the origin country. However, most research on health selection has only been able to measure selection indirectly using US-based data; differences between

immigrants and the US-born are usually attributed to health selection. A small number of binational studies have examined health selection in outcomes such as obesity, disability, other physical health measures, and self-rated health (Angel et al., 2008; Bostean, 2013; Ro and Fleischer, 2014; Rubalcava et al., 2008), but binational work on smoking is limited (Sudhinaraset, 2015).

The few studies examining smoking have found mixed evidence of selectivity. One study found no differences in current smoking between Mexican immigrants to the US and their non-migrating counterparts in Mexico; this study used Mexico data from 2001 and US data from 1997 to 2007 (Riosmena et al., 2013). Another found lower smoking prevalence among Mexican immigrants than among Mexicans, using Mexico data from 2002 to 2003 and US data from 2006 to 2007 (Bosdriesz et al., 2013). However, research to date has not considered how changes in the sending country tobacco control environment may affect smoking selectivity over time. This is a potentially significant oversight for smoking and Mexican immigrants in particular, as there have been several important tobacco control policy changes in Mexico within the last decade. In 2004, Mexico ratified the Framework Convention on Tobacco Control, and in 2008 the Mexican legislature passed the General Tobacco Control Law, which catalyzed several tobacco control policies,

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including higher taxes, stronger health warning labels, and smoke-free policies (Ramírez-Barba et al., 2008). Overall smoking prevalence in Mexico declined from 28% in the late 1990s (Tapia-Conyer et al., 2001) to 22% in 2011 (Encuesta Nacional de Adicciones, 2011). During this same period, there was also a decrease in smoking in the US, including among Mexicans in the US: current smoking prevalence among Mexicans in the US decreased from 25% to 17% for men and from 13% to 9% for women between the periods 1992–1996 and 2003–2007 (Blanco et al., 2014).

In the context of tobacco control and subsequent smoking declines in Mexico, it is unclear whether smoking selectivity among Mexican immigrants to the US has remained constant. If the decline in smoking in Mexico is reflected among recent immigrants in the US, there are three possible scenarios. In the first, smoking selectivity may decrease as the heterogeneity between immigrants and non-migrants diminishes. In other words, there is less variation in smoking prevalence in Mexico overall, truncating differences between immigrants and non-migrants. This could occur as a result of restrictive smoking policies that reduce smoking among non-migrants to a greater extent. For instance, urban residents are more likely to smoke, but less likely to migrate. If smoking restrictions, such as smoke-free air laws, had a greater effect on urban-dwelling, non-migrants' smoking behaviors, this would decrease the smoking difference, and therefore smoking selectivity, between migrants and non-migrants. In the second scenario, there may be no change in smoking selectivity if the reduction in smoking prevalence is similar in magnitude for immigrants and non-migrants. Finally, smoking selectivity may increase if the decline in smoking prevalence is concentrated among immigrants and not their non-migrating counterparts. This could happen if individuals who think they may migrate practice better health behaviors (e.g., do not smoke) in anticipation of future opportunities (Kennedy et al., 2006). To test these potential dynamics in smoking selectivity, multiple time points of binational data from the US and Mexico are needed.

Migrants are also selected in terms of socio-demographic characteristics including gender, age, education, employment, and place of residence within Mexico (Van Hook et al., 2012). To account for these differences, we must estimate individuals' likelihood of migrating. Thus, an ideal test of smoking selectivity compares recent immigrants in the receiving country to non-migrants in the sending country by their migration likelihood. If selectivity in smoking exists, we would expect the smallest difference in smoking prevalence to be between recent US immigrants and non-migrants with high migration likelihood, and the largest differences to be between recent US immigrants and non-migrants with low migration likelihood. There may also be a gradient among non-migrating individuals, such that those with the highest migration likelihood will have the lowest smoking prevalence and those with the lowest migration likelihood will have the highest.

