

Education, English Proficiency, and Health as Predictors of Employment among Filipino  
Migrants and Non-migrants

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Abstract

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Immigrants face a number of unique challenges when migrating to the United States. One of the most important concerns is securing employment. For decades, Human Capital Theory has been the prevailing framework supporting the idea that types of human capital such as education, skills, English-proficiency, and other attributes are important for individuals to succeed in the labor market. This study examines the association between specific human capital factors - education level, English proficiency, and a novel type of human capital, health – and employment status among Filipino migrants (n=355) in the U.S. and non-migrants (n=721) in the Philippines. Data were taken from the larger, longitudinal Health of Philippine Emigrants Study (HoPES). Statistical analyses included a multivariate logistic regression analysis. Among migrants, education level (college and above) and health were associated with finding employment post migration. Additionally, male sex was found to be important for employment

in the U.S. Among non-migrants, college education and health status were associated with employment. These findings indicate important upstream factors that can impact immigrant worker well-being in the U.S.

**Key words:** immigrant, health, employment, human capital

## **BACKGROUND**

Immigration to the U.S. has steadily increased over the past decades. In 2019, there were 28.4 million foreign-born people in the U.S. labor force, comprising 17.4% of the total labor force [1]. Roughly 1.1 million people obtained lawful permanent resident status in 2017, with about 4% of this number being Filipinos [2]. Filipinos comprise the fourth largest immigrant group by country of origin, after Mexico, India, and China [3].

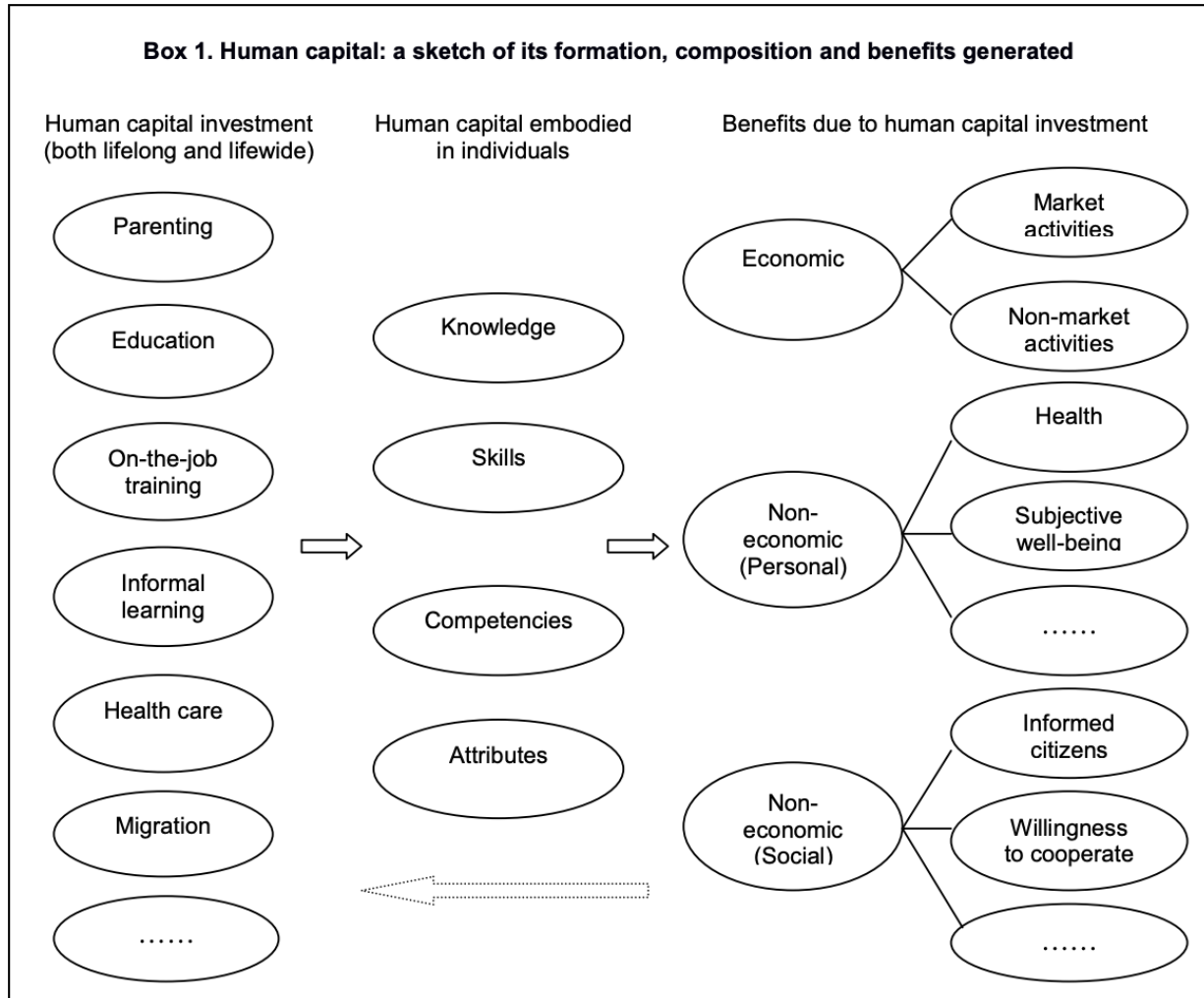
Employment is a major driver of immigration to the U.S. and is an important indicator of socio-economic integration. Immigrants face unique and complex challenges related to labor market integration after arrival. These include disadvantages in the local labor market such as downward occupational and social mobility, underemployment, job stress, overqualification, lack of knowledge of the local employment conditions and systems, discrimination, lack of proficiency of the local language and employment resources, and pressure from multiple household and familial responsibilities [4]–[12].

