January 2009

Examining The Longitudinal Impact Of Assets And Income On Immigrant Health Behaviors

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EXAMINING THE LONGITUDINAL IMPACT OF ASSETS AND INCOME ON IMMIGRANT HEALTH BEHAVIORS

by

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A dissertation presented to the
Graduate School of Arts and
Sciences of Washington University
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

December 2009

Saint Louis, Missouri

Abstract of the Dissertation

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Doctor of Philosophy in Social Work

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The foreign born population is an integral part of U.S. society and continues to experience a steady numerical increase. This study uses longitudinal data to determine the effects of culture and acculturation on the health behaviors of the foreign born. Drawing from the behavioral model of health service utilization for vulnerable populations (Gelberg, Andersen, & Leake, 2000), the assets effects model (Schreiner & Sherraden, 2007; Sherraden, 1991), and acculturation models and using generalized linear, latent, and mixed models (GLLAMM), the study constructs longitudinal models to establish the determinants of health behaviors (recreational physical activity, alcohol consumption, and cigarette smoking) through the trajectory of earned income and acquired assets. The study finds several key institutions that are instrumental in explaining health behaviors namely culture, language, and employment. The implications of these findings which are highly relevant to professions that work to improve the health of foreign-born communities in the country are discussed in detail.

Acknowledgment

I would like to thank the Fahs-Beck Fund for Research and Experimentation that funded this work. Thank you to my committee members who in spite of time constraints worked tireless to provide feedback and direction. Special thanks to my committee chair Dr. Shanta Pandey who has provided consistent guidance and encouragement over the years. Finally, I would like to acknowledge and thank my family and friends for their support throughout this process.

Dedication

To the Kamau, Kagotho and Kariuki families without whose support this would have been a much harder road to travel.

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CHAPTER 1

Research Problem

The foreign-born population is an integral part of U.S. society. This population is currently experiencing a steady numerical increase. Current Population Survey data estimates that 11.7% (33.5 million) of the U.S. population are foreign born (Larsen, 2004). Not only has there been a numerical increase but also an increase in the diverse nations from which they originate. Given the unique social-cultural characteristics compared to those of native-born Americans, this population experiences distinct health needs, health behaviors, and—consequently—health outcomes.. At the point of immigration the foreign-born are known to have better health outcomes as compared to their native born peers—a phenomenon referred to as the 'healthy immigrant effect'. This health advantage is attributed to several factors. Research has found that the pre-migration behaviors that are beneficial to one's health explain some of these health variations (Jasso, Massey, Rosenzweig, & Smith, 2002). It is also established that individuals who elect to migrate are more likely to be in superior health as compared to their counterparts who do not migrate (Akresh & Frank, 2008; Swerdlow, 1991). Over time, however, the health advantage enjoyed by the foreign-born begins to diminish, and ultimately disappears. Studies have found that ten to twelve years after migration, the health of the foreign-born not only begins to mirror that of the native-born, but also falls below national trends in many instances. Increasing chronic health conditions and mortality rates among the foreign-born are factored into the nation's health burden,

thereby straining an already overwhelmed health care sector. Several reasons have been posited to explain declining health among the foreign-born including changing health behaviors. The link between health behaviors and health outcomes has been well established in the literature. Healthy dietary practices, avoidance of tobacco products, engaging in physical activity, and avoidance of excessive alcohol consumption are linked to strong health outcomes. In the case of the foreign-born, changing behaviors post-migration not only increases their risks to ill health but also dismantles and reverses the protective factors set in place by positive pre-migration behaviors.

This situation is exacerbated by barriers that direct how the foreign-born population interacts with the U.S. health care system. First, the number of uninsured immigrants is twice that of native-born Americans. In addition, policies restrict segments of this population's access to state and federal health care programs, including Medicare and Medicaid. These and other barriers result in an underutilization of mainstream healthcare services (such as those provided through HMOs and private physicians), and an increase in the number who report a total lack of health care service utilization (Ku & Matani, 2001). The lack of private and government-provided health insurance has further resulted in the over-utilization of hospital emergency room services. Given the costs related to these barriers it is vital to expand our understanding of health behaviors that both promote good health and preempt chronic health conditions. To establish the factors that influence these changing post-migration health behaviors this study constructs longitudinal models. The study uses light and vigorous physical activities, cigarette smoking, and alcohol consumption to conceptualize the construct of health behavior.

Household wealth (operationalized as household income and household asset holdings) is modeled as the main independent variable.

The overall focus of this project is twofold: first to introduce the immigrant sample collected by the Panel Study of Income Dynamics (PSID), the analysis of which is lacking in the literature. Second, drawing from the behavioral model of health service utilization for vulnerable populations (Gelberg, et al., 2000), the assets effects model (Schreiner & Sherraden, 2007; Sherraden, 1991), and acculturation models and using generalized linear, latent, and mixed models (GLLAMM), the study constructs longitudinal models to establish the determinants of health behaviors through the trajectory of earned income and acquired assets.

The results of this study are relevant to professions that work to improve the health of foreign-born communities in the country. Whereas a search of the literature indicates an association between wealth and health behaviors and health outcomes, this study finds little to no association between the health behaviors of the foreign-born and their earned income and/or their accumulated assets. The study finds that several social institutions are key in explaining health behaviors namely culture, language, and employment. Culture was operationalized using variables such as region of origin, gender, and acculturation status, and demonstrates statistical significance in explaining who participates in the selected health behaviors. For instance, respondents who report a better grasp of the English language are more likely to be physically active and less likely to report cigarette smoking. Women and respondents who are linguistically separated (high proficiency in 'other' language and low proficiency in English) are less likely to consume alcoholic beverages. Research has shown that a majority within both the

documented and undocumented foreign-born do hold some type of employment. This study found that employed respondents were more likely to participate in recreational physical activity, and less likely to consume alcoholic beverages. The implications of these findings are discussed in detail including the work place environment as a promising intervention point.

Study aims and significance

The United States' comprehensive public health plan has set out to achieve two national goals by 2010: improving quality of life and eliminating health disparities. Research, however, continues to document persistent health outcome disparities more so within minority populations (Brown, Ojeda, Wyn, & Levan, 2000; U.S. Department of Health and Human Services, 2000b). The Office of Minority Health (OMH) within the Department of Health and Human Services (DHHS) notes that disparities in health outcomes in minority populations indicate a shortfall in current practice strategies (Office of Minority Health, 2008). The persistence of disparities has led to a need for continued long-term research on the health of minority populations. To build on the current minority health literature, this study will critically examine the relationship of two contributing factors to minority health disparities identified by OMH: health behaviors and economic factors. While there is a growing body of literature investigating the relationship of health and economic factors in the native population, there remains a dearth of knowledge regarding these factors within the immigrant population.

The field of social work is strategically placed to initiate and foster dialogue between political, public, and private entities in instituting policies and programs. The complex nature of immigration as it interacts with U.S. institutions necessitates interventions to

tackle both practice and policy concerns. Social work has proven a worthy bridge between different disciplines that deal with immigration, and the field's intervention with foreign-born communities continues to play an integral role in encouraging wealth creation (Office of Refugee Resettlement, 2008). Although the field has come a long way in working towards policies that enable the foreign-born to improve their health and to create wealth, more work is required towards the establishment of a level playing field for foreign born communities. An understanding of the relationship between health behaviors and wealth among non-U.S. citizens will help increase practitioner understanding of best practices with minority populations both in terms of social and economic outcomes and health outcomes.

This study uses data from the panel study of income dynamics (PSID). The PSID is one of a few multi-generational studies that collect both health information and social economic information. In 1997 PSID introduced a sample of immigrant households. The new sample consisted of 441 families introduced in 1997, and 70 in 1999. With the additional split of several families, the 2005 final sample has a total of 572 immigrant families (Gouskova, Heeringa, McGonagle, & Schoeni, 2008). This addition was undertaken so as to include immigrant families who would not have originally qualified for the initial sample (Heeringa & Connor, 1999). Despite having health behavior, and health outcome variables, the PSID still remains highly underutilized in the health literature (Andreski, McGonagle & Schoeni, 2007) and to our knowledge no peer review study has been conducted drawing primarily from the new immigrant sample.

The aims of this project are to:

- describe in detail the PSID immigrant sample

- test the relationship between income and health behaviors among foreign born residents
- test the relationship between assets and health behaviors among foreign born residents

This study makes several substantial contributions to the current state of knowledge. First, the literature does not include any peer-reviewed studies that describe the characteristics of this sample. It should be acknowledged that several papers exist that are accessible via the PSID web site that adequately describe basic demographic characteristics of this population (Panel Study of Income Dynamics, n.d-a). This study goes a step further to describe those immigration characteristics that are known to inform health behaviors. In addition, no studies have been found that utilize the PSID immigrant sample in the study of health behaviors. This, coupled with the fact the health data in the PSID is still highly underutilized, strengthens the contribution that this study makes to the literature. This current study, therefore, draws from this relatively unused sample to increase knowledge on the wealth and health nexus among foreign-born residents. Past studies investigating health behaviors among the foreign-born have used cross-sectional data. This study goes a step further and constructs models using longitudinal data, which allows the study of health behavior differences and similarities over time. The ability to model time allows this study to make a significant contribution to the understanding of the effects of acculturation on changing health behaviors.

CHAPTER 2
State of the Literature

The Office of Minority Health calls for an evidence- based approach to tackling minority health issues (Office of Minority Health, 2008). This chapter synthesizes what is known about immigrant health, health behaviors, and wealth by looking at the two proposed constructs of interest, health behaviors (physical activity, smoking and alcohol consumption), and wealth (assets and income).

Migration into the United States oscillates in response to policy shifts. Current numbers place the foreign-born population at 35,689,842 with an estimated 4.5 million increase, between 2000 to 2005 (Migration Policy Institute, 2007). Unlike early migration movements in the U.S, a majority of current immigrants are non-white and come from developing nations. Although often used interchangeably, the terms “immigrant” and “migrant” hold distinct differences as defined in the U.S legal system. “Immigrant” is used to identify those persons granted permanent visa status, sometimes referred to as legal permanent residents (LPR). The terms “non-immigrant” and “migrant” are designated for individuals whose admission is based on their intent to reside in the country for a specified duration of time only.

LPRs are further subdivided into categories that are informed by the reasons given for migration. Immigrants include those admitted for employment purposes or under the family reunification program; diversity visa lottery winners; refugees; and asylum seekers. Department of Homeland Security data indicates a marked increase in the number of LPRs admitted. Between 1980 and 1989 more than six million immigrants were granted LPR status. This figure increased in the 1990’s with nine million visas

issued. In total between 1973 and 2004 there have been 23.1 million individuals granted LPR status, and of these, eight million had been deemed eligible for naturalization by 2004 (Potocky-Tripodi, 2002). The countries most represented in these figures include Mexico, The Philippines, and India (Rytina, 2006).

Documented non-immigrants are admitted on a temporary basis in pursuit of employment or educational ventures, as visitors and tourists, and to participate in cultural exchange programs. Data from the Department of Homeland Security indicates that in 2004 there were slightly over 30 million non-immigrants admitted into the United States. These numbers included students (0.6 million), tourists and visitors (22.8 million), business travelers (4.6 million), skilled workers (0.8 million) and diplomats (Rytina, 2005).

Undocumented immigrants enter the country with falsified documents, with no documents, or overstay their visa stipulations (Ross & Wu, 1995). The number of undocumented individuals has continued to rise steadily over the past decades. Conservative estimates placed this number at five million undocumented immigrants residing in the country by 1996 (Grieco, 2005). Current estimates, however, place this population at between seven to 11 million. States that have continued to experience a hike in the number of undocumented individuals include California, Texas, Illinois, Arizona, Georgia, and North Carolina (DHS, 2004).

Today, immigration in the United States is regulated by the 1990 Immigration Act (an amendment of the Immigration Reform and Control Act IRCA), and is currently under the purview of the Department of Homeland Security (DHS). The Homeland Security Act of 2002 dismantled the Immigration and Naturalization Services (INS).

Immigration enforcement and regulation functions were then allocated to the United States Citizenship and Immigration Services (USCIS), the United States Immigration and Customs Enforcement (ICE), and the United States Customs and Border Protection. For consistency, this document will use the term foreign-born throughout the document.

Immigrants and health

The foreign-born are known to enjoy a positive health advantage over the native-born population at migration. Over the years, however, this health advantage beings to diminish and is totally eradicated after several years in the Diaspora. Research has established several factors that explain this phenomenon, including interaction with health institutions, and changing life style habits pre-migration.

Access to health care

The foreign-born's health care access differs significantly from that of native-born populations (Capps, Passel, Perez-Lopez, & Fix, 2003). Immigrant families are less likely than native U.S. residents to have access to health care (INS, 2003). The factors posited to explain this phenomenon include personal-/individual-level factors, community-level factors and system-level structural factors (Office of Minority Health, 2008; Potocky-Tripodi, 2002). Personal-level barriers encompass the individual's knowledge of and attitudes toward disease and healing and health behaviors. Also included in this category are genetic and biological determinants of health. Community-level barriers to health include environmental, cultural, and socio-political factors. Finally, system-level factors include those that inform the individual's interaction with the public health care system, including programs and policies that inform access.

To a great extent, culture as a community-level barrier determines an individual's interaction with health care institutions. The Purnell model for cultural competency provides a framework through which to understand the relationship between health and culture (Purnell, 2002). Among other things, the framework posits that although there are shared characteristics between cultures, there also exist inherent differences both between and within cultures (Purnell, 2002). These inter and intra differences are explained by the context specificity of culture. Because culture results from a group's unique interaction with their social, physical, economic, and political environment, the resulting rules of behavior become common only to that group of individuals. These distinct behavioral markers are partially why it is detrimental to generalize behavior associated with health and health care institutions across groups. This rationalization underscores the hazard of using just race and/or ethnicity as cultural proxies, as—even within each racial/ethnic category—there are experiential and behavioral variations. These differences have been documented in literature with studies finding differences in health, health care seeking, and health behavior trends within ethnic groups (Grant, et al., 2004; Perez-Stable, et al., 2001).

Systems-level factors that inform access to health care among the foreign born are national and local policies that determine the foreign born population's interactions with health institutions. Past and recent policies continue to influence the immigrant population's ability to access services at the federal and state level. Policies such as the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) regulate access to entitlement and welfare programs such as public health insurance. The introduction of PRWORA explicitly defined the immigrant's relationship with the public

health care system. In addition to excluding all migrants from Medicaid and Medicare programs, it curtailed services that other groups of immigrants, such as legal permanent residents, had previously enjoyed. Refugees, asylum seekers, and military personnel were deemed eligible for Medicaid for the first seven years, after which eligibility was to be determined by individual states. Legal permanent residents were ineligible for Medicaid and Medicare for the first five years in the United States pursuant to which eligibility became a state option (Potocky-Tripodi, 2002). Finally, both documented and undocumented migrants were only eligible for emergency medical services (Clancy, et al., 2007).

Life style changes

A second set of reasons given to explain declining health pre-migration are those that relate to life style habits. Health is a culturally conceived and shaped phenomenon. The concepts of disease and illness elicit different meanings both from a western medical standpoint and a traditional cultural stand point (Kleinman, Eisenberg, & Good, 2006). Fabrega defines disease as "a socially constructed phenomenon that we try to eliminate and control" (1974, p. 221). Subsequently, it can be argued that what is labeled as 'disease' will depend on what a society deems unpleasant and thus in need of elimination. Kleinman et al., define illness as "an individual's approach to disease as informed by culture and personal values" (2006, p. 141). Socio-cultural elements that inform how we interact with our physical and social environment also inform our perception of disease and illness and, consequently, our health behaviors. These socio-cultural elements include (1) the medical belief system; (2) social structure and organization, (3) values regarding individual attributes and behavior, characteristics of social interaction, and

spiritual or religious obligation; (4) history of cultural groups (Sussman, 1996). Region of origin, which is often used as a proxy for socio-cultural factors, has been identified as a strong indicator of health behavior (Ham, Yore, Kruger, Heath, & Moeti, 2007; Neighbors & Marquez, 2008) and health outcomes (Choi & Harachi, 2002; C. I. Cohen, Berment, & Magai, 1997; Garbers & Chiasson, 2006; Gomez, Kesley, Glaser, Lee, & Sidney, 2004). The cultural literature argues that culture, including social networks and norms, protects immigrants from adverse conditions (Amaro & de la Torre, 2002). Immigrants seem to have better health and report fewer chronic health problems as compared to natives (Jasso, et al., 2002; Kandula, Kersey, & Lurie, 2004). The two reasons clearly identified in literature to explain this phenomena are health selectivity and culture , both of which buffer against risk behavior and environmental conditions (Jasso, et al., 2002). Proponents of the healthy migrant effect argue that only those individuals who exhibit good health outcomes are selected to migrate (Swerdlow, 1991). In a study of recently admitted legal permanent residents Akresh & Frank, (2008) found that health selectivity is informed by various factors including region of origin, visa type at migration, gender, and socioeconomic status.

In addition, acculturation determines many behaviors, including health behaviors. Constant interaction amongst groups results in the exchange of cultural traits—a process referred to as acculturation. Acculturation is therefore the process individuals or groups of people undergo as they come into contact with others of a different cultural orientation. This contact of cultures is characterized by interpersonal conflict, as cultures fight for dominance (Berry, 1990). There are different forms and stages of acculturation namely integration, assimilation, separation, and marginalization. Integration occurs

when an individual successfully reconciles and integrates both his/her culture and that of the dominant society (Mendoza & Martinez 1981). Assimilation, according to Berry (1990) , is the process by which one culture overwhelms another and eliminates it. Separation, also referred to as cultural alienation, occurs when the individual completely shuns the dominant culture and chooses to retain his/her own cultural identity. Older immigrants are much more likely to experience this form of acculturation. Marginalization occurs when an individual opts to abandon his/her culture so as to gain acceptance in the dominant culture. Subsequently, both cultures shun the individual leaving him/her with no culture to identify with (Cuellar, Arnold, & Maldonado, 1995).

Acculturation experienced by individuals involves the transformation of personal values and beliefs at the behavioral, cognitive, and affective levels (Berry, 1990; Cuellar, et al., 1995). Behavioral level transformations include verbal and dietary changes. Other transformations include emotional changes and value alterations with regard to gender and sex roles. Acculturation studies measure such constructs as proximity to ethnic enclaves, personal interactions, employment rates and retention, duration and types of public welfare access, and language skill acquisition (Berry, 1980; Cuellar, et al., 1995).

The relationship between acculturation and immigrant health is complex. During the acculturation process health behaviors are either reinforced or altered. First, as individuals begin to acculturate to the native population's way of life, some of the buffering mechanisms associated with the immigrant's culture may be lost, resulting in a decline in the negative change of health behaviors. Such is the case for immigrant adolescents who are exposed to health risk behaviors as they begin to interact with their mainstream peers (Mody, 2008). Overall changes in diet and a move towards a sedentary

life style begin to exert a negative effect on immigrant health with increased acculturation. On the other hand, acculturation has been found to positively impact health seeking behaviors (K. Larsen, 2007). Individuals who are more attuned to the culture of the dominant group are more likely to interact with institutions, including health care providers. English proficiency is one common measure of acculturation that has been found to be positively associated with ones interaction with the health care system (Cuellar, et al., 1995; Majka & Mullan, 1992; Montgomery, 1996; Nicassio, 1983; Padilla, 1980; Westermeyer, Callies, & Neider, 1990; Westermeyer & Her, 1996). Another commonly used measure of acculturation is duration of residency in the immigrant's host society. Studies looking at this construct have found a positive relationship between duration of residency and health seeking behavior (Carrasquillo & Pati, 2004; Jacobs & Rapoport, 2002; Juon, Seung-Lee, & Klassen, 2003; Pandey & Kagotho, forthcoming). Immigrants who have resided in the United States longer are more likely to access care, including secondary preventative care.

Taking into consideration the personal-level, community-level and structural-level factors that inform health, the following section looks at what is known about immigrant health behaviors. The three behaviors of interest are physical activity, cigarette smoking, and alcohol consumption. Health behaviors partially determine health outcomes. Mortality is attributed to behaviors such as the use of tobacco, level of physical activity, consumption of alcohol, and dietary practices, to name a few (Mokdad, Marks, Stroup, & Gerberding, 2004).

Physical activity

Lack of physical activity could soon be the leading causes of mortality in the United States (Mokdad, et al., 2004). It therefore follows that one objective set out by Healthy People 2010 is to encourage daily regular moderate physical activity (PA) in the adult population (U.S. Department of Health and Human Services, 2000a). Caspersen, Powell & Christenson (1985) define physical activity as "any bodily movement produced by skeletal muscles that results in energy expenditure" (p. 126). Physical activity is not to be confused with exercise, —a subset of physical activity that is defined as structured physical activity aimed at bolstering physical fitness (Caspersen, et al., 1985).

Physical activities are categorized by their metabolic equivalent (MET) intensity levels. A metabolic equivalent is defined as "the ratio of work metabolic rate to a standard resting metabolic rate" (Ainsworth, et al., 1993, p. S498). The Compendium of Physical Activities is the widely accepted standardized instrument used to assess energy expenditure in epidemiological studies. The Compendium of Physical Activities lists a range of activities which range from a MET of 0.9 (sleep) to 18 (running at 10.9 mph) (Ainsworth, et al., 1993, p. S498). According to the Centers for Disease Control's guidelines, physical activity is categorized into moderate and vigorous physical activities. Moderate physical activities are those that are measured at an intensity of 3-6 METs and which allow the participant to expend 3.5 to 7 kcal/min. Vigorous activities are measured at an intensity greater than 6 METs and allow participants to expend more than 7 kcal/min (Centers for Disease Control and Prevention, n.d)[1]. A 2009 update of the 1995 physical activity and public health issued by the American College of Sports Medicine

[1] These categories are calculated for an average individual weighing 154 pounds and aged 30-50 years (male) and 20-40 (female) (Centers for Disease Control and Prevention, n.d).

and the American Heart Association, sets the recommended physical activity sessions at 20 minutes, 3 times a week at a vigorous level, or 30 minutes, 5 times a week at a moderate level (Haskell & Lee, 2007).

