Health Selection Among New Immigrants

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Objectives. We sought to quantify the extent of health selection (i.e., the degree to which potential immigrants migrate, or fail to migrate, on the basis of their health status) among contemporary US immigrant groups and evaluate the degree that selection explains variation in self-rated health among US legal permanent residents.

Methods. Data came from the New Immigrant Survey 2003 cohort. We estimated the extent of positive and negative health selection through a unique series of questions asking immigrants in the United States to evaluate their health and compare it to that of citizens in their country of origin.

Results. The extent of positive health selection differed significantly across immigrant groups and was related to compositional differences in the socioeconomic profiles of immigrant streams.

Conclusions. The salience of socioeconomic status and English-language ability in explaining health differentials across immigrant groups reinforces the importance of further research on the role of these factors in contributing to the health of immigrants above and beyond the need for additional attention to the health selection process. (*Am J Public Health.* 2008;98:2058–2064. doi:10.2105/AJPH.2006.100974)

The health and health needs of the growing US immigrant population have challenged many of our conventional perceptions about how social factors influence health and well-being.[1] In general, immigrants have health profiles that are better than those of their US-born counterparts,[2,3] despite socioeconomic status and experiences of discrimination among many immigrant subgroups that might suggest the likelihood of poorer health profiles.[4] The disjuncture between known social risk factors and ultimate health outcomes among immigrants has often been referred to as an epidemiological paradox.[5,6]

Debates over the origin of immigrants' health advantage primarily fall into 3 camps. One emphasizes the role of origin culture in lowering stress and fostering healthy behaviors through family cohesion and the provision of social support.[7,8] In this framework, conventional risk factors for poor health, such as less education and low income, are understood to be less influential than the protective cultural strengths immigrants bring with them from their countries of origin. Another explanation emphasizes selective migration as the main source of the observed patterns. Health selection may refer to the immigration of healthier individuals to the United States, as well as to selective emigration (i.e., migration of less healthy individuals back to their home countries).[9–11] A third possibility is that the healthy immigrant effect is attributable to errors in reporting or other data quality issues.[12,13]

Although the immigrant health advantage is observed among most immigrant groups, its source and strength have been shown to vary widely.[14,15] Until now, a lack of appropriate data precluded a simultaneous evaluation of how health selection and behavioral factors influence immigrant health and whether these patterns vary by country of origin. We took advantage of a series of unique questions asked of the 2003 cohort of the New Immigrant Survey (NIS) that compared the health of respondents in the United States with the population in their home country.[16] We used these data to consider the following questions: How does health selection among immigrants vary across regions of origin? To what extent does health selectivity account for variation in immigrants' observed health outcomes?

METHODS

Sample

The data for this study came from the first round of the NIS 2003 cohort. The sampling frame included all immigrants granted legal permanent residency between May and November of 2003, and the survey response rate was 69%.[17] Although the sampling design dictated that only legal permanent residents be included, some of the respondents had lived in the United States before being granted legal permanent residency. As a result, the NIS included immigrants from a variety of backgrounds, including previously unauthorized immigrants. We classified immigrants into 4 admission categories (established by the US Citizenship and Immigration Services): employment preference, family preference, refugee, and diversity visas. The diversity lottery provides 55 000 visas per year and is open to qualified applicants from eligible countries.

Because the sample was drawn from a list of all green card recipients at that time, the vast majority of countries in the world were represented. Interviews were conducted in the language of the respondent's choice as soon as possible after legal permanent residency was granted. Slightly fewer than half (48%) of the interviews were conducted in English. Our analysis used the adult sample, which was restricted to individuals who were 18 years or older at the time of admission.

Interviews were conducted with 8573 individuals; we used listwise deletion to identify 6183 as available for our analysis. The remaining respondents were missing data on certain variables included in the analysis, such as essential health information. We used multiple imputation to impute occupational prestige for individuals who reported that they were in the labor force yet were missing this information.