The ‘healthy immigrant hypothesis’ or ‘paradox’ as it is sometimes called, refers to the phenomenon that upon arrival to a new country (such as the U.S., in this analysis), immigrants are generally healthier than the native-born population. However, over time, their health converges (generally decreases) with that of their same race/ethnic counterparts born in the destination country over time [13]. This is important to emphasize because this analysis examines health as a type of human capital advantage that individuals may leverage when seeking work. In doing so we must consider the possibility of health change, even over the course of a year, which could influence the ability to secure employment. Health as a form of human capital is a relatively novel idea in the context of Human Capital Theory, as it has not traditionally been thought of as an attribute an individual may leverage, such as education level,

when seeking employment. However, health is an advantage for employability because it is often implicitly required for participation in the labor market. People who have a certain level of physical functioning are able to meet the demands of most jobs in U.S. occupational sectors as compared to those unable to work due to disease or disability. For example, working in construction requires a certain level of physical health to be able to carry out basic job requirements.

The concept of Human Capital was formally developed in the 1950s in the United States and was most famously formally introduced by Theodore Schultz and Gary Becker at the Chicago School of Economics as Human Capital Theory (HCT) [14]. At its core, the idea of human capital is that people possess various attributes and experiences that can be defined as “productive wealth embodied in labour, skills, and knowledge” ([15]. Though it has a strong focus on education, human capital has also been conceptualized to include job training and experience, literacy level, English-proficiency, migration status, and gender [16]–[25]. Human capital is said to provide individuals competitive advantage and contribute to countries’ economic success [26]. Following the tenets of HCT, investing in various aspects of human capital is hypothesized to bring about economic success to the individual and society as a whole. In addition to economic gains, a number of other ‘unintended’ gains are also hypothesized, as displayed in *Figure 1*, taken from the Organisation for Economic Co-operation and Development (OECD).

Figure 1. OECD Statistics Working Papers, 2012. *Approaches to Measuring the Stock of Human Capital: A Review of Country Practices.*



## **METHODS**

The objective of this study was to analyze which, if any, human capital predictors are associated with employment in the context of migration. Specifically, we compare correlations between individual-level human capital factors and employment comparing migrants from the Philippines to the U.S. to non-migrants based in and remaining in the Philippines. Based on HCT, our hypotheses are that, for both migrants and non-migrants:

1. Higher education will be associated with higher likelihood of employment at one year. Higher education level can expand one's labor prospects no matter the country of residence.
2. Good English proficiency will be associated with higher likelihood of employment at one year, because English proficiency is often required or desired for most occupations in the U.S. labor market. This is self-explanatory in the U.S., as English is the primary language. However, due to globalization, in the Philippines this can mean increased job prospects for work that is increasingly requiring English proficiency.
3. Good health will be associated with higher likelihood of employment at one year. Health status can be leveraged when competing in the labor market, and often increases the types of employment one can engage in, no matter the country context. People who are healthier generally have more availability for various types of work (not having to spend time seeking or receiving healthcare treatment or missing work from injury/illness/disability).

Data were collected from Health of Philippine Emigrants Study (HoPES), a dual-cohort longitudinal, transnational study [27], [28]. The overarching HoPES study consists of a baseline

cohort of Filipinos who migrated to the U.S. (n=832) and a cohort of non-migrant Filipinos who planned to remain in the Philippines (n=805). Baseline data was collected from both groups in the Philippines in 2017 via questionnaires and included demographic characteristics and a variety of health measures, reported elsewhere [27], [28]. Follow-up surveys of migrants in the U.S. and non-migrants in the Philippines include Wave 1 which ranged from 8 months to 17 months after baseline, and Wave 2 and 3, which were not included in this analysis as data collection had not finished at the time of this study.

Data for this analysis was restricted to the Baseline and Wave 1 survey waves. 832 migrants and 805 non-migrants provided data at baseline. 442 migrants (53%) and 758 (721) non-migrants (94%) provided follow up data on employment status at Wave 1. Participants were excluded from the analysis if they were missing information on employment status (the outcome variable) or any of the independent variables. Given the significant loss of follow up in the migrant sample, inverse-probability weighting was implemented to help reduce bias due to attrition.

