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Immigration, Health, and New York City: Early Results Based on the U.S. New Immigrant Cohort of 2003

1. Introduction

Every year, several hundred thousand persons become legal permanent residents (LPRs) of the United States,[1] averaging 781,848 in the 1991-95 period, 771,307 in the 1996-2000 period, and 944,884 in the 2001-04 period.[2] They include new arrivals to the United States (some coming for the very first time) as well as persons already living in the United States, having come earlier on a temporary visa or without documents and now achieving the coveted LPR status. Mingled with their hopes and dreams are the personal characteristics that propelled the move—the peculiar migrant energy—and the myriad faculties, experiences, attributes, and skills that will shape the immigrant trajectory.

Immigrants settle in one point within the vast U.S. geography. Classically, there are four great reception areas: the two coasts, Chicago, and the southern border. New York City was the gateway for the great migrations of the turn of the twentieth century, and it remains a major destination for new immigrants.[3] Repeatedly, the city has been shaped and reshaped by the distinctive characteristics of successive waves of new immigrants; new immigrants, in turn, like their native-born counterparts who arrive from Seattle and Iowa City and Laredo, have found in New York City both haven and spur.

Among the things immigrants bring with them to the United States is their health set: the combination of health levels and health behaviors. This paper has the twofold objective of exploring immigrant health and doing so with an emphasis on New York City. We make use of a new data source, the New Immigrant Survey (NIS)—the first longitudinal survey of a nationally representative sample of new legal immigrants to the United States—drawing information from Round 1 of its fiscal year 2003 cohort, known as NIS-2003. (At this writing, the data from Round 1 are being prepared for initial public release in 2005, and plans are under way for fielding Round 2.) An important additional objective of this paper is to make known the availability of this new data source, which will enable researchers to address a wide variety of topics, from language acquisition and identity formation to religion dynamics, not to mention the staples of studies of immigration, such as selectivity, emigration, and naturalization.

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Two questions dominate the study of immigrant health:

1. What is the health status of a new immigrant?
2. What is the immigrant's health trajectory over the life course?

The first question, the *selection* question, encompasses all factors and mechanisms in both origin and destination countries that influence who migrates—including, for example, origin-country skill prices and destination-country visa allocation regimes—some of which are, directly or indirectly, attentive to matters of health. The second question, variously called the *assimilation* or *incorporation* question, focuses on the health-relevant aspects of the receiving country environment and the immigrant's resources and behaviors in the new country.

At first blush, the immigrant health problem considers health at arrival and examines subsequent health. For example, a popular story in recent years has been that of a healthy person immigrating to the United States and subsequently acquiring some of the bad eating habits associated with American fast food, leading to health decline.

Migration is complicated, however, and we argue that a more faithful approach would incorporate the health effects of the migration process itself, which may begin long before "arrival" and may differ for immigrants facing different migration-relevant environments, such as different visa regimes (Kasl and Berkman 1983; Vega and Amaro 1994; Jasso 2003; Jasso et al. 2004). For example, navigating the visa application process may be quite stressful, illegal immigrants are constantly in fear of discovery and deportation, some legal immigrants have "conditional" visas for two years after admission to legal permanent residence, and immigrants may face prejudice.

Prolonged exposure to stressful circumstances has been shown to have powerful negative effects on a variety of bodily systems (McEwan and Lasley 2002). One important set of effects is cardiovascular. Chronically elevated levels of adrenaline increase blood pressure associated with the human stress response and raise the risk of hypertension. At the same time, elevated fibrogen levels increase the likelihood of blood clots and thrombosis while the build-up of "sticky" white blood cells causes the formation of arterial plaques that contribute to atherosclerosis. Excessive stress also causes the production of excess glycogen and fat, raising the risk of obesity; and the suppression of insulin during periods of stress leads to excessive blood sugar and a greater risk of Type II diabetes (McEwan and Lasley).

Chronic stress also compromises the human immune system, suppressing the human immune response and increasing susceptibility to illness and infection (McEwan and Lasley 2002). Under some circumstances, it may also over-stimulate the immune system, causing it to attack targets within the body that normally do not pose a threat, leading to the expression of inflammatory diseases such as asthma and autoimmune diseases such as multiple sclerosis, arthritis, and Type I diabetes (McEwan and Lasley).

Attentiveness to the migration process suggests that if the migration process is stressful, then the appropriate time for assessing health selectivity is at the time of the *migration decision*—rather than at the time of actual migration—and, further, that assessment of health change subsequent to immigration should take into account heterogeneity in the sources of health change and their timing.

Accordingly, and building on the health and immigration literatures, we formulate a model that distinguishes between the permanent and transitory components of health and that identifies three distinct sources of change in the transitory component of immigrant health: 1) *visa stress*, defined as the set of stresses related to the process of obtaining legal permanent residence; 2) *migration stress*, defined as the set of stresses related to the process of moving from one country to another, net of the visa application process; and 3) *U.S. exposure*, conceptualized as dietary and environmental factors.

Each of the three sources of health effects has a distinctive temporal span and affects distinctive subpopulations. For example, U.S. exposure affects everyone, not only immigrants; migration stress affects all international movers, whether or not they have to go through the visa process, including, to illustrate, persons born in Puerto Rico or American Samoa and persons who, though born in the United States, were raised abroad by their foreign-born parents, possibly since infancy; and visa stress affects only those who must obtain legal permanent residence. With respect to the time dimension, visa stress presumably ends with admission to LPR (or, as will be seen, somewhat earlier for refugees and somewhat later for conditional immigrants); migration stress probably ends at some point after inception of U.S. residence; and U.S. exposure effects do not end, although positive effects may be accentuated and negative effects mitigated by discerning choices and behaviors.

Accordingly, to assess health selectivity, it is important to measure health before the onset of visa stress, migration stress, and U.S. exposure, or to control for their operation in the estimating equations. And assessing health changes requires isolating the separate effects of the three sources of health change.

Overall, the contributions of this paper include: 1) a sharp distinction between health at the time of the migration decision and health at admission—the former being the variable of interest in exploring health selectivity; 2) a distinction between

three sources of health change among immigrants (and concomitantly among others); 3) a description of key health-relevant features of the U.S. immigration system and of NIS data, which will enable substantial new work among immigration and health researchers; 4) an NIS-based description of recent legal immigrants both to the United States in general and to New York City in particular; and 5) a preliminary NIS-based estimation of health selectivity, health change, visa depression, and body-mass index (BMI).

2. Immigration and Health

2.1. A Brief Overview of U.S. Legal Immigration

An immigrant visa is a scarce commodity, as more persons would like to immigrate to the United States than current or foreseeable law permits.[4] In the face of high demand for immigrant visas, the United States allocates visas by means of a system that includes family reunification and employment criteria, as well as humanitarian and diversity considerations. In brief, the system of visa allocation in the period since 1921 may be characterized by three features. First, the United States restricts the number of immigrants (restricting since 1921 the number from the Eastern Hemisphere, and since 1968 the number from the Western Hemisphere as well). Second, immediate relatives of adult U.S. citizens—defined as spouses, minor children, and parents—are exempt from numerical restriction.[5] Third, numerically limited visas are allocated via two sets of preference categories: one for family-sponsored immigrants, the other for employment-based immigrants. Over the years, the United States has altered both the definition of immediate relatives of U.S. citizens (for example, in 1952 by extending to U.S. citizen women the right, already held by men, to sponsor the immigration of an alien spouse outside the numerical limitations) and the system for granting numerically limited visas (for instance, by establishing a structure of preference categories in 1965 but not placing the Western Hemisphere under that structure until 1977, and subsequently revising the preference categories in the Immigration Act of 1990). Under current law, the number of visas available annually in the family preference categories is at least 226,000, but may be larger (though never larger than 480,000) depending on the previous year's volume of numerically unrestricted immigration; in the employment-based categories, the annual number of visas available is at least 140,000, but may be larger if there are unused family preference visas.[6]

Additionally, U.S. immigration law provides legal permanent resident visas on humanitarian and diversity grounds. On humanitarian grounds, persons admitted to the United States with refugee visas or given asylee status (both refugee and asylee visas are nonimmigrant temporary visas) may adjust to legal permanent residence after residing in the United States for one year. There is no ceiling on refugee adjustments to permanent residence, and the number has ranged in recent years from a low of 39,495 in fiscal year 1999 to 118,528 in fiscal year 1996; in contrast, asylee adjustments are constrained to 10,000 per year. On diversity grounds, the United States grants 50,000 visas annually to nationals of countries from which the number of numerically limited immigrants is less than 50,000 in the preceding five years. Eligibility requirements include a high-school degree or equivalent, or two years' work experience (within the preceding five years) in an occupation requiring two years of training or experience; selection is by lottery.[7]

Finally, U.S. immigration law provides for the legalization of certain persons illegally in the United States, through the registry provisions or via cancellation of removal.[8] Of course, illegal persons may also acquire LPR via all the other immigrant visa categories.

Among family-based and employment-based immigrants, a key actor in the migration process is the visa sponsor (also known as the "petitioner")—the individual (or firm, in the case of some employment-based immigrants) who, as relative or employer of the prospective immigrant, establishes the latter's eligibility for an immigrant visa.[9] The visa sponsor initiates the paperwork. For all family-sponsored immigrants and for a subset of employment immigrants, the visa sponsor must also become the main support sponsor, assuming responsibility for the immigrant's support, should the immigrant require assistance, and signing an affidavit of support contract.[10]

Additionally, the prospective immigrant must pass a medical examination to ensure that he or she is not inadmissible on medical grounds. The medical grounds for inadmissibility are grouped into four categories: 1) communicable disease of public health significance (such as tuberculosis or syphilis), 2) lack of required vaccinations (for example, for polio and hepatitis B), 3) physical or mental disorders with harmful behavior, and 4) drug abuse or addiction. Thus, U.S. immigration law plays a part in shaping the immigrant's health status at admission to legal permanent residence.

In most visa categories except those for immediate relatives of U.S. citizens (spouse, parent, minor child), visas are awarded not only to the individual qualifying for an immigrant visa but also to his or her spouse and minor children who are "accompanying, or following to join" the immigrant principal.