Analyses

Our multivariate analyses encompassed 2 components. First was a series of multinomial logistic specifications predicting the type of health selection, negative or positive, versus neutral. Second was a set of binary logistic regressions predicting current self-reported health as very good or excellent. All of the analyses relied on measures of perceived health. The use of respondents' self-perception of health in place of an objective evaluation of health implies certain assumptions about the accuracy

of self-reports and the uniformity of meaning of health across population subgroups.[18,19] However, substantial evidence suggests that self-reported health is an independent predictor of actual health, net of actual medical diagnoses, demographic factors, and health behaviors.[20–23] Given the paucity of data assessing health across national contexts and in the United States, the advantages of the NIS outweighed the limitations inherent in self-reported health data.

For health selection, we classified respondents according to a series of algorithms derived from the following survey questions: (1) "Compared with your health right before you most recently came to the United States to live, would you say that your health is better now, about the same, or worse?" (2) "If you compared your current health to people in your home country, how would you rate it—excellent, very good, good, fair, or poor?" (3) "At the time of that first filing that started the process for the immigrant visa that you now have, would you say your health was excellent, very good, good, fair, or poor?"

For respondents who said that their current health was the same as prior to coming to the United States (4581 observations), health selection was defined by their reply to the second question (i.e., how they rated their health in comparison to the health of people in their home country). Responses of very good and excellent were coded as positive health selection, fair and poor were coded as negative, and good was coded as neutral.

For the remaining 26%, who said that their health had changed since coming to the United States, the following sequence was used: if they were not in the United States (503 observations) or were in the United States for less than 5 years (868 observations) at the time they began the filing process, their response to question 3 was coded positive if the response was very good or excellent, neutral if reported as good, and negative if reported as fair or poor. (To ensure that the results were robust to the categorization schema designed for the 1602 respondents who reported that their health had changed since their arrival in the United States, the analyses were rerun restricting the sample to only those who reported that their health had stayed the same. All substantive findings and conclusions remained the same.)

Individuals who had been in the United States for more than 5 years at the time they began filing were classified by consistent responses to questions 2 and 3 and an additional question on their evaluation of their health while growing up (affecting 231 observations). In other words, for the latter group, responses of excellent or very good on all 3 would merit classification as positive health selection, fair or poor on all 3 as negative, and good on all 3 as neutral. To ensure accurate classification, only respondents with 3 consistent responses were coded.

We tested the validity of this classification system by comparing age- and gender-standardized rates of self-reported health and disability for NIS respondents with the standardized rates from 2 national samples. We used data from the Mexican National Health Survey and census data from the Philippines and found that positively selected NIS respondents had substantially higher rates of self-reporting their health to be excellent or very good (Mexican immigrants) and substantially lower rates of disability (Filipino immigrants) than did their counterparts in their countries of origin.

RESULTS

Table 1 presents summary statistics for the entire sample and separate figures for each of the 7 regions of origin. Approximately 40% of all immigrants in the sample arrived from South or Central America or Asia, and another 12% of the sample came from Mexico.

Education level varied considerably across the regions of origin: 92% of western Europeans had 12 years or more of education, compared with only 40% of immigrants from Mexico. Family preference admissions accounted for the highest proportion of respondents from each region of origin, with the exception of African and eastern European immigrants, who had similar proportions of respondents who were diversity immigrants.

Health Selection

Immigrants from western Europe and Africa were the most likely to report having excellent current health (87% and 78%, respectively) and the most likely to experience positive health selection (82% and 81%, respectively). Conversely, Mexican immigrants were the least likely to experience positive health selection (61%).