## Measures

### *Outcome variable.*

The dependent variable was employment status at Wave 1. Participants were asked, via questionnaire, “Are you currently employed?” (1=yes, 2=no).

### *Independent variables*

Human capital predictors of employment included education level, English proficiency, self-rated health status at one year, and change in health status from baseline to Wave 1.

*Education level.* At baseline, participants were asked, “What is the highest level of education you completed?” (1=never attended school, 2=some elementary school, but did not finish, 3=elementary, 4=some high school, but did not finish, 5=high school, 6=some college, 7=college, 8=some post-graduate, but did not finish, 9=post graduate). This variable was further condensed into strata that reflect milestone education attainment in the U.S. and accounted for small numbers of post-graduate trained participants (1= less than high school, 2= high school, 3= some college, but did not finish, 4=college and above).

*English proficiency.* At baseline, participants were asked “How well do you speak English? (1=very well - 4=not at all). This variable was further condensed into two categories labeled good (very well/well) and poor (not very well/not at all).

*Self-rated health.* At one-year, participants were asked, “Compared to other people your age, would you say that in general your health is...”(1=excellent - 5=poor). Data from Wave 1 was used because it reflected the current health status of participants when they were asked about employment status.

*Change in health status.* To capture the longitudinal aspect of health status and how it may change from baseline to Wave 1, a new variable was created to characterize this change. The health status score at baseline was subtracted from the health score at Wave 1. The resulting data ranged from (-3, -2, -1, 0, 1, 2, 3, 4). Having a negative value indicated the participant experienced a decline in health, zero indicated no change, and a positive value indicated an improvement in health.

*Control variables.* Sex, age, marital status, and time interval between baseline and Wave 1 were included as control variables in the logistic regression analysis. Survey time interval was

implemented as a continuous variable by number of days between baseline and Wave 1, but categorized by months for ease of data display in Table 1.

## **ANALYSIS**

Statistical software R (version 4.1.3) was used for data analysis. Descriptive statistics to describe sample characteristics were separately calculated for migrant and non-migrant participants. Inverse probability weighting was implemented to address bias due to attrition.

*Bivariate analysis.* A correlation matrix was compiled to determine associations present among the included variables. Chi-square tests of independence, one-way ANOVA, Fisher's exact tests, simple linear regression, and binary logistic regression were used depending on the type of variable.

*Multivariate analysis.* Afterward, all independent variables were included in multivariate logistic regression models to analyze which variables were associated with employment status at Wave 1. The multivariate analysis was run un-weighted, and then weighted with inverse probability weights as a sensitivity analysis. Five models were run for each group (migrants and non-migrants), with a total of 10 models. The first model included the survey time interval, sex, marital status, and age. The second model added education level. The third added English proficiency. The fourth added health status at Wave 1. The fifth and final model added health change.

Ethics review and approval to conduct HoPES were granted by the institutional review boards at the University of California, Los Angeles (USA), UCLA Office of the Human Research Protection Program, and the University of San Carlos (Cebu, Philippines).

## RESULTS

355 migrants and 721 non-migrants were included in the analysis. Table 1 depicts demographic data on participants included in the study, stratified by migrant status. Among migrants, 78% had an education level higher than high school, compared to 66% of non-migrants. Regarding English proficiency, 69% of migrants reported “good” proficiency compared to 22.3% of non-migrants. Employment rates at Wave 1 were nearly identical for both groups (70% for migrants, 71% for non-migrants). At Wave 1, more migrants reported having good to excellent health (71%) compared to non-migrants (28%). 38% of migrants reported an improvement in health from baseline to Wave 1, compared to 21% of non-migrants.

[TABLE 1 ABOUT HERE]

Bivariate analyses examining the association between variables among migrants and non-migrants are shown in Table 2.

[TABLE 2 ABOUT HERE]

Multivariate regression model results are displayed in Table 3 (migrants) and Table 4 (non-migrants). After all variables were included, adjusting for sex, age, marital status, and survey time interval, college education was a positive predictor of employment among migrants (OR 3.026, 95% CI: 1.850 – 4.995). Health status at Wave 1 was also a significant predictor of employment (OR 1.327, 95% CI: 1.047 – 1.688). Among all the five models, male sex continued to be statistically significant even after inclusion of all variables. After inclusion of all variables, male migrants were roughly four times as likely to be employed at Wave 1 compared to their

female counterparts (OR 4.379, 95% CI: 2.682 – 7.427). English proficiency was not a statistically significant predictor of employment, nor was health change.

[TABLE 3 ABOUT HERE]

Non-migrants in the Philippines with a college education were roughly twice as likely to be employed compared to peers with a high school education (OR 1.908, 95% CI: 1.229 – 2.969). Health status was a significant predictor of employment at Wave 1 among this group as well (OR 1.247, 95% CI: 1.003 – 1.562). English proficiency and health status were not statistically significant.