Finally, the processes driving both smoking and migration are gendered. Mexican women have much lower smoking prevalence than men (Christopoulou et al., 2013; Jamal et al., 2014). The factors influencing smoking behaviors also differ by gender, with age and educational gradients in smoking differing for men and women (Christopoulou et al., 2013). Furthermore, women are more likely to migrate to follow a spouse, whereas men are most likely to migrate for employment, which suggests that the migration selection mechanisms differ for men and women (Cerrutti and Massey, 2001; Massey et al., 2006). Therefore, smoking selectivity patterns should be examined separately for men and women.

This study examines: 1) the extent to which Mexican immigrants to the US are selected with regard to cigarette smoking, and 2) whether smoking selectivity varies between 2000 and 2012. Addressing the first question, we hypothesize that: (a) recent Mexican immigrants in the US will have lower smoking prevalence than Mexican nationals, and (b) the greatest difference will be between recent immigrants and

non-migrants with lowest migration likelihood. Addressing the second question, we test three competing hypotheses about changes in smoking selectivity between 2000 and 2012: greater smoking selectivity, less selectivity, or no change in selectivity. Finally, due to the gendered patterns of smoking and migration, we expect differences between men and women in these patterns over time.

2. Methods

2.1. Data sources

We constructed a binational data set from the 1999/2000 and 2011/2012 waves of the US National Health Interview Survey (NHIS) (NCHS, 2012), the 2000 Mexican National Health Survey (ENSA) (Olais et al., 2003; Valdespino et al., 2003), and the 2012 Mexican National Health and Nutrition Survey (ENSANUT) (Gutierrez et al., 2012). The years were chosen based on availability of the Mexican surveys for the time periods before and after implementation of the tobacco control policies. In order to ensure adequate sample size for Mexican immigrants, we combined data from two waves of NHIS to correspond with the Mexican datasets. All surveys were nationally representative, cross-sectional, household surveys conducted in their respective countries. All NHIS data were downloaded from the Integrated Health Interview Series (IHIS) (Minnesota Population Center and State Health Access Data Assistance Center).

Adults aged 20 to 64 years with data on smoking status and relevant covariates were included in the sample. From NHIS, we included all respondents who self-identified as Mexican or Mexican-American. Our final sample size was 5020 for 1999/2000 NHIS; 5881 for 2011/2012 NHIS; 37,447 for 2000 ENSA; and 29,741 for 2012 ENSANUT. We dropped 346 cases (251 from 1999/2000 NHIS, 95 from 2011/2012 NHIS) with missing information on covariates.

2.2. Variables

2.2.1. Smoking status

Smoking was coded into three categories: current, former, and never smokers. A current smoker was classified according to whether a person had smoked at least 100 cigarettes in his/her lifetime and was currently smoking; a former smoker had smoked at least 100 cigarettes in his/her lifetime but was not currently smoking; and a never smoker had never smoked or smoked fewer than 100 cigarettes in his/her lifetime (CDC, 2015).

2.2.2. Migration status

Mexicans in the US (from NHIS) were classified as recent immigrants if they immigrated to the US from Mexico in the past 9 years. We also included additional comparison groups of longer-term Mexican immigrants (have resided in US for 10 or more years), and US-born Mexicans. Mexican nationals (from Mexico ENSA and ENSANUT) were classified as having low, medium, or high likelihood of migrating to the US. Because we could not directly assess whether respondents had ever migrated to the US in the ENSA or ENSANUT, we estimated migration likelihood for Mexican nationals using data from the 2000 and 2010 Mexican Censuses, downloaded from the Integrated Public Use Microdata Series International (Minnesota Population Center). We coded whether someone in the household had gone to live in the US in the past five years as our marker of household migration, which has been used to approximate migration likelihood in previous studies (Buttenheim et al., 2010; Ro and Fleischer, 2014). In each Mexican Census dataset, we regressed household migration on age, age squared, gender, marital status, education, employment, state-level indicator variables, municipal-level migration rate, and urbanicity due to their relevance to Mexico-US migration (Massey and Espinosa, 1997; Van Hook et al., 2012). We used a logistic regression model with robust standard errors, and from this, we predicted the log-odds of migration for

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