Table 2 presents the results from 3 multinomial logit specifications predicting health selection as positive or negative, relative to neutral. The baseline model indicated that there were only 2 significant differences in the odds of negative health selection among the contemporary immigrant groups examined here. Mexico, the country with the largest single share of immigrants, was the reference group. Immigrants from South or Central America and from Asia were less likely than were Mexican immigrants to have experienced negative health selection. Respondents from every other region of origin were more likely than were Mexicans to have experienced positive health selection. The magnitude of positive health selection ranged from more than twice as high for immigrants from western Europe (b=0.98; odds ratio [OR]=2.66) to 26% higher for immigrants from Asia (b=0.23; OR=1.26).

Both family preference immigrants and refugees were less likely to experience positive health selection than were immigrants with employment visas. Refugees had more than twice the odds of negative health selection than did employment migrants (b=0.84; OR=2.30). The results indicated that women had about 18% lower odds than men of positive health selection (b=0.19; OR=0.83).

In model 2, a measure of the under-5 child mortality rate for each respondent's country of origin was added to control for systematic differences in the health distributions across countries. The measure came from the 2000 World Bank Development Indicators and was the probability (expressed as a rate per 1000) that a newborn would die before reaching 5 years of age, if subject to current age-specific rates.[24] The inclusion of this measure did little to alter region-of-origin differences in the odds of health selection.

In model 3, we added to model 2 a set of socioeconomic variables to examine whether region-of-origin variation in the odds of health selection was explained by differences in the socioeconomic profiles of different immigrant groups. The addition of socioeconomic controls resulted in uniform decreases in the gap in positive health selection between immigrants from each region of origin and Mexican immigrants. The gap in positive selection between immigrants from Asia and

TABLE 1—Selected Descriptive Statistics of Sample, by Region of Origin: New Immigrant Survey, 2003

	Total Sample	South and Central America, Caribbean	Mexico	Western Europe, Canada, Australia, New Zealand	Eastern Europe, Former Soviet Union	Asia	India, Pakistan, Nepal, Bangladesh, Middle East	Africa
Percentage of sample	100.0	20.9	12.7	4.5	13.3	20.9	16.1	11.6
Admission category, %								
Family preference	66.3	62.6	95.6	69.6	38.0	79.6	57.7	40.5
Refugee	13.7	31.9	4.2	4.6	23.3	2.1	6.7	13.1
Diversity visa or other	9.6	2.1	1.6	3.9	34.5	1.8	7.3	42.3
Employment preference	10.4	3.3	2.6	21.9	4.2	16.4	28.3	4.1
Age, y, mean	37.8	37.8	35.9	35.9	38.8	41.0	38.3	33.9
Women, %	55.8	54.1	58.9	52.3	56.5	64.0	49.6	45.1
Married, %	75.9	63.6	79.5	85.3	79.9	80.6	87.2	64.5
First trip to United States was after 2000, %	48.3	37.3	24.7	39.4	59.8	68.6	52.8	60.7
Occupational prestige,[a] mean	39.4	27.8	22.5	40.3	30.0	28.1	35.6	32.8
≥12 Years of education,[b] %	67.7	59.3	39.6	92.4	83.4	69.1	79.5	86.3
≥12 Years of education abroad,[b] %	61.4	52.1	26.6	86.8	78.5	66.5	78.3	83.3
Current health very good or excellent, %	65.5	67.5	53.0	86.7	63.0	62.3	69.5	78.4
Health selection, %								
Negative	3.8	3.3	6.6	1.6	4.2	3.5	2.8	1.9
None	24.4	21.8	32.1	16.5	21.0	29.2	21.8	17.5
Positive	71.8	74.8	61.3	81.8	74.9	67.2	75.5	80.6
Entire Sample, no.	6183	1293	783	281	822	1293	997	714

Note: All descriptive statistics were weighted with sampling weights.
[a]Occupational prestige was measured using the International Socioeconomic Index. Averages are for those who were in the labor force.
[b]Education was categorized as a dummy variable that took a 0 for respondents with less than 12 years and a 1 for those with 12 or more years of education.

Mexico disappeared completely when socioeconomic differences in the immigrant flows were taken into account.

