

# Healthy Aging among Older Mexican Immigrants

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## Abstract

A large literature has documented the so-called Hispanic Health Paradox (HHP), that is, the epidemiological finding that some health outcomes of Hispanics residing in the United States are comparable to, and in some cases better than, those of non-Hispanic whites. In this paper, we use nationally-representative data from the Health and Retirement Study (HRS) to examine the evidence in support of the HHP for Mexican-born men and women above age 50 living in the US. Analyses based on self-reports of diagnoses of chronic conditions and health behaviors yield evidence consistent with a weak form of the HHP for all health outcomes in the sample of males. Instead, Mexican immigrant women have significantly higher odds of diabetes than NH whites. Overall, Mexican immigrant men have a more favorable health profile, relative to their non-Hispanic white counterparts, than do Mexican immigrant women. The disparity between genders may reflect actual health differences. It may also be a data artifact due to the fact that Mexican immigrant women are more likely than men to interact with the healthcare system, and hence less likely to have undiagnosed health problems. Using indicators of chronic conditions based on biomarkers and anthropomorphic measures available in the HRS, we find evidence consistent with underdiagnoses of diabetes for both Mexican immigrant men and women and of hypertension for Mexican immigrant men. The weak form of the HHP holds for some health outcomes but not others, with Mexican immigrants of both genders displaying an advantage in hypertension, no advantage in obesity, and a disadvantage in diabetes. Moreover, the health disparities between Mexican immigrant men and women disappear once the biomarker-based measures are considered.

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## Introduction

Previous research has shown that the Hispanic population in the United States displays favorable mortality profiles relative to non-Hispanic (NH) whites (Hummer et al., 2000; Markides and Eschbach, 2005; Ruiz et al., 2013, Sorlie et al., 1993). This phenomenon is deemed paradoxical because of Hispanics' generally disadvantaged socioeconomic composition and is referred to as the "Hispanic Mortality Paradox." The Hispanic mortality advantage has been found to vary by nativity and across national subgroups and appears to be strongest among foreign-born Mexicans ("Mexican immigrants"), who are the focus of this study (Markides et al., 2007; Palloni and Arias, 2004). Few studies have explored differences in the Hispanic mortality advantage by gender. Among those, Singh and Siahpush (2001) find similar decreases in all-cause mortality risk for both Hispanic men and women relative to NH whites. Among foreign-born Mexicans, Palloni and Arias (2004) find that the mortality advantage is stronger for men than for women, and only significant for the former.

The Hispanic advantage extends to some chronic health outcomes and health behaviors. Because socioeconomic status and health are positively related (Marmot 2002; Diez-Roux et al., 2004) and Hispanics have below-average socioeconomic status, this phenomenon is commonly known as the Hispanic health Paradox (HHP). In some cases, the Hispanic advantage only becomes apparent after controlling for socioeconomic status. This weaker form of the HHP posits that Hispanic immigrants have less unfavorable health relative to NH whites with similar socioeconomic characteristics.

Evidence consistent with the HHP is most evident for hypertension, particularly among Mexican immigrants (Riosmena et al., 2012; Singh and Siahpush, 2002). The weaker version of the HHP has been found to hold for smoking behavior (Riosmena et al., 2012; Singh and Siahpush, 2002). Instead, Hispanic immigrants do not appear to have a health advantage in disability in old age and a predisposition to dementia (Casanova and Aguila, 2019; Eschbach et al., 2007; Markides et al., 2007). For other health outcomes such as diabetes and obesity, the results are conflicting and likely depend on the strength of acculturation effects in the sample considered, given that the health profile of immigrants tends to worsen as they spend more time in the United States (Antecol and Bedard (2006); Beard et al., 2009; Riosmena et al., 2012).