## **DISCUSSION**

This study offers a novel perspective on what factors are helpful for Filipino migrants to secure employment in the U.S. Additionally, by looking at how education level, English proficiency, and health play out in the Philippines, we apply the tenets of Human Capital Theory to the context of international migration, to test whether they bear out in different country contexts. To integrate these findings with previous work it is necessary to discuss past findings on types of human capital and employment among immigrants.

A large portion of the Human Capital Literature with respect to immigrants is based internationally. The literature reports on varying impacts of human capital across different demographic immigrant groups and country contexts. Research on the impact of education level on migrant employment shows that for specific demographic groups, education is positively related to employment and high-status occupations [6], [7], [9], [12], [25], [29]. English-proficiency is an important consideration when seeking employment in a predominantly English-speaking country. Higher English-proficiency has been found to be associated with lower

likelihood of poverty, higher likelihood of employment in a high-earnings occupation, and on employment probability, among countries where English is widely spoken [4], [19], [25]. Studies examining health show that improvements in health are correlated with increased earnings and employment [30]–[32]. People who are generally healthier are able to participate in the labor market and spend less time missing work due to health issues. However, few studies have conceptualized health status as a form of human capital that immigrants possess that can offer a competitive advantage when seeking work [33].

There is some research on Filipino immigrant experiences in the U.S., but very little on what is required for this group to integrate successfully into the U.S. labor market. Some studies have found unique differences in the ability of various Asian groups to convert human capital such as education into employment, suggesting the advantage that these factors offer are not universal [34]. This study adds to the literature on Filipinos in the U.S. and abroad.

In this study sample, college education, health, and sex are important predictors of employment for Filipino migrants post migration to the U.S. Previous research on education level among immigrants in the U.S. has been inconclusive [25], [34]. Our work adds to this body by showing that for Filipino immigrants, college education is important in securing employment in the States. English proficiency has been studied among immigrants in the U.S. and abroad and found to increase the likelihood of finding work [4], [19], [25]. However, this did not hold true for our sample in this analysis. This finding is somewhat surprising, as English fluency is desired and often required for many occupations (especially high-status occupations) in the U.S. This analysis did not include analyses of occupation types. Migrants could possibly have been employed in jobs that do not require strong English-proficiency. This is a potential question for future HoPES analyses.

In addition to our study variables of interest, we found that migrants of male sex had higher likelihood employment relative to female migrants. This could reflect a potential gender bias in the U.S., resulting in men being more likely to get hired. A number of occupations across U.S. industry sectors are disproportionately male-dominated (i.e., construction, forestry, fishing, etc.), and, it would be beneficial to analyze the types of occupations participants were employed in.

Health status was found to be significant for employment among migrants in our sample. This finding adds to a small but growing body of literature that perceives health as a type of human capital [33]. Over the years, public health professionals have begun to recognize work as a social determinant of health. The findings of this study imply that health status is important for securing employment. This is extremely important because it could suggest that migrants with poorer health have less advantages in the labor market. Barriers to achieving financial stability can in turn result in worsened health, developing a cycle that perpetuates health and economic disparities simultaneously. Measures to improve and sustain good health among the U.S. immigrant population could, as Human Capital Theory would argue, bring about economic returns but also provide important health-enhancing benefits that are associated with employment in general.

Compared to our findings on migrants, we found that for non-migrant Filipinos, college education and health were the only aspects of human capital that were associated with employment from among the variables studied. This is similar to findings among the migrant group, though male sex was not associated with greater likelihood of employment among non-migrants. No other human capital variables were statistically significant. It is understandable why English proficiency may not be important, as it is not the primary language in the

Philippines and may not be required for most occupations. Health status was important for employment, suggesting that, irrespective of the country context, possessing good health is important for labor market participation. This also may have policy implications for the Philippines, which could encourage investments in health.

### Limitations

There are a number of limitations to this study. Firstly, the sample was limited to those with complete data in the baseline and Wave 1 surveys, meaning a key number of people were excluded due to data missingness. This decreased our sample size, mostly among migrants because this group suffered the most from loss-of-follow-up. Important systematic differences could be present in those that were included in the analysis versus those excluded, potentially biasing results. In response to this, we implemented inverse-probability-weighting to help reduce bias related to attrition.

Additionally, the binary nature of the outcome variable (being employed or not) does not fully capture migrant experiences in the labor market. Future analyses should consider additional characteristics of employment to better depict the immigrant story. For migrants, Wave 1 surveys happened between 12 and 17 months after baseline. Migrants who had secured employment prior to this time but then lost it by Wave 1 would not be captured in the outcome variable for this analysis. This was not a comprehensive or exhaustive analysis of all the human capital variables that can be associated with finding employment, and, this analysis was limited to key predictors available in the HoPES dataset.

Future work to test or confirm this work should include more sophisticated approaches for dealing with missing data to increase sample size and statistical power, thereby strengthening

the quality of results. Additionally, it will be of benefit to consider looking at occupational mobility of migrants, and perhaps incorporating even more longitudinal data, if available, to better illustrate the immigrant story. It can also be worthwhile to examine these variables among different immigrant groups to test whether the education and health advantage applies to them as it did for Filipinos.