We also tested for dependent relationships between several covariates. One significant interaction term was found between gender and education. The point estimate of 0.278 indicated that education was a stronger determinant of positive health selection for women than for men.

Current Health

Table 3 presents the next set of models, which evaluated the degree to which health selection influenced the current health profiles of contemporary immigrants and how its explanatory power compared with other factors, such as health behaviors and socioeconomic status. Model 1 indicated that all other immigrant groups were significantly more likely than were immigrants from Mexico to report their current health as very good or excellent. (We used "excellent health" to describe respondents who reported that their health was either very good or excellent.)

Model 2 was used to determine the extent to which differences in the magnitude of health selection explained variation in current health status across immigrant groups. The results indicated that negative health selection was not significantly associated with self-reported current health but that positive health selection had a strong significant relationship with reporting excellent health. Once health selection processes were accounted for, the gap in reporting excellent health between Mexican immigrants and other immigrants decreased, although in most cases, the change was not as large as in subsequent models when the other factor sets were added (e.g., English-language ability and socioeconomic status).

Models 3 and 4 tested the competing explanations that behavioral or acculturation factors influenced immigrant health more than selection processes. Of the behavioral factors (model 3), only physical activity was significantly and positively associated with excellent current health. Accordingly, the behavioral variables did little to change the region-of-origin or visa-category differences in current health profiles. Measures of time in the United States and language use had stronger associations with self-reported current health (model 4). Speaking English well and speaking English with friends increased the odds of reporting excellent current health, as did arriving in the United States after 2000. The addition of these variables decreased the gaps in self-reported health between immigrants from other regions and Mexican immigrants (in comparison with model 1). These patterns suggested that Mexican immigrants' lower levels of English fluency and their increased time spent in the United States were 2 of the reasons for their poorer health status relative to other immigrant groups.

Model 5 accounted for the role of socioeconomic status in influencing current health status. Having 12 or more years of education and a higher-prestige job increased the odds of reporting excellent health. Adjusting for the lower socioeconomic status of Mexican immigrants reduced the gaps in excellent current health between Mexican immigrants and all other immigrant groups.

TABLE 2—Multinomial Logistic Regression Predicting Health Selection as Positive or Negative: New Immigrant Survey, 2003