Studies that have disaggregated the Hispanic population by gender have found that women tend to have relatively worse health outcomes than men, relative to their NH white counterparts. For example, Antecol and Bedard (2006) found that, upon arrival in the United States, both Hispanic immigrant men and women had a lower incidence of being overweight than Hispanic natives, but women converged to the BMIs of their US-born counterparts much faster than men. Markides et al. (2007) report higher disability rates in old age for Mexican immigrants than NH whites, but the gap is substantially larger for women than men.

In this paper, we use nationally-representative data from the Health and Retirement Study (HRS) to study gender differences in health disparities between Mexican immigrants and NH whites in a sample of individuals above age 50. We first replicate earlier analyses that have looked for evidence of the HHP using data on self-reported health conditions. Analyzing self-reports of diagnoses of chronic conditions and health behaviors, we find evidence consistent with a weak form of the HHP for all health outcomes in the sample of males. Instead, Mexican immigrant women have significantly higher odds of diabetes than NH whites. Overall, Mexican immigrant men have a more favorable health profile, relative to their non-Hispanic white counterparts, than do Mexican immigrant women.

As Read and Reynolds (2012) have pointed out, results based on self-reports are difficult to interpret. The disparity between genders may reflect actual health differences, but it may also be a data artifact due to the fact that Mexican immigrant women are more likely than men to interact with the healthcare system, and hence less likely to have undiagnosed health problems. To address this issue, we take advantage of a subset of the HRS data for which biomarker data from blood tests and blood pressure readings, as well as height and weight measurements, are available. For this subsample, we can construct indicators of chronic conditions based on both self-reported diagnoses and clinical tests and anthropomorphic measurements. Re-running our analysis on both self-reported and biomarker-based indicators, we find evidence consistent with underdiagnoses of diabetes for both Mexican immigrant men and women and of hypertension for Mexican immigrant men. The weak form of the HHP holds for some health outcomes but not others, with Mexican immigrants of both genders displaying an advantage in hypertension, no advantage in obesity, and a disadvantage in diabetes. Moreover, the health disparities between Mexican immigrant men and women disappear once the biomarker-based measures are considered.

Overall, the results from this study underscore the need to combine self-reported data on health diagnoses with information obtained from biomarkers in order to draw conclusions about health disparities for Mexican immigrants. Relying only on the former overstates the gender gap in health between Mexican immigrant men and women. The findings also have broader policy implications. Interventions aimed at improving the health of immigrant men and women should focus on removing the obstacles—from language barriers to affordability and access to health insurance and cultural norms on gender roles that may make immigrant men less likely to seek care—leading to underdiagnoses of certain conditions.

The rest of the paper is organized as follows. Section 1 presents the data, outcome variables, and covariates and describes the empirical methodology. Section 2 presents estimates of health disparities between Mexican immigrants and NH whites. In section 3, the models are re-estimated for a subsample of individuals for whom biomarkers and anthropomorphic measurements are available; and section 4 concludes.

## **1. Data and Methods**

The data used in the empirical section come from the Health and Retirement Study (HRS), a nationally representative biennial panel survey of individuals aged 50 years and older living in the United States and their spouses. The first wave is from 1992. Similar to other surveys in the U.S., the HRS sampling strategy leads to an oversample of Hispanics, in general, and Mexican-Americans specifically (Ofstedal and Weir, 2011). The core HRS interview is offered in English or Spanish.

The variables used in the main analysis are drawn from the RAND HRS Longitudinal File 1992-2016 v1 (Bugliari et al., 2019). This is a large, user-friendly subset of the HRS that combines data from all waves, adds information that may have been provided by the spouse to the respondent's record, and has consistent imputation of financial variables. To identify Mexican-born immigrants, we complement the RAND-HRS data with information on the country of origin from the RAND HRS FAT files (RAND HRS, 2020). We restrict the core dataset to individuals aged 50 to 80 for whom demographic information is available. The subsample of men includes 57,296 observations for Non-Hispanic whites and 3,224 for Mexican immigrants, while that of women includes 65,839 observations for Non-Hispanic whites and 3,649 for Mexican immigrants. To test whether the results are driven by diagnosis rates of chronic conditions, we restrict our analysis to waves 8 to 12 (2006-2014) from the RAND HRS dataset. For those waves, biomarkers and anthropometric measurements are available for a random subset of the sample.