2.2. Health Implications of the U.S. Visa Allocation System

Health Selection

The U.S. visa allocation system has several implications for immigrant health at the time of the initial migration decision. A priori, the spouses of U.S. citizens—approximately a third of adult immigrants—would be expected to be healthy; the marital tastes of U.S. citizens, assortative mating mechanisms, and the energies and attributes required for participation in the international marriage market would militate to produce healthy spouses. Employment-based immigrants would also be expected to be in superior health, again in view of their participation in international labor markets. Similarly, the children of U.S. citizens would be expected to be healthy, especially given their youth. On the other side of the ledger, less healthy immigrants may include refugees (who may have suffered many privations) and parents of U.S. citizens (who may be of advanced age).

Health Trajectory—Visa Stress

The visa allocation system also has implications for the health trajectory during the visa application process. While all visa classes require assembling documents—such as birth certificate, marriage certificate, police record, military record—and filling out forms, they differ on the requirements for a sponsor and for an affidavit of support.

Numerically limited and numerically unlimited visas differ in the time required to obtain them. The overall waiting period has two phases. The first phase, applicable only to numerically limited visas, involves waiting for availability of a visa. Visa waiting times vary by both class of admission and country of origin; for example, in April 2005, there was no delay for some employment-based visas, but the delay for family-based visas ranged from four years in the first family category (unmarried sons and daughters of U.S. citizens) for natives of all countries except Mexico and the Philippines to more than twenty-two years in the fourth family category (siblings of U.S. citizens) for persons from the Philippines (see U.S. Department of State [various years]).

The second phase of the waiting period consists of application processing. Of course, for prospective migrants who qualify for a numerically unlimited visa, this phase is coterminous with the entire waiting period. The length of this phase varies with administrative factors, such as the number of personnel assigned to immigrant visa processing and whether changes in immigration law make necessary the design of new forms and/or retraining of personnel.

As would be expected, qualifying for an immigrant visa is an overriding concern for prospective immigrants to the United States, and visa allocation law is a critical component of the environment faced by prospective immigrants. Accordingly, the time waiting for a visa may be a time of accumulating visa stress.

In some situations, all or some of the waiting period is spent in the United States. For example, persons with legal temporary nonimmigrant visas—as foreign students, say, or H-1B specialty workers—may be applying for legal permanent residence under family or employment provisions of the law. Some persons do not qualify for a legal permanent visa under any provision of the law. They may enter the United States with a legal temporary visa and then lapse into illegality. Or they may enter the United States illegally (that is, "without inspection").

For most persons admitted to LPR, visa stress ends on the day of admission. The date of admission to permanent residence is a milestone in an immigrant's life. The new immigrant, who may be arriving from abroad at a U.S. port of entry (a "new arrival") or may be adjusting to permanent residence from a legal temporary visa in the United States (an "adjustment of status"), acquires a set of privileges, including that of sponsoring the immigration of certain kin. The passport is stamped to indicate admission to legal permanent residence, the "green card"—the paper evidence of legal permanent residence—is ordered, and the clock starts on the residency requirement for naturalization.

For some categories of immigrants, visa stress may end earlier or later than admission to LPR. The main category of immigrants for whom visa stress may end prior to admission to LPR is that of refugees, who gain permanent admission when they are admitted with a (nonimmigrant temporary) refugee visa. Arguably, for refugees, the stressful part of the application process ends with arrival in the United States. Refugees may, but need not, adjust to legal permanent residence; they are eligible to do so after one year. Asylees also may, but need not, adjust to legal permanent residence, and they are eligible to do so after one year; however, in contrast to refugees, there is an annual ceiling of 10,000 on their adjustment. We may surmise that the ceiling generates stress, and thus for asylees visa stress would definitely continue until admission to permanent residence.

Meanwhile, for a subset of immigrants, visa stress does not end on the date of admission to LPR. These are the conditional

immigrants—chiefly spouses of U.S. citizens and of LPRs, in marriages of less than two years' duration, and employment-based investor immigrants—whose visas are conditional for two years and who must apply for removal of the conditionality restrictions.

2.3. The Distinction between Visa Stress and Migration Stress

Individuals may be subject to visa stress and not migration stress, or, conversely, to migration stress but not visa stress. This distinction paves the way for future research in identifying the separate effects of these two potential sources of health change.[11]

Migration Stress without Visa Stress

Not all persons who move permanently to the United States from a foreign country require a visa, and thus such persons would be vulnerable to migration stress but not to visa stress. Two important subpopulations may be considered; they may be regarded as "natural" comparison groups in migration research: 1) U.S. citizens who are natives of territories of the United States, such as Puerto Rico, American Samoa, and the Northern Marianas, and 2) U.S. citizens who were born in the United States to foreign-born parents and raised abroad, such as the young children of foreign students. These groups may experience all the migration stress associated with an international move, but none of the visa stress. Future research might undertake a sharp examination of the two distinct kinds of stresses by studying one or more of these groups together with new immigrants. Here we focus on new legal immigrants, most of whom experience both visa stress and migration stress.[12]

Visa Stress without Migration Stress

The opposite may also arise—persons who experience visa stress but not migration stress. Three cases come to mind. The first two pertain to children raised in the United States who might either be born in the United States to diplomat parents and thus not citizens at birth or foreign born and raised in the United States by illegal parents. Such children are often fully "American" in sensibility but must undergo the visa process. The third case pertains to persons who acquire LPR but never take up residence in the United States; this situation, in which U.S. permanent residence operates as insurance, has come to light in the course of NIS fieldwork. The first two cases, involving children, may be more useful for empirical identification of the operation of visa stress and migration stress, given that the situation is exogenous, the choices and decisions made by the parents and not by the children.

3. Theoretical and Empirical Framework

3.1. Modeling Immigrant Health

Health Selection

Consider an adult residing in a foreign country and contemplating a permanent move to the United States. At the time of the migration decision—roughly when the first steps are taken to obtain legal permanent residence in the United States—he or she has a certain level of healthiness. The distribution of healthiness among all prospective immigrants to the United States around the world at this stage of the immigrant career is determined by selectivity forces, including U.S. immigration criteria. Of course, the intensity of self-selection on healthiness may vary; for example, refugees may be less self-selected on health than are employment immigrants. The healthiness distribution may be a composite distribution, consisting of several distinct subdistributions corresponding to distinct migration flows.

We conceptualize overall healthiness H as having two components—a permanent component, denoted h^p, and a transitory one, denoted h^t:

$$H = h^p + h^t. \tag{1}$$

Following the standard model, pioneered by Grossman (1972), health is an important form of human capital, and includes both a persistent time-invariant component and a time-varying component (Strauss and Thomas 1998).

We assume that immigrants make their initial migration decision based on the permanent component of their healthiness. If the transitory component of health does not change between the initial migration decision and the actual migration, then health selectivity can be inferred from observed healthiness at migration. If, however, the transitory

component changes, then observed healthiness at migration would provide a biased estimate of the persistent component, and hence of the selectivity forces. As sketched above and as we will discuss, there is reason to believe that the transitory component changes nonrandomly. Accordingly, understanding health selectivity in migration requires attentiveness to the permanent component and thus, in empirical analysis, attentiveness to observed healthiness at the time of the initial migration decision, rather than at immigration.

The selectivity forces on health differ for different migration streams. In general, the decision to migrate can be thought of as a balance between the gains and costs of migrating—or, as the Romans put it, *ubi bene, ibi patria*: Where one is well-off, there is one's country. To the extent that economic considerations play a part—as they no doubt do for most immigrants who will join the labor force—we can begin with a model of migration in which the individual migrates if the economic gains from migrating exceed the costs (as set forth in Jasso et al. [2004]). Incorporating wages, skill prices, and skill transferability, as well as costs of migrating, yields the implication that the higher the skill prices in a country of origin and the greater the country's distance from the United States, the higher the skill levels of its emigrants to the United States. If skill levels are higher among healthier people, then the gains from migrating will be greater for healthier individuals and migrants will be positively self-selected on health. Thus, *ceteris paribus*, the higher a country of origin's skill prices and the greater its geographic or cultural distance from the United States, the greater the health selectivity of U.S. immigrants from that country.

Labor market considerations may be less important or not important at all for older immigrants and immigrants who do not plan to work, as well as for refugees who are fleeing for their lives. Accordingly, such immigrants may be less positively selected on health. Of course, individuals who become refugees in the United States are the survivors of extreme situations, and thus may possess higher levels of health.

Moreover, migration to the United States may be fueled by the freedoms and other aspects of the American social and political climate, independent of economic considerations, and it is not obvious how health selection would operate. For example, a young person may want to live in a society where parental permission to marry is not required or where a baby may be given any name one chooses or where one can stop going to church without fear. These "freedom gains" would not necessarily be greater for healthier individuals. Thus, immigrants primarily seeking freedom gains would not be positively selected on health.

Health Trajectory—Visa Stress

The initial migration decision is followed by the process of applying for permanent residence. As discussed above, this process can be highly stressful, and the transitory component of health declines in response to visa stress. Similarly, living in the United States illegally is highly stressful, and the transitory component declines.[13]

The decline in the transitory component of health can be characterized by its magnitude, by the length of time during which the decline occurs, and by the shape of the decline (such as its steepness). These aspects of the decline may vary by migration stream. For example, visa stress may be greater for immigrants requiring an affidavit of support (all family immigrants and a subset of employment immigrants) than for other immigrants, and therefore the magnitude of the decline may be greater for these immigrants; visa stress may also be greater for illegals.

