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Research Article

Effects of Foreign-Born and Length of U.S. Residency on Health Measures among Immigrants

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Abstract

Objectives: To examine the impact of immigration and acculturation on health and access to care among Los Angeles County residents to provide specific information on the health conditions and needs of immigrants to inform local health policy and public health program development and implementation.

Design: Using data from the 2011 Los Angeles County Health Survey, we examined the independent effects of being foreign-born and the length of U.S. residency on individuals' health behaviors, conditions, insurance coverage, and service utilization.

Results: After adjusting for the sociodemographic covariates, short-term immigrants have lower risks for all of the health conditions examined, while long-term immigrants are losing these health advantages, especially for high cholesterol and diabetes, as compared to non-immigrants. Although acculturation helps improve health insurance coverage and medication affordability, inadequate health insurance and difficulty navigating the health care systems remain to be challenges even for long-term immigrants. Despite acculturation, immigrants display lower risks for smoking, drinking, and drug use than non-immigrants.

Conclusion: The findings underline the importance of immigrant status in evaluating health disparities and design interventions, and the need to prevent the deterioration of health and preserve healthy behaviors and practices among immigrant populations.

INTRODUCTION

With the pass of the Affordable Care Act, state and local policy-focused efforts to expand access to health care services have been launched in many communities. These policies reflect the limitations of national policy to restrict immigrants' participation in federally funded programs such as Medicaid and the private health insurance exchanges. These limitations pose formative challenges to local jurisdictions such as Los Angeles County that has many foreign born individuals. Yet there is little information about the local immigrant population that would otherwise be useful for developing effective programs for engaging immigrants and bringing them into the health care system. Instead, local organizations use national studies to inform local policies and programs.

Over the years, research has shown that, regardless of country of origin and race/ethnicity, foreign-born immigrants are generally healthier than the native-born population when they first arrive in the United States (U.S.). But this healthy advantage, often referred to as "Healthy Immigrant Effect", disappears the longer immigrants live in the U.S. [1-5]. Length of U.S. residency is linked with acculturation that is associated with both behavioral and environmental changes affecting health [3-4]. As immigrants stay longer, many adopt changes in lifestyle and diet, face language and cultural barriers, poverty, and limited employment.

Many lack knowledge of the healthcare systems. These have been linked to the deterioration of health outcomes among immigrants over time [6-9]. Moreover, immigrants are less likely to have health insurance. They also use fewer health services, compared to U.S.-born individuals [10-16]. It remains unclear how these trends translate to the local level and are useful to policy makers and program planners. This study will help fill this gap and be a model for how other communities could tailor programs and policies to the needs of immigrant residents.

Studies of health disparities usually focus on racial/ethnic and socioeconomic differences, without considering the immigrant status. For example, Healthy People, the national health initiative focusing on reduction of health inequalities does not highlight the health problems facing U.S. immigrants [17-19]. In many surveillance systems, there is insufficient monitoring of health and disease patterns among the immigrant populations regardless of ethnic and national origins [20]. Yet the growing number of foreign-born residents in the U.S., coupled with the deterioration of health among immigrants is likely to have serious social, economic, and public health consequences. This is especially true of health care where immigrants generally have had lower access to care than native born Americans. For regions with large immigrant populations, better understanding of the impact of immigration and acculturation on people's health behaviors, outcomes, and access to services will improve health program planning, and contribute to a national strategy for reversing the deteriorating health of immigrant residents in the U.S. One of the unique features of this study is its focused examination of the situation in Los Angeles County.

Why Los Angeles County? Los Angeles County (LAC) has the largest number of immigrants of all U.S. counties. Over a third of the County's nearly 10 million residents are foreign-born immigrants, [21] almost three times the national share of 12.9% [22]. Since 1997, the LAC Department of Public Health periodically conducts a population-based random digit-dialed telephone survey. The Los Angeles County Health Survey (LACHS) provides information about the health of the County's non-institutionalized residents. The LACHS includes questions on birthplace and years living in the U.S. among other health related questions. The most recent data available were from the 2011 LACHS that offers an opportunity to study the health profile in LAC by immigrant status in comparison to U.S. born residents.

Using data from LACHS, we were interested in examining the "healthy immigrant effect" among LAC residents and to identify specific health conditions and behaviors that are more or less affected by immigration and acculturation than others. Our goal is to provide locally relevant information for policy and program development, which will also have implications for communities that experience increasing immigrant populations. This study has been reviewed and approved by the Institutional Review Board at both the University of Southern California and the LAC Department of Public Health.