Documented research is available on the positive role physical activity/exercise plays in preventive health (U.S. Department of Health and Human Services, 1996). Physical activity has been known to reduce risks of chronic diseases and increase life expectancy (U.S. Department of Health and Human Services, 2000a). There are health outcome differences between light and vigorous physical activity. Whereas moderate and vigorous physical activity has been associated with lower mortality levels, light physical activity has not (I. M. Lee & Paffenbarger, 2000). Other studies have found that vigorous physical activity is a protective factor against disease such as coronary heart disease (Sesso, Paffenbarger, & Lee, 2000). In addition, research further suggests that adults who engage in physical activities are also more apt to observe other positive health practices such as better diets (Blair, Jacobs, & Powell, 1985) , and less cigarette use (Blair, et al., 1985; Pate, Heath, Dowda, & Trost, 1996). The reverse has also found to be true with negative health practices, such as smoking reducing the likelihood of participating in physical activities (Nagaya, Yoshida, Takahashi, & Kawai, 2007). As a health promotion strategy, exercise is infrequently used (Sohng, Sohng, & Yeom, 2002), a trend that is even more pronounced in minority populations (Caspersen, Christenson, & Pollard, 1986; Kandula & Lauderdale, 2005; U.S. Department of Health and Human Services, 2000a). Data drawn from the Healthy People 2010 indicates that African Americans report the lowest exercise rates followed by Asian populations and American Indian/ Alaskan

Natives. Whites report the highest rates of exercise among all sampled ethnic groups (U.S. Department of Health and Human Services, 2000a).

Diversity in physical activity trends is also observable between first generation and second generation immigrants. Studies have found that first generation immigrants are less likely to report leisure time physical activity when compared to their ethnic peers born in the United States (Ham, et al., 2007; Wolin, Colditz, Stoddard, & Emmons, 2006). Research has also found physical activity heterogeneity among similar ethnic groups drawn from different geographic locations. For example, research among American Latinos has found that physical activity varies by region of origin (Ham, et al., 2007; Neighbors & Marquez, 2008).

Conceptualizing the meaning and benefits of physical activity also differs among immigrant groups. Data from focus groups of older adults drawn from seven minority groups Belza et al., (2004) found that people from the Philippines viewed exercise as an offset to the high-fat American diet. Chinese, Korean, and Philippine respondents considered exercise as vital in the aid of digestion. Chinese, Philippine, and Vietnamese respondents indicated that exercise was vital for blood circulation, while Latinos considered it vital for mental health.

Acculturation, income, and education are significantly associated with physical activity among immigrant groups. Acculturation measured with proxies such as English language proficiency and age at immigration, increase immigrants' participation in physical activities (Crespo, Smit, Carter-Pokras, & Andersen, 2001; Evenson, Sarimento, & Ayala, 2004; Ham, et al., 2007; Wolin, et al., 2006). Education (Sohng, et al., 2002),

chronic health conditions, and family support (Belza, et al., 2004) has also been associated with physical activity.

In conclusion, minority populations are less likely to participate in physical activities, and the concept of physical activity holds different meanings for different cultural groups. However, this population's placement in the manual labor sector could preclude the fact that they do not engage in physical activity. Employment in this sector is often more physically demanding and may constitute some form of physical activity, albeit not at the recommended levels. So while many do not report exercise, their daily activities could constitute strenuous physical activity.

Cigarette smoking

Smoking is a leading cause of preventable mortality in the United States. Cigarette smoking has been linked to cancers and diseases of the respiratory, cardiovascular, and gastrointestinal systems (Fagerström, 2002). Current National Health Interview Survey (NHIS) data shows that 20.8% of adults 18 years and over are current smokers (Centers for Disease Control, 2008a). Although smoking rates have declined between 1997-2007 (Centers for Disease Control, 2008a) prevalence rates are still high. Current Population Survey (CPS) data gathered in the late 1990s placed the national smoking prevalence rate at 21.6% (Baluja, Park, & Myers, 2003). Cigarette smoking varies by gender, education, age, and race and ethnicity (Centers for Disease Control, 2007).

National and community studies indicate variations in smoking both within immigrant groups and between immigrants and the U.S.-born population (Baluja, et al., 2003; Centers for Disease Control, 1992; Perez-Stable, et al., 2001). A study using CPS

data found that smoking prevalence rates among U.S.-born respondents were close to 23% while among immigrants the rates were approximately 13% (Baluja, et al., 2003). In the same sample, White-non-Hispanic immigrants reported the highest rates (16.8%), followed by Hispanic (13%) and Asian/Pacific Islanders (11.8%). Black non-Hispanic immigrants reported the lowest smoking prevalence rates (Baluja, et al., 2003). Variations have also been noted between first and second generation immigrant groups (Centers for Disease Control, 1992; Perez-Stable, et al., 2001), with second generation immigrants reporting higher smoking rates. These variations have been attributed to socio-cultural factors (Kandula, et al., 2004).

Alcohol consumption

Alcohol exacerbates many health conditions in the human body and is a leading cause of life style death in America (Centers for Disease Control and Prevention, 2008). Alcohol consumption is related to long-term and short-term health risks, including unintentional accidents, poisoning neurological disorders, and cancers. Excessive drinking is used to refer to those who engage in heavy or binge drinking. Heavy drinkers consume one or more drink per day on average (women) or two or more drinks per day (men). Binge drinking is used to refer to those who consume four or more drinks a day (women) or five or more drinks a day (men) (Centers for Disease Control, 2008b).

Distinct ethnic and nation of origin differences have been noted in alcohol consumption patterns and rates (Dawson, 1998; Grant, et al., 2004). For instance, immigrants consume alcohol at a significantly lower rate compared to native-born individuals. Data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) indicates that Mexican and non-Hispanic White immigrants have

a much lower risk of alcohol abuse and dependence compared to U.S.-born non-Hispanic Whites. These trends are also similar within groups, with foreign born Mexicans reporting lower risks of alcohol use when compared to U.S.-born Mexicans (Grant, et al., 2004). Such evidence and other anecdotal data would therefore seem to suggest a cultural connection in alcohol consumption (Dawson, 1998). However, Gutmann, (1999) cautions against stereotyping immigrant behaviors (in this case alcohol consumption) based on ethnic or national origins and instead recommends maintaining the focus on social, economic, and political factors.

Immigrants and wealth

Wealth accumulation in immigrant communities is determined by various factors. These include human capital characteristics, social capital, interaction with financial institutions, and adequate identification documentation. Most immigrants are active participants in the U.S labor market with a desire to succeed financially. By strategically maximizing individual, family, and community resources, they seek to maximize returns on their human capital. Although a significant percentage of migrating populations arrive in the United States with limited skill sets, a substantial number are well educated, highly trained, and bring with them several years of professional experience. Statistics show that immigrants are over represented on both ends of the educational and employment continuum (Grieco, 2004). Compared to U.S natives and immigrants hailing from Mexico and Central America, those who migrate from other parts of the world such as Europe and Asia are much more likely to hold bachelor's and graduate degrees.

Americans access the health care system through employer provided insurance, and it is a well documented fact that immigrants are well represented in the current labor

market (Grieco, 2004). According to the Congressional Budget Office (CBO), in 2004 one in every seven workers (approximately 21 million individuals) in the United States were foreign-born, with 6.3 million of these estimated to be undocumented. It is projected that the ratio of foreign-born to native worker will continue to increase as the baby boomer generation exits the work force (CBO, 2005). Despite this fact, immigrants experience higher unemployment rates as compared to native-born Americans (Capps, Fortuny, & Fix, 2007) and are more likely to work at low-wage, temporary jobs (Potocky-Tripodi, 2002), thus compromising their ability to access health care through the work place.

The unique policy, social, economic, and demographic circumstances immigrants face make it imperative to understand their health behaviors and health outcomes over time. The following chapter presents a review of the current health literature as it relates to immigrants in the United States.

Income and assets

Two commonly used constructs in the study of health disparities are income and assets. Sometimes used interchangeably, income and assets are two distinct social-economic constructs that have different health outcome impacts (Deaton, 2002). Studies have used income, socio-economic status, and assets to determine their relationship with health outcomes (Pollack, et al., 2007; Ssewamala, Han, & Neilands, 2009). Health outcomes such as morbidity and diminishing physical functioning are known to be significantly negatively associated with these measures of economic well-being (House, Kessler, & Herzog, 1990; Kitagawa & Hauser, 1973; Menchik, 1993).

Income is commonly defined as the summation of all earnings including wages, interest payments, and profits. Indeed, the global community recognizes that an individual's well-being is influenced by more than income (WHO, 2004). In health studies, the construct is often operationalized as individual or household annual income. Although income, both permanent and transient, remains a key determinant of mortality it still does not fully explain health disparities. Assets have been considered a better measure of well-being, as compared to income. To this end, the researcher put concerted efforts into studying assets as opposed to income, as they relate to health. Assets are defined as the accumulation of financial resources over one's lifetime (Sherraden, 1991) with asset holdings exerting an impact on individual behavior and quality of life (Sherraden, 1991).

A composite of income and assets is a better measure for health for several reasons. First, the fluctuating nature of income makes it difficult to predict future behavior and an individual's security. The inadequacy of equating income to individual well-being is further bolstered by Sherraden's (1991) argument that the effect of assets on the individual's welfare transcends consumption. He posits that in addition to the immediate consumption benefits derived from the asset, individuals may begin to experience and exhibit behavioral changes including the altering of life choices as they accumulate assets

Second, McDonough, Duncan, Williams & House (1997) argue that using annual income may not adequately capture the full extent of lifetime resources available to the individual as he/she makes lifetime health behavior decisions. To correct for this, their study uses a five-year average income to capture household income volatilities

(McDonough, et al., 1997). Unlike income, assets are less likely to suffer the effects of life course events. The extended life course during which assets are accumulated means that assets are less likely to suffer the effects of unexpected life events that plague income (Feinstein, 1993). This ability of accumulated assets to weather life course events such as unexpected injury and loss of livelihood addresses some of the measurement problems inherent in income. However, there have been documented exceptions to this rule, such as in the case of severe illness or loss of employment that may lead families to dip into their wealth reserves.

Although the study of income and asset differentials in health and mortality continues to be a vibrant area of interest, discussion continues on the exact nature of this relationship. The most notable discussions revolve around the issues of reverse causality, Endogenicity, and the moderator effect of income and assets on health outcomes and disparities. There are two models that seek to explain the relationship between social economic status (SES) and health—the social causation and the social drift hypotheses. (Gallo & Matthews, 2003). The social causation hypothesis states that an individual's SES has a direct impact on health outcomes. SES therefore acts as a buffer against negative health outcomes; stated another way, SES facilitates positive health outcomes. On the other hand, the social drift hypothesis attributes an individual's social status to prevailing health conditions (Turner & Morton, 1967; Yen & Syme, 1999). For example, poor health ultimately leads to lower earned income, more so if prevailing health conditions adversely impact an individual's ability engage in the labor market. Poor health, therefore, detracts from an individual's ability to ascend the socio-economic ladder and in some cases causes drift down the rungs. Gallo & Matthews (2003), find

that although social drift does offer an explanation to the health and wealth nexus, the argument presented is insufficient to arrive at convincing argument for the hypothesis.

Some studies have shown a directional relationship between income and health (House, et al., 1990; Kitagawa & Hauser, 1973; Menchik, 1993; Sloggett & Joshi, 1998). Kitagawa & Hauser's (1973) studies of 1960 data documented an inverse relationship between income and mortality by age and gender. White males drawn from family units with annual income levels of less than $2,000 reported an 80% higher mortality rate as compared to those with incomes of $10,000 or more. Among comparable White women, there was a 40% difference in mortality rates. Their research further indicated that an increase in age decreased mortality differences between low- and high-income earners. For instance, the authors could not determine a relationship between family income and mortality among White women 65 years and older (Kitagawa & Hauser, 1973).

Reverse causality

As noted above, there does not exist a simple causal relationship between income and health outcomes (Deaton, 2002). Reverse causality, or selection as it is known in public health literature, refers to the possible explanation that it is positive health outcomes that determine individual resources and not the other way around. For instance, it would be logical to argue that poor health will cause one to reduce his/her contribution to the workforce, thus resulting in lower income returns. Research has now established that individuals that suffer from ill health are more likely to experience poverty (Mills, Bennett, & Gilson, 2008). Increased income allows individuals the resources to access preventive, curative, and rehabilitative services.

Endogenicity

Studies that look at the Endogenicity of wealth seek to evaluate the hypothesis that wealth influences health outcomes while controlling for the possibility that better health also contributes to building wealth. For this reason, studies have used exogenous shocks like non-earned income, such as inheritance and lottery winnings, and investigated their impact on health. Meer, Miller & Rosen (2003), use data from the Panel Study of Income Dynamics (PSID) and use inheritance and assets variables to investigate the relationship between wealth and health. Several conclusions were drawn from this study. The study found that wealth increased more slowly among respondents with poor health while those that reported illness in the course of the study accumulated less wealth. Further, a small but statistically significant effect of wealth on health was established. The study concludes that wealth does not exert an impact on health when fluctuations occur in the short term (Meer, et al., 2003).

Other studies have found an association between non-earned income and health (Gardner & Oswald, 2001; Gardner & Oswald, 2007). In a longitudinal British study tracking lottery winners, Gardner & Oswald (2007) tested the association between winnings and mental health. The study found that when compared to non-lottery winners and small lottery winners, the mental health of medium-sized lottery winners (£1000-120,000) improved over time.

Moderator effect

Income and wealth are not only directly associated with health outcomes but they also act as a psychological buffer against the negative effects of ill-health on the individual. Individuals with larger wealth reserves are less prone to stressors associated

with adverse life effects (Gallo & Matthews, 2003). Smith, Langa, Kabeto & Ubel (2005), found that respondents who had higher net worth were better protected from the effects of a sudden disability.

As previously noted, as far as we know there is little in the literature that documents the relationship between wealth and health within the immigrant community in the United States. This study hopes to begin a dialogue in this area by providing a starting point from which practitioners and researchers may begin to understand how income and assets impact immigrants' engagement in physical activity, cigarette smoking, and alcohol consumption.

CHAPTER 3
Health and Wealth Theories

This section presents the theoretical framework that was applied in this study. The behavioral model of health services utilization for vulnerable populations was used to frame the overall study and to help select control variables identified in the literature as determinants of immigrant health behaviors. The asset effect model was used to test and explain the relationship between assets and income on immigrant health. Finally, the model of acculturation was used in the construction of the language acculturation variable

The behavioral model of health services utilization for vulnerable populations

The over arching framework of this study was drawn from a modified version of the behavioral model of health services— 'the behavioral model of health services use for vulnerable populations' (behavioral model) (Gelberg, et al., 2000). This conceptual framework was first developed by Ronald Andersen in the late 1960s (Andersen, 1968, 1995). He developed the model to explain and measure health care access and consequently shape health policies that created an environment within which families could more readily access care (Andersen, 1968). The model attributed health care use to a family's inclination to seek care, the need for care, and factors that facilitated or impeded their ability to access care (Andersen, 1995).

The behavioral model states that the use of health care is a function of predisposing, enabling, and need factors. Predisposing factors may be defined as those that point to a greater inclination to service use (Andersen, 1968). Past studies have used variables such as demographic characteristics, social characteristics, and health beliefs to capture predisposing factors. Enabling factors are those that facilitate or impede access to

services, such as health insurance, physical access to health care, affordability of care, and income. Need factors are characterized as an individual's discernment of their health care needs and physician recommendations for care. Components such as physician referrals, current health needs, or a health crisis can be used to capture this factor. One of the strengths attributed to the behavioral model in policy research is its inclusion of adjustable variables that allow the researcher to determine intervention points that would elicit behavioral change (Andersen, 1995). For instance, demographic and social variables have low mutability, but health beliefs and enabling factors have medium and high mutability, respectively. This means that health beliefs and enabling constructs are points around which practitioners can develop interventions. Further, unlike intrapersonal theories (e.g. health belief model) that focus only on individual attributes as determinants of health, the behavioral model captures environmental and institutional factors such as social networks and social structures (Gehlert, 2006).

The behavioral model has undergone several modifications since it was originally proposed in the 1960s. In the 1970s variables were added that recognized the importance of the formal health care system in determining access. Also included in this phase of alterations were variables that rated health services from a consumer's perspective. In a third phase of modifications, life style choices, such as diet and exercising, and environmental systems, such as polity, were added (Andersen, 1995). In 2000 the behavioral model for health services utilization for vulnerable populations was developed to include a vulnerable domain. Gelberg et al., (2000) hypothesized that the factors that contributed to a population's vulnerability (in this case the homeless population) were also apt to inform their health practices and health outcomes.

The model has been applied in a number of immigrant and minority health studies (Andersen, Harada, Chiu, & Makinodan, 1995; Atchinson & Gift, 1997; Kagotho & Tan, 2008; Leclere, Jensen, & Biddlecom, 1994; Shi, 1999). Atchinson and Gift (1997) used predisposing, enabling, and need factors to determine individual self-rated oral health status among White, Hispanic, African-American, and Native American populations. Shi (1999), applied factors derived from the behavioral model to determine the experiences in health care system across racial groups.

Assets effect model

Research has shown that asset holdings have an impact on psychological, economic, and social outcomes (Sherraden, 1991). The assets effect model is based on the premise that assets are best measured cumulatively over one's life course. It also posits that asset effects transcend daily consumption, meaning that above and beyond daily expenditures, assets provide individuals and families with other non-material benefits. Sherraden (1991) theorizes a set of welfare effects that stem from assets including the change in an individual's orientation toward their future (p. 148) Need one to be consistent with APA style. The accumulation of assets influences the perception of what is possible in one's future. Shobe and Page-Adams (2001), extend this discussion by arguing that future orientation mediates other positive social and economic outcomes. Assets give individuals the means to circumvent those structural barriers that could otherwise impede their ability to dream about their future.

Studies that draw upon the asset effect theory have begun to show encouraging health outcome results. A study conducted with HIV/AIDS orphans in Uganda shows the positive effects assets have on preventative health (Ssewamala, Alicea, Bannon, &

Ismayilova, 2008). Youths receiving assets in the form of matched savings accounts and life skills, among other services, were found to exhibit a better perception of HIV prevention methods as compared to those who received life skills only (Ssewamala, et al., 2008). The promise of future economic security would therefore increase life mastery, leading to positive steps to improve life outcomes.

Acculturation models

Models that measure acculturation fall into two distinct groups: those that measure acculturation in a linear fashion, and those that are multidimensional in nature (Cabassa, 2003; Cuellar, et al., 1995; Padilla, 1980). A linear acculturation model, also referred to as a uni-dimensional model, is centered on the assumption that the acculturation process occurs along a continuum. On this continuum, a decrease in one's competence in one culture corresponds to an increase in the competence of another (Cabassa, 2003; Cuellar, et al., 1995). Critics of linear models such as the ARSMA state that by measuring acculturation in a linear fashion, one assumes that an individual or community experiences acculturation on a continuous scale. In the case of the ARSMA, for example, the model assumes that a person classified as Anglo Oriented Bicultural has decreased Mexican cultural characteristics as compared to a person classified as Very Mexicano. This model therefore states that one has to lose Mexican cultural elements to progress successfully along the continuum. Secondly, this model does not identify those individuals who have characteristics derived from both cultures—that is Mexican and Anglo culture. To address some of these issues, multidimensional acculturation models have been developed.

Multidimensional acculturation models on the other hand postulate that not only does the individual acquire cultural traits from the culture they are in contact with but that they also retain aspects of their own culture (Cabassa, 2003; Cuellar, et al., 1995; Padilla, 1980). An example of a multidimensional model is Padilla's acculturation model. Padilla (1980) states that acculturation is driven by an individual's level of cultural awareness and loyalty to their ethnic community. The stronger these two aspects are, the more difficult it is to reconcile one's culture with that of another.

To incorporate a multidimensional acculturation model, the current study drew from the acculturation scale for Southeast Asians developed by Anderson et al. (1993) in the creation of the language acculturation variable. This variable measured a respondent's competency in both English and their native language. The resulting variable placed respondents in one of four acculturation categories— integration, assimilation, separation, or marginalization.

Study questions

This study investigated the role of wealth (income and assets) on health behaviors. The following research questions were answered:

A. What are the health characteristics of the PSID immigrant sample?

B. Does wealth impact health behaviors among immigrants?

B.1 Higher income levels will increase the likelihood of engaging in leisure time physical activity

B.2 Assets will increase the likelihood of engaging in recreational physical activity

B.3 Higher income levels will increase the likelihood of smoking abstinence

B.4 Assets will increase the likelihood of smoking abstinence

B.5 Higher income levels will decrease the likelihood of alcohol consumption

B.6 Assets will decrease the likelihood of alcohol consumption

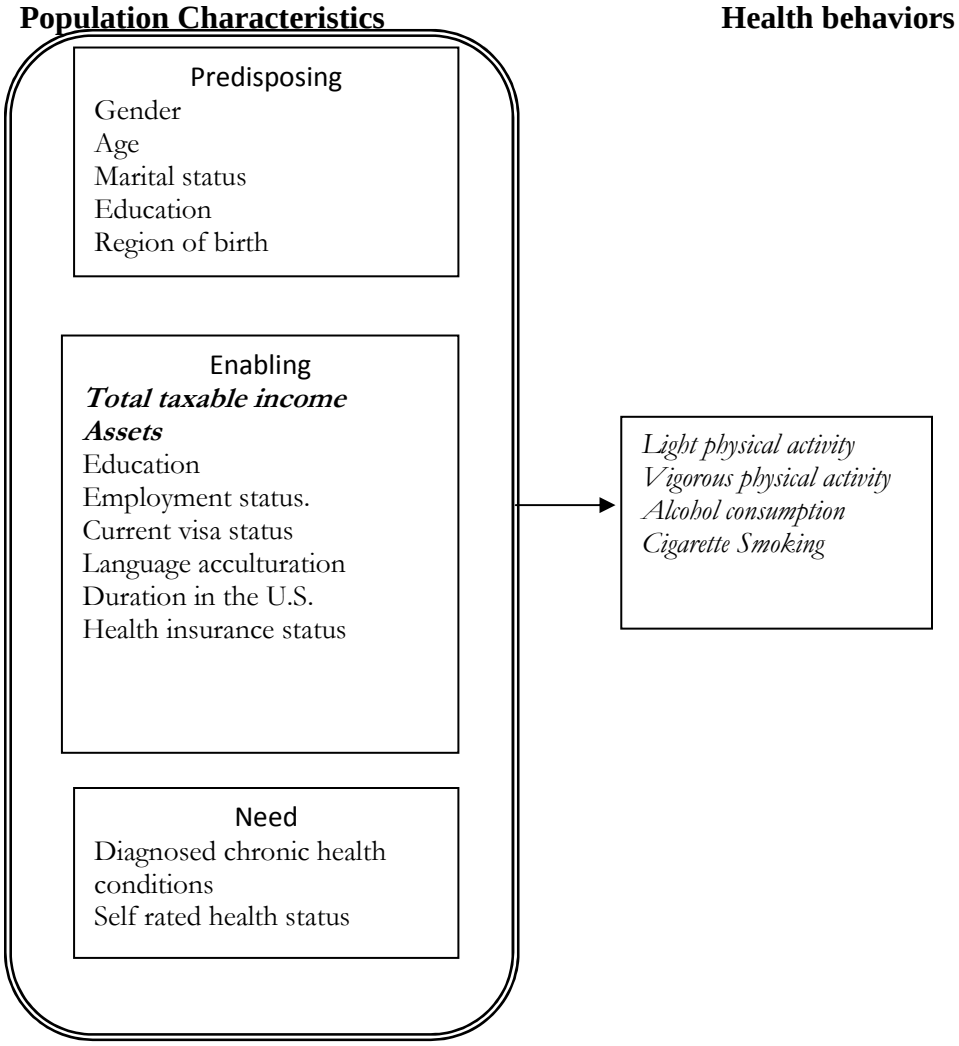
CHAPTER 4
Methodology

The project utilized the Panel Study of Income Dynamics (PSID), a longitudinal study of non-institutionalized United States householders. In addition to PSID, other panel and longitudinal datasets appear in the literature, including the Survey of Income and Program Participation (SIPP). SIPP is a panel study that gathers several waves of data within each panel. Each panel is collected over a forty-month period, each from a different cohort of respondents. This is unlike PSID, which has followed the same respondents since 1968. Further, the PSID allowed the study a greater time span within which to address the questions posed, at the time of data analysis the data available spanned nine years (1997-2005). Although SIPP collects detailed information on health, assets, and income, data pertaining to health behaviors is lacking including recreational physical activity, and smoking and drinking behaviors. Finally, because most of this study's variables of interest are collected in the topical modules, their availability is not consistently guaranteed throughout the SIPP data collection period. This is unlike the PSID where the variables of interest are found in each wave of data collection (with a few exceptions in the 1997 wave).