Among applicants for legal immigrant visas, permanent residence is eventually obtained. At that point, visa stress ends, and we may conjecture that observed healthiness—more precisely, the transitory component of health—begins an upward trajectory. The incline, like the decline, may be characterized by its magnitude, by the length of the recovery period, and by its shape. And, as with the decline, aspects of the recovery period may also vary by immigrant stream. Except for normal aging, one might imagine that following the recovery period, the immigrant returns to the original level of observed healthiness, so that the magnitude of the decline would equal the magnitude of the incline, unless, of course, the stresses have been so severe or prolonged that the body's physiology is altered (Seeman et al. 1997; Smith 1999).[14]

This model raises several new empirical questions, including: 1) whether the steepness of the decline and the steepness of the recovery are related, 2) whether the duration of the application process affects the duration of the recovery period, and 3) whether, within the application and recovery periods, steepness, total decline/recovery, and duration are related.

Health Trajectory—Migration Stress and U.S. Exposure

Additionally, as we discussed, there are two other effects that must be incorporated into the model. The first is the migration stress associated with adjusting to life in a new country. It includes stress due to different language, different customs,

and so on. As with visa stress, migration stress may end, and its health effect may be characterized by decline and recovery, with attention similarly paid to magnitude, duration, and steepness.

The second, U.S. exposure, involves the possibly deleterious effect of the U.S. environment. It has been conjectured that the combination of a possibly less healthy diet and environmental agents may induce a deterioration of the immigrant's health (Frisbie, Cho, and Hummer 2001; Rumbaut and Weeks 1996). Of course, an opposite conjecture is also plausible, given that: 1) health-relevant conditions are more favorable in the United States than in many origin countries; 2) immigrants experience large gains in earnings, on average, after immigration;[15] and 3) immigrants, whose propensity to invest in themselves is visible in their migration behavior, are likely to invest in their health, taking advantage of their earnings gains and new opportunities in the United States.[16]

Health Trajectory—Disentangling Visa Stress, Migration Stress, and U.S. Exposure

It is illuminating to contrast these three sets of effects on immigrant health, and we do so along two dimensions: first, by noting their spatio-temporal character; second, by highlighting comparison groups.

Visa stress is tightly linked to the visa process. It begins with the first filing, proceeds differentially by visa class, and ends with admission to LPR, or, for conditional immigrants, at removal of the conditionality restrictions.[17] Moreover, visa applicants are subject to visa stress, regardless of where they are located, whether in the origin country or in the United States.

In contrast, migration stress and U.S. exposure have different life spans, independent of the visa process and both beginning with inception of U.S. residence. Moreover, as discussed above, migration stress and U.S. exposure affect different subsets of people. U.S. exposure affects all residents, whether native born or foreign born. Migration stress affects all movers, whether they go through the visa process or, as discussed earlier, are already U.S. citizens (such as persons born in Puerto Rico or the foreign-raised, U.S.-born children of foreign students). Table 1 provides a brief summary of the three sources of health change and the subpopulations at risk.

Two examples illustrate. First, consider Pato Pascual. He came to the United States to study oenology, obtaining a Ph.D. Halfway through his studies, he fell in love with and married a U.S. winemaker, who sponsored his immigration as the spouse of a U.S. citizen. He worries that the immigration authorities will not believe that he is really in a love marriage; he worries about obtaining all the documents that are needed; he worries that the documents will be lost, etc. For him, U.S. exposure and migration stress began when he started school; he shares U.S. exposure with everyone who lives in the area (including his new bride), and he shares migration stress with everyone who comes from another country, including a golden classmate with a U.S. passport but little knowledge of English who was born in Baltimore when her parents were graduate students. Visa stress, however, began when his wife filed the first application for his legal permanent residence.

Meanwhile, Caperucita Roja applied for a diversity visa in her home country of Peru, went through the entire visa process in Peru, and arrived in Chicago with her visa, receiving the stamp on her passport in the "secondary" inspection area at O'Hare. For her, visa stress ended on the day that U.S. exposure and migration stress began.

This discussion suggests that for assessing both migration stress and U.S. exposure effects, the point at which inception of U.S. residence occurs is a critical time. The visible effects, if any, of migration stress and U.S. exposure will differ depending on whether inception of U.S. residence occurs before admission to permanent residence or at admission to permanent residence—that is, before or during the decline associated with visa stress or at its end. If the combined migration-U.S. exposure effect is zero, then both the visa-stress decline and the post-LPR recovery are unaffected. However, when inception of

Table 1

Sources of Health Change, by Subpopulation at Risk

Subpopulation	Visa Stress	Migration Stress	U.S. Exposure
Legal immigrants, potentially in NIS, residing in United States			
Born under diplomatic status (DS1)	Yes	No	Yes
Living in United States since infancy	Yes	No	Yes
All other immigrants residing in United States	Yes	Yes	Yes
Legal immigrants, potentially in NIS, not residing in United States			
Various types	Yes	No	No
Other persons (not immigrants), in NIS, residing in United States			
U.S. citizen sponsors of spouses	No	No	Yes
Newcomers (not immigrants), not in NIS, residing in United States			
Born in U.S. territories	No	Yes	Yes
Born in United States, raised abroad by foreign-born parents	No	Yes	Yes

U.S. residence occurs prior to admission to legal permanent residence, a positive net effect of the combined migration-U.S. exposure would attenuate the visa-stress decline, while a negative net effect would exacerbate it. Moreover, the combined migration-U.S. exposure net effect would also alter the recovery incline, exaggerating it if positive, attenuating or even reversing it if negative.[18]

3.2. Empirical Framework—Data, Measurement, Estimation

Data are drawn from Round 1 of the New Immigrant Survey's first full cohort, a probability sample of new legal immigrants whose administrative records were compiled by the U.S. government during a seven-month period in 2003. The NIS-2003 drew a sample that undersampled immigrants admitted as the spouse of a U.S. citizen (who constitute about a third of adult new legal immigrants) and oversampled employment-visa principals and diversity-visa principals (two categories that are smaller but in which there is much interest). In order to reach sampled individuals as soon as possible after admission to LPR, the sample was drawn in eight replicates (the first and last replicates were half-month replicates, the other six were full-month replicates). Interviews were conducted with the main sampled immigrant (8,573—achieving a response rate of 69 percent), the spouse of the main sampled immigrant (if he or she was living in the household—4,336), and with up to two children aged eight to twelve (1,062). Information was obtained on virtually every sociobehavioral domain, including migration history, schooling, employment, as well as earnings histories, language and religion histories, marital history, health, health behaviors, and health care. Information was also obtained on all children under eighteen residing in the household, and cognitive assessments were carried out on children aged three to twelve.

To ensure sample coverage and data quality, a basic principle of the NIS is that all persons are interviewed in the language of their choice. Accordingly, interviews were conducted in English, Spanish, Chinese, Russian, and eighty-two other languages, plus sign language. The mean and median time elapsed between admission to LPR and interview were seventeen weeks and fourteen weeks, respectively. (For further detail on the NIS project, the NIS-2003 sampling design, language design, and questionnaires, see Jasso et al. [forthcoming].)

Full empirical assessment of the immigrant health model that we have sketched is quite demanding, requiring health measures at several carefully chosen points in time: 1) at or just before the start of the visa application process, 2) at inception of U.S. residence, 3) at admission to legal permanent residence, 4) at several points between the start of the application process and admission to legal permanent residence, and 5) at several points after inception of U.S. residence and after admission to permanent residence.

Further, measuring health is no simple matter. Here we use two types of measures: the subjective assessment of overall health widely used in U.S. data collection and a subjective measure of health change.

The subjective assessment of overall health asks, "In general, would you say your health is: ?" and provides five response categories: excellent, very good, good, fair, and poor. Previous research suggests that subjective assessment of overall health accords well with objective measures (Ware and Donald 1978; Wallace and Herzog 1995). Nonetheless, it is possible that measured healthiness includes a new component—the immigrant's style of reporting, a style that may be understated or overstated. Moreover, the style of reporting may also have both a permanent component and a transitory component.

Thus, overall health, subjectively measured (denoted H^*), may contain four distinct components: the two health components introduced earlier plus two style-of-reporting components—a permanent component of the style of reporting, denoted s^p, and a transitory component of the style of reporting, denoted s^t:

$$H^* = h^p + h^t + s^p + s^t. \tag{2}$$

The NIS-2003 Round 1 data include three subjective assessments of health, pertaining to three points in time: 1) during childhood ("when you were growing up, from birth to age 16"), 2) at the time of the migration decision ("at the time of that first filing that started the process for the immigrant visa that you now have"), and 3) at the time of the interview.

All the measures capture the same permanent health component and permanent style component. They differ, however, in the transitory health component and the transitory style component.

With respect to the transitory health component, the question on healthiness at the time that the first application was filed taps healthiness prior to the start of visa stress; the childhood question does so as well, provided that the sample is restricted to respondents for whom the first filing occurred after they were age sixteen. In contrast, the question on current healthiness taps overall healthiness at a point subsequent to admission to permanent residence. The precise difference between the transitory health components in the at-filing and the current assessment depends on: 1) whether inception of

U.S. residence has occurred prior to the first immigration application filing, in which case the U.S. exposure effects and migration stress have started, and 2) whether the immigrant visa is conditional, in which case visa stress has not ended by the time of the interview.

With respect to the transitory style component, it is tempting to assume that because the measures are obtained at the same time, they contain the same transitory style component. However, one pertains to the present and the other two to the past. The measure of current healthiness is subject to underestimation, to avoid displaying hubris or jinxing one's health. The measures of past healthiness are probably more free of style distortions, although they may be subject to overestimation, if the past is remembered fondly.

Health Selection Equation

To estimate the health selection equation, we use two subjective measures of overall healthiness: during childhood and at the time of the first filing. These measures approximate a pure measure of the permanent component of health at the time of the initial self-selection. They are imperfect, however, because inception of U.S. residence may already have occurred, and thus migration stress and the effects of U.S. exposure may already have begun. To correct for this effect, we use information on whether the new immigrant is adjusting to LPR while already residing in the United States. Moreover, to distinguish between effects of legal and illegal prior residence, we define two binary adjustment variables, one for adjusting from a legal status and the other for adjusting from an illegal status.

To control for the transitory style component, we exploit the language feature of the NIS, including a control for whether the interview was conducted in English (Jasso 2003). To ensure that interview language does not operate as a proxy for English language skill, which could be associated with investments in health, we also include in the specification the interviewer's assessment of the respondent's fluency in English.