### **Outcome Variables**

The self-reported indicators of diabetes and hypertension are based on survey questions asking the respondent if they have ever been told by a doctor that they had either condition (1=yes, 0=no). The self-reported obesity indicator is constructed using self-reported height and weight to compute a respondent's BMI. We classify those with a BMI > 30 as obese (WHO, 2015). Functional status is measured with an indicator equal to 1 if the individual has difficulty performing one or more of a list of 6 activities of daily living (ADL), including bathing, dressing, eating, getting into or out of bed, and sitting down or standing up from the toilet. To capture unhealthy behaviors, we include a measure of whether the individual currently smokes (1=yes, 0=no).

The biomarker-based health indicators are constructed as follows. The indicator for diabetes is based on the blood level of Glycosylated hemoglobin (HbA1c), an indicator of glycemic control over the past two to three months. High blood concentrations of HbA1c indicate poor control of the levels of glucose in the blood. The biomarker-based diabetes indicator is equal to 1 for individuals with HbA1c above 6.5%, the recommended cutoff point for diagnosing the condition. (WHO, 2011). The indicator for hypertension is based on three blood pressure measurements performed on HRS respondents at 45-second intervals. The

measurements are performed on the respondent's left arm using an Omron HEM-780 Intellisense Automated blood pressure monitor with ComFit cuff. Systolic and diastolic blood pressure readings are recorded for each measurement (Crimmins et al., 2008). We computed the average of the three readings of systolic and diastolic blood pressure. Individuals are classified as having hypertension when the average systolic reading is greater or equal to 140, or the average diastolic reading is greater or equal to 90 (Whelton et al., 2017). The biomarker-based obesity indicator is based on direct measures of height and weight taken by HRS interviewers. Those are used to construct BMI, and the same threshold for obesity is used as in the self-reported measure ( $BMI > 30$ ).

### **Covariates**

The set of covariates includes a quadratic polynomial in age; a dummy variable measuring whether the respondent is married or lives with a partner (1=yes, 0=no); four education dummies measuring whether the individual (1) has not completed high school, (2) is a high-school graduate, (3) has some college education, and (4) graduated from college, respectively; and five income dummies measuring whether the household belongs to each of 5 household income quintiles. The "Mexican immigrant" indicator is equal to 1 for Mexican-born individuals currently residing in the U.S. and 0 for NH whites.

### **Methods**

We estimate logistic regressions to predict the probability that an individual has any of the chronic conditions considered or currently smokes. All regressions include an indicator equal to 1 if the individual is a Mexican immigrant and 0 if the individual is NH white. Odds ratios for this variable are reported in the results section.

In all models, we control for age and age squared to standardize for differences in age composition between groups. Specification II controls for additional socioeconomic factors described above. All regressions are estimated separately by gender and include survey-wave fixed effects.

### **Main Sample**

Table 1 shows descriptive statistics for Mexican immigrants and NH whites stratified by gender. Mexican immigrants of both genders were, on average, about four years younger than NH whites and somewhat more likely to live in a couple.

Education levels were substantially lower in the sample of Mexican immigrants, where the highest educational level was less than high school for 76 percent of men and 78 percent of women, and only 9 percent of men and 8 percent of women had attended college. In contrast, among NH whites, just 13 percent

of men and women had an educational level below high school, and 52 percent of men and 46 percent of women had at least some college. The Mexican immigrant sample was also significantly poorer, with more than two-thirds of men and women reporting a value of household income in the 1st and 2nd quintiles of the household income distribution, compared to less than one-third of NH white men and 34 percent of NH white women. The lower levels of educational attainment and household income of Mexican immigrants align with existing evidence of lower SES for Hispanics living in the U.S., relative to NH whites (Jiménez, 2011; Williams and Collins, 1995).