A noteworthy point in regard to the structure of the PSID is its design, which results in an over sampling of low-income families and households. Due to the over representation of low income and minority families weighting is used to ensure that the results are able to be generalized to the entire population.

Variable operationalization

Figure 1 Research model including independent, outcome and control variables



Outcome variables

The unit of analysis was the head of household (N=511) with a breakdown of 78% men and 22% women. To determine the relationship between accumulated wealth and income on health behaviors, this study used recreational physical activity, smoking, and alcohol consumption as outcome variables.

Physical activity: This variable was created from questions that record the frequency of engaging in light and vigorous physical activities. Coding of the variables was based on the American College of Sports Medicine and the American Heart Association recommendations (Haskell & Lee, 2007). Respondents who engaged in vigorous physical activity at least once a day or three times or more a week were coded as vigorous physical activity=2 (high levels of vigorous activity). Those who engaged in vigorous physical activity less than three times a week were coded as vigorous physical activity =1 (lower levels of vigorous activity). Those who did not engage in any form of vigorous physical activity were coded as 0.

Respondents who reported engaging in light physical activity daily or at least five days a week were coded as light physical activity =2 (high levels of light physical activity). Those who engaged in light physical activity less than five times a week were coded as light physical activity =1 (lower levels of light physical activity) while those who reported no light physical activity were coded as 0.

Smoking was coded as a dichotomous variable. Respondents who had never smoked cigarettes in their lifetime and those who reported ever smoking cigarettes but did not currently smoke were coded as 0. Those who reported that they currently smoked were coded as current smokers. Due to limited cell sizes the study was unable to create a four-level variable denoting those who had never smoked, those who had quit smoking, those who had quit and relapsed, and finally, those who were current smokers.

Alcohol consumption was also coded as a dichotomous variable. Excessive drinking is used to refer to those who engage in heavy or binge drinking. Heavy drinkers consume one or more drink per day on average (women) or two or more drinks per day

(men). Binge drinking is used to refer to those who consume 4 or more drinks a day (women) or five or more drinks a day (men) (Centers for Disease Control, 2008b). Due to small cell sizes, the study was unable to adhere to this classification in the creation of the alcohol consumption variable. Those who reported that they drank alcohol (beer, wine, liquor) were coded as 1 while those who indicated that they did consume alcohol were coded as 0.

Independent variables

The assets and income variables were selected as the independent variables. N*et wealth with main home equity included* was a continuous variable a compilation of houses and real estate, farms, businesses, vehicles, stocks, and cash accounts less debts. Net wealth (hereafter referred to as assets) was log transformed due to skeweness. *Total taxable income* as the second independent variable was a compilation of earnings and business profits as reported by the head of household and spouse. Due to skeweness in the income variable, the study performed a log transformation that was subsequently used in the multiple regression and longitudinal modes. It should be noted that it was possible for respondents to declare negative assets and/or income. Negative income and assets were converted to zero and a constant was added to allow for a log transformation. PSID household income information does not include income information from individuals who are not recognized as family members (Gouskova & Schoeni, 2007). We, however, know that immigrants are likely to reside in households with extended family members (Blank & Ramon, 1998) who would not be recognized as immediate family by the PSID. Caution should therefore be used in interpreting these results, as households could be

drawing in additional income from extended family/household members who are not included in the calculation.

Control variables

Drawing from the behavioral model, the study controlled for the following predisposing, enabling, and need characteristics. Predisposing characteristics included age, gender, marital status, education, and geographic region of birth. Enabling characteristics were health insurance status, current employment status, and current immigration status. Language acculturation and duration in the U.S were used as proxies for acculturation. The need characteristics included in the study were medically diagnosed chronic health condition as a proxy for evaluated need, and self-rated health status as proxy for perceived health status.

Gender was coded as female=1 and male=0. Age as used in the study was a continuous variable measured as the respondent's age at last birthday. Marital status was collapsed into a dichotomous variable, with respondents who self identified as married coded as 1, and those who identified as single/never married, and divorced/widowed/separated coded as 0. Research has documented a positive relationship between marital status and physical health (Murphy, Glaser, & Grundy, 1997; Ross, Mirowsky, & Goldsteen, 1990), with married individuals more likely to experience lower mortality rates as compared to their non-married counterparts. Years of Education was used as a continuous variable. However, due to the nature of the variable as it is presented by the PSID, those respondents who reported as having earned more than an undergraduate college degree were coded as 17. Region of origin was collapsed into three regions namely the Americas, South and East Asia, and "Other" (Europe and Central

Asia, and Africa and the Middle East). Past studies looking at the general foreign-born population have used these categorizations in their analysis. Although very broad in nature, socio-cultural factors are often the reason behind these regional demarcations.

Health insurance was created from the variable that indicated the respondent's first mention of health insurance. The resulting dichotomous variable consisted of respondents who mentioned any type of health insurance (employer provided, private insurance, state provided insurance, veterans, and insurance provided by foreign governments) coded as 1, and those who at first mention indicated that they did not have any form of health insurance coded as 0. Past research has found health differences when comparing respondents with private health insurance verses those with public health insurance. Although the study differentiated between private and public health insurance at the univariate level, the variable was dichotomized at the bivariate and multivariate levels.

Literature proposes a twofold relationship between employment and health. On the one hand, employed respondents are known to engage in positive health behaviors (King, et al., 2000)—a fact that could be attributed to the social support derived from one's work place. On the other hand, stress associated with the multiple social roles leads to negative health behavior. To investigate the relationship between employment and health behaviors, a dichotomous employment status variable was created. Current employment status was used to capture whether or not the head of household was currently engaged in any income generating ventures. Respondents who indicated that they were currently working were coded as 1, all others— including those who were temporarily laid off, unemployed, retired, home makers, and students—were coded as 0.

As previously discussed, immigration status determines the type of services an individual has access to. To capture these differences, a variable denoting the head of household's immigration status was constructed to identify the respondent's visa status. Respondents were classified as being naturalized American citizens, legal permanent residents or migrants. The two measures of acculturation were language proficiency and amount of time spent in the United States. Language proficiency as used in the study was a compilation of two sets of language questions, how well the respondent indicated that they read and wrote in English, and how well the respondent rated their ability to read and write in their native language. Drawing from the acculturation scale for Southeast Asians developed by Anderson et al. (1993), the study created a new language acculturation variable that incorporated both English and native-language ability. An ordinal level variable was created by taking the median of the two sets of language variables. This was done in an attempt to capture the four dimensions of a bi-dimensional acculturation measure (Cuellar, et al., 1995). Respondents were identified as 1) low on English high on native language also referred to as separated; 2) low proficiency on both English and native language, also referred to as marginalized, ;3) high English, low on native language, also referred to as assimilated; and 4) high on English and native language, or integrated. Duration in the United States, a continuous variable calculated based on time in the United States from last entry, was the second variable used to operationalize acculturation.

Self rated health status (SRHS) was a likert scale variable that measured the respondent's rating of overall health. The scale responses run from 1 to 5 (Poor=1, Fair=2, Good=3, Very good=4, Excellent=5). Due to small cell sizes the 'poor' and' fair'

categories were collapsed into one category. A variable measuring the occurrence of a medically diagnosed health condition was created to denote the need factor. The variable was a compilation of eleven physical and mental health conditions, including stroke, high blood pressure, diabetes, cancer, lung disease, heart attack, emotional problems, arthritis, asthma, mental loss, and learning disorders.

Other variables used in the descriptive and bivariate analysis, but not included in the final longitudinal models, included race, living arrangements, number of individuals in the household, and number of children in the household. Living arrangements was a dichotomous variable with homeowners coded as 1 and renters and those who lived for free coded as 0. All data used in the study was weighted using cross-sectional, and longitudinal weights were applicable.

The structure of PSID

PSID was first collected in 1968 and data was collected annually until 1997 when data collection became biennial. With the use of computer aided telephone surveys the data follows a sample of individuals and their family units and focuses on intergenerational wealth transfers. It poses questions that relate to demographic, economic, social, and psychological factors. By 2005, a total of 7,400 families were surveyed—up from the 4,800 that were surveyed in 1968 when collection begun. The PSID is a combination of two probability samples, a cross-sectional national sample drawn from the Survey Research Center, and a sample of low-income families collected by the Census Bureau (Hill, 1992). Starting in 1990 the PSID stores data in two files, a cross-year individual level file consisting of an individual respondent's data collected from 1968 onward, and a single-year family level file consisting of family data collected

in a specific year (Panel Study of Income Dynamics, n.d-b). Since1999 a majority of the data was collected through telephone interviews with the use of computer aided instruments.

Variables selected for study were drawn from the family and the cross-year individual files. In 1997, PSID introduced a sample of nationally representative immigrant households (Heeringa & Connor, 1999). This was done to make the PSID a more representative dataset by including immigrant families who would not have originally qualified for the original sample (Heeringa & Connor, 1999). The criteria for inclusion into the PSID were those families with heads of households who migrated after 1968 and who are not spouses of individuals who resided in the United States in 1968. The sample was drawn from the Survey Research Center's (SRC) 1990 sample. The new sample consists of 511 immigrant families, 441 introduced in 1997 and 70 in 1999. With the additional split of several families the 2005 final sample has a total of 572 immigrant families (Gouskova, et al., 2008). Within the sample, 52.4% of the heads of households self identify as Latino, 21.1% as Asian, 11.7% as White, 7.8% as Black, and 6.8% as Other. Immigrant households are over sampled from areas with high rates of immigrant households (Gouskova, et al., 2008). After weighting, the immigrant sample represents 7% of the PSID sample, which is the estimated percentage of immigrant households that have migrated to the United States between 1968 to 1997 (Gouskova, et al., 2008). To adjust for non-response and sample selection, weights are calculated and included in the PSID data files. The immigrant sample is weighted separately from the core PSID sample each year after which the two samples are combined. All univariate and bivariate cross-sectional analysis is weighted using the individual cross-sectional weight. Revised

longitudinal weights, which are available for 1993-2005 panel years, were used in the longitudinal analysis.

Subsetting data

As mentioned, the PSDI has enrolled a total of 572 immigrant families between 1997 and 2005. However, immigration information was only collected for those families that were enrolled in 1997 and the re-contact families of 1999. As immigration characteristics are key to informing institutional interaction, this study opted to subset only those individuals for whom this immigration information was available. This study, therefore, analyzed information for those individuals who:

- were in the original 1997 and 1999 sample
- were heads of households in any of the subsequent study years

1997 to 2005 data were downloaded from the PSID web site for all immigrant families, i.e, those families whose 1968 family ID number was between 3001-3511.

Due to attrition (death, moving out of household both permanently and temporarily, ceasing to be head of household), family members other than the original head of household (from whom immigration information was originally collected) could be enrolled and interviewed as household head at subsequent time points by PSID. To identify only those heads of household interviewed in 1997 and 1999, thereby creating a baseline sample, a unique identifier for each individual (Immigrant ID) was created by concatenating 1968 family ID and 1968 individual ID number (although the immigrant sample was not included in PSID until the late nineties each family and individual was assigned a unique 1968 family and individual ID number for easy identification). Taking into consideration all heads of households interviewed at any point between 1997 and

2005 resulted in a gross sample of 770 unique individuals, of which only 511 were eligible for analysis.

Missing data

Multiple imputation in this study was conducted not only to handle item non response but also sample attrition. To handle sample attrition thereby ensuring a sufficient sample size, the study imputed the data of those respondents missing from each wave. Individuals with 80% or more missing data are not included in the multiple imputation, leading to the exclusion of 68 individuals. These 68 individuals were only included in the years that they participated in the study. Through the course of the five waves, 171 were coded as 'mover out,' that is, at one point or other they were coded as having moved out of the family with their absence having been for a year or more. In 1999, 86 respondents had become non-responders. In addition, although four of the respondents had moved out of the household, their absences had not been for a year or longer. In 2001, 103 had been missing for a year or more, with one respondent coded as 'institutionalized'. In 2003, 109 of them had been out of the family for more than one year and of these, 26 were coded as absent for the very first time since their enrolment in the study. In 2005, one respondent was coded as 'institutionalized,' with an additional 23 respondents missing from the study as first-time non-responders. Finally—although their data was not missing—in the course of the study, 330 individuals were recorded as being out of the home for duration of time that did not exceed one year.

Imputation

Using the imputation of chained equation (ICE) method in Stata cross-sectional data were imputed. ICE uses all other variables in the dataset as predictors of the missing

variables. In the current study, due to multicollinierity issues across the waves, the individual cross-sectional data were imputed and then a multiple imputation merge was done to consolidate all five waves. The data were imputed 10 times thereby yielding 10 individual implicate datasets. Rubin (1987) suggests creating between two and 10 imputed datasets. Data were not only imputed for missing variables but also for respondents who were missing for no more than 80% of the study period. Whereas multiple imputation strengthens analysis of data that are missing it also has several documented drawbacks, studies have used multiple imputation and have found it to be a credible mechanism for rectifying data that is missing at random (Rubin, 1996; Schafer & Graham, 2002). Multiple imputation is known to be a robust defense against departures from normality. It generates unbiased estimates, even in instances where there are high rates of missing data (Wayman, 2003). On the other hand, multiple imputation has several shortcomings including taking up a substantial amount of disk storage space, more so in this case, where 10 separate imputed datasets were created for analysis purposes. Second, several statistical analysis commonly used at the univariate, bivariate, and multivariate levels are unavailable for use with imputed data. Imputed univariate data was compared with the original un-imputed dataset and the results were found to be relatively similar.

In working with imputed data, Stata has the ability to combine the analyzed results of all implicates, thereby producing a statistic that is best representative of the 10 implicates. This procedure was used to analyze the data at the univariate, bivariate and cross-sectional levels. Due to the fact that the generalized linear latent and mixed models (GLLAMM) program in Stata is unable to analyze separate implicates and produce a

single statistics, individual implicates were analyzed and an average of the coefficients and z scores were hand calculated. Further, because of Stata's inability to calculate overall fit statistics and post-estimation statistics for bivariate, cross-sectional, and longitudinal models, individual implicates were analyzed and hand calculation used to determine each model's fit statistic.

To determine if there was indeed a difference between the results obtained from the multiply imputed data as compared to listwise deletion models. To do this all the univariate and longitudinal models were re-constructed using the original dataset. At the univariate level the percentages were relatively comparable to those from the multiply imputed datasets. At the longitudinal level goodness of fit tests were assessed and all the models fit the data well. The results at the longitudinal level differed from those attained from the imputed dataset. This is an indication that multiple imputation was necessary for this analysis. With the exception of the 68 respondents who were excluded for having an 80% non response rate, multiple imputation allowed this study to retain information that would have otherwise been lost thereby reducing the amount of bias that would have been introduced had they been excluded from the analysis.

Data analysis

All data were weighted using cross-sectional and longitudinal weights, where applicable. The MIM prefix was used in Stata commands so as to allow for the calculation and combination of results from several imputed datasets. Univariate data is presented for all years (1997 to 2005). However, since not all variables of interest to the study were asked in 1997 (health insurance, smoking, alcohol consumption, and vigorous and light physical activity), at the bivariate level, logit and multinomial logit models were

constructed to determine variable relationships. Multicollinearity diagnostics at the cross-sectional level determined that none of the predictor variables were highly correlated to each other.

Linearity diagnostics were run to investigate linearity in the models. To do this the study obtained each model's fitted values then re-fit the models including only the outcome variable, the fitted value and its square. As none of the square terms were significant non-linearity was refuted.

At the longitudinal level, generalized linear latent and mixed models (GLLAMM) were constructed to determine the longitudinal impact of wealth on health behaviors. GLLAMM was used to construct models with random effect estimators to determine change over time of the outcome variables. GLLAMM was selected for several reasons including the method's ability to construct longitudinal models that can handle dichotomous and ordinal outcome variables. In addition, the method allows for a random intercept model. Fitting a random intercept model takes into consideration data heterogeneity, thus leading to less biased parameter estimates.

CHAPTER 5
Results

This chapter presents the study results in three major sections. The first section introduces the PSID immigrant sample by analyzing non-imputed baseline information. Baseline information is a composite of 1997 and 1999 data gathered at the point of entry for every respondent. The second section consists of a presentation of univariate and bivariate statistics of the 1997 to 2005 data. The final section consists of longitudinal models constructed to establish the determinants of engaging in the selected four health behaviors.

Immigration information at baseline

This section looks at the immigrant sample at baseline (1997 & 1999). The baseline data presented in this section is raw data that has not undergone any multiple imputation. Weighted univariate statistics were run to determine the immigration characteristics of the baseline sample. Respondents ranged in age from 18-86 years old, with an average age of 40 years.. At baseline the sample consists of 78.2% male respondents, with more than half the respondents currently married (65.6%) and 17.6% never having married. The remaining 16.8% were widowed, divorced, or separated. On average, respondents lived in households with 3.7 individuals. Those who reported non-family household members lived with one to four individuals.

Although PSID immigrant data is not designed to be representative of the individual ethnic and racial immigrant groups, baseline results indicate a mirroring of these data with current national numbers. Within the sample, 52.8% identified as Latino, 21.1% as Asian, 11.7% as White, 7.8% as Black and 6.8% as Other. The Americas region was the largest sending region (n=341), followed by East and Southern Asia (n=105).

Other respondents hailed from Europe and Central Asia (n=31), Middle East (n=13), Africa (n=10), and Oceania (n=1). Based on these nationality numbers it was not surprising, therefore, that the largest sending country was Mexico (n=204). This was followed by Cuba (n=26) and the Philippines (n=19).

Results indicate that the respondents did not engage in cyclical migration, with 92% of the sample currently in the country on their first migration trip. Approximately 32% of the respondents were naturalized U.S. citizens. Of those who were not naturalized, 77.5% planned on acquiring citizenship within a five-year period, 18.5% had no plans of naturalizing, and 4% did not know. In addition, 47% indicated that they were legal permanent residents, approximately 7% were undocumented, and 5% were temporary residents. Economic immigrants are well represented in this sample, with the two most commonly cited reason for migration being work purposes (31%), and to seek a better life and more opportunities (27.4%). Family reunification and persecution were also cited (9.9% and 10.8% respectively) as migration reasons. Social networks were integral in explaining the sample's migration experiences. When asked who was primarily responsible for their migration into the United States, approximately 54% cited a relative and 12% a non-related individual. Thirty percent of the respondents reported having no help migrating into the United States.

The foreign-born migrate with human capital received in other countries, and some then proceed to supplement this capital with activities in the receiving country. At baseline, 23% reported having received their education in both the United States and in foreign countries. Approximately 66% of the respondents reported receiving all their education outside of the United States with only 6% having received all their education in

the U.S. The average respondent had a less then high school education (M=10; SD =25.8), with a range of no education to some graduate education.

Two variables were used as proxy for acculturation: duration in the United States and language acculturation. The average respondent had been in the United States approximately 14 years (M= 13.8; SD=7.3) since their last migration trip. The amount of time reported on this current migration trip ranged from 1 to 39 years, with 18 respondents opting out of providing an answer to this question. In the construction of the language acculturation variable, English and other language proficiency variables were used. The variable means for English reading abilities were missing word? Reading? (M= 2.6; SD= 1.66) and writing (M= 2.88; SD=1.78). The variable mean for the "other language" reading abilities were (M=1.35; SD=1.26) and "other writing" (M=1.38; SD= 1.32). The cumulative score of these two sets of variables was calculated with a resulting mean of 5.51 in English proficiency and 2.74 in the "other language" proficiency. Integrated respondents had a mean English reading and writing score of one and a mean score of 0.6 in both reading and writing in their "other language". Assimilated respondents reported "other language" reading scores of (M= 3.06; SD=1.37) and "other language" writing scores of (M=3.255; SD= 1.52). Marginalized individuals reported a mean English reading and writing score of 4.3 and 4.6 respectively, and an "other language" reading and writing mean score of 2.8 and 2.9, respectively. Separated individuals had a mean English reading and writing score of 3.8 and 4.3, respectively, and "other language" average scores of 0.8.