In one version of the health selection equation, we include binary variables for continent of birth and for the top-ten origin countries; in the second version, we include skill prices and distance from the United States, interacted with visa category, plus origin-country GDP per adult equivalent.[19, 20]

Note that as NIS survey rounds accumulate, it will be possible to use individual-specific fixed-effects estimation to obtain sharper estimates of the permanent component of health and thus of the health selection equation.

Health Change Equation

To assess the effects of visa stress, migration stress, and exposure to the U.S. environment, we make use of a question tapping health change between inception of U.S. residence and the baseline-round interview. For immigrants whose U.S. residence started at admission to LPR, visa stress ended at admission to LPR for all sample members except those with conditional visas, and thus the health change reflects migration stress and U.S. exposure, plus the recovery from visa stress. For immigrants whose U.S. residence started at some point prior to admission to LPR (which could have been before or after the first visa filing), the health change also reflects visa stress. Accordingly, the specifications include the adjustment variables and a dummy variable for a conditional visa. We expect adjustees to have greater incidence of health deterioration and lower incidence of health improvement, due in part to the visa stress experienced by adjustees and in part to the greater duration of the period of migration stress and U.S. exposure. The specifications also include the time elapsed between admission to LPR and the baseline interview; this variable targets the joint effects of migration stress and U.S. exposure after the end of visa stress (or net of visa stress, for immigrants with conditional visas).

4. Basic Characteristics of the NIS-2003 Cohort

4.1. General Characteristics

We begin by presenting an overview of the basic characteristics of the NIS-2003 immigrants—sex ratio and sex-specific average age and schooling and the proportions adjustee and fluent in English (Table 2). The table also reports the proportions in each of the thirteen major visa categories, plus a residual category, as well as basic characteristics for each of the visa categories. There is great heterogeneity across migration streams. For example, average schooling is highest among employment principals and diversity principals, and, by mechanisms of assortative mating, among their spouses, and lowest among parents of U.S. citizens, legalization immigrants, and spouses of LPRs. Age, of course, differs, as would be expected when some categories are reserved for parents and others for offspring under age twenty-one. Overall English fluency is high, almost 49.4 percent among men and 43.5 percent among women—with higher proportions among

Table 2

Basic Characteristics of New Legal Immigrants Aged Eighteen and Older: NIS-2003 Cohort

Visa Category	Percentage Female	Age		Schooling		Percentage Adjustees		English Fluency	
		Men	Women	Men	Women	Men	Women	Men	Women
Spouse of U.S. citizen (34.1%)	62.9	32.9	32.6	12.6	13.1	81.6	72.5	56.2	54.0
Spouse of legal permanent resident (2.44%)	82.4	43.8	40.1	8.48	7.79	51.0	63.4	24.8	19.3
Parent of U.S. citizen (11.9%)	66.1	65.5	62.7	8.75	6.93	25.5	33.5	26.6	24.4
Minor child of U.S. citizen (3.38%)	41.9	20.2	20.2	11.5	11.9	46.1	41.4	58.2	50.8
Sibling of U.S. citizen (3.94%)	51.4	48.5	48.2	11.8	11.1	8.97	12.9	41.9	25.7
Spouse of sibling (2.49%)	53.4	50.3	46.3	13.0	10.9	4.03	3.94	37.7	17.8
Employment principal (6.02%)	32.6	37.2	36.8	15.7	15.2	78.8	55.2	81.0	81.7
Employment spouse (3.63%)	77.3	40.2	35.3	14.6	15.3	57.1	76.2	72.3	79.3
Diversity principal (5.53%)	41.2	32.3	32.8	14.5	14.5	8.47	11.4	55.3	47.4
Diversity spouse (2.58%)	49.2	37.7	34.5	14.6	13.1	5.21	3.52	41.4	42.8
Refugee/asylee/parolee principal (5.35%)	41.7	40.8	38.2	12.8	11.8	100	100	46.2	41.1
Refugee/asylee/parolee spouse (1.22%)	76.0	44.5	43.2	13.3	11.0	100	100	32.9	37.4
Legalization (7.98%)	49.6	38.7	38.0	9.04	8.42	100	100	26.7	17.2
Other (9.36%)	51.8	35.9	36.2	12.1	11.8	24.2	23.0	44.5	36.8
All immigrants	56.4	38.7	39.1	12.3	11.6	57.9	57.0	49.4	43.5

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: The sample size is 8,573. Estimates are based on weighted data. The measure of English fluency requires that either the interview be conducted entirely in English or that the interviewer give the respondent's English the highest rating ("very good"). Among the subset coded fluent in English, 89.5 percent completed the interview entirely in English.

Table 3

Basic Characteristics of New Legal Immigrants in New York City Aged Eighteen and Older: NIS-2003 Cohort

Visa Category	Percentage Female	Age		Schooling		Percentage Adjustees		English Fluency	
		Men	Women	Men	Women	Men	Women	Men	Women
Spouse of U.S. citizen (23.8%)	56.0	35.7	34.3	12.1	12.3	70.8	44.6	63.5	62.1
Spouse of legal permanent resident (1.17%)	—	—	—	—	—	—	—	—	—
Parent of U.S. citizen (12.4%)	63.1	64.1	61.9	9.29	5.16	6.04	9.03	20.5	33.2
Minor child of U.S. citizen (5.95%)	32.0	19.5	19.5	11.7	11.7	17.4	21.7	55.5	38.2
Sibling of U.S. citizen (3.79%)	39.1	49.3	49.9	11.2	9.06	0	6.95	62.1	24.1
Spouse of sibling (2.84%)	48.8	52.0	49.4	12.2	8.53	0	0	88.0	9.34
Employment principal (3.94%)	41.3	39.2	40.0	14.8	14.2	84.6	74.3	63.7	83.6
Employment spouse (2.62%)	—	—	—	—	—	—	—	—	—
Diversity principal (9.62%)	42.9	32.4	33.0	14.7	15.0	7.77	7.81	60.5	45.8
Diversity spouse (5.15%)	56.4	38.2	36.8	14.6	13.6	5.93	4.07	24.5	42.9
Refugee/asylee/parolee principal (7.09%)	27.1	42.9	47.0	13.6	13.4	100	100	57.1	61.8
Refugee/asylee/parolee spouse (2.04%)	—	—	—	—	—	100	100	—	—
Legalization (1.38%)	—	—	—	—	—	100	100	—	—
Other (18.2%)	42.3	36.5	36.8	12.0	12.0	9.21	7.48	51.7	48.3
All immigrants	48.8	39.3	40.9	12.3	11.2	36.9	30.1	53.7	46.2

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: The sample size is 866. Estimates are based on weighted data. The measure of English fluency requires that either the interview be conducted entirely in English or that the interviewer give the respondent's English the highest rating ("very good"). Among the subset coded fluent in English, 95.5 percent completed the interview entirely in English. The sample sizes for spouse of legal permanent resident, employment spouse, refugee spouse, and legalization immigrants are too small to report summary characteristics.

employment principals and the spouses and children of U.S. citizens.[21]

Approximately 9.27 percent of the new immigrants declared New York City to be their initial residence.[22] Table 3 summarizes the basic characteristics for this subset. The New York City–bound immigrants differ in several important ways from the larger set. First, the proportion female is lower by almost 8 percentage points (48.8 percent versus 56.4 percent). Second, and consistent with the sex ratio, the proportion achieving LPR via marriage to a U.S. citizen is substantially lower—24 percent versus 34 percent. The New York City group has a smaller proportion who are employment principals (4 percent versus 6 percent) and a larger proportion who are diversity principals (9.6 percent versus 5.5 percent), and among employment principals, a substantially larger proportion who are female (41 percent versus 33 percent). Third, the proportion adjusting status is markedly lower in the New York City subset (by 20 percentage points among men and 27 percentage points among women), reflecting in part the smaller proportion of marriages to U.S. citizens but also fewer adjustments even among these couples. Fourth, New York immigrants display somewhat greater English fluency (53.7 percent versus 49.4 percent among men and 46.2 percent versus 43.5 percent among women).

The patterns in Tables 2 and 3 suggest differences in the origin countries of immigrants who settle initially in New York City and their counterparts who settle elsewhere in the country. Table 4 displays the top five origin countries for the entire set of immigrants as well as for the New York City and non-New York City subsets. As shown in the middle and lower panels, the two areas share only one country in the top five—China, which is the second-leading origin country in New York City and fifth among the non-New York City immigrants. Besides the largely nonoverlapping sets of top-five countries, the other important difference concerns the somewhat greater evenness among the New York City top five, in contrast to the non-New York City countries, which are dominated by Mexico.

As we observed, a basic principle of the NIS design is that every respondent is interviewed in his or her preferred language. Consistent with the greater English fluency among the New York City subset, 47.9 percent of the New York immigrants preferred English, compared with 40.6 percent in the rest of the country. English preference among New York City immigrants was led by immigrants from Guyana and Jamaica, virtually all of whom preferred English. In contrast, among non-New York City immigrants, English preference was led by immigrants from India and the Philippines, but the proportions from those two countries preferring English did not exceed 73 percent.