#### **[TABLE 1 ABOUT HERE]**

The prevalence of undesirable health outcomes and behaviors was generally higher among Mexican immigrants than NH whites, and Mexican immigrant women were generally more disadvantaged relative to their NH white counterparts than Mexican immigrant men. Based on self-reported outcomes, Mexican immigrant men had a 6 percentage-point higher prevalence of diabetes and a 5 percentage-point higher prevalence of obesity. They were 7 percentage points more likely to report one or more functional limitations and 3 percentage points more likely to be current smokers. However, consistent with previous findings such as Riosmena et al. (2013), they displayed an advantage in hypertension relative to NH white men, with a 9 percent lower prevalence.

Mexican immigrant women were 6 percentage points less likely to smoke than NH white women but displayed a significant disadvantage in all other health outcomes. They had a 22 percent higher prevalence of diabetes and a 12 percent higher prevalence of obesity. Unlike men, they did not display an advantage in hypertension, with a 4 percentage-point higher likelihood of reporting a diagnosis than NH white women. They were also 12 percentage points more likely to report one or more ADLs.

#### **Sample using Biomarkers**

Table 2 shows descriptive statistics for the subsample of Mexican immigrants and NH whites for which data on diabetes, hypertension, and obesity based on biomarkers and anthropomorphic measurements were available. The subsample of Mexican immigrants that provide biomarker information was somewhat younger than the full sample from table 1. They were also more likely to live in a couple, while the subsample of NH whites was less likely to live in a couple. Both Mexican immigrants and NH whites in the subsample with biomarkers were slightly better educated and had somewhat higher household income.

#### **[TABLE 2 ABOUT HERE]**

The subsample with biomarkers displayed a disadvantaged health profile relative to the full sample in terms of self-reported health outcomes, with a higher prevalence of diabetes, hypertension, and obesity

for all groups and genders. Among men, Mexican immigrants generally displayed a relatively worse health profile in the subsample with biomarkers relative to the full sample than NH whites, while the opposite was true among women.

The availability of biomarker-based measures in this subsample allows us to compare them to the self-reported measures. For diabetes and hypertension, a direct comparison is not possible. For these two conditions, the self-reported measure asks individuals about any previous diagnosis. Instead, the biomarker-based measure captures whether the respondent meets the criteria for diagnosis at the time of the interview. According to the CDC, approximately 50 percent of older individuals with a hypertension diagnosis are able to control the condition with medication or behavior modification and hence would not meet the criteria for diagnosis at the time of the interview (Fryar et al., 2017). Furthermore, close to 40% of individuals above age 65 with a diabetes diagnosis are able to maintain HbA1c levels below the 6.5% threshold used to construct our biomarker-based measure (Centers for Disease Control and Prevention, 2020). Hence, our biomarker-based measures should be interpreted as capturing uncontrolled hypertension and diabetes and would, therefore, be expected to be lower than those based on self-reports. This is indeed the case for hypertension. For diabetes, NH white men and women and Mexican immigrant women display significantly lower prevalence according to the biomarker measure. Instead, the prevalence of diabetes is statistically the same for Mexican immigrant men according to the two measures. This finding may reflect that the self-reported measure is artificially low as a result of underdiagnoses.

The self-reported and biomarker-based measures of obesity are constructed similarly. For the former, self-reported height and weight are used to compute BMI, while for the latter, we use height and weight measurements obtained by HRS interviewers. We find a significantly higher prevalence of diabetes according to the biomarker measure (5 percentage points higher for Mexican immigrant men, 10 for NH white men, 9 for Mexican immigrant women, and 7 for NH white women). The finding indicates that individuals tend to understate their weight (or overstate their height) in the self-reports, with some of those who meet the criteria for an obesity diagnosis potentially never having been formally diagnosed.