	Model 1		Model 2		Model 3	
	Negative, b (95% CI)	Positive, b (95% CI)	Negative, b (95% CI)	Positive, b (95% CI)	Negative, b (95% CI)	Positive, b (95% CI)
Region of origin						
Mexico, (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
South/Central America, Caribbean	-0.656** (-1.135, _0.177)	0.642*** (0.423, 0.860)	-0.644** (-1.123, -0.164)	0.644*** (0.425, 0.863)	-0.684** (-1.176, -0.192)	0.540*** (0.315, 0.766)
Western Europe, Australia, Canada, New Zealand	-0.503 (-1.504, 0.498)	0.979*** (0.601, 1.357)	-0.569 (-1.580, 0.441)	0.970*** (0.589, 1.351)	-0.587 (-1.619, 0.446)	0.805*** (0.414, 1.197)
Eastern Europe, former Soviet Union	-0.177 (-0.750, 0.396)	0.575*** (0.309, 0.841)	-0.198 (-0.772, 0.376)	0.572*** (0.305, 0.838)	-0.216 (-0.829, 0.398)	0.389** (0.107, 0.672)
Asia	-0.459* (-0.915, -0.002)	0.231* (0.015, 0.446)	-0.453 (-0.910, 0.003)	0.231* (0.015, 0.447)	-0.497* (-0.981, -0.012)	0.100 (-0.128, 0.328)
Indian subcontinent, Middle East	-0.454 (-0.996, 0.088)	0.527*** (0.291, 0.763)	-0.317 (-0.926, 0.293)	0.547*** (0.288, 0.805)	-0.307 (-0.950, 0.336)	0.391** (0.118, 0.664)
Africa	-0.461 (-1.203, 0.282)	0.728*** (0.437, 1.019)	-0.128 (-1.121, 0.865)	0.774*** (0.392, 1.156)	-0.111 (-1.126, 0.905)	0.609** (0.217, 1.001)
Admission category						
Employment preference (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Family preference	0.210 (-0.305, 0.726)	-0.307** (-0.498, -0.117)	0.211 (-0.304, 0.726)	-0.307** (-0.498, -0.117)	0.192 (-0.333, 0.718)	-0.243* (-0.438, -0.048)
Refugee	0.835** (0.250, 1.420)	-0.468*** (-0.708, -0.227)	0.843** (0.259, 1.428)	-0.466*** (-0.707, -0.226)	0.839** (0.234, 1.443)	-0.346** (-0.596, -0.096)
Diversity/other	-0.708 (-1.540, 0.125)	-0.114 (-0.376, 0.147)	-0.722 (-1.555, 0.110)	-0.116 (-0.378, 0.146)	-0.703 (-1.538, 0.132)	-0.080 (0.344, 0.184)
Gender						
Men (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Women	0.118 (-0.184, 0.419)	-0.188** (-0.312, -0.063)	0.118 (-0.183, 0.419)	-0.187** (-0.311, -0.063)	-0.099 (-0.514, 0.315)	-0.359*** (-0.558, -0.160)
Under-5 mortality rate	...	...	-0.003 (-0.009, 0.003)	0.000 (-0.003, 0.002)	-0.003 (-0.010, 0.003)	0.000 (-0.003, 0.002)
Education, y						
<12 (Ref)	...	...	...	...	1.00	1.00
≥12	...	...	...	...	-0.338 (-0.839, 0.163)	0.114 (-0.092, 0.320)
Father's education, y						
<12 (Ref)	...	...	...	...	1.00	1.00
≥12	...	...	...	...	0.204 (-0.208, 0.615)	0.049 (-0.112, 0.209)
Data missing	...	...	...	...	0.165 (-0.183, 0.513)	-0.037 (-0.190, 0.116)
Women × ≥12 y education	...	...	...	...	0.392 (-0.208, 0.992)	0.278* (0.024, 0.532)
Constant	-0.923 (-2.270, 0.423)	1.291*** (0.667, 1.914)	-0.835 (-2.195, 0.526)	1.304 (0.677, 1.932)***	-0.878 (-2.280, 0.523)	1.275*** (0.629, 1.921)
Pseudo R^2	0.040		0.040		0.043	

Note. CI = confidence interval. All models included indicators for age, age squared, married at first trip to United States, and year of first trip after 2000. In model 2, an indicator for each country's under-5 mortality rate was added. In model, 3, a set of controls for socioeconomic status were added. Each model had 6183 observations.
*P<.05; **P<.01; ***P<.001.

TABLE 3—Logistic Regression Predicting Current Health as Very Good or Excellent: New Immigrant Survey, 2003