The NIS included the two questions on race and ethnicity that are standard in U.S. surveys. Among the New York City immigrants, the largest racial/ethnic group consisted of non-Hispanic Asians, of whom there are 27 percent, followed closely by non-Hispanic whites (25 percent), non-Hispanic blacks (17 percent), Hispanic whites (16 percent), Hispanics who did not provide race (5 percent), and non-Hispanics who also did not provide race (4 percent). In contrast, among the non-New York City immigrants, the largest group was Hispanic whites (30 percent), followed closely by non-Hispanic Asians (28 percent), non-Hispanic whites (19 percent), non-Hispanics who did not provide race (14 percent), non-Hispanic blacks (10 percent), and Hispanics who did not provide race (6 percent). The different origin-country distributions help explain these patterns. For example, the different proportions of Hispanic whites (16 percent in the New York City subset versus 30 percent in the non-New York City subset) can be

Table 4

Top Five Countries of Origin among New Legal Immigrants Aged Eighteen and Older, by Sex and Initial Residence

	Men	Women	All
All immigrants			
Mexico	16.2	18.7	17.6
India	7.19	7.36	7.28
El Salvador	6.82	6.49	6.13
China	5.14	5.61	5.49
Philippines	4.19	5.60	5.40
Top five	39.5	43.8	41.9
Immigrants with initial residence in New York City (n = 866)			
Dominican Republic	11.9	14.3	13.1
China	11.3	10.8	11.0
Guyana	7.84	5.45	6.28
Jamaica	6.5	4.63	5.05
Ecuador	4.67	4.55	4.27
Top five	42.2	39.7	39.7
Immigrants with initial residence not in New York City (n = 7,707)			
Mexico	18.0	20.2	19.3
India	7.67	7.66	7.66
El Salvador	7.55	6.95	6.67
Philippines	4.54	6.01	5.92
China	4.34	5.16	4.83
Top five	42.1	46.0	44.4

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: The sample size is 8,573. Estimates are based on weighted data.

attributed in part to different rates of declaring this combination (Hispanic white) among the top origin countries—51 percent among the New York City group from the Dominican Republic and 72 percent in the larger non-New York City group from Mexico.

Recall the higher proportion who are diversity principals in the New York City group (9.6 percent versus 5.5 percent). An important feature of recent immigration is that the diversity visa program has, as intended, generated new streams of immigrants from countries that have been underrepresented. Thus, almost half of diversity principals are from Africa—44 percent in the NIS-2003 cohort. And the fraction of Africa-born diversity principals who reside in New York City is larger than the corresponding fraction of other immigrants (12 percent versus 9 percent).

New York City has a large concentration of foreign-born persons—currently estimated at 36 percent of the population. Accordingly, the pool of marriageable persons is likely to be substantially foreign born, generating a higher-than-average proportion of foreign born among the U.S. citizen sponsors of spouses. As expected, while overall 47 percent of the U.S. citizen sponsors of spouses are native born, in the New York City immigrant subset, the corresponding figure is less than half—22 percent.

Finally, we examine home ownership among immigrants in the NIS-2003 cohort. New York City differs from the rest of the country in the proportion who own their home, and, indeed, in the ethos surrounding home ownership. Overall, more than 26 percent of the new immigrants already own their home—as well as 37 percent of adjustee immigrants, who have had more time in the United State. Not surprisingly, however, the corresponding figures for the New York City subset are 7 percent and 13 percent—or roughly 28 to 35 percent of the nationwide figures.

4.2. Health Characteristics

Health Self-Assessment

Table 5 reports the immigrants' assessments of their health at the time of the initial filing, which started the process by which they became legal permanent residents, reported at the baseline interview. As shown, overall the new immigrants thought of themselves as quite healthy at the time of the initial self-selection—almost three-fourths judged themselves to be in excellent or very good health and only slightly more than 4 percent in fair or poor health. In general, male immigrants judged themselves to be healthier than did female immigrants—although the largest difference is in the "excellent" category, which may reflect mechanisms other than actual health (such as male brashness or female wish to avoid hubris). There is a pronounced difference between those with very little schooling and those with a very high amount of schooling (53 percent of those with more than sixteen years of schooling pronouncing themselves to be in excellent health versus 27 percent among those with less than nine years of schooling).

Comparable figures (not shown) for the New York City contingent of immigrants indicate that at each of the three time points, New York immigrants are substantially healthier than other immigrants. For example, in the assessment of health at the time of first filing, 59 percent of the New York City immigrants judged their health to be excellent versus 41 percent of the non-New York City immigrants.

Health Change

In Table 6, we present the immigrants' reported health change between the last time they came to live in the United States and the time of the baseline interview, by visa category and separately for new arrivals and adjustees. As discussed earlier, for "true" new arrivals, visa stress will have ended at arrival (except for conditional immigrants) and all effects will be due to migration stress and U.S. exposure. For adjustees, the period since last arrival will also include a period of visa stress followed by the post-LPR recovery phase. Moreover, the length of the interval is substantially greater for adjustees than for new arrivals (less than four months for new arrivals and more than five years for adjustees, on average). As shown in the table, the results indicate that while similar proportions report improved health (20 percent of new-arrival immigrants and 22 percent of adjustee immigrants), a much larger proportion of adjustee immigrants report deteriorating health (14 percent versus 4 percent). This health decline could be due to the greater likelihood that for adjustees, arrival occurred before the start of the decline associated with visa stress or it could be due to the longer interval during which migration stress and the effects of U.S. exposure are experienced.

Immigrants who settle in New York City have a smaller proportion with deteriorating health than immigrants who settle elsewhere—7.1 percent versus 10.2 percent—a difference almost completely offset by the larger fraction of New York City immigrants whose health remained the same.

Table 5

Health Status at Time of First Filing for Immigrant Visa, Self-Reported at Baseline Round: NIS-2003 Immigrants Aged Eighteen and Older

Characteristic or Population	Health Status					
	Five-Category Variable (Percent)					
	Excellent	Very Good	Good	Fair	Poor	Index (Mean)
Selected basic characteristics						
All immigrants	42.6	30.9	22.5	3.53	0.52	3.11
Male immigrants	47.4	29.8	19.5	3.07	0.25	3.21
Female immigrants	38.8	31.8	24.8	3.88	0.74	3.04
Schooling less than nine years	26.7	28.2	36.9	7.37	0.83	2.73
Schooling more than sixteen years	52.9	32.5	12.7	1.93	0.04	3.36
Visa category						
Spouse of U.S. citizen	45.4	31.1	20.8	2.09	0.58	3.19
Spouse of legal permanent resident	28.1	37.7	31.2	3.00	0	2.91
Parent of U.S. citizen	21.4	29.3	37.1	11.0	1.18	2.59
Child of U.S. citizen	54.8	31.4	10.7	2.63	0.36	3.38
Sibling of U.S. citizen	37.8	35.7	23.3	3.21	0	3.08
Spouse of sibling	38.2	37.9	22.6	1.33	0	3.13
Employment principal	52.8	32.4	13.7	0.96	0.17	3.37
Employment spouse	43.2	38.1	15.2	3.49	0	3.21
Diversity principal	56.8	30.3	12.3	0.24	0.35	3.43
Diversity spouse	50.4	30.7	18.2	0.75	0	3.31
Refugee/asylee principal	44.3	28.7	20.6	4.93	1.40	3.10
Refugee/asylee spouse	37.0	24.4	30.3	5.28	3.04	2.87
Legalization	37.2	24.1	33.0	5.44	0.29	2.92
Other	48.4	31.0	18.4	2.16	0.09	3.25
Continent of birth						
Africa	59.0	24.9	12.6	2.97	0.62	3.86
Asia	39.2	35.5	21.9	2.99	0.35	3.10
Europe	44.7	33.3	18.6	2.50	0.82	3.19
Oceania	62.2	26.9	7.26	0	3.71	3.44
North America	39.8	27.9	27.1	4.75	0.56	3.02
South America	48.6	28.7	20.1	2.34	0.23	3.23
Top five countries of birth						
Mexico	33.2	28.3	32.5	5.32	0.81	2.88
India	47.7	29.8	19.7	2.64	0.17	3.22
El Salvador	39.1	24.7	30.7	5.47	0	2.98
Philippines	42.7	39.0	17.1	1.13	0.09	3.23
China	31.4	42.2	19.5	6.90	0	2.98
Adjustment of status						
New arrivals	43.1	31.5	21.4	3.78	0.28	3.13
Adjustees	42.2	30.5	23.3	3.34	0.71	3.10

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: The health status variable is coded 0-4, with poor coded 0. Estimates are based on weighted data.

Table 6

Health Change between Most Recent Arrival "to Live" and First Interview after Admission to Legal Permanent Residence: NIS-2003 Immigrants

Visa Category	Time since Arrival (Years)	Health Change		
		Worse	Same	Better
New-arrival immigrants				
Spouse of U.S. citizen	.325	5.72	75.3	19.0
Spouse of legal permanent resident	.289	3.05	88.0	8.91
Parent of U.S. citizen	.312	5.91	68.4	25.7
Minor child of U.S. citizen	.279	2.12	72.5	25.4
Sibling of U.S. citizen	.313	3.39	82.8	13.8
Spouse of sibling	.305	3.47	79.7	16.9
Employment principal	.323	5.40	79.1	15.5
Employment spouse	.045	3.74	74.3	22.0
Diversity principal	.316	2.86	79.7	17.5
Diversity spouse	.351	2.79	79.5	17.7
Other	.291	2.18	77.2	20.7
All new-arrival immigrants	.305	4.05	76.2	19.7
Adjustee immigrants				
Spouse of U.S. citizen	5.20	13.2	67.3	19.5
Spouse of legal permanent resident	6.34	11.7	63.5	24.7
Parent of U.S. citizen	6.41	15.9	64.3	19.7
Minor child of U.S. citizen	7.24	12.4	59.8	27.9
Sibling of U.S. citizen	8.16	16.7	60.0	23.5
Spouse of sibling	—	—	—	—
Employment principal	2.61	13.2	67.7	19.1
Employment spouse	2.19	11.7	74.5	13.9
Diversity principal	3.67	5.72	69.1	25.2
Diversity spouse	—	—	—	—
Refugee/asylee/parolee principal	6.89	16.3	57.5	26.2
Refugee/asylee/parolee spouse	6.18	24.1	51.7	24.2
Legalization	11.1	17.2	50.7	32.0
Other	9.64	6.55	68.9	24.6
All adjustee immigrants	5.25	14.0	63.6	22.3

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: Estimates are based on weighted data. Missing estimates pertain to subsets with fewer than twenty observations.