MATERIALS AND METHODS

We analyzed data from the 2011 LACHS adult component of the survey. Households in LAC were selected using a random digit dial (RDD) protocol. A total of 8,036 adults aged 18 years and older were interviewed, 6,686 using a landline and 1,350 using a cell phone. Respondents in each household were randomly selected using a dual overlapping design including a RDD sample frame of all eligible LAC households with landline telephones, as well as a cross-sectional RDD cell phone sample frame of telephone numbers from LA County (based on county of the billing office). The sample design was considered "overlapping" because households that have both landline and cell phone service have a probability of being selected from both frames. Population weights were developed by calculating a design weight, a compositing factor to account for the overlapping dual frame sample design, and then raking to population control totals [23]. Population control totals come from the 2010 Census and the 2006-2010 American Community Survey data for LAC. The raking weighting methodology considered the distributions of 11 demographic, housing, and geographic characteristics of the control population to reduce biases from non-response and non-coverage in the survey [23].

Interviews were conducted in English, Spanish, Chinese (Mandarin and Cantonese), Korean and Vietnamese. About one fifth (19.5%) of all interviews were completed in non-English languages. The cooperation rate (percentage of the number of completed survey divided by the sum of completed, partially completed, and refusal or break off surveys) for the adult survey was 59.2% for landline survey, 70.8% for the cell phone survey, and 65.6% combined, based on guidelines provided in the Standard Definitions of the American Association for Public Opinion Research (AAPOR) [24]. The overall LACHS response rate (percentage of the number of completed survey divided by the sum of completed and partially completed surveys, the refusals, non-contacts, and the estimated eligible households in the unknown/other categories) for the adult survey was 34.8% for the landline survey, 23.1% for the cell phone survey, and 28.4% combined that is comparable to other large RDD phone surveys [23].

Study variables

To preserve the analytical power, we used as few categories as possible in defining each of the study variables to maximize the size of each subgroup. Residual responses of "Do not know" or "Refused" were excluded from the analysis.

Dependent variables

Health behaviors: Variables with dichotomized responses (Yes or No) selected for analysis including: smoking (smoked cigarettes every day or some days), drinking (had at least one drink of any alcohol beverage during past month), and drug use (used marijuana, prescription drug non-medically, methamphetamines, cocaine, or ecstasy in the past year).

Health conditions: We calculated body mass index (BMI) based on the self-reported weight and height measures and grouped the respondents as underweight/normal or overweight/obese. Other chronic health conditions were based on participants' reporting that they had ever been told by a doctor or other health professional that he/she had arthritis, diabetes, hypertension, depression/anxiety, or high cholesterol.

Health insurance coverage: We used two variables regarding

health insurance coverage, one for individuals under age 65 and the other for those 65 and older. We combined these two recoded variables into one with Yes or No responses to indicate whether respondents had any kind of medical insurance policy at the time of the interview including private or government programs for all ages 18 years and older.

Access to and utilization of health services: These variables were measured by the reported overall ease of using medical care (Easy or Difficult) and affordability of prescription medicine (Able or Unable). Utilization of health services was represented by whether or not the respondent had a regular source of care (Yes or No) and time gap since last dental visit (less than 12 months, 12 months or more).

Independent variables

Immigrant status: This was determined based on the responses to the question, "In which country were you born?" Individuals born in the U.S. were defined as non-immigrants, while immigrants were those born in foreign countries. The latter include naturalized U.S. citizens, authorized immigrants (those possessing proper documentation enabling them to live and work in the U.S.), and undocumented immigrants. Acculturation was measured using the question: "How many years have you lived in the United States?" This enabled us to designate the foreign-born individuals as: short-term immigrants who have lived in the U.S. for less than 15 years, and long-term immigrants who have lived in the U.S. for 15 years or more.

Sociodemographic characteristics: We grouped respondents into three groups: 18-24, 25-64, and 65+ years. Gender was defined as male or female. The 2011 LACHS provides recoded racial hierarchy, based on which we used Latino, White, African American, and aggregated the remaining (i.e., Asian/Pacific Islander, American Indian, White/American Indian, and Do not know/Refused) into Asian/Other due to their relative small shares. Educational attainment was defined as: high school or less, and college or more. Family incomes relative to the federal poverty level were: 0-199%, 200-399%, and 400+% representing the low, middle, and high income groups.