Univariate Analysis of imputed data (1997-2005)

Table 1: Univariate analysis—variable description by year (1997-2005)

	1997		1999		2001		2003		2005	
Categorical variables	%	SE	%	SE	%	SE	%	SE	%	SE
Gender										
Male	78.30%	0.021	75.21%	0.024	76.15%	0.025	72.57%	0.026	75.02%	0.03
Female	21.70%	0.021	24.79%	0.024	23.85%	0.025	27.43%	0.026	24.98%	0.03
Marital status										
Not married	36.12%	0.024	39.80%	0.025	39.68%	0.025	43.41%	0.025	46.18%	0.026
Married	63.88%	0.024	60.20%	0.025	60.32%	0.025	56.59%	0.025	53.82%	0.026
Race										
White	11.18%	0.016	12.00%	0.018	15.12%	0.022	15.54%	0.029	14.88%	0.057
Asian	20.51%	0.020	19.31%	0.020	18.71%	0.021	19.09%	0.023	16.76%	0.028
Latino	55.47%	0.024	53.69%	0.026	53.06%	0.026	51.81%	0.028	56.07%	0.041
Other	12.83%	0.016	14.99%	0.019	13.11%	0.019	13.56%	0.024	12.28%	0.032
Health status										
Poor	15.69%	0.018	24.48%	0.023	25.28%	0.026	26.50%	0.028	28.61%	0.031
Good	31.26%	0.023	30.33%	0.024	35.21%	0.026	31.79%	0.027	34.94%	0.034
Very good	25.25%	0.021	24.95%	0.023	21.65%	0.023	23.77%	0.023	18.15%	0.023
Excellent	27.80%	0.022	20.23%	0.022	17.86%	0.022	17.94%	0.022	18.29%	0.033
Health insurance										
None	N/A	N/A	35.28%	0.026	32.41%	0.028	31.28%	0.027	29.38%	0.032
Employer			48.08%	0.027	51.18%	0.028	49.06%	0.030	46.65%	0.028
Other			16.64%	0.020	16.41%	0.023	19.66%	0.024	23.98%	0.029
Home ownership										
No	60.60%	0.025	55.37%	0.026	48.41%	0.029	45.95%	0.029	44.14%	0.037
Yes	39.40%	0.025	44.63%	0.026	51.59%	0.029	54.05%	0.029	55.86%	0.037

	1997		1999		2001		2003		2005	
Categorical variables	%	SE	%	SE	%	SE	%	SE	%	SE
Employment status										
No	21.38%	0.021	20.85%	0.022	19.30%	0.021	19.79%	0.021	18.74%	0.022
Yes	78.62%	0.021	79.15%	0.022	80.70%	0.021	82.21%	0.021	81.26%	0.022
Diagnoses	N/A	N/A	68.52%	0.025	62.74%	0.029	60.98%	0.03	55.44%	0.039
No			31.48%	0.025	37.26%	0.029	39.03%	0.03	44.56%	0.039
Yes										
Smoking										
Does not	N/A	N/A	85.18%	0.018	82.75%	0.241	81.15%	0.026	84.40%	0.213
smoke			14.82%	0.018	17.25%	0.241	18.50%	0.026	15.59%	0.213
Current										
Drinking	N/A	N/A								
No			44.79%	0.027	43.85%	0.03	42.79%	0.03	47.94%	0.04
Yes			55.21%	0.027	56.15%	0.03	57.21%	0.03	52.06%	0.04
Light Physical	N/A	N/A								
No			16.04%	0.020	23.42%	0.022	16.92%	0.02	35.84%	0.028
< 5 days			34.43%	0.025	36.26%	0.026	47.51%	0.027	29.62%	0.025
5 days >			49.53%	0.028	40.33%	0.026	35.57%	0.025	34.54%	0.027
Vigorous physical										
No										
< 3 days	N/A	N/A	51.47%	0.027	52.64%	0.026	54.95%	0.027	55.12%	0.027
3 days >			27.86%	0.023	25.49%	0.022	26.26%	0.023	20.31%	0.022
			20.66%	0.021	21.87%	0.022	18.82%	0.020	24.56%	0.022

Continuous	1997 %	SE	1999 %	SE	2001 %	SE	2003 %	SE	2005 %	SE
Age, y	40.19	0.620	42.93	0.7	44.90	0.69	46.97	0.72	49.04	0.97
Education, y	10.42	0.252	10.03	0.28	10.62	0.310	10.40	0.28	11.00	0.40
Household size	3.74	0.087	3.60	0.094	3.56	0.117	3.47	0.112	3.41	0.126
Number of kids	1.49	0.071	1.37	0.074	1.37	0.082	1.30	0.081	1.23	0.086
Income $	34,795.6	1945	31,879.0	1902	43,767.0	5664	39,993.0	2836	49,288.9	3566
Assets $	N/A	N/A	88,152.2	21468	156,377.0	58359	107,116.0	15542	173,569.0	17540

Data was analyzed cross-sectionally from 1997 through 2005. This was done to understand the distribution of the variables and the bivariate relationships between the outcome and independent variables. There was a dramatic shift in the number of respondents who reported not engaging in any light physical recreational activity. In 1999, 16% did not engage in any light recreational activity, while in 2005, 36% did not. Fewer respondents engaged in vigorous recreational activities, as compared to light recreational activities. Approximately 50% of the respondents through all four waves did not report any type of vigorous physical activity. Between 15% and 18% of the sample were current smokers. In 2003, 42% were non-social drinkers, and in 2005 47% were non-social drinkers.

The 1997 immigrant sample consisted of 441 individuals, 22% of whom were women, and 64% of whom were married. The average respondent reported living in a household with an average of 3.7 individuals and an average of 1.5 children. The mean age in the 1997 sample was 40 years, with the average respondent not holding a high school diploma holder (M=10.4 years). As in years to follow, Latino respondents made up the bulk of the respondents (55%) with 20% Asian, 11% White, and 13% Other. Only 15% of the respondents rate their health as poor, and 31% rated their health as good. Sixty one percent were either renters or live in their current residences for free. The average head of household and wife income were $34,795.

With the inclusion of the 70 re-contact families, and the exclusion of some of the chronic missing heads of households, the 1999 sample consisted of 452 individuals. Twenty four percent of the head of households were women and in the entire sample 60% were married. The mean age was 43 years old. The mean household consisted of 3.6

individuals, with an average of 1.4 children. As in the previous year, the average respondent did not have a high school diploma (M=10 years). Latino respondents made up approximately 54% of the respondents, 19% self identified as Asian, 12 % as White, and 15% as Other. In 1999, there was a slight increase in the number of homeowners. Approximately 45% were homeowners while 55% were either renters or living in their residence for free. Seventy nine percent of the respondents in 1999 were currently employed. The median head of household and wife income was $31,879 and the median family assets were $88,152.20.

Thirty five percent did not have any form of health insurance, while 48% had employer-based insurance, and 17% reported some other form of insurance. Twenty four percent of the sample reported poor health, and 31% reported one medically diagnosed disease. Fifty seven percent had never smoked a cigarette, 27% were former smokers, and approximately 15% were current smokers. More than half the sample reported alcohol consumption (55%). Sixteen percent reported that they did not engage in any type of light physical activity. However, 34% of the sample engaged in physical activities less than five times a week, while 50% reported activity at five or more times a week. Approximately 21% reported engaging in vigorous physical activities three or more times a week, while 51% did not engage in vigorous physical activity at all.

The imputed 2001 to 2005 data sample remained consistent at 443 individuals with 24% women and 76% men. In 2001, as in past years, 60% remained in marital relationships. Approximately 53% self identified as Latino, 19% as Asian, 15% as White, and 13% as Other. The average age was approximately 45 years. Mean education gained was 10.6 years. The average household contained 3.6 individuals, with 1.4 children on

average per household. Approximately 52% indicated that they were homeowners while 48% lived in their residence for free. The median income was $43,767 while the median household assets stood at $156,377.

There was a slight increase in the number or respondents who indicated employer-provided insurance (51%). Thirty two percent did not have any health insurance, while 16% reported other forms of health insurance. Twenty five percent self reported their health as poor, 35% as good, 22% as very good, and 18% as excellent. Sixty two percent did not have any medically diagnosed conditions. There was a slight increase in the number of current smokers from the previous year (17%), and 56% were current alcohol consumers. Finally 23% did not engage in any light physical activity, while 40% engaged in physical activity five or more times a week. Approximately 22% reported participating in vigorous physical activity three or more times a week, and 53% did not engage in any vigorous physical activity at all.

In 2003, the mean age was 46 years. The average household consisted of 3.4 individuals with an average of 1.3 children. Fifty six percent were currently married. 52% were Latino, 19% Asian, and 15% White. Fifty four percent were homeowners with a median household income of $39,992.90 and median family assets of $107,116. Eighty two percent of the respondents were currently employed, and 49% received health insurance through their employment. Within the sample, 31% did not have health insurance while 26% reported poor health, and 39% reported having a medically diagnosed condition. Nineteen percent were current smokers and 57% consumed alcohol. Of the respondents, 36% engaged in light physical activity five or more times a week, while 17% did not engage in any form of light physical activity. Approximately 18%

reported vigorous physical activity three or more times a week, while 55% did not engage in any form of vigorous physical activity.

In 2005, 54% of the respondents were married. More than half were homeowners (55%)—a slight increase from previous years. The median household income was $49,288.90, and median family net wealth was $173,569. Employed respondents stood at 82%. There was a decrease in the number of respondents who indicated that they did not have health insurance (29%). Approximately 47% received their health insurance from their employer. Twenty nine percent reported their health as poor, 35% as good, 18% as very good, and 18% as excellent. There was a slight increase in the number of respondents who indicated a diagnosed condition (44%). Within the sample, 15.5% were current smokers, 28% were former smokers while 56% had never smoked. Approximately 52% were current alcohol consumers. Finally 36% and 55% did not engage in any form of light and vigorous PA respectively.

Bivariate Analysis (1999 and 2005)

This section presents bivariate information for 1999 and 2005. Data from all other years may be found in the appendix section of this document.

Table 2: Bivariate analysis—association between light physical activity and study variables (1999 and 2005)

Variable	OR t		OR t		OR t		OR t	
1999					2005			
	Less then 5 days		5 days and more		Less then 5 days		5 days and more	
Gender (Male=0)	0.65	*-0.99*	1.28	*0.64*	0.80	*-0.62*	0.96	*-0.13*
Age	0.98	*-1.88*	0.98	*-1.54*	0.98	*-1.40*	0.99	*-0.24*
Married (No=0)	1.77	*1.64*	0.78	*-0.78*	1.14	*0.49*	1.0	*0.01*

Employment status (No=0)	2.40	*2.37**	2.2	*2.24**	1.03	*0.09*	1.44	*0.99*
Race								
Asian	1.58	*0.82*	1.95	*1.16*	0.63	*-0.87*	0.66	*-0.83*
Latino	1.01	*0.02*	1.70	*1.09*	0.59	*-1.17*	0.56	*-1.33*
Other (White=0)	0.63	*-0.77*	1.51	*0.70*	1.09	*0.13*	0.92	*-0.14*
Region of origin								
S&E Asian	1.52	*1.08*	0.88	*-0.33*	1.08	*0.23*	1.19	*0.54*
Other (Americas=0)	1.18	*0.36*	1.15	*0.31*	1.82	*1.37*	1.38	*0.71*
Duration in US	0.96	*-2.16**	0.96	*-2.20**	0.98	*-1.04*	0.99	*-0.43*
Visa status								
LPR	0.89	*-0.33*	0.95	*-0.16*	0.79	*-0.71*	0.55	*-1.91*
Migrants (Naturalized=0)	0.79	*-0.51*	1.02	*0.06*	0.74	*-0.68*	0.73	*-0.74*
Language								
Acculturation	0.86	*-0.35*	0.63	*-1.14*	0.97	*-0.07*	1.01	*0.05*
Marginalized	0.92	*-0.15*	1.02	*0.04*	0.72	*-0.64*	1.12	*0.27*
Assimilated	2.01	*1.75*	1.70	*1.38*	1.89	*1.80*	2.24	*2.38**
Integrated (separated =0)								
Education	1.01	*2.61***	1.05	*1.73*	1.07	*2.31**	1.07	*2.31**
Living arrangements								
homeowner	2.25	*2.57**	1.14	*0.44*	1.35	*1.06*	1.44	*1.35*
(Renter/free=0)								
Log income	1.14	*2.32**	1.06	*1.31*	1.07	*1.51*	1.04	*0.88*
Log assets	1.17	*3.5****	1.05	*1.5*	1.04	*1.34*	1.04	*1.42*
Health insurance								
Yes (No=0)	1.37	*0.95*	1.25	*0.73*	1.66	*1.77*	1.45	*1.27*
Diagnosed medical								
Yes (No=0)	0.56	*-1.76*	0.47	*-2.40**	0.73	*-1.13*	1.14	*0.49*
Health status								
Good	3.36	*2.95***	2.79	*2.63***	1.28	*0.73*	1.07	*0.20*
Very good	2.41	*1.95*	3.69	*3.23****	1.79	*1.54*	1.42	*0.91*
Excellent (poor/fair=0)	2.81	*2.00**	3.56	*2.61***	1.33	*0.69*	2.17	*2.07*

* <.05 **<.01 ***<.001 ****<.0001

Maximum-likelihood multinomial logit models and logistic models were constructed to determine the relationship between the outcome variables and the independent and control variables. Data presented here is from 1999 and 2005; data from other waves can be found in the appendix.

Bivariate analysis of light physical activity indicated that income and assets employment status, education, duration in the United States, diagnosed medical condition, and health status were significantly related to light physical activity.

The odds of participating in low levels of light physical activity increased by 1.14 (t=2.32, p= 0.023) for each log unit increase in income and 1.17 (t=3.52, p= 0.001) for each log unit increase in household assets. Respondents who were currently employed were more likely to participate in both types of light physical activity. The odds of participating in levels of light physical activity at or below four days a week increased by 2.4, and the odds of participating five or more times a week were increased by 2.2. Respondents who had been in the country for a longer duration of time were less likely to participate in either form of light physical activity. The odds of participating in light physical activity less than five times a week were increased by 0.96 (t=-2.16, p= 0.031 & t=-2.20, p= 0.028). Finally, respondents who rated their health as good, very good, and excellent were more likely to participate in light physical activities.

Table 3: Bivariate analysis—association between vigorous physical activity and study variables (1999 and 2005)

Variable	OR	t	OR	t	OR	t	OR	t
	1999				2005			
	Less then 3 days		3 days and more		Less then 3days		3 days and more	
Gender (Male=0)	1.05	*0.18*	1.03	*0.09*	0.51	*-1.53*	0.78	*-0.75*
Age	0.94	*-4.9****	0.95	*-3.9*****	0.97	*-1.97**	0.97	*-2.30**
Married (No=0)	0.79	*-0.90*	0.78	*-0.88*	1.61	*1.55*	1.16	*0.61*
Employment status (No=0)	3.58	*3.6*****	3.0	*2.93***	3.2	*2.61***	3.63	*3.03****
Race								
Asian	0.69	*-0.83*	1.57	*0.80*	0.46	*-1.44*	0.9	*-0.18*

Latino	0.52	*-1.64*	1.12	*0.22*	0.311	*-2.55**	0.76	*-0.54*
Other	0.58	*-1.19*	1.33	*0.50*	0.93	*-0.11*	0.97	*-0.06*
(White=0)								
Region of origin								
S&E Asian	1.19	*0.56*	1.26	*0.69*	1.97	*0.5**	1.18	*0.50*
Other	2.06	*1.89*	0.56	*-0.97*	3.67	*3.27*	1.11	*0.23*
(Americas=0)								
Duration in US	0.94	*-3.4***	0.95	-2.35*	0.96	*-2.17**	0.97	*-1.42*
Visa status								
LPR	0.80	*-0.76*	0.91	*-0.29*	0.56	*-1.70*	0.93	*-0.23*
Migrants	1.21	*0.58*	1.04	*0.09*	0.69	*-0.91*	1.09	*0.24*
(Naturalized=0)								
Language								
Acculturation	0.36	*-2.62***	0.41	*-2.16**	0.73	*-0.65*	0.54	*-1.34*
Marginalized	1.39	*0.77*	1.69	*1.07*	1.66	*0.98*	1.0	*0.02*
Assimilated	1.64	*1.67*	1.59	*1.45*	3.54	*3.71****	1.75	*1.81*
Integrated								
(separated =0)								
Education	1.13	*4.7*****	1.10	*3.4****	1.13	*3.6*****	1.1	*3.1***
Living arrangements	0.97	*0.23*	0.88	*0.23*	1.7	*1.7*	1.4	*1.14*
homeowner								
(Renter/free=0)								
Log income	1.19	*2.46**	1.07	*1.5*	1.2	*1.66*	1.14	*1.63*
Log assets	1.02	*0.67*	1.01	*0.40*	1.1	*1.70*	1.0	*0.73*
Health insurance								
Yes	1.71	*2.04**	1.24	*0.74*	1.92	*1.26*	1.88	*0.79*
(No=0)								
Diagnosed medical								
Yes	0.38	*-3.2****	0.44	*-2.56**	0.88	*-0.39*	0.70	*-1.22*
(No=0)								
Health status								
Good	2.52	*2.55**	1.44	*0.88*	1.50	*0.96*	1.67	*1.22*
Very good	3.91	*3.50****	3.47	*2.99***	2.87	*2.32**	1.80	*1.37*
Excellent	4.35	*3.6*****	2.78	*2.46**	2.49	*1.92*	2.68	*2.10**
(poor/fair=0)								

* <.05 **<.01 ***<.001 ****<.0001

Bivariate analysis for vigorous physical activity indicated that employment status, education, region of origin, duration in the United States, language acculturation, and self evaluated and medically evaluated health status were significantly associated with vigorous physical activities. In 1999, an increase in income resulted in a higher likelihood of participating in lower levels of vigorous physical activity. There was, however, no significant relationship between assets and vigorous physical activity. In both 1999 and

2005, employed respondents were more likely to participate in both forms of vigorous physical activity. The odds of participating in vigorous physical activity increased by approximately 3 for employed respondents. Similarly, across both years, education increased the likelihood of participating in vigorous physical activity. In 1999, the odds of vigorous physical activity increased by 1.13 and 1.1 while in 2005, the odds increased by 1.13 and 1.1. In 1999, a medically diagnosed condition resulted in a decreased likelihood of participating in vigorous physical activities. On the other hand, a better rating of health resulted in a higher likelihood of participating in vigorous physical activity.

Table 4: Bivariate analysis—association between cigarette smoking and study variables (1999 and 2005)

Variable	OR	t		OR	t
1999	Cigarette smoking		**2005**	Cigarette smoking	
Gender (Male=0)	0.29	*-2.63***	Gender (Male=0)	0.14	*-2.18**
Age	0.97	-0.98	Age	0.99	*-0.51*
Married (No=0)	1.24	*0.72*	Married (No=0)	1.53	*1.17*
Employment status (No=0)	0.80	*-0.66*	Employment status (No=0)	0.84	*-0.49*
Race			Race		
Asian	1.17	*0.30*	Asian	1.41	*0.40*
Latino	1.38	*0.70*	Latino	1.56	*0.57*
Other (White=0)	0.89	*-0.21*	Other (White=0)	0.86	*-0.16*
Region of origin			Region of origin		
S&E Asian	0.74	*-0.79*	S&E Asian	0.97	*-0.06*
Other (Americas=0)	0.95	*-0.13*	Other (Americas=0)	0.95	*-0.10*
Duration in US	0.99	*-0.47*	Duration in US	1.00	*0.03*
Visa status			Visa status		
LPR	1.96	*1.91**	LPR	1.56	*1.20*
Migrants (Naturalized=0)	2.75	*2.49***	Migrants (Naturalized=0)	2.14	*1.67*
Language Acculturation			Language Acculturation		

Marginalized	*1.54*	*1.18*	Marginalized	1.52	*1.00*
Assimilated	*0.21*	*-2.01**	Assimilated	0.89	*-0.20*
Integrated	*0.71*	*-0.98*	Integrated	1.05	*0.13*
(separated =0)			(separated =0)		
Education			Education		
Living arrangements			Living arrangements		
homeowner	0.59	*-1.79*	homeowner	0.70	*-1.14*
(Renter/free=0)			(Renter/free=0)		
Log income	1.06	*1.12*	Log income	1.1	*1.51*
Log assets	0.99	*-0.39*	Log assets	0.99	*-0.65*
Health insurance			Health insurance		
Yes	0.64	*-1.55*	Yes	0.66	*-1.27*
(No=0)			(No=0)		
Diagnosed medical			Diagnosed medical		
Yes	1.04	*0.14*	Yes	0.93	*-0.24*
(No=0)			(No=0)		
Health status			Health status		
Good	1.17	*0.40*	Good	0.64	*-1.12*
Very good	0.84	*-0.41*	Very good	0.41	*-1.72*
Excellent	0.93	*-0.16*	Excellent	0.85	*-0.37*
(poor/fair=0)			(poor/fair=0)		

* <.05 **<.01 ***<.001 ****<.0001

Income and assets were not significantly associated with smoking. Being female and linguistically assimilated reduced the odds of cigarette smoking. In 1999 and 2005, the odds of being a female smoker increased by 0.29 and 0.14 respectively. Legal permanent residents and migrants were more likely to smoke cigarettes when compared to naturalized respondents.

Bivariate determinants of alcohol consumption included income and assets, gender, age, employment status, and education attainment. In 1999, an increase in log income and log household assets resulted in multiplied odds of alcohol consumption by 1.1 (t=3.19, p= 0.002 & t=2.58, p= 0.010). In the 2005 data, the relationship was only significant for the log of income but not log of assets (t=3.24, p= 0.002). Women were

less likely to report alcohol consumption. The odds of reporting alcohol consumption increased by 0.39 in 1999 and 0.44 in 2005.

Table 5: Bivariate analysis—association between alcohol consumption and study variables (1999& 2005**)**

Variable	OR	t		OR t
	1999			2005
	Alcohol consumption			Alcohol consumption
Gender (Male=0)	0.39	*-3.24***	Gender (Male=0)	0.44	*-2.33**
Age	1.04	*1.76*	Age	1.07	*2.53**
Married (No=0)	1.5	*1.79*	Married (No=0)	1.29	*0.77*
Employment status (No=0)	1.49	*1.51*	Employment status (No=0)	1.84	*2.05**
Race			Race		
Asian	0.66	*-1.01*	Asian	0.98	*-0.03*
Latino	0.86	*-0.42*	Latino	0.66	*-0.77*
Other (White=0)	1.00	*0.01*	Other (White=0)	1.29	*0.44*
Region of origin			Region of origin		
S&E Asian	0.76	*-1.03*	S&E Asian	1.04	*0.14*
Other (Americas=0)	1.56	*1.28*	Other (Americas=0)	1.26	*0.62*
Duration in US	0.99	*-0.13*	Duration in US	0.98	*-1.04*
Visa status			Visa status		
LPR	1.03	*0.13*	LPR	1.04	*0.14*
Migrants (Naturalized=0)	1.02	*0.08*	Migrants (Naturalized=0)	0.83	*-0.57*
Language			Language		
Acculturation	1.38	*1.12*	Acculturation	0.75	*-0.90*
Marginalized	1.59	*1.25*	Marginalized	1.53	*1.03*
Assimilated	1.79	*2.35**	Assimilated	1.61	*1.87*
Integrated (separated =0)			Integrated (separated =0)		
Education	1.03	*1.76*	Education	1.07	*2.53**
Living arrangements			Living arrangements		
homeowner (Renter/free=0)	1.77	*2.67***	homeowner (Renter/free=0)	1.0	*0*
Log income	1.14	*3.19***	Log income	1.18	*3.24**
Log assets	1.07	*2.58**	Log assets	1.02	*1.01*
Health insurance			Health insurance		
Yes (No=0)	0.94	*-0.28*	Yes (No=0)	1.30	*1.13*

Diagnosed medical			Diagnosed medical		
Yes (No=0)	0.68	*-1.72*	Yes (No=0)	0.71	*-1.39*
Health status			Health status		
Good	1.48	*1.33*	Good	1.66	*1.83*
Very good	1.27	*0.79*	Very good	2.42	*2.40**
Excellent (poor/fair=0)	1.89	*1.96*	Excellent (poor/fair=0)	1.96	*1.92*

* <.05 **<.01 ***<.001 ****<.0001

Conclusion

The table below lists the independent and control variables that informed health practices at the bivariate level.