5. Multivariate Results

5.1. Health Selection

Ordered-logit estimates of the health selection equation are reported in Table 7, with three specifications (sex-specific and pooled) for the two health measures: health at first filing and health during childhood. The objective is to estimate the selectivities associated with the permanent component of health. Health at first filing is a good approximation of the permanent component of health among new-arrival immigrants but it is not as good for adjustees, whose U.S. residence may have antedated the first filing so that they may have already been experiencing migration stress and the effects of U.S. exposure. Additionally, both new-arrival and adjustee immigrants may have suffered harm in the origin country prior to the first filing. We address these possibilities by including control variables, such as the adjustee variables, and by estimating the health selection equation with health during childhood as the dependent variable. Health during childhood, for example, is likely to be free of the harm effects and free as well of migration stress and U.S. exposure—unless U.S. residence started before age sixteen.

We first assess the controls for sources of change in the transitory component of health. The controls we inserted for adjustees, as well as the control for having suffered harm, operate as predicted and most of the estimates are statistically significant. For example, the two adjustee variables are jointly highly statistically significant and both are negative, indicating that the observed health of adjustees is indeed lower than that of new arrivals, consistent with a negative net effect of the combined migration stress and U.S. exposure. The negative effect of adjusting from an illegal status is substantially larger than that of adjusting from a legal status, consistent with the operation of visa stress. Similarly, the effect of having suffered harm in the origin country is negative and statistically significant in the pooled and male specifications of the first-filing equation and not significant and of mixed sign in the childhood equation, indicating that men were more vulnerable to such harm and that on average it occurred after childhood.[23]

With respect to the control for style of reporting, the effect of being interviewed in English was statistically significant in all specifications except the male childhood one and positive, net of skill in English, consistent with the hypothesized association between English and a style of reporting that does not refrain from declaring high healthiness.

Turning now to our main focus, the health selectivities, we note that the estimates indicate that men are more highly positively selected on health than are women and that racial/ethnic characteristics and area of origin are importantly linked to health selection. The coefficients on the racial/ethnic categories indicate that Hispanic whites are the most positively selected for health, followed by non-Hispanic black men; the least selected for health are Hispanics who decline to declare a race.

The visa category variables are jointly significant in the women's at-filing equation and in both the men's and women's

childhood health equations. Comparison of the coefficients in the at-filing and childhood equations reveals interesting patterns. Among men, legalization immigrants are among the most robust in childhood, but by the time of the first filing they are less healthy; in contrast, refugee principals are less robust in childhood but by the time of the first filing they are healthier than many of their fellow immigrants. Among women, diversity principals are the most positively selected for health, followed by employment principals.

The joint tests for the continent and country dummies indicate high statistical significance in all cases except one—the continent dummies in the male first-filing equation. The coefficients (not shown) indicate that immigrants from North America (which includes Canada, Mexico, and Central

TABLE 7

Selected Estimates, Ordered-Logit Health Selection Equation: NIS-2003 Immigrants Aged Eighteen and Older at Time of First Filing for Legal Permanent Residence

	Specification					
	Health at First Filing			Health during Childhood		
Variable	All	Men	Women	All	Men	Women
Sex	-.260	—	—	-.109	—	—
	(7.08)			(2.73)		
Age at first filing	0.0266	.0123	.0340	.0326	.00697	.0496
Age squared	-.000597	-.000426	-.000680	-.000329	-.000045	-.000502
Age joint test chi^2 (2 df)	133.01	35.8	93.3	11.6	.49	15.5
Suffered harm in origin country	-.287	-.372	-.188	-.0479	-.0985	.0111
	(2.40)	(2.61)	(1.23)	(.52)	(.82)	(.08)
Hispanic, no race	-.469	-.270	-.631	-.567	-.514	-.621
Hispanic, white	.199	.0884	.302	.0228	.00298	.0399
Not Hispanic, Asian	-.230	-.228	-.219	-.144	-.177	-.0972
Not Hispanic, black	-.0893	.0747	-.318	.144	.160	.100
Not Hispanic, white	-.0330	-.0217	-.0142	.325	.382	.247
Race/ethnicity joint test chi^2 (5 df)	24.6	9.76	36.2	41.3	37.0	14.9
Spouse of U.S. citizen	.0855	.147	.0673	.101	.104	.107
Parent of U.S. citizen	-.161	-.375	-.0663	-.120	-.255	-.110
Child of U.S. citizen	.145	.366	-.251	-.227	-.475	.0744
Employment principal	.107	-.00945	.272	.0707	-.0650	.166
Diversity principal	.314	.219	.405	.229	.0889	.380
Refugee/asylee principal	-.0158	.136	-.250	.0360	-.0139	.00360
Legalization	-.0943	.0528	-.235	.109	.445	-.218
Visa category joint test chi^2 (7 df)	11.9	12.3	27.4	11.7	23.6	18.2
Adjustee, not illegal	-.107	-.142	-.0843	-.0616	.0718	-.155
Adjustee, illegal	-.440	-.467	-.408	-.389	-.493	-.295
Adjustee joint test chi^2 (2 df)	27.1	11.4	18.1	20.8	26.6	12.8
Interview in English	.211	.212	.216	.171	.173	.193
	(2.78)	(1.94)	(2.59)	(2.00)	(1.51)	(2.22)
English "very good"	.385	.479	.295	.222	.277	.153
	(5.18)	(4.27)	(3.72)	(3.15)	(2.91)	(1.82)
Continent dummies joint test chi^2 (5 df)	27.3	6.57	20.9	37.4	18.1	25.3
Country dummies joint test chi^2 (10 df)	892.1	892.7	563.3	470.0	685.1	534.7
Number of observations	7,517	3,687	3,830	7,246	3,569	3,677
Log pseudolikelihood	-8332.30	-3904.21	-4408.25	-7891.35	-3804.76	-4066.73

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: The dependent variables are coded 0-4, with poor coded 0 and excellent coded 4. Standard errors are corrected for heteroskedasticity due to clustering by origin country; absolute values of asymptotic *t*-ratio appear in parentheses under parameter estimates for numeric and binary variables. Joint tests are reported for multiple-category categorical variables. Cut-points are not shown.

America and the Caribbean) and Africa are the most highly positively selected for health, while immigrants from Europe (the omitted category), Asia, and Oceania are the least positively selected for health. Of course, for any individual immigrant, these effects have to be combined with the country effects. For example, the coefficients for India and Mexico indicate the highest and lowest selectivities, respectively, so that combining the country and continent effects alters the picture somewhat.

The area-of-origin effects point to mechanisms involving country characteristics. Table 8 presents ordered-logit estimates of the health selection equation based on an economic model in which selection responds to skill prices and the origin country's distance from the United States. Control variables—the adjustee variables, for example, and the English-language variables—operate as they do in the previous equations. However, the new results indicate important selectivity by origin-country skill prices. The joint test of skill prices and skill prices interacted with visa category indicates that these effects are highly statistically significant in all three at-filing specifications and in the women's childhood health specification. In contrast, distance and its interactions with visa

Table 8

Selected Estimates, Ordered-Logit Health Selection Equation, with Skill Prices and Distance: NIS-2003 Immigrants Aged Eighteen and Older at Time of First Filing for Legal Permanent Residence

	Specification					
	Health at First Filing			Health during Childhood		
Variable	All	Men	Women	All	Men	Women
Sex	-.251	—	—	-.0961	—	—
	(6.05)			(2.16)		
Age at first filing	0.302	.0115	.0438	.0386	.00645	.0650
Age squared	-.000618	-.000425	-.000741	-.000400	-.000057	-.000662
Age joint test chi^2 (2 df)	97.9	30.4	64.8	12.2	.22	25.3
Suffered harm in origin country	-.234	-.426	.0854	-.0828	-.229	.164
	(1.67)	(2.64)	(.48)	(.68)	(1.49)	(.82)
Race/ethnicity joint test chi^2 (5 df)	34.4	18.2	30.5	48.8	32.3	25.3
Spouse of U.S. citizen	-.697	-.121	-.394	.286	.297	.343
Parent of U.S. citizen	-.556	-.899	-.382	-.222	-.363	-.273
Child of U.S. citizen	-.454	.0550	-2.24	-.259	.0128	-2.24
Employment principal	.100	-.0400	.219	.283	.289	.242
Diversity principal	-.0800	-.338	.110	-.222	-.0481	-.602
Refugee/asylee principal	-.584	-.237	-1.21	-.477	-.471	-.419
Legalization	1.80	1.76	3.10	.483	.678	.742
Visa category joint test chi^2 (7 df)	38.9	24.7	13.5	17.1	17.3	13.7
Adjustee, not illegal	-.140	-.165	-.137	-.113	.0402	-.208
Adjustee, illegal	-.621	-.673	-.573	-.548	-.644	-.460
Adjustee joint test chi^2 (2 df)	47.4	16.4	36.2	31.5	29.1	17.5
Interview in English	.263	.245	.284	.252	.313	.209
	(3.37)	(2.19)	(3.12)	(2.96)	(2.55)	(2.53)
English "very good"	.376	.448	.307	.198	.269	.112
	(4.72)	(3.50)	(3.82)	(2.66)	(2.52)	(1.39)
Skill price interacted with visa joint test chi^2 (8 df)	28.3	35.4	29.3	5.33	7.74	21.4
Distance interacted with visa joint test chi^2 (8 df)	13.6	7.57	15.8	8.41	21.2	10.5
Real GDP per adult equivalent	8.34e-08	-1.75e-06	8.98e-07	2.06e-06	-1.30e-06	6.88e-06
	(.01)	(.23)	(.10)	(.29)	(.14)	(.93)
Number of observations	6,449	3,196	3,253	6,207	3,091	3,116
Log pseudolikelihood	-7151.94	-3368.99	-3758.69	-6777.83	-3302.51	-3446.55

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: The dependent variables are coded 0-4, with poor coded 0 and excellent coded 4. Standard errors are corrected for heteroskedasticity due to clustering by origin country; absolute values of asymptotic *t*-ratio appear in parentheses under parameter estimates for numeric and binary variables. Joint tests are reported for multiple-category categorical variables. Cut-points are not shown.

category produce mixed results, achieving statistical significance only among women in the at-filing equation and among men in the childhood equation. It is possible that distance is becoming less important as globalization takes root.