Data analysis

We conducted bivariate analysis to examine the distribution of the sociodemographic characteristics and immigrant status by health related variables. We applied the 2011 LACHS adult population weights to calculate the weighted population distribution. Ninety-five percent confidence intervals (95% CI) were calculated for each point estimate. The effect of immigration and acculturation on health risks was measured by the odds ratio (OR) of relative risk comparing short-term and long-term immigrants, respectively, to non-immigrants who serve as the reference group. Two logistic regression models were employed to obtain the OR estimates. One was unadjusted and the other was adjusted for the covariates of age, gender, race, education, and income. All analyses were conducted using SAS (version 9.2, SAS Institute Inc, Cary, North Carolina).

RESULTS

We examined the sociodemographic and health characteristics among the sample representing nearly 1.2 million short-term immigrants, 1.1 million long-term immigrants, and 3.9 million non-immigrants in LAC.

Table 1 shows the sociodemographic characteristics of immigrants and non-immigrants are different among LAC residents. The proportion of working age adults (ages 25-64) is much higher among immigrants (78.3% among short-term immigrants and 83.4% among long-term immigrants) than non-immigrants (63.9%). Among short-term immigrants, 3.6% are 65 years and older, as compared to 13.2% of long-term immigrants and 17.9% of non-immigrants. Latinos comprise over 60% of the LAC immigrant population, more than double their share in the non-immigrant population (27.8%). Short-term immigrants have much higher percentages of lower education and lower income (65.5% of high school or less and 74.5% of 0-199% FPL, respectively) as compared to non-immigrants (31.8% and 32.7%, respectively). Both measures improve with the length of stay in the U.S (59.6% and 57.5% respectively among long-term immigrants), more substantially with income than education.

Table 2 shows that the percentages of immigrants who are smokers, drinkers, and drug users are lower than non-immigrants. Long-term immigrants report even lower smoking and drug use rates than short-term immigrants. Moreover, the prevalence of chronic health conditions is lower among short-term immigrants than non-immigrants, but increases significantly among long-term immigrants. The prevalence of obesity/overweight is higher among long-term immigrants compared to non-immigrants (66.2% vs. 59.3%). Similarly long-term immigrants are more likely to have diabetes (12.0% vs. 9.2%), hypertension (25.6% vs. 27.5%), and high cholesterol (31.2% vs. 25.7%) compared to non-immigrants.

As immigrants live in the U.S. for longer period of time, their health insurance coverage and access to health services improve significantly. For example, insurance coverage increases from 52.1% among short-term immigrants to 70.8% among long-term immigrants; having regular source of care jumps from 65.1% among short-term immigrants to 80.0% among long-term immigrants. Still, long-term immigrants lag behind non-immigrants (84.7% for health insurance coverage, 82.8% in having regular source of care). Likewise, access to medical and dental care services improved significantly for long-term immigrants, there is still a lot more catch-up to do to match with the levels of non-immigrants (61.4% vs. 79.5% for medical care access, 50.0% vs. 63.7% for last dental visit within 12 months).

Table 3 summarizes the relative risk, with adjustment for sociodemographic confounders, between immigrants and non-immigrants on health related behaviors, conditions, insurance coverage, and access to services. Long-term immigrants are 30-40% less likely than non-immigrants to smoke, drink, and use drugs. Short-term immigrants have a clear health advantage of lower risk relative to non-immigrants, for developing health conditions such as obesity/overweight (60%), arthritis (50%), diabetes (60%), hypertension (30%), high cholesterol (60%), and depression (40%). However, these health advantages disappear among long-term immigrants as their risks approach or even exceed those of the non-immigrants. Although longer U.S. residency helps to improve the health insurance coverage and health service utilization, compared to non-immigrants,

Table 1: Sociodemographics of adult residents by immigrant status, Los Angeles County, 2011.