## **CONCLUSION**

Occupational and environmental health researchers and practitioners have long recognized that work is a social determinant of health. Whether we work, and the type of work we do matters for our health. Work is important because it is associated with the accumulation of economic and social benefits which trickle down into various consequences for individuals and society as a whole. Thus, increasing our understanding of what is important for safe and meaningful employment is critical, especially for groups that are traditionally disadvantaged. As a public health professional we know that employability contributes to health and well-being through a myriad of mechanisms, such as the accumulation of financial wealth, social networks, occupational prestige, or the exposure to health-damaging or health-promoting occupations, to name a few. The factors that impact immigrant employability are therefore important for their overall health trajectory and consequently, the well-being of immigrant workers in the U.S. in general. As a field, occupational health can sound the alarm to broader public health that health matters for employment among immigrants, and employment matters for worker well-being, especially among people of color and minority groups, such as Filipinos. Creating and supporting policies and initiatives that boost immigrant employability, and improve their health, can support larger equity goals for U.S. immigrants.

## APPENDICES

**Table 1. Demographic and human capital characteristics, stratified by migrant status**

Characteristics		Migrants (n=355)			Non-migrants (n=721)		
		N	%	Mean (yrs)	N	%	Mean(yrs)
<b>Sex</b>	<b>Women</b>	241	68		498	69	
	<b>Men</b>	114	32		223	31	
<b>Age</b>	<b>18-24</b>	86	24.2	22.1	163	23	22.6
	<b>25-55</b>	244	69	37.1	508	71	39.9
	<b>55+</b>	25	7	58	50	7	57.6
<b>Education</b>	<b>Less than high school</b>	18	5		113	15.7	
	<b>High school</b>	61	17.2		134	18	
	<b>Some college</b>	64	18		255	35.3	
	<b>College and above</b>	211	60		219	30.4	
<b>English proficiency</b>	<b>Good</b>	244	69		161	22.3	
	<b>Poor</b>	111	31.3		560	77.7	
<b>Marital status</b>	<b>Married</b>	122	34.4		326	45.2	
	<b>Not married</b>	233	66		395	55	
<b>Health at wave 1</b>	<b>Poor</b>	6	2		69	10	
	<b>Fair</b>	96	27		451	63	
	<b>Good</b>	127	36		182	25.2	
	<b>Very good</b>	0	0		0	0	
	<b>Excellent</b>	126	36		19	3	
<b>Health change from baseline to wave 1</b>	<b>-3</b>	4	1.1		10	1.4	
	<b>-2</b>	26	7.3		33	4.6	
	<b>-1</b>	80	23		141	20	
	<b>No change</b>	111	31.3		388	54	
	<b>1</b>	65	18.3		133	18.5	
	<b>2</b>	46	13		12	2	

	<b>3</b>	21	6		4	0.6	
	<b>4</b>	2	0.6		0	0	
<b>Time between survey waves</b>	<b>8 months</b>	0	0		29	4	
	<b>9 months</b>	0	0		115	16	
	<b>10 months</b>	0	0		231	32	
	<b>11 months</b>	0	0		331	46	
	<b>12 months</b>	21	6		14	2	
	<b>13 months</b>	30	8.5		1	0.1	
	<b>14 months</b>	67	19		0	0	
	<b>15 months</b>	152	43		0	0	
	<b>16 months</b>	47	13.3		0	0	
	<b>17 months</b>	37	10.5		0	0	
	<b>Employment status at one year</b>	<b>Employed</b>	247	70		509	71
<b>Unemployed</b>		108	30.4		212	29.4	

\*Education level includes 354 migrant observations due to a participant not including education level at the baseline wave

\*\*percentages may not sum up to 100% exactly due to rounding

\*\*\*health change from baseline to twelve months – negative value denotes worsened health and positive value signifies improvement in health

**Table 2. Bivariate correlation results, stratified by migrant status**

	Survey time	Age	Sex	Marital status	Education	English Proficiency	Health at wave 1	Health change
Survey time		2.20	7.79**	1.85	58.31***	13.57***	3.73**	-1.38
Age	3.37*		20.65***	147.87***	48.03***	27.54***	5.43**	1.80
Sex	16.62***	.19		25.73***	9.22*	3.97*	1.19 [0.99 – 1.41]	0.86 [0.75 – 0.99]*
Marital status	28.86***	67.40***	3.86*		20.01***	12.02***	0.86 [0.73 – 1.01]	1.18 [1.03 – 1.35]*
Education	4.11**	1e-07***	2.42	10.65*		93.01***	3.30*	1.13
English proficiency	14.58***	14.05***	13.73***	6.55*	40.25***		1.43 [1.19 – 1.71]***	0.87 [0.75 – 1.01]
Health at wave 1	6.81***	5.09**	0.91 [0.80 – 1.04]	0.93 [0.81 – 1.06]	1.48	1.26 [1.09 – 1.45]**		14.81***
Health change	2.69***	2.32	1.00 [0.89 – 1.14]	0.95 [0.84 – 1.07]	2.42	1.26 [1.09 – 1.45]**	0.69***	

\*p<0.05

\*\*p<0.01

\*\*\*p<0.001

Migrant correlation results are in the left lower hand corner of the matrix, and non-migrant results are displayed in the upper right hand corner.