Finally, we re-estimated all the specifications in Tables 7 and 8 and include a binary variable for initial residence in New York City. The estimates are uniformly highly statistically significant and positive, indicating that at the initial selection, those immigrants who claim New York City as their first home after admission to LPR are more highly positively selected on health than are their fellow immigrants who settle elsewhere.

5.2. Visa Depression

In the health model sketched above, an important factor is the visa application process itself and the associated visa stress that may negatively affect health. We turn now to immigrants' subjective experience of visa stress. A question in the NIS-2003 Round 1 interview asks, "During the past 12 months, have you ever felt sad, blue, or depressed because of the process of becoming a permanent resident alien?" For convenience, we use "visa depression" as shorthand for feeling "sad, blue, or depressed. . . ." All respondents except for thirty-three achieved LPR during the twelve months before the interview (the mean time elapsed between LPR and interview was seventeen weeks; the median time elapsed was fourteen weeks). Overall, 15.9 percent of the men and 18.5 percent of the women reported becoming depressed because of the visa process. There is substantial variation in the experience of visa depression across visa category and origin country/region. Furthermore, notwithstanding the greater overall depression among women, the gender pattern itself varies, with men reporting higher depression rates among employment and refugee spouses. Visa depression is larger for adjustees than for new arrivals (by 2.0 percentage points among women and 4.5 percentage points among men). A question for future research concerns the possibility that visa depression may be reduced if visa stress is not experienced jointly with migration stress.[24]

The figures for the New York City immigrants indicate that the incidence of visa depression is lower among them and substantially so for men (10.7 percent versus 15.9 percent). Relatedly, the gender differential is substantially larger in New York City than it is in the larger cohort. Rates of visa depression are high among the city's largest immigrant contingent: those born in the Dominican Republic—the rates are more than twice those of all New York City immigrants, among both women and men (21 percent among men and 39 percent among women). At the other extreme, not a single case of visa depression was reported among China-born immigrant men in the New York City subset. Like the immigrants in the larger cohort, New York City adjustees have higher depression rates than do new arrivals; this is substantially so among women (20.5 percent versus 15.8 percent).

To explore visa depression in a multivariate context, we estimate a binary logit specification that includes age, race/ethnic background, visa category, years of schooling, the two adjustee variables, and binary variables for continent and selected country of origin, both for the sample as a whole and separately for men and women. The specification also includes a binary variable for having suffered harm in the origin country. Table 9 reports the results. As one would expect from the raw figures, women are significantly more likely to report visa depression. Moreover, the visa depression process differs importantly by gender, with apparently gender-specific risk and protective factors.

Having suffered harm in the origin country is a strong predictor of visa depression among men, but it does not reach statistical significance among women, although it remains positive. The visa category variables are jointly significant for men but not for women. It is no surprise that among men, legalization principals are more likely to report visa depression or that having a spouse or parent who is a U.S. citizen confers some protection against visa depression. What is surprising is that among women, having a spouse or parent who is a U.S. citizen appears not to provide substantial protection against visa depression. Moreover, among men, visa stress may be more manageable in the origin country than in the United States. The two adjustee variables are highly statistically significant among men, positive, and of approximately the same magnitude, suggesting that the lack of protection against depression while being in the United States prior to becoming a legal permanent resident is independent of legal or illegal status. Among women, however, the two adjustee variables are far from statistically significant, negative, and of magnitudes close to zero. Thus, the data hint that the origin-country environment protects men from visa stress but does not influence, in either direction, women's higher propensity for visa depression.[25]

The racial/ethnic variables are jointly significant in the women's equation but not in the men's. Of the groups identified, and net of origin area, non-Hispanic whites have the strongest likelihood of reporting visa depression.

Schooling does not protect against visa depression, on net, though the nonsignificant and small coefficients could be masking the opposite operation of two mechanisms—one

positive, the other negative. For example, high schooling might indeed make it easier to handle the vicissitudes of the visa process, while at the same time exacerbating the costs of waiting for LPR.

Finally, we re-estimated the equations with a binary variable for New York City. Immigrants who settle there are less likely to report having experienced visa depression than their counterparts who settle elsewhere in the country. This effect is highly statistically significant among men (β = -.559, absolute value of asymptotic t-ratio = 2.6) and almost twice as large as the not-quite-significant coefficient among women (β = -.312, absolute value of asymptotic t-ratio = 1.86).

Table 9
Selected Coefficients of Binary Logit Estimate of Visa Depression Equation: NIS-2003

	Specification		
Variable	All	Men	Women
Sex	.177	—	—
	(2.20)		
Age at admission to legal permanent residence	.419	.0316	.0458
Age squared	-.000579	-.000465	-.000627
Age joint test chi^2 (2 df)	14.9	4.54	14.7
Hispanic, no race	.148	.335	-.00346
Hispanic, white	-.0413	.129	-.205
Not Hispanic, Asian	-.0254	-.0571	.00976
Not Hispanic, black	.0243	.0482	-.0188
Not Hispanic, white	.161	-.00868	.323
Race/ethnicity joint test chi^2 (5 df)	5.08	2.44	13.4
Schooling (years)	.107	.00936	.0110
	(1.03)	(.58)	(.99)
Spouse of U.S. citizen	.0143	-.234	.128
Parent of U.S. citizen	.123	.0717	.123
Child of U.S. citizen	.113	-.302	.459
Employment principal	.249	.138	.142
Diversity principal	-.169	-.188	-.215
Refugee/asylee principal	-.336	-.866	.107
Legalization	.354	.466	.212
Visa category joint test chi^2 (7 df)	28.9	39.1	9.37
Adjustee, not illegal	.186	.512	-.0524
Adjustee, illegal	.220	.543	-.00311
Adjustee joint test chi^2 (2 df)	4.40	16.3	.30
Suffered harm in origin country	368	.440	.285
	(3.33)	(3.11)	(1.79)
Continent dummies joint test chi^2 (5 df)	19.6	7.42	21.8
Country dummies joint test chi^2 (10 df)	6284.14	770.99	8276.78
Intercept	-2.87	-2.57	-2.80
	(7.47)	(4.57)	(4.64)
Number of observations	8,149	3,951	4,198
Log pseudolikelihood	-3660.62	-1706.83	.-1926.80

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: Standard errors are corrected for heteroskedasticity due to clustering by origin country; absolute values of asymptotic t-ratio appear in parentheses under parameter estimates for numeric and binary variables. Joint tests are reported for multiple-category categorical variables.

5.3. Body-Mass Index and Time in the United States

Overweight and obesity have increased in the United States over the past forty years (Ogden et al. 2004). Accordingly, there is much interest in the causes and correlates of the increasing American girth. Immigrants present a useful laboratory for studying overweight. How do they compare with Americans? And what happens to their weight as they adjust to life in the United States?

The New Immigrant Survey asks respondents to provide their height and weight. Thus, the data enable analysis of three key characteristics—weight, height, and body-mass index. We examined BMI (weight in kilograms divided by the square of height in meters) among the NIS-2003 immigrants and among their native-born counterparts in the 1999-2002 sample of the National Health and Nutrition Examination Survey (NHANES), published in McDowell et al. (2005), focusing on the mean and selected percentiles, separately by age and sex. NHANES data are collected by trained health technicians in mobile examination centers, and thus are no doubt more accurate than the self-reported data collected in the NIS. Nonetheless, the contrasts point to some unmistakable results. In brief, immigrants have lower BMI than do Americans in the NHANES sample—lower mean, lower median, and, with only two exceptions, lower percentiles at every age.

A key question pertains to the effects on weight of living in the United States. Mean BMI is larger for adjustees than for new arrivals among both men and women and in every age group except, for both sexes, the sixty to sixty-nine age group. Of course, increasing BMI may be healthful, if BMI at arrival in the United States was too low. A BMI below 18.5 is considered to represent being underweight. Mean BMI in the new-arrival subsets is never below 18.5. Indeed, the fifth percentiles for the whole cohort are never below 18.5. Accordingly, it appears that the increase in BMI associated with time in the United States does not indicate an increase in health.

To explore in a multivariate context the effect of time on BMI in the United States, we specify and estimate a model with sex, age, age squared, visa-fixed effects, the two adjustee variables (adjusting from a legal status and adjusting from an illegal status), and continent and country dummies. Table 10 reports the results, estimated for the sample as a whole as well as separately for men and women. The results indicate that the

two adjustee variables are jointly statistically significant in all three equations and are both positive—BMI increases with time in the United States. Their relative effects, however, are sex-specific. Among women, the effect of time spent illegally is double the effect of time spent legally, while for men, the two effects are more similar, though the pattern is the reverse of that found among women, with time spent legally producing greater girth. This result suggests that among illegals in the United States, men may be more likely than women to be employed in high-exertion occupations; stress, too, may be a factor.

The results suggest other gender-based differences in BMI. Racial background is statistically significant only for men, and non-Hispanic Asian men are thinner than other immigrants. Visa category, in contrast, is significant only for women, with new immigrants who are sponsored by U.S. citizen spouses significantly thinner and parents sponsored by U.S. citizen offspring significantly heavier. As well, immigrant women with conditional visas are statistically significantly thinner. Given that 99 percent of the women with conditional visas are spouses of U.S. citizens married for less than two years, this result further suggests that, net of time in the United States, female thinness is not only an asset in the marriage market but also a further asset in the early years of marriage.

The continent dummies are jointly significant only for men, but the country dummies are significant for both sexes. If we rank-order the summed continent and country coefficients (not shown) for all ten countries, the country with the highest-girth women is Guatemala, followed by El Salvador, Mexico, Haiti, the Dominican Republic, Colombia, India, the Philippines, China, and Vietnam. Among men, the rank-ordering of countries would begin with Mexico, followed by the Dominican Republic, Guatemala, El Salvador, Colombia, the Philippines, Haiti, India, China, and Vietnam.