	Short-term Immigrants		Long-term immigrants		Non-immigrants		Total	
	(N=1,167,388)		(N=1,119,680)		(N=3,909,290)		(N=7,196,358)	
Demographics	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
Age	100.0		100.0		100.0		100.0	
18-24	18.1	(14.0 - 22.1)	3.4	(2.0 - 4.8)	18.3	(16.6 - 20.0)	13.9	(12.6 - 15.1)
25-64	78.3	(74.1 - 82.5)	83.4	(81.3 - 85.5)	63.9	(62.0 - 65.7)	72.0	(70.6 - 73.3)
65+	3.6	(2.0 - 5.2)	13.2	(11.5 - 14.9)	17.9	(16.7 - 19.1)	14.2	(13.3 - 15.1)
Gender	100.0		100.0		100.0		100.0	
Female	48.9	(44.1 - 53.7)	52.5	(49.6 - 55.4)	51.5	(49.7 - 53.4)	51.4	(49.8 - 52.9)
Male	51.1	(46.3 - 55.9)	47.5	(44.6 - 50.4)	48.5	(46.6 - 50.3)	48.6	(47.1 - 50.2)
Ethnicity	100.0		100.0		100.0		100.0	
Latino	62.5	(57.8 - 67.3)	61.8	(59.1 - 64.6)	27.8	(26.0 - 29.5)	43.4	(41.9 - 45.0)
White	8.4	(5.5 - 11.2)	13.6	(11.9 - 15.3)	48.6	(46.7 - 50.4)	31.8	(30.4 - 33.1)
African American	1.0	(0.1 - 1.9)	2.5	(1.5 - 3.5)	14.2	(12.9 - 15.5)	8.6	(7.8 - 9.4)
Asian/Other	28.1	(23.7 - 32.5)	22.1	(19.5 - 24.6)	9.5	(8.2 - 10.8)	16.2	(14.9 - 17.5)
Education	100.0		100.0		100.0		100.0	
High School or Less	65.5	(61.0 - 70.0)	59.6	(56.8 - 62.3)	31.8	(29.9 - 33.6)	45.4	(43.8 - 47.0)
College or More	34.5	(30.0 - 39.0)	40.4	(37.7 - 43.2)	68.2	(66.4 - 70.1)	54.6	(53.0 - 56.2)
Income	100.0		100.0		100.0		100.0	
Low	74.5	(70.4 - 78.6)	57.5	(54.7 - 60.3)	32.7	(30.9 - 34.6)	46.8	(45.3 - 48.3)
Middle	18.1	(14.3 - 21.9)	21.9	(19.6 - 24.2)	27.3	(25.7 - 29.0)	24.2	(23.0 - 25.5)
High	7.4	(5.3 - 9.5)	20.6	(18.4 - 22.8)	39.9	(38.2 - 41.7)	28.9	(27.7 - 30.2)

Table 2: Population distribution of health behaviors, conditions, insurance coverage, and access to services by immigrant status, Los Angeles County, 2011.

	Short-term Immigrants		Long-term immigrants		Non-immigrants		Total	
	(N=1,167,388)		(N=1,119,680)		(N=3,909,290)		(N=7,196,358)	
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
Health Related Behaviors								
Smoking	100.0		100.0		100.0		100.0	
Yes	15.0	(11.3 - 18.6)	11.9	(9.8 - 14.0)	16.0	(14.6 - 17.4)	14.6	(13.5 - 15.8)
No	85.0	(81.4 - 88.7)	88.1	(86.0 - 90.2)	84.0	(82.6 - 85.4)	85.4	(84.2 - 86.5)
Drinking	100.0		100.0		100.0		100.0	
Yes	44.1	(39.2 - 49.0)	42.3	(39.4 - 45.1)	59.9	(58.1 - 61.7)	52.1	(50.6 - 53.7)
No	55.9	(51.0 - 60.8)	57.7	(54.9 - 60.6)	40.1	(38.3 - 41.9)	47.9	(46.3 - 49.4)
Drug Use	100.0		100.0		100.0		100.0	
Yes	12.5	(9.1 - 15.9)	10.1	(8.1 - 12.1)	14.8	(13.3 - 16.2)	13.0	(11.9 - 14.1)
No	87.5	(84.1 - 90.9)	89.9	(87.9 - 91.9)	85.2	(83.8 - 86.7)	87.0	(85.9 - 88.1)
Health Conditions								
BMI	100.0		100.0		100.0		100.0	
Normal/Underweight	45.1	(40.0 - 50.2)	33.8	(31.0 - 36.5)	40.7	(38.8 - 42.6)	39.3	(37.8 - 40.9)
Obese/Overweight	54.9	(49.8 - 60.0)	66.2	(63.5 - 69.0)	59.3	(57.4 - 61.2)	60.7	(59.1 - 62.2)
Arthritis	100.0		100.0		100.0		100.0	
Yes	8.6	(6.1 - 11.0)	17.0	(15.0 - 19.0)	20.3	(19.0 - 21.7)	17.4	(16.4 - 18.5)
No	91.4	(89.0 - 93.9)	83.0	(81.0 - 85.0)	79.7	(78.3 - 81.0)	82.6	(81.5 - 83.6)
Diabetes	100.0		100.0		100.0		100.0	