## **2. Results**

Table 3 compares health outcomes and health behaviors of Mexican immigrants with those of NH whites. Results for men are shown in column (1) and for women in column (3). The first panel of the table reports odds ratios computed adjusting only for age. Mexican immigrant men have 26% lower odds of reporting hypertension, consistent with the strong version of the HHP. Despite their lower SES, they do not have significantly different odds of smoking, which would be consistent with the weaker form of the HHP.

Although they seem to have a mild disadvantage on obesity (11% higher odds), it is not statistically significant. For all other outcomes, Mexican immigrant men fare statistically worse than NH whites, with 52% and 39% higher odds of reporting diabetes and at least 1 ADL, respectively.

**[TABLE 3 ABOUT HERE]**

Mexican immigrant women display an advantage in smoking behavior, with 54 lower odds of reporting current smoking than NH whites. They have significantly higher odds of reporting all other health outcomes, namely diabetes (257% higher odds), hypertension (39%), obesity (45%), and at least 1 ADL (72%).

Column (5) reports p-values for the test of equality of odds ratios across genders. The odds ratios for women are statistically higher than those obtained for men for all outcomes except for current smoking. For this outcome, the odds ratio is statistically significantly lower for women. Hence, with the exception of smoking behavior, Mexican immigrant women display a significantly more disadvantaged health profile, relative to NH whites, than do Mexican immigrant men.

As discussed earlier, failure to adjust for sociodemographic factors known to affect health outcomes may exaggerate the health disadvantage of Mexican immigrants (or lead to an understatement of their health advantage). Controlling for sociodemographic factors is also important to tease out potential differences in health advantages or disadvantages across genders, given that Mexican immigrant men have a more favorable socioeconomic composition than women—they tend to be more educated and have significantly higher household income, as shown in Table 4. The second panel of Table 3 reports odds ratios adjusted for socioeconomic and demographic characteristics. As expected, the magnitude of the estimated odds ratios decreases relative to those estimated in the first specification. Mexican immigrant men now display statistically significant advantages in hypertension (41% lower odds) and current smoking (52% lower odds) relative to NH whites. They also have a mild advantage in obesity and functional limitation (8 and 14 percent higher odds, respectively) and a somewhat higher odds of reporting diabetes (9%), but none of these differences are statistically significant. Consistent with previous findings (Riosmena et al., 2013), the results for men are consistent with the weak version of the HHP, whereby they have better or not statistically worse health outcomes than NH whites after controlling for socioeconomic factors.

Mexican immigrant women have 80% lower odds of smoking than NH white women. They have a slight advantage in hypertension (13% lower odds), and a slight disadvantage in obesity and functional disability (9 and 14 percent higher odds, respectively), but these differences are not statistically significant. Unlike Mexican immigrant men, however, they have 80% higher odds of reporting a diabetes diagnosis.



Hence, at least in terms of diabetes, the results for women are not consistent with the weak form of the HHP.

The p-values reported in column 5 indicate that the odds ratios in the sample of women are statistically higher than those obtained for men for all outcomes except current smoking. That is, Mexican immigrant women remain at a higher relative health disadvantage with respect to their NH white counterparts than do Mexican immigrant men even after controlling for socioeconomic status.

### **3. Biomarker-based health outcomes**

The analysis so far is based on self-reports of chronic conditions and health behaviors. Those are obtained from HRS questions asking respondents they have ever been told by a doctor that they have diabetes, hypertension, or obesity and to self-report whether they smoke or have difficulty performing certain activities. While most existing studies of migrant differentials in health outcomes have been based on self-reports, those can be problematic for two reasons. First, immigrants as a group tend to have lower rates of healthcare use than US-born individuals of comparable socioeconomic status (Fortuny and Chaudry, 2011; Singh and Siahpush, 2002). If lower care utilization results in lower rates of diagnosis of chronic conditions, the estimates of the odds ratios reported in Table 3 would be biased downwards (Barcellos et al., 2012). Second, the rate of underdiagnosis may vary across genders. Both US-born and Mexican-born immigrant women are more likely to utilize health care services than their male counterparts (Bustamante et al., 2010; Read and Smith, 2018). It has been suggested that women may appear to be less healthy because their higher rate of interaction with the healthcare system makes them more knowledgeable about their health ailments (Read and Reynolds, 2012).