Table 6: Bivariate conclusions

Characteristics that increased the likelihood of light physical activities	*Characteristics that decreased the likelihood of light physical activities*
Higher household assets Higher household income Being employed Higher education Linguistic integration Better self rated health status	Longer duration in the United States Diagnosed medical condition
Characteristics that increased the likelihood of vigorous physical activities	*Characteristics that decreased the likelihood of vigorous physical activities*
Increased household income Being employed Higher education South & East Asian Linguistic integration Having health insurance Better self rated health status	Latino Longer duration in the United States Linguistic marginalized Diagnosed medical condition
Characteristics that increased the likelihood of alcohol consumption	*Characteristics that decreased the likelihood of alcohol consumption*
Increased household assets Increased household income Higher age Being employed Better self rated health status	Being female
Characteristics that increased the likelihood of cigarette smoking	*Characteristics that decreased the likelihood cigarette smoking*

Legal permanent residency Migrant	Being female Linguistic assimilation

Longitudinal analysis

To determine the relationship between wealth and immigrant health behaviors, the study constructed a series of cross-sectional and longitudinal models, with head of household and spouse taxable income/family assets as the two main independent variables. Light physical activity, vigorous physical activity, alcohol consumption, and cigarette smoking, were the outcome variables. As many variables were not available in the 1997 dataset, cross-sectional models were only constructed from 1999 through2005. To determine model fit, all individual implicate models were compared to a null model. A null model, or an intercept only model, fits a model where all parameters are set to zero, with the exception of the intercept. Goodness of fit tests were then used to determine the data with the better fit—the null model or the model with parameters included. In this study, the log likelihood of the null model was compared to the log likelihood of the study model, and the difference was multiplied by two. A chi square distribution table was then consulted to determine whether the result was significant.

Income and health behaviors

The likelihood ratio χ^2 for the GLLAMM models, with light physical activity as the outcome variable and household income as the independent variable, indicated that all five implicates fit the data better then a null model. Respondents who did not engage in light physical activity were modeled as the comparison group (light physical activity =0).

Table 7: Longitudinal model predicting the relationship between income and light physical activity

Variable	β	OR	Z	β	OR	Z

Less then 5 days				5 days and more		
Log income	**-0.01**	**0.99**	**-0.20**	**-0.04**	**0.96**	**-0.99**
Gender	-0.31	0.73	-1.14	0.01	1.01	-0.22
(Male=0)						
Age	-0.04	0.96	-2.66**	-0.04	0.96	-2.29*
Married	0.35	1.42	1.47	0.25	1.28	0.98
(No=0)						
Employment status	-0.79	0.45	-2.72**	-0.72	0.49	-2.32*
(No=0)						
Education	0.01	1.01	0.56	-0.03	0.97	-1.08
Region of origin						
S&E Asian	0.67	1.95	2.32*	0.51	1.67	1.65
Other	0.20	1.22	0.66	0.63	1.87	2.40**
(Americas=0)						
Duration in US	0.00	1.00	-0.85	0.02	1.02	0.94
Visa status						
LPR	-0.05	0.96	-0.34	-0.25	0.77	-1.62
Migrants	0.06	1.07	0.13	-0.08	0.92	-0.21
(Naturalized=0)						
Language Acculturation	-0.25	0.78	-0.83	-0.68	0.51	-2.90**
Marginalized						
Assimilated	0.75	2.12	2.34*	0.57	1.77	2.22
Integrated	1.52	4.56	6.88****	1.57	4.83	7.60****
(separated =0)						
Health insurance						
Yes	0.24	1.28	0.96	0.07	1.07	0.24
(No=0)						
Diagnosed medical						
Yes	-0.08	0.92	-0.35	-0.09	0.92	-0.32
(No=0)						
Health status						
Good	-0.15	0.86	-0.50	-0.07	0.93	-0.21
Very good	0.20	1.22	0.65	0.49	1.63	1.45
Excellent	0.60	1.82	1.42	1.14	3.11	3.05**
(poor/fair=0)						
cons	3.15		3.00	3.55		3.41

* <.05 **<.01 ***<.001 ****<.0001

Log income was not significantly associated with light physical activities. Older immigrants, those who were employed, and those who were linguistically marginalized were less likely to participate in light physical activities. Asians, respondents who were both linguistically assimilated and integrated, and those in excellent health were more likely to be physically active.

Good health was associated with light physical activities. As previously discussed, health behaviors are strongly linked to health outcomes. This model indicates that individuals who rated their health as excellent were more likely to participate in higher levels of light physical activities, when compared to those who rated their health as poor/fair. Holding all else in the model constant, the odds of participating in light physical activities for five days or more increased by 3.1 for respondents who rated their health as excellent as compared to those who rated their health as poor/fair.

Language acculturation was a significantly associated with light physical activities. Individuals who had high levels of English language capabilities were more likely to report engaging in physical activities. When compared to respondents coded as linguistically separated, linguistically assimilated, and linguistically integrated, respondents were more likely to participate in light physical activities. The odds of participating in lower levels and higher levels of light physical activity increased by 2.12 and 1.7 for those coded as assimilated and 4.6 and 4.8 for those coded as integrated. On the other hand, not only was English proficiency a determinant of light physical activity, but so was knowledge of a respondent's "other" language. Those who had lower levels of English proficiency and lower levels of "other" language abilities were less likely to report light physical activities. As compared to respondents coded as separated, those coded as linguistically marginalized were less likely to engage in light physical activity, ceteris peribus. These results point to more than a mere ability to communicate in English, but also the ability to interact with different groups of people. For instance, the inability of marginalized respondents to interact with both their native community and

mainstream American society could explain why they are more vulnerable to low physical activities, as compared to separated respondents.

The second groups of models constructed in this series were those that investigated the relationship between income and vigorous recreational physical activity. The likelihood ratio χ^2 for the GLLAMM models, with vigorous physical activity as the outcome variable and household income as the independent variable, indicated that all five implicates fit the data better then a null model. Respondents who did not engage in vigorous activities were modeled as the comparison group (vigorous physical activity =0).

Table 8: Longitudinal model predicting the relationship between income and vigorous physical activity

Variable	β	OR	Z	β	OR	Z
Less then 3 days				3 days and more		
Log income	**0.00**	**1.00**	**-0.12**	**0.00**	**1.00**	**-0.07**
Gender (Male=0)	-1.67	0.19	-5.83****	-0.91	0.40	-3.39***
Age	-0.02	0.98	-1.42	-0.02	0.98	-1.20
Married (No=0)	-0.54	0.58	-2.40*	-0.54	0.58	-2.10*
Employment status (No=0)	0.81	2.25	1.95	0.89	2.44	2.25*
Education	-0.01	0.99	-0.45	-0.02	0.99	-0.66
Region of origin						
S&E Asian	-0.53	0.59	-2.44**	-0.27	0.76	-1.33
Other (Americas=0)	0.41	1.50	1.58	-0.20	0.82	-0.46
Duration in US	-0.08	0.92	-5.39****	-0.03	0.97	-2.29*
Visa status	-0.71	0.49	-3.51***	-0.58	0.56	-2.89
LPR Migrants (Naturalized=0)	-0.04	0.96	-0.23	0.12	1.13	0.24
Language Acculturation						
Marginalized	-1.34	0.26	-4.86****	-1.20	0.30	-4.57
Assimilated	0.66	1.94	2.44**	0.48	1.62	1.60
Integrated (separated =0)	0.72	2.06	3.56***	0.84	2.32	3.69

Health insurance (No=0)	0.37	1.44	1.35	0.13	1.14	0.42
Diagnosed medical (No=0)	0.30	1.36	0.96	0.19	1.21	0.69
Health status	-0.15	0.86	-0.47	-0.21	0.81	-0.67
Good	0.05	1.05	0.12	-0.13	0.88	-0.35
Very good	0.70	2.02	1.69	0.27	1.31	0.74
Excellent (poor/fair=0)						
cons	0.61	1.83	0.69	-0.12	0.89	-0.14

* <.05 **<.01 ***<.001 ****<.0001

Log income was not significantly associated with vigorous physical activities. Gender, marital status, employment status, duration in the country, visa status, and language were significantly associated with vigorous physical activity. The likelihood of engaging in either form of vigorous physical activity was lower for linguistically marginalized respondents but higher for integrated and assimilated respondents. Holding all else constant in the model, when compared to separated respondents, the odds of participating in lower levels and higher levels of vigorous physical activities increased by 0.26 and 0.30 for marginalized respondents, respectively.

The work setting demonstrated an interesting relationship with high recreational physical activities. Respondents who were employed reported a higher likelihood of participating in vigorous physical activities. Holding all else constant in the model, when compared to those who were un-employed, the odds of lower levels increase by 2 and the odds of higher levels of physical activities increased by 2 for employed respondents. Finally, gender also had an effect of determining whether a respondent participated in high levels of recreational physical activity. When compared to male respondents, women were less likely to participate in vigorous physical activities.

The study constructed models to determine the relationship between alcohol consumption and household income. The likelihood ratio χ^2 for the GLLAMM models, with alcohol consumption as the outcome variable and household income as the independent variable, indicated that all five implicates fit the data better then a null model. Respondents who did not report alcohol consumption were modeled as the comparison group.

Table 9: Longitudinal model predicting the relationship between income and alcohol consumption

Variable	B	OR	Z
Log income	**0.06**	**1.06**	**1.43**
Gender	-2.31	0.10	-8.77
(Male=0)			
Age	-0.04	0.96	-2.82*
Married	0.31	1.36	1.07
(No=0)			
Employment status	-0.69	0.50	-2.16*
(No=0)			
Education	0.11	1.12	2.65**
Region of origin			
S&E Asian	-0.66	0.52	-4.42****
Other	-0.18	0.84	0.38
(Americas=0)			
Duration in US	0.06	1.06	4.23****
Visa status			
LPR	0.95	2.57	4.43****
Migrants	0.20	1.22	1.22
(Naturalized=0)			
Language Acculturation			
Marginalized	0.68	1.96	3.08**
Assimilated	0.97	2.64	4.69****
Integrated	1.94	6.98	8.31**
(separated =0)			
Health insurance	-0.23	0.80	-1.01
(No=0)			
Diagnosed medical	-0.08	0.92	-0.32
(No=0)			

Health status			
Good	0.05	1.05	0.20
Very good	0.06	1.06	0.11
Excellent	0.39	1.48	0.84
(poor/fair=0)			
cons	-0.29		-0.20

* <.05 **<.01 ***<.001 ****<.0001

As previously discussed, alcohol consumption captured levels of social drinking as opposed to levels of problem drinking, including heavy and binge drinking. The log of income as in previous health behavior models was not a significant contributor to the model. Women, older immigrants, those who were currently employed, and those who were from South and East Asia were less likely to engage in social drinking.

Culture had an effect on social drinking. First, the study found that women were less likely to report the consumption of alcoholic beverages—a fact that has been previously well-documented in the literature. The odds of alcohol consumption increased by 0.1 for women, ceteris peribus. These results are attributed to gender roles, which are culturally determined. Culture as a significant factor was also evident in the results pertaining to region of origin. Individuals from South and East Asia were less likely to consume alcoholic beverages when compared to those from the Americas. The odds of alcoholic consumption increased by 0.52 for South and East Asian respondents, holding all else in the model constant.

Finally, each additional year in age resulted in a decrease in social drinking. Holding all else constant in the model, older respondents were less likely to consume alcoholic beverages with the odds multiplied by 0.96 with each unit increase in age (z=-2.82, p= 0.004).

The final model in this series investigated the relationship between income and cigarette smoking. The likelihood ratio χ^2 for the GLLAMM models, with cigarette smoking as the outcome variable and household income as the independent variable, indicated that all five implicates fit the data better then a null model. Non-smokers were modeled as the comparison group.

Table 10: Longitudinal model predicting the relationship between income and cigarette smoking

Variable	B	OR	Z
Log income	**0.11**	**1.11**	**0.93**
Gender	-0.32	0.72	-1.51
(Male=0)			
Age	-0.03	0.97	-0.89
Married	0.74	2.10	1.73
(No=0)			
Employment status	1.03	2.79	2.16*
(No=0)			
Education	-0.02	0.98	-0.26
Region of origin			
S&E Asian	-0.31	0.73	0.92
Other	-0.21	0.81	-1.03
(Americas=0)			
Duration in US	-0.01	0.99	-2.73**
Visa status			
LPR	0.33	1.40	1.11
Migrants	1.49	4.45	2.15*
(Naturalized=0)			
Language Acculturation			
Marginalized	0.09	1.10	-0.02
Assimilated	-2.39	0.09	-3.29***
Integrated	-1.53	0.22	-3.88****
(separated =0)			
Health insurance	-0.61	0.54	-1.54
(No=0)			
Diagnosed medical	0.27	1.31	0.34
(No=0)			
Health status			
Good	0.50	1.64	0.56
Very good	-0.37	0.69	-0.64
Excellent	-0.25	0.78	-0.46

(poor/fair=0)		
cons	-3.71	-1.40

* <.05 **<.01 ***<.001 ****<.0001

As in the previous three models, income was not a significant predictor of cigarette smoking for this sample. Duration in the United States, being linguistically assimilated and linguistically integrated were protective factors against smoking. Employed individuals and migrants were more likely to report cigarette smoking.

Culture was again a factor in cigarette smoking, as evidenced by the respondent's duration in the country and language acculturation. Respondents who had been in the country longer, and had therefore had more chances to interact with mainstream society, reported lower chances of smoking as compared to those who had more recently arrived. Holding all else constant in the model, each additional year in the Diaspora multiplied the odds of smoking by 0.9. On the same vein, when compared to linguistically separated immigrants, assimilated and integrated individuals were less likely to smoke (z= -3.29, p= 0.001 and z= -3.88, p= 0.0001), respectively. Due to their higher levels of English proficiency, linguistically assimilated and linguistically integrated individuals are more likely to have opportunities for interaction with native-born Americans. Finally, as compared to naturalized citizens, migrants were more likely to report current cigarette smoking. Holding all else constant in the model, the odds of current smoking increased by 4.4 for migrants. One explanation for this result could be that naturalized citizens have access to more resources, as compared to migrants, which could include smoking cessation information and programs.

In conclusion, this first series of models indicated that household income did not significantly inform immigrant health behaviors. Some of the reasons posited are explored further in the following discussion section. Culture, language proficiency, and employment status were shown to significantly explain some of the variation in recreational physical activity, alcohol consumption, and smoking.

Assets and health behaviors

The next series of models constructed were aimed at determining the effect household assets had on the health behaviors of the foreign-born. As discussed previously, the variable "assets" was a compilation of a household's net wealth (including home equity) and was log transformed due to the original variables failure to meet the assumptions of normality. The likelihood ratio χ^2 for the GLLAMM models, with light physical activity as the outcome variable and the log of household assets as the independent variable, indicated that all five implicates fit the data better then a null model. Respondents who did not engage in light physical activity were modeled as the comparison group (light physical activity =0). Unlike household income, household assets were significantly associated with light physical activities.

Table 11: Longitudinal model predicting the relationship between assets and light physical activity

Variable	B		Z	β		Z
	Less then 5 days			5 days and more		
Log assets	**0.07**	**1.07**	**2.26***	**-0.01**	**0.99**	**-0.27**
Gender (Male=0)	-0.11	0.90	-0.11	0.19	1.21	0.87
Age	-0.04	0.96	-3.09**	-0.03	0.97	-2.33**
Married (No=0)	0.19	1.21	1.01	0.18	1.20	0.90
Employment status (No=0)	-0.77	0.46	-2.76**	-0.71	0.49	-2.28*
Education	0.01	1.01	0.45	-0.03	0.97	-1.31

Region of origin						
S&E Asian	-0.22	0.81	-0.80	-0.34	0.71	-1.26
Other	0.90	2.47	3.59***	1.36	3.88	5.65****
(Americas=0)						
Duration in US	0.01	1.01	0.45	0.03	1.03	2.92**
Visa status						
LPR	0.52	1.68	2.57**	0.24	1.27	1.03
Migrants	-0.39	0.67	-1.80	-0.61	0.54	-2.61**
(Naturalized=0)						
Language Acculturation						
Marginalized	0.30	1.35	1.19	-0.18	0.83	-0.87
Assimilated	1.01	2.75	2.96**	0.78	2.18	2.35**
Integrated	1.99	7.31	8.27**	2.07	7.94	9.18
(separated =0)						
Health insurance	0.24	1.27	1.00	0.14	1.15	0.59
(No=0)						
Diagnosed medical	-0.08	0.93	-0.18	-0.08	0.92	-0.15
(No=0)						
Health status						
Good	-0.19	0.83	-0.60	-0.10	0.90	-0.33
Very good	0.21	1.24	0.68	0.53	1.69	1.53
Excellent	0.51	1.66	1.22	1.04	2.83	2.85**
(poor/fair=0)						
cons	1.73		1.92	2.18		2.38**

* <.05 **<.01 ***<.001 ****<.0001

Holding all else constant in the model, the odds of participating in lower levels of light physical activity increased by 1.07 (z=2.26, p=0.02) for respondents with higher family assets. The relationship between light physical activity and other control variables remained fairly similar to those found in the income model above, with the major exceptions being duration in the United States and visa status. As in the previous model, when investigating the determinants of light recreational physical activity, age was a significant contributor. An increase in age was associated with less recreational activity. Holding all else constant in the model, each year increase in age increased the odds of physical activity increased by approximately 0.9 for lower and higher levels of light physical activities. Finally, respondents who were migrants were less likely to be

physically active as compared to naturalized citizens. The odds of participating in light physical activity three or more times a week increased by 0.54 for migrants, ceteris peribus. Again, these results could be attributed to the level or quality of resources available to these groups of individuals.

The likelihood ratio χ^2 for the GLLAMM models, with vigorous physical activity as the outcome variable and the log of household assets as the independent variable, indicated that all five implicates fit the data better then a null model. Respondents who did not engage in vigorous activities were modeled as the comparison group (vigorous physical activity =0).

Table 12: Longitudinal model predicting the relationship between assets and vigorous physical activity

Variable	B	OR	Z	β	OR	Z
	Less then 3 days			3 days and more		
Log assets	**-0.02**	**0.98**	**-0.56**	**-0.04**	**0.96**	**-1.06**
Gender (Male=0)	-1.39	0.25	-3.03**	-0.64	0.53	-1.43
Age	-0.03	0.97	-1.59	-0.02	0.98	-1.21
Married (No=0)	-0.46	0.63	-1.42	-0.43	0.65	-1.24
Employment status (No=0)	0.88	2.41	1.70	0.99	2.68	2.01*
Education	-0.03	0.97	-0.65	-0.04	0.96	-0.80
Region of origin						
S&E Asian	-0.34	0.71	-0.77	-0.09	0.92	-0.09
Other (Americas=0)	0.56	1.74	0.94	-0.06	0.95	-0.25
Duration in US	-0.10	0.91	-4.93****	-0.05	0.95	-2.52*
Visa status						-
LPR	-0.54	0.58	-1.58	-0.45	0.64	1.18
Migrants (Naturalized=0)	0.06	1.06	0.01	0.16	1.17	0.26
Language Acculturation						
Marginalized	-1.00	0.37	-2.86**	-0.85	0.43	-2.60**
Assimilated	0.62	1.86	1.94*	0.41	1.50	1.26
Integrated (separated =0)	1.33	3.79	4.79****	1.48	4.38	4.63****

Health insurance (No=0)	0.39	1.48	1.15	0.16	1.18	0.50
Diagnosed medical (No=0)	0.37	1.44	1.17	0.20	1.22	0.75
Health status						
Good	-0.06	0.94	-0.07	-0.11	0.89	-0.23
Very good	0.16	1.17	0.44	-0.04	0.96	-0.01
Excellent (poor/fair=0)	0.88	2.41	1.67	0.39	1.47	0.84
cons	1.20		1.35	0.61		0.70

* <.05 **<.01 ***<.001 ****<.0001

Log assets were not significantly associated with engaging in vigorous physical activity. Consistent with results from previous models, an individual's employment status increased the likelihood of engaging in vigorous physical activity. The results indicated that within the foreign-born population the odds of participating in high levels of recreational physical activities at three times or more a week increased by approximately 2.7. The effect of the workplace on health behavior is discussed in detail below with additional cross-sectional data presented to show why the workplace could be an integral point of intervention. A second notable mention in this model was the relationship between the outcome variable and duration of residence in the United States. The models indicated that the longer an individual reported residence in the United States, the less likely they were to report participation in vigorous physical activities.

The next series of models were constructed to determine the relationship between alcohol consumption and a household's log assets. The likelihood ratio χ^2 for the GLLAMM models, with alcohol consumption as the outcome variable and assets as the independent variable, indicated that all five implicates fit the data better then a null model.

Table 13: Longitudinal model predicting the relationship between assets and alcohol consumption

Variable	β	OR	Z

Log assets	**-0.01**	**0.99**	**-0.21**
Gender	-1.60	0.20	-5.94****
(Male=0)			
Age	-0.04	0.96	-3.19***
Married	0.54	1.71	2.00
(No=0)			
Employment status	-0.71	0.49	-2.66**
(No=0)			
Education	0.11	1.12	3.59***
Region of origin			
S&E Asian	-2.14	0.12	-9.70
Other	-0.95	0.39	-3.61***
(Americas=0)			
Duration in US	0.01	1.01	0.55
Visa status			
LPR	0.50	1.65	2.46**
Migrants	0.68	1.98	2.12*
(Naturalized=0)			
Language Acculturation			
Marginalized	0.17	1.18	0.66
Assimilated	1.71	5.51	7.08****
Integrated	0.30	1.36	2.10*
(separated =0)			
Health insurance	-0.10	0.90	-0.49
(No=0)			
Diagnosed medical	-0.17	0.84	-0.50
(No=0)			
Health status			
Good	0.05	1.05	0.20
Very good	0.12	1.13	0.38
Excellent	0.41	1.51	1.09
(poor/fair=0)			
cons	1.68		1.61

* <.05 **<.01 ***<.001 ****<.0001

Assets were not a significant predictor to this model. Marriage, education, visa status, and acculturation increased the likelihood of alcohol consumption. Being female, older, employed, and from South and East Asia were protective factors. Culture, as an institution, again demonstrated a relationship with being a social drinker, as evidenced by the role played by gender, region of origin, and language acculturation in the model. The

odds of drinking alcoholic beverages increased by 0.2 for female respondents, ceteris peribus. This relationship can again be attributed to cultural expectations on the genders. Immigrants from South and East Asia and those collapsed into the 'Other' category were less likely to consume alcohol when compared to immigrants from the Americas. Those who had more interaction with mainstream America were more likely to self-identify as social drinkers. Assimilated and integrated respondents were more likely to consume alcoholic beverages when compared to respondents who were coded as linguistically separated.