Yes	5.9	(3.7 - 8.1)	12.0	(10.3 - 13.7)	9.2	(8.2 - 10.2)	9.5	(8.6 - 10.3)
No	94.1	(91.9 - 96.3)	88.0	(86.3 - 89.7)	90.8	(89.8 - 91.8)	90.5	(89.7 - 91.4)
Hypertension	100.0		100.0		100.0		100.0	
Yes	9.8	(7.1 - 12.4)	25.6	(23.1 - 28.0)	27.5	(25.9 - 29.1)	24.1	(22.8 - 25.3)
No	90.2	(87.6 - 92.9)	74.4	(72.0 - 76.9)	72.5	(70.9 - 74.1)	75.9	(74.7 - 77.2)
High cholesterol	100.0		100.0		100.0		100.0	
Yes	15.6	(12.2 - 18.9)	31.2	(28.7 - 33.8)	25.7	(24.2 - 27.2)	25.7	(24.4 - 26.9)
No	84.4	(81.1 - 87.8)	68.8	(66.2 - 71.3)	74.3	(72.8 - 75.8)	74.3	(73.1 - 75.6)
Depression/Anxiety	100.0		100.0		100.0		100.0	
Yes	10.4	(7.5 - 13.2)	16.6	(14.5 - 18.6)	20.1	(18.6 - 21.6)	17.5	(16.4 - 18.6)
No	89.6	(86.8 - 92.5)	83.4	(81.4 - 85.5)	79.9	(78.4 - 81.4)	82.5	(81.4 - 83.6)
Health Insurance Coverage								
Insurance	100.0		100.0		100.0		100.0	
Yes	52.1	(47.2 - 57.0)	70.8	(68.1 - 73.5)	84.7	(83.2 - 86.2)	75.4	(73.9 - 76.8)
No	47.9	(43.0 - 52.8)	29.2	(26.5 - 31.9)	15.3	(13.8 - 16.8)	24.6	(23.2 - 26.1)
Access to Health Services								
Medical care accessibility	100.0		100.0		100.0		100.0	
Easy	42.4	(37.5 - 47.3)	61.4	(58.5 - 64.4)	79.5	(77.8 - 81.2)	68.4	(66.8 - 69.9)
Difficult	57.6	(52.7 - 62.5)	38.6	(35.6 - 41.5)	20.5	(18.8 - 22.2)	31.6	(30.1 - 33.2)
Last visited dental care	100.0		100.0		100.0		100.0	
< 12 months	39.5	(34.8 - 44.2)	50.0	(47.1 - 52.8)	63.7	(61.9 - 65.6)	55.8	(54.2 - 57.3)
>= 12 months	60.5	(55.8 - 65.2)	50.0	(47.2 - 52.9)	36.3	(34.4 - 38.1)	44.2	(42.7 - 45.8)
Prescription meds affordability	100.0		100.0		100.0		100.0	
Able	82.4	(78.7 - 86.0)	84.8	(82.6 - 87.0)	85.2	(83.8 - 86.7)	84.6	(83.5 - 85.8)
Unable	17.6	(14.0 - 21.3)	15.2	(13.0 - 17.4)	14.8	(13.3 - 16.2)	15.4	(14.2 - 16.5)
Regular Source of Care	100.0		100.0		100.0		100.0	
Yes	65.1	(60.4 - 69.8)	80.0	(77.5 - 82.5)	82.8	(81.2 - 84.3)	79.1	(77.7 - 80.5)
No	34.9	(30.2 - 39.6)	20.0	(17.5 - 22.5)	17.2	(15.7 - 18.8)	20.9	(19.5 - 22.3)

Table 3: Effect of immigration and acculturation on health behaviors, conditions, insurance coverage, and service access and utilization, Los Angeles County, 2011*