The problems posed by the use of self-reported measures of health outcomes can be partly addressed by using health indicators based on biomarkers and anthropomorphic data. As discussed in section 2, the self-reported and biomarker-based measures of diabetes and hypertension are not directly comparable because the former aims to capture diagnoses while the latter fails to detect the condition in individuals who have been diagnosed but manage it appropriately with behavioral interventions and/or medication. Variables based on biomarkers, however, are less susceptible to underreporting. As such, they can help disentangle whether the relatively more disadvantaged health profile of Mexican immigrant women reflects actual health differences or is driven by higher healthcare use and/or lower under-reporting than among Mexican immigrant men.

Table 4 compares self-reported and biomarker-based health outcomes of Mexican immigrants with those of NH whites, using the subsample of HRS respondents for which biomarker and anthropomorphic data were available.

## [TABLE 4 ABOUT HERE]

### **Diabetes**

As was the case for the full sample, both Mexican immigrant men and women have higher odds of self-reporting a diabetes diagnosis (27% higher odds for men and 78% higher odds for women), but the difference is only statistically significant for women. Using the biomarker-based measure yields much higher odds ratios for both genders. Mexican immigrant men and women have 105% and 119% higher odds, respectively, of having a blood HbA1c level that meets the threshold for a diabetes diagnosis. In this case, the magnitude of the odds ratios for the two genders is not statistically significant.

The results for diabetes are not consistent with neither the strong nor the weak versions of the HHP. Both Mexican immigrant men and women have higher odds than NH whites of reporting a diabetes diagnosis—the difference is not statistically different for men, likely reflecting a lower rate of diagnosis among Mexican immigrant men because of their lower utilization of healthcare services. The biomarker-based measure shows that the prevalence of uncontrolled diabetes is about twice as high for Mexican immigrant men and women as it is for their NH white counterparts. This is consistent with epidemiological data showing a substantially higher prevalence of diabetes among Hispanics relative to NH whites (Mendola et al., 2018).

### **Hypertension**

In terms of hypertension, both Mexican immigrant men and women have an advantage relative to NH whites according to self-reported measures, although the difference is only statistically significant for men. With the biomarker-based measure, the trend is reversed. Mexican immigrant men have 16% lower odds of a blood pressure reading that meets the criteria for a hypertension diagnosis, and Mexican immigrant women have 30% lower odds. In this case, the difference is only statistically different for women. The odds ratios for the two genders are not statistically different.

These results replicate the advantage in hypertension for Mexican immigrant men relative to NH whites when using self-reported diagnoses (Riosmena et al., 2013), a finding that may reflect either actual underlying health differences or a lower rate of diagnosis among the former group as a result of their lower utilization of healthcare services. When the hypertension indicator based on biomarker data is considered, the advantage for Mexican immigrant men weakens and becomes statistically insignificant. That is, Mexican immigrant men are slightly (but not significantly) less likely to have uncontrolled hypertension than their NH white counterparts. Because healthcare utilization is significantly lower in the former group, the result is still consistent with the weak form of the HHP.

The results in the sample of females are also consistent with the weak form of the HHP. Despite the lower access and utilization of healthcare services, Mexican immigrant women are not more likely than their NH white counterparts to report a hypertension diagnosis and are significantly less likely to have uncontrolled hypertension.

## **Obesity**

There are no substantial differences between the results obtained with the two obesity measures. Mexican immigrant males have 10% higher odds of obesity based on the self-reported measure and 5 percent lower odds based on the biomarker, but none of the two odds ratios is statistically different from 1. Mexican immigrant women have higher odds of obesity both based on the self-reported measure (16%) and the biomarker (17%), but none of the differences is statistically significant. There are also no significant differences in the odds ratios for males and females.