One-way ANOVA (F-value reported) used for: survey time and age, survey time and sex, survey time and marital status, survey time and education, survey time and English proficiency, age and health at wave 1, age and health change, education and health at wave 1, and education and health change.

Simple linear regression (regression coefficient reported) used for: survey time and health at wave 1, survey time and health change, and health at wave 1 and health change.

Chi-square test of independence (x-squared value reported) used for: age and sex, age and marital status, age and education, age and English proficiency, sex and marital status, sex and education, sex and English proficiency, marital status and education, marital status and English proficiency, and education and English proficiency.

Fisher's exact test (p-value reported) was used for: education and age among Migrants only due to small category sample sizes.

Binary logistic regression (odds ratio and 95% confidence interval reported) was used for: sex and health at wave 1, sex and health change, marital status and health at wave 1, marital status and health change, English proficiency health at wave 1, and English proficiency and health change.

**Table 3. Multivariate logistic regression results, migrants (n=355)**

	Model 1	Model 2	Model 3	Model 4	Model 5
	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
<b>Survey time interval</b>	.99 [.98 – .99]** *	.99 [.98 – .99]***	.99 [0.98 - .99]***	.99 [.98 – .99]***	.99 [.91 – .99]***
<b>Male</b>	5.30 [3.41- 8.55] ***	5.32 [3.40 – 8.64]* **	4.99 [3.18 – 8.15]* **	4.38 [2.69 – 7.43]* **	4.38 [2.68 – 7.43]* **
<b>Married</b>	1.31 [.89 - 1.94]	1.28 [.87 - 1.91]	1.24 [.83 - 1.85]	.93 [.58 – 1.49]	.92 [.578 – 1.48]
<b>Age</b>					
<b>18-24</b>	1.54 [1.04 – 2.30]*	1.63 [1.09 – 2.46]*	1.64[1.09 – 2.49]*	1.24 [0.77 – 2.02]	1.24 [.77 – 2.02]
<b>55+</b>	.67 [.32 – 1.44]	.78 [.37 – 1.71]	.75 [.35 – 1.64]	.81 [.37 – 1.82]	.80 [.36 – 1.82]
<b>Education</b>					
<b>Less than high school</b>		1.63 [.69 – 3.98]	1.43 [.60 – 3.53]	1.39 [.53 – 3.72]	1.41 [.54 – 3.84]
<b>Some college, but did not finish</b>		2.04 [1.18 – 3.56]*	2.16 [1.24 – 3.79] **	1.78 [.96 – 3.34]	1.80 [.97 – 3.39]
<b>College and above</b>		2.64 [1.76 – 3.98]* **	3.03 [1.96 – 4.712] ***	3.05 [1.86 - 5.03]* **	3.03 [1.85 – 5.00]* **
<b>English Proficiency (good)</b>			.65 [.41 – 1.03]	.63 [.37 – 1.04]	.61 [.36 – 1.02]
<b>Health (wave 1)</b>				1.27 [1.09 – 1.49]* *	1.33 [1.05 – 1.69]*
<b>Health change</b>					0.95 [0.76 – 1.18]
<b>(intercept)</b>	4.0e-03 [5.0e-04 – .04]***	3.0e-03 [4.0e-04 – .03]***	.01 [6.0e-04 – .06] ***	9.0e-04 [5.0e-05 – .01]***	7.0e-04 [4.0e-05 – .01]***

\*p<0.05

\*\*p<0.01

\*\*\*p<0.001

**Table 4. Multivariate logistic regression results, non-migrants (n=721)**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
	<b>OR [95% CI]</b>	<b>OR [95% CI]</b>	<b>OR [95% CI]</b>	<b>OR [95% CI]</b>	<b>OR [95% CI]</b>
<b>Survey time interval</b>	1.00 [.99 –1.00]	.99 [.99-1.00]	.99 [.99 –1.00]	1.00 [.99 –1.00]	1.00 [.99 – 1.00]
<b>Male</b>	1.58 [1.18 –2.13] **	1.54 [1.15 –2.08] **	1.54 [1.15 –2.09] **	1.36 [1.00 –1.87]	1.35 [.99 –1.86]
<b>Married</b>	.84 [.62 – 1.14]	.87[.64-1.18]	.87 [.64 – 1.18]	.85 [.62 – 1.17]	.86 [.62 – 1.18]
<b>Age</b>					
<b>18-24</b>	.50 [.36 –.71]***	.45 [.32 –.65]***	.46 [.32 –.65]***	.54 [.37 – .78]**	.54 [.37 – .78]**
<b>55+</b>	.85 [.52 – 1.43]	.93 [.51 – 1.57]	.93 [.56 – 1.57]	.98 [.57 – 1.77]	.99 [.57 – 1.78]
<b>Education</b>					
<b>Less than high school</b>		.82 [.53 – 1.26]	.82 [.53 – 1.25]	.94 [.60 – 1.48]	.94 [.60 – 1.49]
<b>Some college, but did not finish</b>		1.23 [.83 – 1.82]	1.23 [.82 – 1.84]	1.25 [.82 – 1.90]	1.25 [.82 – 1.90]
<b>College and above</b>		1.94 [1.29 –2.92] **	1.95 [1.27 –2.99] **	1.91 [1.23 –2.98] **	1.91 [1.23 –2.97] **
<b>English Proficiency (good)</b>			.99 [.71 – 1.39]	.87 [.61 – 1.24]	.86 [.60 – 1.23]
<b>Health (wave 1)</b>				1.21[1.00 –1.48] *	1.25[1.00-1.56]*
<b>Health change</b>					.96 [.80 – 1.13]
<b>(intercept)</b>	1.30 [.25 – 6.68]	.36 [.05 – 2.45]	.36[.05-2.46]	.48 [.06 – 3.94]	.44 [.05 – 3.70]