		Unadjusted		Adjusted**	
Health variables	**Immigrant Status**	**OR**	**95% CI**	**OR**	**95% CI**
Smoking	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.9	(0.7 - 1.3)	0.7	(0.5 - 1.0)
	Long-term immigrants	0.7	(0.6 - 0.9)	0.6	(0.5 - 0.8)
Drinking	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.5	(0.4 - 0.7)	0.9	(0.7 - 1.1)
	Long-term immigrants	0.5	(0.4 - 0.6)	0.7	(0.6 - 0.9)
Drug use	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.8	(0.6 - 1.1)	0.8	(0.5 - 1.1)
	Long-term immigrants	0.6	(0.5 - 0.8)	0.7	(0.6 - 1.0)
Obese/overweight	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.8	(0.7 - 1.0)	0.6	(0.5 - 0.8)
	Long-term immigrants	1.3	(1.2 - 1.6)	0.9	(0.8 - 1.1)
Arthritis	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.4	(0.3 - 0.5)	0.5	(0.4 - 0.7)

	Long-term immigrants	0.8	(0.7 - 0.9)	0.8	(0.7 - 1.0)
Diabetes	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.6	(0.4 - 0.9)	0.6	(0.4 - 1.0)
	Long-term immigrants	1.3	(1.1 - 1.6)	1.1	(0.8 - 1.3)
Hypertension	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.3	(0.2 - 0.4)	0.3	(0.2 - 0.4)
	Long-term immigrants	0.9	(0.8 - 1.1)	0.8	(0.6 - 0.9)
High Cholesterol	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.5	(0.4 - 0.7)	0.6	(0.5 - 0.8)
	Long-term immigrants	1.3	(1.1 - 1.5)	1.2	(1.0 - 1.4)
Depression/anxiety	Non-immigrants	1.0		1.0	
	Short-term immigrants	0.5	(0.3 - 0.6)	0.4	(0.3 - 0.6)
	Long-term immigrants	0.8	(0.7 - 0.9)	0.8	(0.6 - 1.0)
No health insurance	Non-immigrants	1.0		1.0	
	Short-term immigrants	5.1	(4.1 - 6.4)	2.1	(1.6 - 2.8)
	Long-term immigrants	2.3	(1.9 - 2.7)	1.2	(1.0 - 1.6)
Difficulty accessing medical care	Non-immigrants	1.0		1.0	
	Short-term immigrants	5.3	(4.2 - 6.6)	2.3	(1.7 - 3.0)
	Long-term immigrants	2.4	(2.1 - 2.9)	1.4	(1.1 - 1.7)
Last dental visit 12+ months ago	Non-immigrants	1.0		1.0	
	Short-term immigrants	2.7	(2.2 - 3.3)	1.4	(1.1 - 1.8)
	Long-term immigrants	1.8	(1.5 - 2.0)	1.1	(0.9 - 1.3)
Prescription medication un affordability	Non-immigrants	1.0		1.0	
	Short-term immigrants	1.2	(0.9 - 1.6)	0.7	(0.5 - 0.9)
	Long-term immigrants	1.0	(0.8 - 1.3)	0.7	(0.5 - 0.9)
No regular source of care	Non-immigrants	1.0		1.0	
	Short-term immigrants	2.6	(2.0 - 3.2)	1.5	(1.2 - 2.0)
	Long-term immigrants	1.2	(1.0 - 1.5)	1.0	(0.8 - 1.2)

*Underlined numbers indicate statistical significance at 95% confidence level.
**Adjusted for age, gender, ethnicity, education, and income.

long-term immigrants are still 20% more likely to have no health insurance, 40% more likely to have difficulty accessing medical care, and about equal chance to have regular source of care. Nonetheless, immigrants are 30% more likely to be able to afford prescription medication.

DISCUSSION

Using the 2011 LACHS adult survey, we found substantial differences between immigrants and non-immigrants, also between short-term and long-term immigrants, in health behaviors, health conditions, health insurance coverage, and access to and utilization of health care services. After adjusting for the sociodemographic covariates, short-term immigrants have lower risks for all of the health conditions examined, but long-term immigrants are losing these health advantages, especially for high cholesterol and diabetes compared to non-immigrants. However, acculturation, as represented by the longer U.S. residency of long-term immigrants, does have positive impact on improving health insurance coverage, access to and utilization of health services, and medication affordability. But lack of health insurance and difficulty navigating the health care systems remain to be challenges even for long-term immigrants. In addition, we found that acculturation did not change immigrants' lower risks for smoking, drinking, and drug use, as compared to non-immigrants.