A final interesting result from this model was the relationship between employment status and alcohol consumption. Controlling for log household assets, respondents who were employed were also less likely to report alcohol consumption holding all else constant in the model ($z=-2.66$, $p= 0.008$).

The final model, constructed to determine the effect of log household assets on the health behaviors of the foreign-born, was one to examine the effect of assets on cigarette smoking. The likelihood ratio χ^2 for the GLLAMM models, with cigarette smoking as the outcome variable and assets as the independent variable, indicated that all five implicates fit the data better then a null model. Log assets were not a significant contributor to this model. Being female and highly acculturated reduced the likelihood of being a current smoker.

Table 14: Longitudinal model predicting the relationship between assets and cigarette smoking

Variable	β	OR	Z
Log assets	**0.00**	**1.00**	**-0.10**

Gender	-1.42	0.24	-3.91****
(Male=0)			
Age	-0.03	0.97	-1.69
Married	0.93	2.53	2.08*
(No=0)			
Employment status	0.67	1.95	1.69
(No=0)			
Education	-0.03	0.97	-0.70
Region of origin			
S&E Asian	-0.56	0.57	-1.16
Other	-0.87	0.42	-2.77**
(Americas=0)			
Duration in US	0.08	1.08	2.06*
Visa status			
LPR	-0.28	0.76	-0.93
Migrants	0.83	2.30	2.17*
(Naturalized=0)			
Language Acculturation			
Marginalized	-0.40	0.67	-0.65
Assimilated	-3.04	0.05	-5.33****
Integrated	-1.08	0.34	-2.73**
(separated =0)			
Health insurance	-0.47	0.63	-1.43
(No=0)			
Diagnosed medical	0.25	1.29	0.51
(No=0)			
Health status			
Good	0.44	1.56	1.02
Very good	-0.26	0.77	-0.58
Excellent	-0.34	0.71	-0.65
(poor/fair=0)			
Cons	-3.02		-1.53

* <.05 **<.01 ***<.001 ****<.0001

Marriage, duration in the United States, and being a migrant all increased the odds of ever having interacted with cigarettes. Protective factors against smoking included gender, age, and acculturation. The odds of being a current smoker were reduced for women and for each additional year in age. Respondents coded as assimilated and integrated were less likely to be current smokers. Holding all else constant in the model,

the odds of cigarette smoking increased by 0.05 for assimilated respondents, and 0.34 for integrated individuals.

Wealth and health behaviors

To determine the combined contribution of household wealth, new models were constructed using a wealth construct—a composite of head of household and spouse taxable income and assets. Not surprisingly, controlling for both income and assets did little to change the relationship between the outcome and other control variables. Modeling the determinants of light recreational physical activity, an increase in household assets, a longer length of stay in the country, high English and 'other' language capabilities, and a better rating of one's health all increased the chances of participating in physical activities. Respondents who were currently employed, and again, those who were linguistically integrated were all more likely to report vigorous recreational activities, even after controlling for both household income and household assets. Social drinkers were more highly educated, had high proficiency in the English language, and were migrants. Women, those who were currently employed, and older respondents were less likely to report consumption of alcoholic beverages. Finally, in the model investigating the effect of household wealth on cigarette smoking, those who were coded as linguistically integrated or assimilated were less likely to report cigarette use, holding all else in the models constant.

The likelihood ratio χ^2 for the GLLAMM models, with light physical activity as the outcome variable and wealth as the independent construct, indicated that all five implicates fit the data better then a null model. Income was not significant but assets did contribute significantly to the model.

Table 15: Longitudinal model predicting the relationship between household wealth and light physical activity

	B	OR	Z	β	OR	Z
Variable	Less then 5 days			5 days and more		
Log income	**-0.03**	**0.97**	**-0.54**	**-0.05**	**0.95**	**-1.19**
Log assets	**0.07**	**1.07**	**2.35***	**-0.01**	**0.99**	**-0.25**
Gender	-0.59	0.55	-1.80	-0.31	0.73	-0.75
Age	-0.05	0.95	-3.14***	-0.04	0.96	-2.49*
Married	0.31	1.36	1.38	0.33	1.38	1.43
Employment status (No=0)	-0.86	0.42	-2.74**	-0.73	0.48	-2.19*
Education	0.01	1.01	0.57	-0.03	0.97	-1.15
Region of origin						
S&E Asian	-0.47	0.63	-2.47**	-0.59	0.55	-2.61**
Other (Americas=0)	0.83	2.30	2.99**	1.28	3.60	4.99
Duration in US	0.01	1.01	-0.35	0.03	1.03	2.16*
Visa status						
LPR	0.52	1.68	1.98*	0.24	1.27	0.72
Migrants (Naturalized=0)	-1.36	0.26	-4.76****	-1.57	0.21	-5.66****
Language Acculturation						
Marginalized	-1.04	0.35	-3.66***	-1.50	0.22	-5.71****
Assimilated	0.31	1.36	1.26	0.09	1.10	0.02
Integrated (separated =0)	1.49	4.45	7.50****	1.59	4.91	7.96****
Health insurance (No=0)	0.22	1.25	0.91	0.14	1.15	0.56
Diagnosed medical (No=0)	0.02	1.02	0.13	0.01	1.01	0.13
Health status						
Good	-0.15	0.86	-0.47	-0.04	0.96	-0.03
Very good	0.20	1.22	0.52	0.54	1.71	1.45
Excellent (poor/fair=0)	0.51	1.67	1.24	1.08	2.93	2.80
cons	2.82		2.82	3.40		3.49

* <.05 **<.01 ***<.001 ****<.0001

Holding all else constant in the model, an increase in log assets resulted in an increase in the likelihood of engaging in light physical activities. The odds of engaging in lower levels of light physical activity increased by 1.07 (z=2.35, p=0.02). Age, employment status, being Asian, a migrant, and being linguistically marginalized, all decreased the odds of engaging in light physical activities. As in light physical activity

models, respondents who held a job were also more likely to report low activity levels. The odds of lower levels and high levels of light physical activity increased by 0.42 and 0.48, respectively, holding all else constant in the model (z=-2.74, p=0.006 & z=-2.19, p= 0.03). When compared to those from the Americas, Asian respondents were less likely to be physically active. The odds of lower and higher levels of physical activity increased by 0.63 and 0.5 respectively, ceteris peribus. Migrants were less likely to report light physical activities when compared to naturalized citizens.

The likelihood ratio χ^2 for the GLLAMM models, with vigorous physical activity as the outcome variable and wealth as the independent construct, indicated that all five implicates fit the data better then a null model. Wealth was not a significant contributor to the model. In this model, being employed and or being linguistically integrated increased the odds of engaging in vigorous physical activity.

Table 16: Longitudinal model predicting the relationship between household wealth and vigorous physical activity

	B	OR	Z	β	OR	Z
Variable	Less then 3 days			3days and more		
Log income	-0.01	0.99	-0.27	0.00	1.00	-0.13
Log assets	-0.02	0.98	-0.40	-0.03	0.97	-0.84
Gender	-1.65	0.19	-4.20****	-0.89	0.41	-2.27*
Age	-0.03	0.97	-2.15*	-0.03	0.97	-1.64
Married	-0.32	0.72	-1.01	-0.31	0.73	-0.81
Employment status (No=0)	0.93	2.53	1.75	1.01	2.74	2.00*
Education	-0.02	0.98	-0.44	-0.03	0.97	-0.57
Region of origin						
S&E Asian	-0.03	0.97	-0.08	0.22	1.24	0.83
Other (Americas=0)	0.20	1.22	0.15	-0.42	0.66	-1.27
Duration in US	-0.08	0.93	-3.20***	-0.03	0.97	-1.08
Visa status						
LPR	-0.24	0.79	-0.48	-0.14	0.87	0.08
Migrants (Naturalized=0)	0.18	1.20	0.56	0.28	1.32	1.13

Language Acculturation						
Marginalized	-1.35	0.26	-2.74**	-1.20	0.30	-2.62**
Assimilated	0.18	1.19	0.52	-0.02	0.98	0.25
Integrated	1.10	3.00	3.15***	1.24	3.47	3.35***
(separated =0)						
Health insurance	0.40	1.49	1.07	0.17	1.18	0.46
(No=0)						
Diagnosed medical	0.46	1.59	1.24	0.30	1.35	0.85
(No=0)						
Health status						
Good	-0.10	0.90	-0.19	-0.17	0.84	-0.38
Very good	0.09	1.09	0.27	-0.11	0.90	-0.17
Excellent	0.78	2.19	1.48	0.29	1.34	0.68
(poor/fair=0)						
cons	0.97		1.05	0.32		0.35

* <.05 **<.01 ***<.001 ****<.0001

The likelihood ratio χ^2 for the GLLAMM models, with alcohol consumption as the outcome variable and the composite income and assets as the independent variable, indicated that all five implicates fit the data better then a null model.

Table 17: Longitudinal model predicting the relationship between household wealth and alcohol consumption

Variable	β	OR	Z
Log income	**0.06**	**1.06**	**1.63**
Log assets	**0.00**	**1.00**	**0.10**
Gender	-2.99	0.05	-11.4
(Male=0)			
Age	-0.04	0.96	-2.73**
Married	0.32	1.38	1.24
(No=0)			
Employment status	-0.77	0.46	-2.58**
(No=0)			
Education	0.10	1.10	2.97**
Region of origin			
S&E Asian	-1.05	0.35	-4.56****
Other	-0.40	0.67	-2.61**
(Americas=0)			
Duration in US	0.01	1.01	0.83
Visa status			
LPR	0.63	1.87	2.87**
Migrants	0.43	1.53	1.52
(Naturalized=0)			
Language Acculturation			

Marginalized	1.83	6.22	7.31****
Assimilated	1.36	3.91	4.54****
Integrated	1.71	5.53	6.95****
(separated =0)			
Health insurance	-0.17	0.84	-0.73
(No=0)			
Diagnosed medical	-0.15	0.86	-0.44
(No=0)			
Health status			
Good	0.04	1.04	0.17
Very good	0.10	1.11	0.29
Excellent	0.40	1.50	0.93
(poor/fair=0)			
Cons	0.25	1.29	0.19

* <.05 **<.01 ***<.001 ****<.0001

Household income and assets were not significant contributors to the model. Education, being a legal permanent resident, and being acculturated all increased the likelihood of alcohol consumption. Being female, older, holding a job, and being Asian decreased the odds of alcohol consumption. Each additional year in education resulted in an increase in the likelihood of alcohol consumption (z=2.97, p=0.003).

Table 18: Longitudinal model predicting the relationship between household assets and cigarette smoking

Variable	β	OR	Z
Log income	**0.13**	**1.14**	**1.87**
Log assets	**0.00**	**1.00**	**-0.20**
Gender	-0.26	0.77	-1.18
(Male=0)			
Age	-0.03	0.97	-1.64
Married	0.78	2.17	1.70
(No=0)			
Employment status	0.70	2.01	1.71
(No=0)			
Education	-0.04	0.96	-1.00
Region of origin			
S&E Asian	0.29	1.33	1.38
Other	0.33	1.40	1.14
(Americas=0)			
Duration in US	0.03	1.03	1.05

Visa status			
LPR	1.10	3.00	2.74**
Migrants	1.55	4.73	3.22***
(Naturalized=0)			
Language Acculturation			
Marginalized	-0.88	0.41	-3.22***
Assimilated	-1.63	0.20	-3.76****
Integrated	-1.01	0.36	-4.00****
(separated =0)			
Health insurance	-0.70	0.50	-1.90*
(No=0)			
Diagnosed medical	0.37	1.44	0.96
(No=0)			
Health status			
Good	0.34	1.41	0.77
Very good	-0.41	0.66	-0.88
Excellent	-0.46	0.63	-0.87
(poor/fair=0)			
Cons	-5.12		-2.61**

* <.05 **<.01 ***<.001 ****<.0001

The likelihood ratio χ^2 for the GLLAMM models, with cigarette smoking as the outcome variable and the composite income and assets as the independent variable, indicated that all five implicates fit the data better then a null model. Wealth was not a significant contributor to the model. The odds of being a current smoker were higher for LPRs and migrants. Holding all else in the model constant, the odds of smoking increased by 3 and 4.7 for LPRs and migrants. When compared to separated individuals, all others were less likely to smoke.

The table below lists the independent and control variables that inform physical activities, cigarette smoking, and alcohol consumption.

Table 19: Longitudinal model conclusions

Independent variable	*Characteristics that increased the likelihood of light physical activity*	*Characteristics that decreased the likelihood of light physical activity*
Household income	• South & East Asian • Linguistically assimilated • Linguistically integrated	• Increase age • Being employed • Linguistically marginalized

Household assets	• Increased household assets • Longer duration in the United States • Legal permanent residency • Linguistically assimilated • Linguistically integrated • Better self rated heath status	• Increase in age • Being employed • Migrant
Household wealth	• Increased household assets • Longer duration in the United States • Linguistically integrated • Better self rated health status	• Increase in age • Being employed status • South & East Asian • Migrant • Linguistically marginalized
Independent variable	*Characteristics that increased the likelihood of vigorous physical activity*	*Characteristics that decreased the likelihood of vigorous physical activity*
Household income	• Being employed • Linguistically assimilated • Linguistically integrated	• Being female • Being married • South & East Asian • Longer duration in the United States • Legal permanent residency • Linguistically marginalized
Household assets	• Being employed • Linguistically integrated	• Being female • Longer duration in the United States • Linguistically marginalized
Household wealth	• Being employed • Linguistically integrated	• Being female • Higher age • Longer duration in the United States • Linguistically marginalized
Independent variable	*Characteristics that increased the likelihood of alcohol consumption*	*Characteristics that decreased the likelihood of alcohol consumption*
Household income	• High education • Longer duration in the United States • Linguistically marginalized • Linguistically assimilated • Linguistically integrated	• Being female • Higher age • Being employed status • South & East Asian
Household assets	• Being married	• Being female

	• Higher education • Legal permanent residency • Migrant • Linguistically assimilated • Linguistically integrated	• Higher age • Being employed • South & East Asian
Household wealth	• Higher education • Legal permanent residency • Migrant • Linguistically assimilated • Linguistically integrated	• Being female • Higher age • Being employed • South & East Asian
Independent variable	*Characteristics that increased the likelihood of cigarette smoking*	*Characteristics that decreased the likelihood of cigarette smoking*
Household income	• Being employed • Migrant	• Longer duration in the United States • Linguistically assimilated • Linguistically integrated
Household assets	• Being married • Longer duration in the United States • Migrant	• Being female • Linguistically assimilated • Linguistically integrated
Household wealth	• Legal permanent residency • Migrant	• Linguistically marginalized • Linguistically assimilated • Linguistically integrated

CHAPTER 6
Discussion

The first section of this discussion is dedicated to the first aim of this dissertation by describing and discussing the PSID immigrant sample

- This section describes in detail the immigrant PSID sample and its potential contribution to the immigrant health literature. First, immigrant characteristics of the PSID sample are compared to those of other national studies. Although some limitations of the dataset are noted in this section, the study concludes that the PSID is a relatively good source of immigrant data. Some major points brought forward in this section include: Demographic characteristics such as ethnicity, gender, marital status, and age are comparable to current national estimates. A summary of these findings and their implications are discussed.
- The distribution of visa composition in this sample differs from national figures, with a smaller number of migrants sampled relative to what other national estimates indicate. Despite this, visa status makes a substantial contribution to health behaviors and these relationships are explored further in this section.
- Univariate results indicate a lack of cyclical migration with this sample, the consequences of which are discussed as they pertain to the U.S. health care system.

The second stated aim of this study was to determine the relationship between income and assets and health behaviors. Past research has shown a relationship between income and assets and an individual's behavior. This could be due to lack of variability in the income and asset variable. The longitudinal models indicated that assets were only

significant in their relationship with light physical activities. This study did not, however, find any significance between household wealth and the other health behaviors. A discussion of this follows below. The role of human capital (employment, education) and social capital characteristics in the health decision-making processes is also explored in this section. The major points discussed under this section include:

- The relationship between employment status and vigorous physical activity and health insurance is discussed in length. Given the current policy environment, the role of health insurance in affecting positive health outcomes is addressed. As the current health and health insurance debate continues, social work practitioners should work to ensure that the unique needs of this population are not lost in policy deliberations.

Finally, the study extends the discussion of socio-cultural factors and health behaviors among the foreign born population. Self-identified race and region of origin are used to make a case for the continued application of culturally appropriate intervention in social work practice.

- Acculturation, and its benefits to health behavior, are discussed. Respondents who have integrated and assimilated have better health practices. For instance, linguistically integrated respondents were more likely to engage in both light and vigorous physical activity and less likely to smoke cigarettes. The vulnerability of immigrants who are separated from mainstream society was also evident.
- The negative association between extended duration in the United States and one's participation in vigorous recreational activity is discussed. This discussion

also clarifies the somewhat conflicting results in the model between duration and language acculturation.

It is prudent to bear in mind that the sampling frame is not nationally representative, and therefore, the results presented cannot be generalized to immigrants across the country. However, as one of the few longitudinal studies, the findings from the PSID still stand to make generous contributions to the immigrant health literature.

Describing the PSID immigration sample

Historical and geo-political factors have determined the ethnic constitution of the foreign-born population in the country. PSID immigrant sample ethnicity make-up is comparable to current population estimates. U.S. Census data indicates that 53.3% of all current immigrants hail from Latin America, 25% from Asia, and 13.7% from Europe (L. J. Larsen, 2004). Similarly, baseline (1997 and 1999) data drawn from the PSID immigrant sample is comparable with 52.85% self-identifying as Latino, and 21.26% as Asian. Historical events dating back to the conquest of the Western and Southern frontiers by White settlers in 19th century have, to some degree, helped shape the composition of this population. On the Southwestern frontier, the annexing of Mexican lands in the 1800s resulted in a Spanish-speaking minority, which consisted of groups and families split on both sides of the U.S and Mexican borders. This necessitated family reunification programs. The situation was similar on the Western frontier, where the Spanish, Chinese, and Japanese provided much-needed labor on the land, gold mines, and railroads. Despite a string of restricted immigration policies aimed at curtailing the growth of these populations, these groups continued to thrive and increase in number. These openly discriminatory policies were justified by the Asian community's

unwillingness to assimilate into the Eurocentric culture and their role in depressing wages (Weissbrodt & Danielson, 2005). Acts such as the 1882, 1888, 1892, and 1902 Chinese Exclusion Act sought to limit the numbers of people immigrating into the country and their ability to seek U.S. citizenship (Timmer & Williams, 1998; Weissbrodt & Danielson, 2005). It was not until 1943 that Chinese immigrants were permitted to apply for and gain United States citizenship (Weissbrodt & Danielson, 2005). In spite of all these restrictions, it is estimated that approximately 150,000 Chinese immigrants resided in the country by 1950 (Moyers, 2003). The Diaspora has further been bolstered by family reunifications programs made possible by current immigration policies. Family reunification policies have historically been known to qualify as admissible individuals, who would otherwise not qualify for immigration into the country. Examples of such policies include the Bracero program between Mexico and the United States (1942-1962), which began as a guest worker program. The program was expanded over the years to facilitate a family reunification program (Boyd, 1989).

Demographically, Latino and Asian immigrants differ on several factors. As the fastest growing foreign born group, immigrants who self-identify as Latino are more likely to hold lower educational attainment as compared to other groups from Europe and Asia. They are also over represented in the ranks of the undocumented immigrant and finally they are less likely to engage mainstream institutions such as the financial sector (Rhine, Greene, & Toussaint-Comeau, 2006). Asian immigrants report better health outcomes as compared to Latino immigrants. They are also less likely to smoke and consume alcoholic beverages. Results of this current study corroborate these findings.

Respondents from South and East Asia were less likely to consume alcohol as compared to their peers from the Americas.

Legal immigration status plays a pivotal role in facilitating access to services. This study classified respondents as either being naturalized citizens, legal permanent residents and migrants. Approximately 32% of this sample was currently naturalized. Of those who were not naturalized, 77.5% reported an intention to naturalize. These large numbers of naturalized and wanting to naturalize respondents indicate the desire to establish permanent residency in the United States, a fact that should be key in the design of services targeting the foreign-born. The true numbers of undocumented individuals in this county are not adequately established. In the PSID sample approximately 7% self identified as undocumented. This number is drastically lower then current national numbers, which are estimated at 26% of the foreign-born population (Passel, Capps, & Fix, 2004), with numerical estimates placing the undocumented population anywhere from seven million to eleven million. National policies have historically determined both the human capability, and the number of immigrants in the United States. These polices not only inform the immigrant's social, economic, and political characteristics, but most importantly, regulate the nature of service provision and utilization (Potocky-Tripodi, 2002). Examples of policies that regulate health service access for different classification of immigrants include the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 and the Illegal Immigration Reform and Immigrant Responsibility Act of 1996. For instance, under the PRWORA, undocumented and documented migrants are ineligible for health services that are open to U.S.-born natives and naturalized citizens. Primary health practitioners are key in the dissemination of

health information. Limiting the access that these groups have jeopardizes the strides that are currently being made in improving health behaviors in the general public. Federal policy mandates are not the only barriers to health care access for the foreign-born—local and state initiatives have also been known to do the same. Minimizing contact with health professionals greatly impedes access to crucial information necessary in the creation and reinforcement of healthy life choices. National statistics show that admission of migrants has continued to rise steadily over the years (with a slight dip after 2001). This ever-growing number of foreign-born individuals with limited health access should be of growing concern to the social work profession. Although discussion on service provision for migrants, and more so for undocumented migrants, continues to be a political hot button issue, practitioners should strive to keep debate around settlement policies—such as those that govern health benefits—at the forefront, to ensure that these populations are adequately served.