\*p<0.05

\*\*p<0.01

\*\*\*p<0.001

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## REFERENCES

- [1] “Foreign-born workers made up 17.4 percent of labor force in 2019 : The Economics Daily: U.S. Bureau of Labor Statistics.” <https://www.bls.gov/opub/ted/2020/foreign-born-workers-made-up-17-point-4-percent-of-labor-force-in-2019.htm> (accessed Jul. 15, 2022).
- [2] “Table 2. Persons Obtaining Lawful Permanent Resident Status by Region and Selected Country of Last Residence: Fiscal Years 2015 to 2017 | Homeland Security.” <https://www.dhs.gov/immigration-statistics/yearbook/2017/table2> (accessed Jul. 15, 2022).
- [3] S. Stoney and J. Batalova, “Filipino Immigrants in the United States,” p. 12.
- [4] B. Chiswick, Y. Lee, and P. Miller, “A Longitudinal Analysis of Immigrant Occupational Mobility: A Test of the Immigrant Assimilation Hypothesis,” *Int. Migr. Rev.*, vol. 39, Feb. 2002, doi: 10.2139/ssrn.305371.
- [5] D. A. Hurtado, E. L. Sabbath, K. A. Ertel, O. M. Buxton, L. F. Berkman, and T. D. Cabot, “Racial disparities in job strain among American and immigrant long-term care workers,” *Int. Nurs. Rev.*, vol. 59, no. 2, pp. 237–244, Jun. 2012, doi: 10.1111/j.1466-7657.2011.00948.x.
- [6] F. Fleischmann and J. Dronkers, “Unemployment among immigrants in European labour markets: an analysis of origin and destination effects,” *Work Employ. Soc.*, vol. 24, no. 2, pp. 337–354, Jun. 2010, doi: 10.1177/0950017010362153.
- [7] A. Gorodzeisky and M. Semyonov, “Labor force participation, unemployment and occupational attainment among immigrants in West European countries,” *PLoS ONE*, vol. 12, no. 5, pp. e0176856–e0176856, May 2017, doi: 10.1371/journal.pone.0176856.

- [8] D. S. Friedland and R. H. Price, "Underemployment: Consequences for the Health and Well-Being of Workers," *Am. J. Community Psychol.*, vol. 32, no. 1–2, pp. 33–45, 2003, doi: 10.1023/A:1025638705649.
- [9] T. de Vroome and F. van Tubergen, "The Employment Experience of Refugees in the Netherlands," *Int. Migr. Rev.*, vol. 44, no. 2, pp. 376–403, 2010.
- [10] P. Oreopoulos, "Why Do Skilled Immigrants Struggle in the Labor Market? A Field Experiment with Thirteen Thousand Resumes," *Am. Econ. J. Econ. Policy*, vol. 3, no. 4, pp. 148–171, 2011.
- [11] J. Dean and K. Wilson, "Education? It is irrelevant to my job now. It makes me very depressed ...": exploring the health impacts of under/unemployment among highly skilled recent immigrants in Canada," *Ethn. Health*, vol. 14, no. 2, pp. 185–204, Apr. 2009, doi: 10.1080/13557850802227049.
- [12] I. Correa-Velez, A. G. Barnett, and S. Gifford, "Working for a Better Life: Longitudinal Evidence on the Predictors of Employment Among Recently Arrived Refugee Migrant Men Living in Australia," *Int. Migr.*, vol. 53, no. 2, pp. 321–337, Apr. 2015, doi: 10.1111/imig.12099.
- [13] H. Antecol and K. Bedard, "Unhealthy assimilation: Why do immigrants converge to American health status levels?," vol. 43, no. 2, p. 24, 2006.
- [14] E. Tan, "Human Capital Theory: A Holistic Criticism," *Rev. Educ. Res.*, vol. 84, no. 3, pp. 411–445, Sep. 2014, doi: 10.3102/0034654314532696.
- [15] "OECD Glossary of Statistical Terms - Human capital Definition."  
<https://stats.oecd.org/glossary/detail.asp?ID=1264> (accessed Jul. 08, 2022).