The estimates from Table 4 confirm previous findings of similar obesity prevalence between Hispanics and NH whites (Hales et al., 2020) and, specifically, Mexican immigrants and NH whites (Riosmena et al., 2013).

## **4. Conclusion**

While analyses of self-reported indicators of diagnoses of chronic conditions reveal health disadvantages of Mexican immigrant women relative to Mexican immigrant men, those disparities disappear when indicators of chronic conditions based on biomarkers and anthropomorphic data are considered.

The results from this study underscore the need to combine self-reported data on health diagnoses with information obtained from biomarkers in order to draw conclusions about health disparities for Mexican immigrants. Relying only on the former overstates the gender gap in health between Mexican immigrant men and women. The findings also have broader policy implications. Interventions aimed at improving the health of immigrant men and women should focus on removing the obstacles—from language barriers to affordability and access to health insurance and cultural norms on gender roles that may make immigrant men less likely to seek care—leading to underdiagnoses of certain conditions.

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Table 1 Descriptive Statistics for Mexican Immigrants and Non-Hispanic Whites

	Mexican-born Immigrants	Non-Hispanic Whites	t test, P val	Mexican-born Immigrants	Non-Hispanic Whites	t test, P val
	% or Mean (SD)	% or Mean (SD)		% or Mean (SD)	% or Mean (SD)	
	Men			Women		
Covariates						
Age	62.41 (7.84)	66.03 (7.99)	0.00	61.74 (8.22)	65.62 (8.54)	0.00
Couple (1 = yes, 0 = no)	82.20	78.43	0.00	65.16	62.00	0.00
Education (1 = yes, 0 = no)						
Less than high-school	75.91	13.16	0.00	77.87	12.73	0.00
High-school graduate	14.85	34.39	0.00	14.51	41.47	0.00
Some college	6.12	22.78	0.00	4.73	24.71	0.00
College graduate or more	3.11	29.66	0.00	2.89	21.10	0.00
Household income						
1st quintile	41.42	7.89	0.00	51.08	14.16	0.00
2nd quintile	26.83	15.44	0.00	24.06	19.84	0.00
3rd quintile	17.80	21.53	0.00	13.67	21.57	0.00
4th quintile	10.13	25.51	0.00	7.74	21.74	0.00
5th quintile	3.81	29.62	0.00	3.45	22.69	0.00
Outcome variables (self-reported)						
Diabetes	25.43	19.55	0.00	36.41	14.63	0.00
Hypertension	44.15	53.12	0.00	53.68	49.91	0.00
Obesity	35.29	30.10	0.00	41.84	29.93	0.00
ADL (1 = 1 or more, 0 = none)	49.29	42.34	0.00	48.94	37.00	0.00
Current Smoking	17.62	15.05	0.00	8.54	14.83	0.00
No. Observations	1,994	37,310		2,494	47,565	

Note: SD=Standard deviation. Data from Health and Retirement Study (HRS), waves 5–12, years 2000–2014

Table 2. Descriptive Statistics for Mexican Immigrants and Non-Hispanic Whites (Subsample with biomarkers)