Our findings are consistent with previous studies on immigrant health and highlight four major issues: 1) The distinct differences in the sociodemographic compositions and health risks among non-immigrants, short-term-immigrants, and long-term immigrants in LAC justify adding immigrant status as a unique analytical dimension, to be taken into consideration in addition to race/ethnicity and socioeconomic status. The lack of reference to immigration in the national Healthy People initiatives and lack of health surveillance systems specific to the changing health profiles of immigrants point to the importance of monitoring immigrant health in national health policy and public health surveillance systems. 2) Acculturation has both positive and negative independent effects on the health of immigrants. Acculturation is an inevitable process for immigrants. It is also an opportunity for behavior and lifestyle changes that are expected by the immigrants. However, the decline of health status and increase in disease risks as a result of acculturation suggest the

missed opportunities for immigrants to make positive changes, as well as the importance of new policy initiatives designed specifically to address the needs of immigrants as they assimilate into American culture. 3) The sustained healthier behaviors in smoking, drinking, and drug use, despite acculturation and sociodemographic differences, remind us of the many culturally based healthy traditions and practices among immigrants that sustain over time. They are reflections of an untapped reservoir of immigrants' strengths and resilience that can be utilized to not only promote health among immigrants, but also contribute to defining the new American culture of health and lifestyle. 4) The persistent struggle in navigating the U.S. health care systems even among the long-term immigrants signify the previously reported systematic barriers (e.g., language, cultural, knowledge, etc.) hindering the access to quality care among immigrants, which in turn underlines the need for targeted education and outreach programs in immigrant communities. While we extol the savings in Medicare Trust Fund made by the underutilization of immigrant subscribers, [16] we should also be concerned about the potential under-diagnosis and delayed detection for timely interventions in immigrant populations.

Policy Implications

These findings are important especially for local and regional planning in Los Angeles County. But it also has relevance for any community with growing numbers of immigrant families particularly in California. The slow take-up of eligible Latinos into the new health insurance programs (Medi-Cal and Covered California) under the Affordable Care Act may reflect the high number of immigrants in the State. However, not all immigrants are eligible under current federal law which prohibits undocumented immigrants from obtaining insurance through the new ACA programs. California also just enacted SB 4, which has expanded access to health insurance through the States' Medicaid program (called Medi-Cal) to undocumented immigrant children. In addition, in LAC, there is a stand alone or supplemental programs for immigrant adults called My Health LA. The success of these programs in engaging immigrants, particularly recent arrivals, will hinge understanding the unique needs and concerns of immigrants which could help bridge this gap and expand enrollment and access to needed health care.

Our study has a few of limitations. One is the self-report nature of the LACHS data collection. Research has shown that using self-reported health information underestimate the true prevalence of conditions, including hypertension and diabetes, particularly among selected immigrant groups [25,26]. However, researchers also found that this underreporting of health conditions generally resulted from under diagnosis and unawareness of health conditions, which may reduce the magnitude of the healthy immigrant effect, but only explains a portion of their healthy effect as compared to the non-immigrants. Another limitation is due to the relatively small numbers of Asian participants in LACHS, we were not able to perform separate analysis to compare Asian immigrants with Hispanic immigrants. Future studies with larger sample size of Asian immigrants are needed to carry out the between-group comparisons. Moreover, because most immigrant participants in the 2011 LACHS have lived in the U.S. for more than 10 years, thus we used 15 years residency in the U.S., instead of a shorter duration, as the cutoff to differentiate short-term and long-term immigrants to obtain meaningful observations on the two groups. The fact that there are clear differences in population characteristics and health related measures between these two immigrant groups further demonstrate the important association of time and degree of acculturation in relation to the changes in immigrant health.

CONCLUSION

In summary, the foreign-born population has been rapidly growing in recent decades and may continue to grow for the foreseeable future. Policy makers at all levels of government as well as leaders in the private sector would benefit from better health information about their immigrant populations. To keep the immigrants healthy is not only in the best interest of the individual immigrants for realizing their American dreams, but also for local communities like LAC who have the mandates to preserve the health and welfare of their indigent populations. To tap the health resources and opportunities existing in the diverse immigrant populations, we shall begin by taking the immigrant experience into consideration as we do with race/ethnicity and socioeconomic status when evaluating health disparities and design interventions.

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