Cyclical migration is well documented in the literature (Donato, Durand, & Massey, 1992; Tunali, 2000). Return migration was, however, not evident in this sample. Within this current sample, 92% of the respondents indicated that they had been on their first migration trip at the time of their baseline interview. Further, at baseline, the average respondent had been in the country for 13.8 years. National data indicates that in 2000, 44.5% of the foreign-born indicated that they had resided in the country 15 years or more (Schmidley, 2000). The foreign-born population's choice to remain in the United States for longer durations is yet another indicator that their health should be an issue of national concern. Several explanations are given for the lack of return migration. These include current immigration laws and family and social reasons. Although restrictive

migration policies are enacted so as to minimize movement to and from the immigrant sending countries (Donato, et al., 1992), an unintended consequence is the lengthening of the migration cycle (Angelucci, 2005). Studies have shown that restrictive immigration policies—including those that tighten international borders—are only slightly effective at stemming the tide of in-migration (Donato, et al., 1992; Hanson, Robertson, & Spilimbergo, 2002). These policies, in effect, make it cost prohibitive to travel back and forth between nations of origin and the United States. Exorbitant costs related to migration, including fees for migration, middle men such as coyotes and traffickers, and visa costs are all factored into the return migration decision. Extended stays in the Diaspora are also attributed to family reasons. More so in the case of older adults, many of whom migrate to re-unite with family. Migration trends flow into regions where existing social networks made up of family and community members exist. Knowing that the majority of the foreign-born population is likely to remain in the United States for the long term should inform the profession's intervention strategy where health behaviors are concerned. The design and implementation of intervention services that help immigrants keep the positive health behaviors they bring with them from their home countries while cushioning them against poor health practices is imperative.

On average, the PSID respondents were between 40-49 years of age. The aging and health literature constitutes a vibrant body of work. Age as it relates to health behaviors and health disparities is well represented in the literature (Carrasquillo & Pati, 2004; Scarinci, Beech, Kovach, & Bailey, 2003). The U.S. immigrant population has a higher mean age as compared to the native-born U.S population. The older an immigrant is, the more likely they are to remain separated from mainstream society after migration. This

separation is a double-edged sword, on the one hand buffering the older immigrant from mainstream society's poor health behaviors, but on the other hand, reducing accessibility to pertinent health information. This is supported by this study's findings, where after controlling for factors including health status, age acted as a protective factor against alcohol consumption but also resulted in a lower likelihood of engaging in physical activities. Understanding the older adults' immigration experiences and the resulting physical, mental, and social ramifications is a significant element when attempting to address their unique heath needs. Although discussed in length elsewhere, it is important to briefly introduce issues of culture and behavior in this case as they relate to the older immigrant. Older adults who are first-generation immigrants are more likely to have immigrated in the United States after their childhood years. That said, this group of immigrants is more likely than not to hold onto traditional cultural practices. These practices include health behaviors shaped by cultural norms that inform one's interaction with their socio and geographic environment. Older adults, and more so those who are linguistically separated, are therefore more likely to carry over and adhere to the practice of traditional, non-western forms of therapy (Shibusawa & Mui, 2008). Drawing from an evidence-based model, culturally sensitive interventions that employ these traditional practices of health and well-being should be at the forefront of social work practice. Finally, creating meaningful connections for older immigrant adults would be yet another way to disseminate health information

The institution of marriage is another well-known health protective factor. The support and economic stability drawn from these partnership have been shown to have positive life impacts (Robles & Kiecolt-Glaser, 2003; Waite, 1995). Immigrants tend to

report higher marital status when compared to native-born Americans (L. J. Larsen, 2004). In 1999, approximately 60% of the sample in this study were married—a percentage that was higher than the recorded national average of 56% in 1998 (Lugaila, 1998). In this study, respondents who were in marital unions had higher levels of economic resources as compared to those who were single never married/widowed/ divorced or separated. In this study, however, marriage did not show any protective health benefits. Controlling for assets, married respondents were more likely to consume alcoholic beverages, and more likely to smoke cigarettes. Controlling for income, they were also less likely to participate in vigorous physical activities when compared to their unmarried peers.

Wealth and health behaviors

Economic reasons are a major factor in the decision to migrate. In this study, the most commonly cited reason for migration was for work (31%), and for the purposes of seeking a better life for respondents and their families. Other immigrant studies have found similar results, thus creating a case for the argument that immigrants desire to create an environment that would improve their abilities to establish economic roots in their new communities. The role of wealth in determining physical activity was investigated in this study. At the bivariate level, income and assets informed health behaviors. This effect, however, disappeared over time in the longitudinal models. The non variation of both income and assets over time within and between the respondents is one of the explanations offered to explain these results. The non-significance of wealth in the longitudinal models notwithstanding, the study can still make a case for addressing asset-building barriers to ensure positive health outcomes. The link between good health

and economic productivity should be an incentive used to encourage positive health behaviors. Encouraging the foreign-born populations to adapt those behaviors that might require expending resources should be understood in the context of an investment in their economic well-being.

Past studies have identified income as a stronger predictor of health outcomes compared to other human capital variables such as education (Stronks, van de Mheen, van den Bos, & Mackenbach, 1997). There is also clear documentation of a significant positive relationship between income, and assets and health both in the non-immigrant and immigrant populations (Newbold & Danforth, 2003). Recent literature suggests that health decisions are affected differently by both income and assets. In a study to determine health insurance purchase, Bernard, Banthin, & Encinosa, (2009) found greater asset level disparities as compared to income disparities between the insured and the uninsured. At the bivariate level, income and assets were positively associated with light physical activities, and at the multivariate level, assets were a significant predictor of light physical activities. This study argues, therefore, that income may not be a sufficient gauge when trying to determine health behavior—in this case health insurance purchase (Bernard, et al., 2009). Income does not capture the true essences of household utility (Krieger, Williams, & Moss, 1997; Sherraden, 1991). Decisions as to how income is allocated within households are uniquely different in immigrant verses non-immigrant households.

Human capital and health behaviors

Human capital is known to inform life outcomes. Society invests in human capital with the expectation of reaping future benefits. Characteristics such as education explain

some of the differences observed between immigrants and the native population (Potocky-Tripodi, 2002). Research indicates that in both native-born and immigrant communities, higher education is associated with better health decisions (Cutler & Glaeser, 2005; Samet, Howard, Coultas, & Skipper, 1992). Unlike native-born populations, immigrants are not always in positions to exercise this human capital to its full potential. For instance, immigrants are often unable to receive a commensurate return on education received outside of the United States. Immigrants often have to undergo re-training to enable them to use their professional qualifications after migration. There is also evidence to suggest that variations in life outcomes may be further attributed to the region in which the human capital in question is acquired (Friedberg, 2000). For instance, research has found variability in the life outcomes of those immigrants who have received their education abroad, as compared to peers who have garnered part or all of their education in the United States. Immigrants, and more so those that migrate at a later stage in life, are likely to have acquired education and skills training in countries other than the destination nation. This is also evident in the current sample where only 6% of the immigrant population report receiving all their education in the United States.

At the bivariate level, higher education was associated with light and vigorous physical activities, a finding that is also well supported in literature. An interesting finding related to education was that education was positively associated with alcohol consumption. This finding could be attributed to the fact that the alcohol consumption variable as coded in this study may be capturing social drinking as opposed to problem or binge drinking. This could also explain why at the bivariate level, income, assets, and employment status were all significantly associated with alcohol consumption.

In attempting to disaggregate findings related to employment, one needs to consider the unique factors that determine employment, or lack thereof, among immigrant communities. Commonly cited reasons for unemployment in the general public are injury and illness, loss of employment, and lack of employable skills. In addition to these, immigrants face unique barriers to employment that include lack of adequate communication abilities and the inability to obtain legal work authorization. Understanding who is employed and where is critical for several reasons. First, health insurance in the United States is heavily tied to the work place. Second, financial resources are key in determining health behaviors, including some forms of physical activity, smoking, and drinking. In the current study, for instance, employed respondents were more likely to report cigarette smoking and more likely to report vigorous physical activities. The study cites the availability of income required to engage in these activities as the main reason for this finding.

To further explore the employment and physical activity nexus analysis was conducted to determine the occupations respondents were engaged in. Literature has noted a decline in the number of Americans who engage in physically demanding occupations (Brownson, Boehmer, & Luke, 2005). This sample was well represented in occupations that would require physical labor. Following the U.S. Department of Commerce and the Bureau of Census 1971 index 1997 to 2001 data yielded the following results. From 1997 to 2001 the most reported occupations were professional and technical (11.5%, 16% and 17% respectively), craftsmen (9%, 10.6%, 11.2% respectively), non transportation operatives (21%, 10.6%, 10% respectively), and service workers (10%, 13%, 12.5% respectively). In 2003 and 2005 the PSID occupation codes were updated to

reflect the 2000 census occupation index. Of those respondents who reported working for money in 2002 and 2004 the most cited occupations were production related (12.6% and 11% respectively). Approximately 9% and 10% of the respondents reported working in transportation and material moving occupations while 8.9% and 7% held jobs in building and grounds maintenance. Those who reported working in farming, fishing or forestry approximated 7.8% and 9% of the 2003, 2005 sample. This over representation in physically intensive occupations could preclude the need for leisure time physical activities within this sample.

Drawing from the current study's findings one interesting question remains: why was this same group of respondents less likely to report participation in light physical activities but more likely to participate in vigorous physical activities?

The questions as posed by the PSID for light physical activity and vigorous physical activity read:

- How often do you participate in light physical activity -- such as walking, dancing, gardening, golfing, bowling, etc.?
- How often do you participate in vigorous physical activity or sports--such as heavy housework, aerobics, running, swimming, or bicycling?

The inclusion of the key phrase "sports" in vigorous physical activity bares the connotation of the need for structured and designated time frame within which to engage in these activities. The activities listed under light physical activities including walking, gardening, and bowling are less frequently associated with physical activity. This is in contrast to sports and sports-like activities that considered exercise, and therefore specifically undertaken to improve physical fitness (Caspersen, et al., 1985). That said,

two reasons are posited for the differences in light and vigorous physical activities. First, setting aside structured time to engage in vigorous physical activities or sports means that respondents consciously apportioned time out of their schedules to perform these activities. That said, respondents were therefore more likely to recall when and for how long they engaged in the activities. Second, as light physical activities such as walking and gardening may not have been viewed as having any long-term physical benefits, respondents may not consciously choose to undertake them as an exercise routine.

A third reason as to why employment status is a crucial factor in health practices is the fact that more places of employment are taking on the initiative to provide health programs on site. Analyzing information data available in the 1999 wave showed that 12% of the immigrant sample reported receiving some health information from their places of employment. Work site physical and recreation are slowly becoming common in organizations across the country. These work site initiatives go a long way in encouraging physical activity among employees.

Health insurance and health behaviors

Health insurance in the United States is strongly tied to employment status. Approximately 47% to 52% of the current sample accessed employer based health insurance. Health insurance is a predictor of health behaviors and health outcomes. Numerous studies have proven that health insurance improves health outcomes. Lack of the same raises the likelihood of delayed care (Ayanian, Weissman, Schneider, Ginsburg, & Zaslavsky, 2000; Hadley, 2007), thereby increasing mortality and morbidity risks. Health insurance coverage disparities may be attributed to lower job-accessed health insurance and diminished Medicaid coverage among minority populations (Brown,

et al., 2000). The rates of uninsured and underinsured Americans have continued to rise over time. In the current study, approximately 29% to 35% individuals had no health insurance at all. This number mirrors other studies that have found the number of uninsured immigrants to stand at around 33% (DeNavas-Walt, Proctor, & Lee, 2006). Current CDC statistics indicate that approximately 15% of the U.S. population was uninsured in 2008.

As already discussed, immigrants are often concentrated in low-paying and temporary employment, and in some instances in the secondary labor marker. Relying on employment-based insurance for all Americans, and more so this population, leaves a large percentage of individuals with insufficient or no health insurance. Immigrants are therefore at greater risk of not having sufficient health insurance coverage when compared to the general U.S. population. Given that this population is mostly ineligible for government-funded health care makes them all the more susceptible to poor health. As this study has demonstrated, health insurance at the bivariate level is a significant determinant of physical activity. Several reasons could be put forward to explain this relationship, including access to health care providers. Continued efforts should therefore be made to ensure that all segments of the population have access to some form of health coverage that ensures constant contact with the health service providers.

Culture and health

Continued and extended contact with mainstream society results in a convergence of behaviors of the foreign-born and U.S-born individuals. Language acculturation and visa status results support the argument that extended contact with the native-born population results in a convergence of health behaviors towards those of native peers. Respondents

who were coded as integrated were more likely to engage in healthy behaviors, including physical activities and less cigarette smoking.

Holding all else constant in the models, results comparing naturalized respondents versus migrants and LPRs also show trends towards a healthy immigrant effect. The nature of the citizenship processes means that naturalized respondents are more likely to have been in the country longer when compared to LPRs and migrants. The naturalization process begins a minimum of three years after admission into the United States. Spouses of U.S. citizens are required to have resided in the country a minimum of three years before embarking on the process. For all other immigrants, naturalization may begin after five years. Data from the Office of Immigration Statistics indicates that the median time spent in the United States prior to naturalization in 2008 was nine years (J. Lee & Rytina, 2009). These findings are reflective of the PSID sample in that naturalized respondents recorded the highest mean number of years since the last migration (16.9 years), followed by LPRs (14 years), and finally migrants (8.8 years). Respondents who had resided in the country longer are therefore more likely to have health outcomes and behaviors similar to those of U.S.-born natives and to be in poorer health as compared to those who have not been in the country as long. In this study, migrants were less likely to participate in light physical activities when compared to individuals who had obtained U.S. citizenship status. Migrants were also more likely to report cigarette use. In contrast to naturalized citizens, migrants are often at a disadvantage when attempting to access mainstream institutions as are culturally separated individuals.

Further, as already demonstrated in this study, less acculturated respondents were less likely to participate in physical activity. Language proficiency is a common measure of

acculturation and has been found to be positively associated with interaction with the health care system (Cuellar, et al., 1995; Majka & Mullan, 1992; Montgomery, 1996; Nicassio, 1983; Padilla, 1980; Westermeyer, et al., 1990; Westermeyer & Her, 1996). The ability to understand written and spoken language determines the quality of health information individuals can access. Language proficiency determines access to both health care and health information. Respondents with a better grasp of the English language experience higher confidence in navigating systems in their new environment. In the current study, for example, linguistically integrated and assimilated respondents were more likely to participate in physical activities and less likely to smoke as compared to those who were linguistically separated.

Acculturation is often associated with duration of time in the receiving society with extended contact between cultures leading to alterations in practices and beliefs. As this study has documented respondents who were coded as assimilated and integrated were more likely to report participation in recreational physical activities. Interestingly however, the study found a negative association between duration in the U.S. and recreational activities controlling for all other variables. These findings were noted both at the bivariate and longitudinal levels pointing to the complex nature of the acculturation process. This paradox can be explained by taking a closer look at the relationship between time and the transmission of culture. Although individuals residing for longer durations of time in the United States would be assumed to have integrated cultural traits from mainstream society, research indicates otherwise. Time is but one of the many factors that determines acculturation. Determinants of acculturation are influenced by individual and social factors. Examples of these could include the individual's orientation

to both cultures and the level of autonomy to negotiation their interaction with the mainstream culture (Berry, 2003). Examples of this paradox would be older adults, refugees, who have been in the diaspora for long durations of time and yet are still identified as culturally separated. This would therefore explain why at the bivariate level in these data individuals who had resided in the country for longer durations of time were not as likely to engage in recreational activities as their integrated and assimilated peers. Finally the finding that that longer duration is associated with lower participation in recreational activities even after controlling for the acculturation status indicates that these populations are more vulnerable to poor health practices as compared to recent arrivals.

Across immigrant groups, gender and sex roles that differ from those of western cultures inform health behaviors differently. For instance, women are less likely to engage in physical activity compared to men (Trost, Owen, Bauman, Sallis, & Brown, 2002). Minority women have been found to interact with the health care system less then native-born women. As compared to women, foreign-born men are also more likely to access health care institutions such as health insurance(Carrasquillo & Pati, 2004). The results in this study mirror those previously found in the literature. First, women were less likely to participate in physical activities. Reasons given for lack of participation in physical activities include gender roles such as motherhood, language issues, lack of peers/role models who participate in physical activities (Evenson, Sarmiento, Macon, Tawney, & Ammerman, 2002), and inaccessibility of physical activity resources. Minority women in particular cite the lack of culturally appropriate programs as a barrier to engaging in organized physical activity (Eyler, et al., 1998).

The way in which female respondents conceptualized the physical activity questions may have informed these findings. Culture could have played a role in the interpretations ascribed to the questions. Past studies have found a cultural component in the response to physical activity questions. For instance, a study with minority women found that the definition of what was considered physical activity broadened to include everyday tasks such as home making and work related activities (Eyler, et al., 1998). However, when we look at the vigorous activity question, activities such as sports, heavy housework, aerobics, running, swimming, or bicycling may be ones that are out of reach for women. Bearing in mind that the PSID sample over samples low income families, activities such as golfing and bowling may be ones that are both socially and economically out of the reach of many immigrant women. Also, as previously noted, activities geared towards the improvement of physical health are both structured and repetitive. Time constraints due to traditional gender roles, which include home making and care giving, could hamper efforts to engage in them. Encouraging the formation of physical activity peer groups where women could encourage and motivate each other could help more women achieve the recommended stipulations for physical activity.

Culture had an impact on the health behaviors of the foreign-born, with regional variations found when explaining health behaviors. This study controlled for socio-cultural factors by including the region of origin variable collapsed into three categories namely the Americas, South and East Asia, and other regions. At the bivariate level a race variable was also included to help determine health behavior differences. Medical anthropologists make a distinction between the western understanding of disease and ill-health (Kleinman, et al., 2006). Immigrants, more so those from societies where

traditional healers and traditional therapies are still common practice, attribute different meanings to the concepts of health and disease. For social workers, understanding the client's cultural background becomes imperative to our understanding of how they conceptualize their health outcomes. It behooves the profession to seek out cultural information in a bid to improve health and the health seeking process (Low, 1984). Cultural differences were evident in this study. For example, while holding income and assets constant in the model, respondents migrating from South and East Asia were less likely to engage in light physical activities and less likely to consume alcoholic beverages. Several factors have been identified in explaining alcohol consumption across different cultural groups (Neff, Prihoda, & Hoppe, 1991). The variations that exist in how cultures have historically viewed alcoholic beverages and their consumption inform the mechanisms that have developed for its use and regulation (Makela, 1983). In attempting a deconstruction of alcohol consumption, one should be mindful of the cultural meanings attached to alcohol consumption (Makela, 1983).

CHAPTER 7
Study Implications

This section presents implications drawn from the findings of this study. Information is laid out in three sections, implications for social work practitioners, implications for policy, and implications for researchers.

Implications for practice

Healy, (2008) rightly identifies international migration as one of the compelling reasons for the advancement of cross-cultural training for social workers. Although most research speaks of the concept of cultural competency in social work, it is this study's belief that cultural competency is a difficult concept to achieve. As mentioned earlier, culture is a complex and nuanced phenomenon. Given this, it would be naïve for social work professionals to claim competence in a culture that is not their own, and hence the need to focus on developing cultural sensitivity in the field. To the nuanced nature of culture, Boyle and Springer (2001) suggest that social work research should continue to address the conceptualization of cultural sensitivity, and to develop evidence based practice around the concept.

Schools of Social Work accredited by Council on Social Work Education (CSWE) are required to integrate cultural sensitivity training in their course work and field education programs. The National Association of Social Worker (NASW) considers cultural sensitivity an integral ethical requirement for social work practice. The increased efficacy of practitioners who share a cultural background with their clients is well documented in the social work and health literature. Given this, and with the ever increasing diversity of immigrants, social work schools and programs should actively

recruit from these communities to bolster diversity within the helping profession. From a practitioner's perspective, the cultural implications of health behaviors discussed above should be considered in the design of health programs to ensure that immigrant groups are adequately served.

Due to the differences in the conceptualization of illness and disease across cultures, programs are needed to assist immigrants in better understanding the western medical model. This would then increase their ability to be stronger advocates in their interaction with the health profession. In the same vein, efficacy studies are needed to create evidence-based practice based on traditional methods of health and well-being. Acculturation is a factor in health behavior. Increased contact with native-born Americans has been shown to increase the chances of behavior changes. Health promotion strategies should make a concerted effort towards reaching out to culturally marginalized and separated individuals. Innovative programs such as Project SHINE, which fosters social engagement for immigrants through civic engagement, should be replicated across the nation.

Resource limitations that plague the social welfare provision system preclude the ability to provide culturally relevant health services to every single cultural group that walks into our practices. Various disciplines, including health, geography, anthropology, public health, and sociology have determined that place and space are highly correlated with health outcomes and health behavior. Geographic trends in health have been attributed to cultural, economic, political, and historic factors (Tunstall, Shaw, & Dorling, 2004). Although data limitations in this study greatly informed the geo-political regions under which respondents were categorized, it is still safe to presume that these broad

categorizations capture some homogeneity in the socio-cultural, economic and political make up of these environments. Low (1984) argues that the diffusion theory could in itself be applied in our profession to make generalizations of health beliefs and practices of individuals and groups who hail similar from these geo-political regions. Diffusion has been defined as the propagation of new ideas to members within a social system (Rogers, 2004). Macdonald (1992) identifies the change agent as an integral part in the diffusion process. Social work and health practitioners who work with immigrant communities should therefore be prepared to act as cultural brokers between organizations that develop and offer health promotion services and communities that seek to access them.

Data from 1999 indicated that 12% of the respondents received health promotion information from their work sites. In the same year, 79% indicated that they were in some form of formal employment. Channels through which immigrants can access health promotion information should be expanded to include the work place.

Migration research has shown that migration trips are facilitated by previously established networks (Donato, et al., 1992). Within the current sample, 68% indicated that a relative and or non-relative was primarily responsible for helping with migrate. Social networks have predominated migration literature from the 1960s, when social scientists studied the role played by kin in chain migrations (Boyd, 1989). Social networks are maintained by reciprocity and obligations fostered between those who first receive support and other network members. The use of social networks after migration provides a form of coping mechanism helping incoming immigrants cope with life stressors. Social work practitioners interested in impacting health behaviors among

recently arrived immigrants should work within network resources already developed and available within existing immigrant communities.

Not only could practitioners impact health outcomes among already arrived immigrants, but the potential exists for trans-national health promotion programs. Immigrant networks are trans-national communities that operate across borders (Portes, 1997). The cyclic nature of migration necessitates the maintaining of these connections in sending countries. These connections become necessary as migrants seek to ensure the continuation of their social and psychological connection to family members left behind (Guilmoto, 1998). The efficacy of peer education programs are well documented (Molly, 1992). Creating programs that target communities that are known to be migrant sending would reinforce the importance of maintaining healthy behaviors.