	Model 1, b (95% CI)	Model 2, b (95% CI)	Model 3, b (95% CI)	Model 4, b (95% CI)	Model 5, b (95% CI)	Model 6, b (95% CI)
Region of origin						
Mexico (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
South/Central America, Caribbean	0.856*** (0.655, 1.058)	0.650*** (0.425, 0.874)	0.852*** (0.650, 1.054)	0.770*** (0.561, 0.978)	0.726*** (0.520, 0.932)	0.493*** (0.257, 0.729)
Western Europe, Australia, Canada, New Zealand	1.632*** (1.255, 2.010)	1.438*** (1.024, 1.851)	1.576*** (1.196, 1.957)	1.156*** (0.763, 1.548)	1.330*** (0.944, 1.716)	0.907*** (0.471, 1.344)
Eastern Europe, former Soviet Union	0.579*** (0.340, 0.819)	0.376*** (0.109, 0.642)	0.566*** (0.324, 0.808)	0.384*** (0.131, 0.636)	0.320** (0.071, 0.569)	0.060 (-0.231, 0.350)
Asia	0.608*** (0.413, 0.802)	0.564*** (0.346, 0.782)	0.634*** (0.438, 0.831)	0.385*** (0.172, 0.598)	0.430*** (0.229, 0.631)	0.317** (0.073, 0.561)
Indian subcontinent/Middle East	0.798*** (0.581, 1.014)	0.649*** (0.409, 0.890)	0.805*** (0.587, 1.023)	0.454*** (0.219, 0.688)	0.532*** (0.306, 0.757)	0.257* (-0.011, 0.525)
Africa	1.165*** (0.892, 1.438)	0.997*** (0.696, 1.299)	1.139*** (0.864, 1.434)	0.699*** (0.405, 0.993)	0.899*** (0.616, 1.181)	0.506*** (0.175, 0.836)
Class of admission						
Employment preference (Ref)	1.00	1.00	1.00	1.00	1.00	1.00
Family preference	-0.315*** (-0.484,-0.147)	-0.231** (-0.417,-0.045)	-0.297*** (-0.466,-0.128)	-0.154* (-0.338, 0.029)	-0.059 (-0.237, 0.119)	0.027 (-0.181, 0.236)
Refugee	-0.837 (-1.056,-0.619)	-0.726*** (-0.967,-0.485)	-0.813*** (-1.032,-0.594)	-0.632*** (-0.856,-0.408)	-0.546*** (-0.774,-0.319)	-0.395*** (-0.649,-0.142)
Diversity/other	-0.069 (-0.298, 0.161)	-0.074 (-0.324, 0.177)	-0.032 (-0.263, 0.198)	0.150 (-0.101, 0.401)	0.137 (-0.100, 0.374)	0.193 (-0.085, 0.471)
Health selection						
Neutral (Ref)	...	1.00	...	...	...	1.00
Negative	...	-0.242 (-0.599, 0.115)	...	...	...	-0.236 (-0.598, 0.127)
Positive	...	2.086*** (1.945, 2.226)	...	...	...	2.055*** (1.912, 2.197)
Acculturation						
Speaks English well/very well[a]	...	...	...	0.602*** (0.449, 0.755)	...	0.315*** (0.141, 0.490)
Speaks English with friends[b]	...	...	...	0.216*** (0.066, 0.366)	...	0.198** (0.030, 0.366)
First trip to United States was after 2000	...	...	...	0.181** (0.035, 0.327)	...	0.153* (-0.010, 0.317)
Behavioral characteristics						
Physically active[c]	...	...	0.389*** (0.244, 0.535)	...	...	0.273*** (0.110, 0.435)
Changed diet after immigration[d]	...	...	-0.014 (-0.036, 0.009)	...	...	-0.013 (-0.039, 0.012)
Current smoker	...	...	-0.097 (-0.287, 0.094)	...	...	-0.042 (-0.255, 0.170)
Problem drinker[e]	...	...	0.007 (-0.208, 0.223)	...	...	0.032 (-0.208, 0.272)
Socioeconomic status						
≥12 Years of education	...	...	...	...	0.454*** (0.317, 0.591)	0.252*** (0.092, 0.413)
ISEI score of current job[f]	...	...	...	...	0.009*** (0.006, 0.012)	0.006*** (0.003, 0.010)
Constant	1.507 (0.922, 2.091)***	0.350 (-0.304, 1.004)	1.375*** (0.776, 1.974)	0.653** (0.044, 1.262)	0.913*** (0.317, 1.510)	-0.635* (-1.330, 0.061)
Pseudo R^2	0.093	0.227	0.097	0.108	0.105	0.240

Note. CI = confidence interval; ISEI = International Socioeconomic Index. All models included indicators for region of origin, class of admission, age, age squared, female gender, and married status. Indicators were added piecewise. In model 2, an indicator for health selection was added. In model, 3, a set of behavioral characteristics was added. In model 4, a set of measures of acculturation were added. In model 5, two measures of socioeconomic status were added. Model 6 included the full set of covariates. Each model had 6183 observations. Negative selection coefficient for the western European group was omitted because it was identified from only 5 respondents and was considered unreliable.