	Mexican-born Immigrants	Non-Hispanic Whites	t test, P val	Mexican-born Immigrants	Non-Hispanic Whites	t test, P val
	% or Mean (SD)	% or Mean (SD)		% or Mean (SD)	% or Mean (SD)	
	Men			Women		
Covariates						
Age	61.49 (7.38)	66.10 (8.21)	0.00	61.20 (7.76)	65.75 (8.31)	0.00
Couple (1 = yes, 0 = no)	84.79	76.91	0.00	65.95	61.66	0.02
Education (1 = yes, 0 = no)						
Less than high-school	72.54	9.86	0.00	74.23	10.03	0.00
High-school graduate	16.70	33.94	0.00	16.42	39.81	0.00
Some college	7.24	24.26	0.00	5.87	26.40	0.00
College graduate or more	3.53	31.94	0.00	3.47	23.76	0.00
Household income						
1st quintile	37.11	7.55	0.00	46.86	13.12	0.00
2nd quintile	28.57	14.79	0.00	24.17	19.45	0.00
3rd quintile	20.22	21.12	0.61	17.09	21.32	0.00
4th quintile	10.58	26.35	0.00	8.01	22.31	0.00
5th quintile	3.53	30.18	0.00	3.87	23.79	0.00
Outcome variables (self-reported)						
Diabetes	30.49	22.42	0.00	39.07	17.41	0.00
Hypertension	46.38	55.94	0.00	53.94	52.35	0.40
Obesity	40.56	32.06	0.00	44.04	33.27	0.00
Outcome variables (biomarkers)						
Diabetes	30.69	16.32	0.00	32.65	12.47	0.00
Hypertension	23.01	21.44	0.40	22.70	24.37	0.29
Obesity	45.13	42.23	0.20	52.62	40.71	0.00
No. Observations	539	9,108		749	11,850	

Note: SD=Standard deviation. Data from Health and Retirement Study (HRS), waves 8–12, years 2006–2014.

Table 3. Gender Gap between Mexican Immigrants and Non-Hispanic Whites controlling for Demographics and Socioeconomic Status.

	Men (1)	obs (2)	Women (3)	obs (4)	p-value (5)
<b>Specification I</b>					
Diabetes (self-reported)	1.523***	39,304	3.568***	50,059	0.000
Hypertension (self-reported)	0.739***	39,306	1.394***	50,065	0.000
Obesity (self-reported)	1.106	39,166	1.455***	48,848	0.000
ADL (1=1 or more,0=none)	1.389***	60,520	1.722***	69,488	0.000
Current Smoking	1.013	39,164	0.462***	49,893	0.000
<b>Specification II: sociodemographic controls</b>					
Diabetes (self-reported)	1.089	39,302	1.798***	50,059	0.000
Hypertension (self-reported)	0.594***	39,304	0.871	50,065	0.000
Obesity (self-reported)	0.923	39,164	1.092	48,848	0.024
ADL (1=1 or more,0=none)	0.861	39,360	1.139	50,115	0.001
Current Smoking	0.477***	39,163	0.208***	49,893	0.000

Note: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . Specification I controls for a quadratic polynomial in age. Specification II includes as additional controls an indicator for whether the respondent is married and dummies for 4 education categories and 5 income categories. In both specifications, the “Mexican immigrant” indicator is equal to 1 for Mexican-born individuals currently residing in the U.S., and 0 for NH whites. All regressions control for survey-wave fixed effects.



Table 4. Gender Gap between Mexican Immigrants and Non-Hispanic Whites using Biomarkers controlling for Demographics and Socioeconomic Status.

	Men (1)	obs (2)	Women (3)	obs (4)	p-value (5)
<b>Specification II: sociodemographic controls</b>					
Diabetes (selfreported)	1.266	8,337	1.777***	11,113	0.030
Diabetes (biomarker)	2.054***	8,337	2.192***	11,113	0.694
Hypertension (selfreported)	0.618***	9,647	0.844	12,599	0.024
Hypertension 2 (biomarker)	0.849	9,647	0.705***	12,599	0.258
Obesity (selfreported)	1.097	9,385	1.164	12,203	0.675
Obesity (biomarkers)	0.946	9,385	1.173	12,203	0.123

Note: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . Specification II includes as controls a quadratic polynomial in age, an indicator for whether the respondent is married, and dummies for 4 education categories and 5 income categories. The “Mexican immigrant” indicator is equal to 1 for Mexican-born individuals currently residing in the U.S., and 0 for NH whites. All regressions control for survey-wave fixed effects.