- [16] G. S. Becker, "Health as Human Capital: Synthesis and Extensions," *Oxf. Econ. Pap.*, vol. 59, no. 3, pp. 379–410, 2007.
- [17] P. Bouchard, "Human Capital Theory: Intersecting Educational and Economic Theories," p. 7.
- [18] S. Coulombe, J.-F. Tremblay, and S. Marchand, "International Adult Literacy Survey Literacy scores, human capital and growth across fourteen OECD countries," Jan. 2004.
- [19] C. Dustmann and F. Fabbri, "Language Proficiency and Labour Market Performance of Immigrants in the UK," *Econ. J.*, vol. 113, no. 489, pp. 695–717, 2003.
- [20] "Health as Human Capital: Synthesis and Extensions on JSTOR." <https://www-jstor-org.offcampus.lib.washington.edu/stable/4500116> (accessed Apr. 05, 2022).
- [21] S. S. Lim *et al.*, "Measuring human capital: a systematic analysis of 195 countries and territories, 1990–2016," *The Lancet*, vol. 392, no. 10154, pp. 1217–1234, Oct. 2018, doi: 10.1016/S0140-6736(18)31941-X.
- [22] J. M. McDowell and L. D. Singell, "An Assessment of the Human Capital Content of International Migrants: An Application to US Immigration," *Reg. Stud.*, vol. 27, no. 4, pp. 351–363, Jan. 1993, doi: 10.1080/00343409312331347615.
- [23] OECD, *The Well-being of Nations: The Role of Human and Social Capital*. OECD, 2001. doi: 10.1787/9789264189515-en.
- [24] J. Scott and G. Marshall, "human-capital theory," in *A Dictionary of Sociology*, Oxford University Press, 2009. Accessed: Apr. 04, 2022. [Online]. Available: <http://www.oxfordreference.com/view/10.1093/acref/9780199533008.001.0001/acref-9780199533008-e-1038>

- [25] J. M. Soltero, “Economic Sector Employment, Human Capital, and Poverty among Mexican Immigrants in Chicago,” *J. Poverty*, vol. 24, no. 4, pp. 318–333, Jun. 2020, doi: 10.1080/10875549.2019.1703129.
- [26] “Approaches to Measuring the Stock of Human Capital: A Review of Country Practices,” OECD Statistics Working Papers 2012/04, Nov. 2012. doi: 10.1787/5k8zlm5bc3ns-en.
- [27] A. B. de Castro *et al.*, “Cohort profile: the Health of Philippine Emigrants Study (HoPES) to examine the health impacts of international migration from the Philippines to the USA,” *BMJ Open*, vol. 9, no. 11, p. e032966, Nov. 2019, doi: 10.1136/bmjopen-2019-032966.
- [28] G. C. Gee *et al.*, “Health of Philippine Emigrants Study (HoPES): study design and rationale,” *BMC Public Health*, vol. 18, no. 1, Jun. 2018, doi: 10.1186/s12889-018-5670-8.
- [29] J. Quiggin, “Human Capital Theory and Education Policy in Australia,” *Aust. Econ. Rev.*, vol. 32, pp. 130–144, Feb. 1999, doi: 10.1111/1467-8462.00100.
- [30] A. Ahuja, S. Baird, J. H. Hicks, M. Kremer, E. Miguel, and S. Powers, “When Should Governments Subsidize Health? The Case of Mass Deworming,” *World Bank Econ. Rev.*, vol. 29, pp. S9–S24, 2015.
- [31] A. Chong, I. Cohen, E. Field, E. Nakasone, and M. Torero, “Iron Deficiency and Schooling Attainment in Peru,” *Am. Econ. J. Appl. Econ.*, vol. 8, no. 4, pp. 222–255, 2016.
- [32] A. Dillon, J. Friedman, and P. Serneels, “Health Information, Treatment, and Worker Productivity,” *J. Eur. Econ. Assoc.*, vol. 19, no. 2, pp. 1077–1115, Apr. 2021, doi: 10.1093/jeea/jvaa024.
- [33] “The ‘healthy worker effect’: Do healthy people climb the occupational ladder? | Elsevier Enhanced Reader.”  
<https://reader.elsevier.com/reader/sd/pii/S1570677X17301879?token=8637D971BF90C0C>

77A5F1C997936F5389DCCF6AB60CF5A34F903F4975D6114591084DC8560B5209ECB  
4E753BFA75394B&originRegion=us-east-1&originCreation=20220721233429 (accessed  
Jul. 21, 2022).

- [34] D. Mar, “Individual characteristics vs. city structural characteristics: explaining self-employment differences among Chinese, Japanese, and Filipinos in the United States,” *J. Socio-Econ.*, vol. 34, no. 3, pp. 341–359, May 2005, doi: 10.1016/j.socec.2004.09.019.