[a]Coded as 1 for individuals responding very well or well to the question, "How well would you say you speak English?" and as 0 for those reporting not well or not at all.

[b]Coded as a 1 for individuals listing English as 1 of the languages in response to the question, "What languages do you speak outside of your home when you are with friends?" and 0 otherwise.

[c]Coded as 1 if the respondent participated in vigorous physical activity at least once per week and 0 otherwise.

[d]Change in diet was coded from 1 to 10, with 10 representing a diet completely different from the respondent's diet before immigration and 1 representing a diet that was completely the same.

[e]Coded as a 1 if the individual reported having 4 or more drinks in 1 instance any time in the previous 3 months.

[f]Occupational prestige was measured with the International Socioeconomic Index. Averages are for those who were in the labor force.

*P<.05; ** P<.01; ***P<.001.

The full model (model 6) indicated that, even with controls included for socioeconomic status, health selection, behavior, and acculturation, a significant amount of variation in current health status across regions of origin remained unexplained. With the exception of immigrants from eastern Europe, who became indistinguishable from Mexican immigrants in their current health profiles, all other immigrant groups continued to display higher odds of excellent current health.

DISCUSSION

In answer to one of the most common puzzles facing immigrant health researchers, our analysis revealed evidence that positive health selection occurs among new legal permanent residents and that its extent varies significantly along several dimensions. Immigrants from all regions of origin experienced higher levels of positive health selection than did immigrants from Mexico. Differences in the extent of health selection by region of origin were not explained by differences in regional health profiles (measured by child mortality), nor was this factor predictive of whether immigrants from a region experienced positive or negative health selection. Instead, differences in the degree of health selection by region of origin appeared to be strongly related to compositional differences in the socioeconomic profiles of immigrant streams. Once we controlled for socioeconomic differences, the gap in positive health selection between Mexicans and every other immigrant group decreased considerably and even disappeared in the case of Asian immigrants. The lower socioeconomic profiles of Mexican immigrants contributed to their lower levels of positive health selection.

Yet even after accounting for compositional differences in socioeconomic status, Mexican immigrants remained significantly less likely to experience positive health selection. This pattern suggested that factors other than socioeconomic status were lowering the level of positive health selection among Mexican immigrants. One possibility is that differences in the nature of the migration process—for instance, the presence of institutionalized migration networks in Mexico and the United States—were an additional factor contributing to the persistent gap. The case of Mexico suggests that where the costs of migration between 2 countries are lower, migrants will have less positive health selection.

The odds of positive health selection were lower for women than for men. In many migratory flows, immigrant women are more likely than their male counterparts to have had partners precede them in migration.[25] Although migration under any circumstances is taxing, the transition is likely significantly easier for individuals moving to a preexisting social network and structure. Although women in general were less likely than men to experience positive health selection, we also found that a higher education level was a stronger determinant of positive health selection for women than for men. There may be strong selection processes operating on women who obtain a postsecondary education in many of the sending countries. For instance, women who reach the upper echelons of education may also be from the uppermost end of the health distribution, a requirement that may be relaxed for their male counterparts. Alternatively, the migration process for highly educated women may be fundamentally different than it is for highly educated men in a way that involves a higher premium on good health.

We found few significant differences in the propensity to select for poor or fair health across national-origin groups. The absence of negative health selection likely reflected baseline difficulties in the migration process that prohibited selection on poor health, regardless of country of origin. Past research has suggested that there may be a minimum health level that makes migration worthwhile.[26] The main exception is in the case of refugees, who are selected for migration on the basis of their persecuted status. To the extent that this status corresponds to factors that contribute to poor health, such as stress and material hardship, it explains their higher odds of negative health selection.