Physical inactivity is highly associated with chronic health conditions that result in high health care costs (Garrett, Brasure, Schmitz, Schultz, & Huber, 2004). That said, however, individuals do not always take professionals' recommendations to engage in physical activity (Williams, Hendry, France, Lewis, & Wilkinson, 2007). In this study, women were found to be less likely to participate in vigorous physical activity. Among the reasons identified in literature is the lack of role models or peer support. To encourage women immigrants—more so those who are separated or marginalized—to participate in physical activities, programs could take advantage of the social networks within which women function. Services targeting the immigrant population could therefore utilize already existing social networks to encourage participation in physical activities.

Culturally and medically appropriate programs that target and encourage physical activity should be considered. Involving the community in organizing and developing physical activity routines and programs would go a long way towards encouraging greater participation, more so from those individuals who are well-connected to a cultural social group. Geo-spatial factors as they relate to gyms and other facilities where physical activity is conducted should also be a key consideration when encouraging immigrant communities to pursue these activities. Proximity of physical activity locations to individuals increases the likelihood of participating in physical activity (D. A. Cohen, et al., 2007; Kaczynski & Henderson, 2007). Facilities that target immigrants should be therefore locate themselves in and around areas where these communities congregate. Facilities should also be architecturally designed in ways that make them conducive and easy to navigate.

The study found that from a longitudinal perspective assets were positively associated with physical activity. Immigrants face great barriers to asset accumulation in the United States. Financial intermediaries facilitate the relationship between savers and borrowers and the finance market. Krahnen & Schmidt (1994) define financial intermediaries as organizations that administer savings and investment plans, credit facilities, checking services, and other banking services. This definition incorporates financial intermediaries that negotiate and facilitate relationships between banking organizations and their clientele. These include depository institutions, non-bank institutions such as pension funds and mutual funds, and privately held assets such as stocks and bonds (Allen & Santomero, 1999). Inaccessibility to these institutions influences the ability to accumulate assets among the immigrant population. The Federal

Reserve Bank of Chicago estimates that compared to 18% of un-banked U.S natives, 36% within the immigrant community are un-banked. Of these, recently arrived immigrants are more likely to be un-banked. Noting these service discrepancies, financial institutions have come a long way in their attempts to redress service gaps in the minority community. These include working with community and private organizations to create products that cater to the un-banked and under-banked populations. Multilingual front office staff, translated bank literature, and transnational bank accounts are ways in which the immigrant community has specifically benefited from this altered viewpoint in banking. However, even with these accomplishments there remains a disproportionate percentage of un-banked individuals among the immigrant community. There is the need to work within immigrant networks not only to disseminate information on banking products but also to determine services offered.

Finally, the recent economic downturn has resulted in the closure of community and non-for profit health facilities that have historically provided services for under-served populations including immigrants (CBS Broadcasting Inc., 2009; Kaisernetwork.org, 2009). These populations should not be overlooked when funding once again becomes available for these services and programs.

Implications for policy

Although not a significant contributor to the longitudinal model, health insurance was significant at the bivariate level. As the current health and health insurance debate transpires, social workers in the policy arena should keep immigrant health insurance issues at the forefront. Any policy that would explicitly exclude a substantial number of American residents (as was the case with the PRWORA) will do a disservice to the

strides made in this nation's health outcomes. The multifaceted nature of this issue necessitates the formation of coalitions that would cut across professional, ethnic, and socio-economic lines. Only multi-sectorial community and national coalitions would carry the mandate required to lobby for such a hot button issue. The ground work for these coalitions is already in existence, with several such groups having played a key role in the recent attempts at immigration law reform. Policy workers should use this infrastructure to disseminate material required to lobby for the inclusion of all American residents in any resulting health care and health insurance initiatives.

Implications for research

This study has documented the multifaceted nature of immigration as it relates to health outcomes. Not only are immigrants culturally heterogeneous, but other social and political factors add to this complexity. For instance, not only does region of origin exert an influence on health behaviors so does language acculturation and visa status. That said, social work researchers should continue to work on practice that is both culturally sensitive and that also takes into consideration the nuanced nature of immigration.

The study found differences in the outcomes of light physical activity verses vigorous physical activity. One of the reasons posited to explain these differing results was the respondent's cultural perception to these two questions. The PSID does not provide literature on the validity and reliability of these and other questions put to the immigrant population. Research is therefore needed to assess the validity and reliability of these questions in the PSID. Attaining valid and reliable data in the social sciences is an especially onerous task, as most concepts measured are ambiguous and intangible. A well developed measure must demonstrate the ability to capture reality as closely as

possible. A reliable instrument is one that demonstrates its dependability and stability (Neuman & Kreuger, 2003). To ensure that measures are reliable, the selection, implementation, and development process should ensure that only minimal errors are recorded (Kerlinger & Lee, 1986). Ways through which reliability can be established include use of the split-half method or inter-coder reliability method.

A valid measure is one that captures reality (Adcock & Collier, 2001). Valid measures result in data that is accurate, authentic, sound, and truthful (Hubley & Zumbo, 1996, p. 206). In the social sciences, where constructs are abstract and in some cases difficult to define, absolute validity is difficult to establish. A measure is said to be valid if it has satisfied content, criterion, and construct validities. Content validity is a measure's ability to adequately sample and capture reality (Kerlinger & Lee, 1986; Neuman & Kreuger, 2003). Establishing content validity is a highly subjective matter as each construct can be measured in any number of ways. Research projects should aim for congruence between how the question is phrased and how it is understood by respondents. While cultural competence in the "others" culture is a farfetched ideal, researchers should aim at enhancing their sensitivity to the culture under study by calling on expertise from group members, judges, and/or experts, who are well-versed in the constructs under study. Construct validity refers to how well a measure reflects some underlying construct or latent variable (Hubley & Zumbo, 1996) Literature suggests that one of the issues plaguing research with refugee and immigrants is the lack of concept uniformity, meaning that the field lacks cohesive variable definitions (Black, 2001; Bulmer, 2001; Jonassen, 1981). Researchers should therefore operationalize concepts in a way that captures the population's world view, which in some instances could be

distinctly different from what has been documented in literature with native-born populations.

Limitations

There are several limitations inherent in the PSID. Despite covering a time period of nine years (1997-2005) only five time points are available for analysis due to the biennial nature of the survey and because the full immigrant sample was not collected until 1999 the study was unable to use 1997 data.

The PSID collects immigration data only at the baseline (1997 and 1999). Immigration characteristics such as visa status and acculturation inform life outcomes after migration. The lack of these immigration variables at subsequent time points, therefore, greatly diminishes the quality of the PSID as a source of immigration data. Immigration information was collected only for the head of household and spouse at baseline. The lack of immigration characteristic information in subsequent years renders unusable the current sample that now includes 61 families that have split from the original sample of 511. If immigration information were collected from all family members at baseline, then these split off families could ideally be included in subsequent analysis.

PSID does not provide pre-migration experience variables. As stated previously, assets are accumulated over one's lifetime. Research has documented that immigrants leave behind wealth in their home countries. The study's inability to account for assets not held in the United States limits the ability to understand their impact on health after migration. As discussed earlier, an individual's culture and geographic region of origin determines health beliefs, behaviors and disease conditions. The lack of cultural schema

variables limits this study's ability to understand and control for these factors. A clearer understanding of health practices prior to migration would greatly enrich this study.

Due to data limitations, the study was unable to code variables in a way that would have enhanced the quality of the dissertation. Ideally, alcohol consumption should have been coded as non-drinkers, social drinkers, and heavy/binge drinkers. However, due to small cell sizes in the latter category, the study collapsed alcohol consumption into a dichotomous variable denoting those who did not consume alcohol and those who consumed alcohol at any amount. Similarly, due to data limitations, the study was unable to construct a cigarette smoking variable that encompassed respondents who had never smoked, those who had quit smoking, those who had quit and relapsed, and finally, those who were current smokers. Future studies investigating these health behaviors with sample sizes that would allow for the proper coding of these health behaviors should be considered. Although the physical activity questions as posed in the PSID questionnaire captures the frequency and type intensity of the activities, it does not ask about the intensity of the activities. Based on current standards, an accurate estimate of physical activity should include an intensity component, i.e. thirty minutes for moderate physical activities, or twenty minutes for vigorous physical activity. Lack of this key element limited the study's ability for accurate measurement of physical activity.

Conclusion

The United State's comprehensive public health plan has set out to achieve two national goals by 2010: improving quality of life and eliminating health disparities. Research, however, continues to document persistent health outcome disparities more so

within minority populations (Brown, et al., 2000; U.S. Department of Health and Human Services, 2000b). This study has made two substantial contributions to the current state of knowledge in immigrant health disparities: Using data from the relatively unused PSID immigrant sample, and drawing from the behavioral model of health service utilization for vulnerable populations (Gelberg, et al., 2000) and the assets effects model (Schreiner & Sherraden, 2007; Sherraden, 1991), this study investigated health behaviors among immigrant groups by examining the trajectory of their acquired assets and earned income. The study used rigorous methods including multiple imputation and generalized linear, latent, and mixed to investigate these relationships. It is hoped that the results of this study will inform both practice and policy practice. These results could enlighten social work's intervention in the fields of health and social economic development within the immigrant community.

Sociological and economic theories attribute the need to improve one's financial well-being as a stimulant to migration (Carrington, Detragiache, & Vishwanath, 1996; Massey, 1987; Massey, et al., 1998; Massey & Espinosa, 1997) —a fact that was confirmed by this study. Many immigrants migrate to the United States with the expectation of providing a secure future, not only for themselves but their families and communities. Policy restrictions result in the inability of some to break into the mainstream financial arena and the inability to access health care services. The ability to hold citizenship in the host nation, for instance, opens doors for immigrants to access otherwise restricted opportunities such as social benefits including healthcare, education, and the ability to engage in the labor market. This ability to access these resources provides the immigrant with a better spring board to a secure future. From a policy

perspective, therefore, a clear understanding of how the immigrant's goal of financial well-being interacts with health behavior and health outcomes is crucial to informing immigration and immigration integration policies.

This study has also identified several limitations inherent in the PSID dataset. Future research that addresses these issues should be considered. Deconstructing the meanings associated with the different forms of physical activity for instance, collecting immigration information periodically.

Health behaviors are linked to health outcomes. The ever expanding costs of health care and the barriers faced by the foreign born in accessing this care necessitates research into their health behaviors. It is hoped that this and other studies will continue to build upon this section of the health literature.

Appendix

Table 20: Bivariate analysis of baseline information

Immigration characteristics at baseline			
Gender	Male=75.21% Female = 24.79%	Duration in the United States	M= 13.8; SD=7.3 Range 0-39 years
Education	M=10; SD =25.8 Range = 0-17years	Naturalization status	Naturalized=32% Not naturalized = 68%
Region of Education	Other country = 71% Only in the U.S. = 6% Education in both = 23%	Plan to naturalize	Yes=77.5% No= 18.5% DK= 4%
Race/Ethnicity	Latino = 52.8% Asian = 21.1% White= 11.7% Black=7.8% Other = 6.8%	Visa status	Naturalized=32% LPR =47% Migrants= 21%
Region of Origin	Americas = 68.9% S&E Asia=19.7% Other regions=11.4%	Migration trips	1st trip=92% Other=8%
		Cited migration reasons	Employment=31% Better life=27.4% Family =9.9% Persecution= 10.8% Other= 20.9%

Table 21: Bivariate analysis—association between light physical activity and study variables (2001-2003)

Variable	OR	t	OR	t	OR	t	OR	t
	2001				2003			
	Less then 5 days		5 days and more		Less then 5 days		5 days and more	
Gender (Male=0)	1.41	*0.97*	1.15	*0.39*	0.57	*-1.66*	0.69	*-0.98*
Age	.96	*-3.34***	.99	*-0.80*	.96	*-3.02***	.99	*-1.16*
Married (No=0)	.72	*-1.08*	.77	*-0.84*	1.18	*0.51*	1.03	*0.10*
Employment status (No=0)	1.75	*1.48*	1.60	*1.24*	3.14	*3.21*	2.25	*2.16**
Race								
Asian	1.89	0.29	1.19	0.77	1.71	0.34	1.42	0.57
Latino	0.60	0.28	0.38	0.04	0.99	0.98	0.73	0.53
Other (White=0)	0.72	0.59	0.69	0.52	1.27	0.70	1.40	0.59
Region of origin								
S&E Asian	2.68	0.02	2.68	0.02	1.71	0.21	1.72	0.21
Other (Americas=0)	3.16	0.04	3.49	0.02	1.43	0.54	1.46	0.51
Duration in US	0.95	-2.87***	0.95	-2.50*	0.96	-1.81	0.98	-1.80
Visa status								
LPR	0.69	0.31	0.55	0.08	1.24	0.52	1.08	0.83
Migrants (Naturalized=0)	1.39	0.47	0.78	0.56	1.21	0.67	0.90	0.81
Language								
Acculturation	0.50	0.07	0.55	0.11	0.75	0.47	0.80	0.59
Marginalized	2.12	0.16	1.80	0.30	5.15	0.04	4.59	0.07
Assimilated	2.21	0.04	2.57	0.01	1.95	0.10	2.13	0.07
Integrated (separated =0)								
Education	1.12	*3.76****	1.11	*3.54****	1.09	*2.86****	1.07	*2.22**
Living arrangements								
homeowner (Renter/free=0)	.98	*-0.06*	.83	*-0.62*	1.29	*0.82*	1.03	*0.08*
Log income	1.08	*1.88*	1.06	*1.48*	1.14	*2.57**	1.08	*1.68*
Log assets	1.12	*3.12***	1.04	*1.24*	1.04	*1.15*	1.02	*0.53*
Health insurance								
Yes (No=0)	2.27	0.01	1.81	0.05	1.92	0.04	2.32	0.01
Diagnosed medical								
Yes (No=0)	0.88	0.66	0.62	0.12	0.64	0.15	0.62	0.16

Health status								
Good	1.46	0.33	1.94	0.07	1.70	0.16	1.58	0.28
Very good	1.99	0.12	1.88	0.16	2.81	0.03	2.85	0.04
Excellent	3.24	0.03	4.40	0.00	4.07	0.01	4.86	0.01
(poor/fair=0)								

* <.05 **<.01 ***<.001 ****<.0001

Table 22: Bivariate analysis—association between vigorous physical activity and study variables (2001-2003)

Variable	OR	t	OR	t	OR	t	OR	t
	2001				2003			
	Less then 3 days		3 days and more		Less then 3 days		3 days and more	
Gender								
(Male=0)	.52	*-1.96**	.83	*-0.57*	.78	*-0.70*	.88	*-0.37*
Age	.94	*-4.5****	.96	*-3.22***	.94	*-3.9****	.96	*-2.83***
Married	1.52	*1.57*	1.05	*0.18*	1.15	*0.53*	0.99	*-0.05*
(No=0)								
Employment status	4.69	3.55****	2.1	2.03*	1.77	1.60	3.51	1.82
(No=0)								
Race								
Asian	1.41	*0.79*	1.08	*0.14*	1.07	*0.16*	.97	*-0.07*
Latino	.75	*-0.75*	1.17	*0.36*	.48	*-1.89*	.52	*-1.50*
Other	.69	*-0.74*	1.20	*0.33*	.75	*-0.63*	.87	*-0.26*
(White=0)								
Region of origin								
S&E Asian	1.47	*1.20*	.96	*-0.11*	1.55	*1.47*	1.51	*1.22*
Other	2.50	*2.38***	1.08	*0.15*	2.01	*1.75*	1.24	*0.40*
(Americas=0)								
Duration in US	.96	*-2.58***	1.00	0.09	.94	*-3.3****	.97	*1.43*
Visa status								
LPR	.45	-2.65**	.68	-1.23	.96	-0.14	.83	-0.57
Migrants	.95	-0.14	.88	-0.29	1.56	1.22	1.63	1.28
(Naturalized=0)								
Language								
Acculturation	*.54*	*-1.49*	1.42	*0.87*	.31	*-2.74*	.42	*-1.85*
Marginalized	*3.26*	*2.69 **	2.57	*1.79*	2.25	*1.94*	1.82	*1.16*
Assimilated	*2.40*	*2.99***	2.54	*2.67***	1.60	*1.55*	2.01	*2.13**
Integrated								
(separated =0)								
Education	1.14	*3.98****	1.07	*2.39***	1.10	*3.45****	1.08	*2.51***
Living arrangements								
homeowner	1.22	*0.82*	1.67	*1.72*	1.19	*0.71*	.88	*-0.43*
(Renter/free=0)								

Log income		*1.92*	1.16	*2.34**	1.10	*1.94**	1.12	*1.49*
	1.25							
Log assets	1.09	*2.26**	1.06	*1.72*	1.03	*0.92*	1.00	*0.10*
Health insurance								
(No=0)	2.22	*2.71***	.83	*-0.66*	2.23	*2.84***	1.40	*1.05*
Diagnosed medical								
Yes	.58	*-1.99**	.40	*-2.74***	.51	*-2.54***	.46	*-2.45***
(No=0)								
Health status								
Good	2.89	*2.86***	2.69	*2.07**	1.29	*0.68*	1.37	*0.66*
Very good	4.46	*3.48****	4.89	*3.00***	1.70	*1.43*	1.89	*1.41*
Excellent	4.06	*3.21****		*2.35**	2.96	*2.68***	3.91	*3.00***
(poor/fair=0)			3.51					

* <.05 **<.01 ***<.001 ****<.0001

Table 23: Bivariate analysis—association between cigarette smoking and study variables (2001-2003)

Variable	OR	t	OR	t
	2001		2003	
Gender		-1.34	0.61	-1.18
(Male=0)	0.53			
Age	0.97	-2.61	0.97	-2.65**
Married	1.53	1.08	0.95	-0.13
(No=0)				
Employment status	1.26	0.59	1.21	0.45
(No=0)				
Race				
Asian	0.74	-0.57	0.84	-0.32
Latino	1.09	0.19	0.95	-0.09
Other	0.67	-0.75	0.63	-0.72
(White=0)				
Region of origin				
S&E Asian	0.68	-0.97	0.81	-0.60
Other	0.88	-0.28	0.65	-0.90
(Americas=0)				
Duration in US	0.98	-0.91	1.00	-0.09
Visa status				
LPR	1.57	1.20	1.39	0.88
Migrants	1.93	1.55	2.81	2.52**
(Naturalized=0)				
Language				
Acculturation	1.25	0.55	1.44	0.88
Marginalized	0.66	-0.72	0.56	-0.96
Assimilated	0.98	-0.05	1.19	0.48
Integrated				
(separated =0)				

Education	1.00	0.07	1.01	0.39
Living arrangements				
homeowner	0.75	-0.98	0.84	-0.62
(Renter/free=0)				
Log income	1.01	0.20	1.04	0.82
Log assets	0.98	-0.60	0.98	-0.58
Health insurance				
Yes	0.54	-2.02*	0.43	-2.99**
(No=0)				
Diagnosed medical				
Yes	0.87	-0.44	0.74	-1.02
(No=0)				
Health status				
Good	1.12	0.30	1.42	0.95
Very good	1.71	1.24	0.68	-0.77
Excellent	1.13	0.26	1.38	0.72
(poor/fair=0)				

* <.05 **<.01 ***<.001 ****<.0001

Table 24:Bivariate analysis—association between alcohol consumption and study variables (2001-2003)

Variable	OR	t	OR	t
	2001		2003	
Gender	.41	-3.10**	.33	-3.64***
(Male=0)				
Age	.97	*-3.08***	.97	*-2.73***
Married	1.54	*1.70*	1.37	*1.22*
(No=0)				
Employment status	1.95	*2.44***	2.28	*2.68***
(No=0)				
Race				
Asian	.82	*-0.51*	1.69	*1.47*
Latino	.85	*-0.48*	1.40	*1.05*
Other	.99	*-0.03*	1.25	*0.52*
(White=0)				
Region of origin				
S&E Asian	.79	*-0.90*	1.08	*0.27*
Other	1.77	*1.63*	.80	*-0.57*
(Americas=0)				
Duration in US	.96	*-2.72***	0.99	*-0.67*
Visa status				
LPR	1.22	0.81	.84	-0.68
Migrants	1.30	0.80	.88	-0.40
(Naturalized=0)				
Language				

Acculturation				
Marginalized	.66	*-1.39*	1.08	*0.24*
Assimilated	1.24	*0.57*	1.86	*1.58*
Integrated	1.37	*1.20*	2.34	*3.19***
(separated =0)				
Education	1.06	*2.32**	1.08	*3.32****
Living arrangements	1.70	*2.31**	1.30	*1.18*
homeowner				
(Renter/free=0)				
Log income	1.15	*3.29***	1.18	*3.97*****
Log assets	1.08	*2.68***	1.05	*2.04**
Health insurance				
Yes	1.00	*-0.00*	1.01	*0.05*
(No=0)				
Diagnosed medical				
Yes	.50	*-2.66***	.51	*-2.55***
(No=0)				
Health status				
Good	1.54	*1.50*	2.61	*3.22****
Very good	2.85	*3.15***	4.86	*4.50*****
Excellent	1.90	*1.90*	2.83	*2.79***
(poor/fair=0)				

* <.05 **<.01 ***<.001 ****<.0001

Table 25: Glossary

Term	Definition
Foreign born	Individuals born outside of the United States. Individuals who qualify for citizenship through Jus sanguinis (born of U.S. parents), and jus soli (born on U.S. territories) are not considered foreign born.
Immigrant	Foreign born individuals granted permanent visa status, sometimes referred to as legal permanent residents (LPR).
Legal Permanent Resident (LPR)	Foreign born individual granted permanent visa status. Avenues of receiving LPR status include family reunification, employment, diversity visa lottery, refugees, asylum seekers.
Migrant/non-immigrant	Foreign born individuals whose admission into the United States is based on their intent to reside in the country for a specified duration of time only. Migrants are either documented or undocumented (see below).
Documented migrant	Foreign born individual whose admission is based on their intent to reside in the country for a specified duration of time These individuals hold documentation that legally allows them entry and temporarily reside in the United States
Undocumented migrant	This group of migrants do not hold documentation that legally allows them entry and or temporary residence in the United States. Avenues that lead one to being classified as undocumented include entering the country with falsified documents, with no documents

	or overstaying ones visa stipulations
1st generation immigrant	This term is used to refer to both immigrants and migrants. These are foreign born individuals currently residing in the United States.
2nd generation immigrant	U.S. born individuals whose parents are 1st generation immigrants.
Wealth	As used in this study is the aggregation of a family's income and assets.
Income	Income is commonly defined as the summation of all earnings including wages, interest payments and profits.
Assets	Accumulated financial resources including real estate, bank accounts, stocks and bonds etc.

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