Competing Explanations for Immigrant Health

The competing explanations of health selection and behavioral differences have animated the debate over immigrant health for quite some time. Although we found support for the possibility that each one influences immigrant health, neither health selection nor health behaviors appeared to play as consequential a role in determining differences in the current health profiles of contemporary immigrant groups as did socioeconomic status and English-language ability. Even as the epidemiological paradox challenges our conventional understanding of how socioeconomic status influences the health of the foreign born compared with those born in the United States, health differentials within the foreign-born population continue to show evidence of being significantly influenced by differences in education level and occupational prestige.

Past work has demonstrated that English-language ability is often associated with higher levels of acculturation, less healthy behaviors, and ultimately poorer health.[27] However, in our sample of newly legalized immigrants, the ability to speak English was positively associated with reporting excellent health. The difference in results between this study and past work is likely related to the fact that this sample consisted of a fairly highly educated subset of immigrants (two thirds had completed 12 years or more of education). For these immigrants, English-language ability may have been more a marker of socioeconomic status than a marker of acculturation toward negative US behavioral norms. Alternatively, these immigrants may have been adapting to healthful US norms, because health behaviors have been shown to vary by socioeconomic status among the native-born US population. It may be that the segment of the US population that many of the NIS sample were assimilating into engaged in more health-promoting behaviors.

These findings offer support for the presence of positive health selection and its contribution to the health profiles of all contemporary immigrant groups. The next logical question concerns whether the presence of positive health selection explains the previously documented immigrant health advantage over US-born Americans. Because the NIS only included immigrant respondents, our data could not answer this question. An ancillary analysis of data from the National Health and Nutrition Examination Survey 2000 to 2002 suggested that, at least for Mexican immigrants, health selection was a contributing factor to differences in the health profiles of immigrants and their US-born counterparts. A comparison of age- and gender-standardized rates of reporting very good or

excellent current health demonstrated that the proportion of positively selected NIS respondents had considerably higher rates of reporting excellent current health than did their US-born counterparts (0.70 vs 0.47). By contrast, negatively selected NIS respondents were less likely to report excellent current health than were their US counterparts (0.200 vs 0.448).

These differences are noteworthy because Mexican immigrants were the least likely to have experienced positive health selection in the NIS data. We would likely find a more pronounced pattern in the case of immigrant groups that experience even higher levels of health selection. Yet the patterns remain only suggestive, and we were unable to quantify the magnitude of a selection effect on disparities in health between native-born citizens and immigrants using these data sets. Only data that include information on US-born citizens, foreign-born US residents, and nonmigrants in sending countries will allow for a proper analysis of this pressing question.

Limitations

The main strength of our study was also one of its limitations. The ability to directly assess how immigrants, compared with citizens in their countries of origin, viewed their health allowed to us to quantify the degree of health selection across contemporary immigrant groups. However, because the comparison rested on a subjective assessment of health, it is possible that the observed patterns did not directly reflect health selection processes. Other factors, such as differences by region of origin in cultural norms, may affect the comparability of self-reported health in cross-national studies.[28]

Our operationalization of health selection relied on individual assessments of health in comparison with "people in your home country." There may have been differences in each respondent's chosen reference group. To ensure that we are measuring differences in the distribution of illnesses across groups and not differences in the interpretation of self-reported health, future studies should incorporate objective measures of health into such analyses. The best way to do this is to begin work on creating publicly available binational data sets that incorporate data from both origin and destination locales. ■

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Both authors contributed equally to originating the research question, planning and carrying out the analysis, and writing the article.

Human Participant Protection

The data used for the analysis were from a secondary data source with minimal risk to the respondents of identity disclosure; therefore, no protocol approval was needed for this study.

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