Thus, among both women and men, and net of visa category and time spent in the United States, immigrants from the Western Hemisphere have the highest girth and immigrants from Asia the lowest. This pattern immediately suggests the possible operation of selection mechanisms; if thinness is productive in the United States, then immigrants will be more positively selected on thinness the greater the distance from the United States. Of course, before exploring this question in greater depth, it is important to assess BMI in the parent populations of the origin countries. As well, it is useful to consider the possible role of such mechanisms as the extent of regulation in the origin country and the type of civil law, as discussed by Cutler, Glaeser, and Shapiro (2003). It is interesting to note that the highest-girth countries in our sample tend to be countries with a French-origin civil law, which runs counter to the hypothesis of Cutler, Glaeser, and Shapiro. Of course, highly regulated countries, besides producing girth-lowering effects via technology, also may inhibit development of greater knowledge as well as techniques for self-control (applying to the BMI context Vives' [1522-40] classic argument for gender equality). However, sharp assessment of the effects of regulation and civil law origin

Table 10

Selected Estimates, Ordinary Least Squares Equation of Determinants of Body Mass Index: NIS-2003

	Specification		
Variable	All	Men	Women
Sex	-.852	—	—
	(3.59)		
Age at Round 1 interview	.363	.370	.320
Age squared	-.492	-.00362	-.00282
Age joint test chi^2 (2 df)	79.2	42.9	61.6
Hispanic, no race	-.519	-.492	-.583
Hispanic, white	-.339	.110	-.895
Not Hispanic, Asian	-1.26	-1.08	-1.37
Not Hispanic, black	.240	-.300	.709
Not Hispanic, white	-.322	-.241	-.542
Race/ethnicity joint test chi^2 (5 df)	1.89	2.33	1.98
Schooling (years)	-.0709	-.0286	-.0860
	(2.95)	(1.18)	(2.42)
Spouse of U.S. citizen	-.348	.280	-.582
Parent of U.S. citizen	.770	-.141	1.15
Child of U.S. citizen	.159	-.213	.458
Employment principal	-.183	-.323	-.285
Diversity principal	-.303	-.322	-.0248
Refugee/asylee principal	.342	.313	.504
Legalization	.184	.464	.126
Visa category joint test chi^2 (7 df)	5.58	1.28	4.26
Adjustee, not illegal	.570	.645	.407
Adjustee, illegal	.677	.401	.916
Adjustee joint test chi^2 (2 df)	11.8	8.13	11.3
Conditional visa	-.527	-.148	-.523
	(2.38)	(.39)	(1.97)
Continent dummies joint test chi^2 (5 df)	1.68	2.46	1.22
Country dummies joint test chi^2 (10 df)	93.7	91.0	213.9
Intercept	18.0	17.8	17.6
	(20.4)	(15.7)	(12.6)
Number of observations	7,802	3,884	3,918
R^2	.124	.100	.158

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: Standard errors are corrected for heteroskedasticity due to clustering by origin country; absolute values of asymptotic *t*-ratio appear in parentheses under parameter estimates for numeric and binary variables. Joint tests are reported for multiple-category categorical variables.

requires careful characterization of all origin countries represented in the sample, a task outside the scope of this paper but an important one for future work.

Schooling achieves statistical significance for women but not for men. Its effect is to reduce BMI, doing so nontrivially, by .086 of a point for each year of schooling. Thus, a college graduate will have BMI .688 lower than an immigrant who did not go beyond the eighth grade.

Finally, estimation of the regression equations including a binary variable for New York City does not in any specification produce a statistically discernible New York City effect. Thus, it appears that immigrants who settle there are neither thinner nor fatter than other immigrants.

5.4. Health Change in the United States

Our work thus far includes several results pertinent to health trajectory and the sources of health change. From the health selection equation, we already know that among immigrants already in the United States at the time of the first filing for legal permanent residence, the combined effects of migration stress and U.S. exposure are negative. Moreover, the health selection equation also provides evidence of visa stress, because the effect of adjusting from an illegal status is in all specifications larger than the effect of adjusting from a legal status (Tables 7 and 8). From the visa depression equation, we already know that adjustee men are more likely to become depressed due to the visa process than are new-arrival men, suggesting that visa stress is more manageable in the origin country, at least for men (Table 9). Finally, from the BMI equation we already know that time in the United States increases girth (Table 10).

To assess further the sources of health change, we estimate the determinants of the self-reported health change between the most recent arrival "to live" in the United States and the baseline interview. Recall that the vast majority of immigrants reported no health change—76 percent of new-arrival immigrants and 64 percent of adjustee immigrants—with the proportions whose health deteriorated registering 4 percent among new arrivals and 14 percent among adjustees. There are two possible reasons for the greater health deterioration among adjustees: 1) only the adjustees experienced visa stress in the interval, and 2) either/or both migration stress and U.S. exposure differ qualitatively for LPRs and non-LPRs (especially LPR applicants who may be in the United States illegally). To distinguish among these effects, the health change equation includes not only the two adjustee variables but also a variable for the time elapsed between admission to LPR and the baseline interview.

Table 11 reports the results of the ordered-logit specification. As shown, the two adjustee variables are jointly highly statistically significant among both women and men. The coefficients differ, however, in that while the effect of adjusting from a legal status is about the same for both sexes—negative and of similar magnitude—the effect of adjusting from an illegal status is negative for men but positive for women. Two possible interpretations are that the deleterious effect of illegal residence is larger for men than for women—consistent with the effects in the selection equation (Tables 7 and 8) and with the visa depression effects (Table 9)—and that women recover faster than men.

The effect of having a conditional visa is negative, as expected, for both women and men, but is not statistically significant, indicating that the effect is weak.

Finally, the effect of time since admission to LPR is positive, statistically significant, and of a nontrivial magnitude among men, but not statistically significant and close to zero among women. Men's health appears to increase with each passing day as an LPR, net of health effects prior to obtaining LPR. Health benefits from U.S. exposure outweigh the lingering or dwindling effects of migration stress. Put differently, if migration stress exerts a negative effect on health, then the pure effect of U.S. exposure must be positive. However, if the

TABLE 11

Ordered-Logit Estimates of Determinants of Health Change between Most Recent Arrival "to Live" and First Interview after Admission to Legal Permanent Residence: NIS-2003 Immigrants

	Specification		
Variable	All	Men	Women
Sex	-.0717	—	—
	(1.65)		
Age at Round 1 interview	.0001827	-.0310	-.00617
Age squared	-.492	.000260	.0000984
Age joint test chi^2 (2 df)	4.09	12.0	1.57
Adjustee, not illegal	-.312	-.318	-.303
Adjustee, illegal	-.0437	-.253	.145
Adjustee joint test chi^2 (2 df)	22.34	16.3	18.1
Conditional visa	-.0777	-.126	-.0238
	(.76)	(.79)	(.21)
Time since admission to legal	.207	.414	-.00243
permanent residence (years)	(1.49)	(2.40)	(.01)
Number of observations	7,660	3,988	4,232
Log pseudolikelihood	-6060.89	-3125.77	-3365.28

Source: New Immigrant Survey, 2003 Cohort, Round 1.

Notes: Standard errors are corrected for heteroskedasticity due to clustering by origin country; absolute values of asymptotic *t*-ratio appear in parentheses under parameter estimates for numeric and binary variables. Joint tests are reported for multiple-category categorical variables. Cut-points are not shown.

migration gains experienced by new LPRs (including the freedom gains) outweigh migration stress, then the effect of U.S. exposure could be negative (and outweighed by the net positive effect of migration "stress").

We also re-estimated the equations including a binary variable for the New York City immigrants. The coefficient is not statistically significant in any specification, though it is positive in all three.

6. Concluding Note

This paper explores immigrant health, emphasizing New York City and using for the first time a large database in the final stages of preparation for public release: Round 1 of the New Immigrant Survey's immigrant cohort of 2003. We formulated a health model based on two related insights: 1) if migration is stressful, then the appropriate time for assessing health selectivity is at the time of the migration decision rather than at the time of the actual migration, and 2) assessment of health change subsequent to immigration should take into account heterogeneity in the sources of health change and their timing. The model distinguishes between the permanent and transitory components of health and identifies three distinct sources of change in the transitory component: visa stress, migration stress, and U.S. exposure. Though not all the data required for a thorough empirical assessment have become available, we estimated several key components of the envisioned analyses.

To examine health selectivity, we relied on self-reported health at the time of the initial filing for an immigrant visa; we also looked at health during childhood (to guard against contamination of health at the initial filing by changes in health already in progress among immigrants residing in the United States at the time of the migration decision). Our results indicate that men are more positively selected for health than women (though we cannot yet rule out differential reporting styles by sex—future rounds of the longitudinal survey will enable controlling for the style of reporting via fixed-effects estimation). Diversity immigrants appear to be among the most positively selected for health. Among men, legalization immigrants are the most robust during childhood, but by the time of the first filing, they rank lower on health than many of their fellow immigrants. Health selectivity is responsive to skill prices in the country of origin, but results for the effects of distance are somewhat mixed.

Women are more likely than men to report experiencing sadness or depression because of the visa process, and the pattern of effects appears to differ across the sexes. Men with a spouse or parent who is a U.S. citizen are less likely to experience visa depression, but women do not appear to receive a similar benefit from their kin. Men adjusting to legal permanent residence in the United States are more likely to experience visa depression than new-arrival immigrant men, a finding that suggests that visa stress may be more manageable in the origin country, but only for men—women's propensity to visa depression is not responsive to location.

We also examined body-mass index. Among both women and men, time in the United States increases girth. It does so differentially, however, depending on legal status prior to admission to legal permanent residence. Among women, the effect of time spent illegally is double the effect of time spent legally, while for men the two effects are more similar, though the pattern is the opposite of that found among women, with time spent legally producing greater girth. This result suggests that among illegals in the United States, men may be more likely than women to be employed in high-exertion occupations. Women admitted to legal permanent residence as the spouses of U.S. citizens are substantially thinner than other immigrants, and women married for less than two years are even thinner, suggesting that female thinness is an asset not only in the marriage market but also in the early years of marriage.

The combined effects of migration stress and U.S. exposure are negative in the time before admission to legal permanent residence but non-negative afterwards and positive among men. It thus would appear that the pure effect of U.S. exposure is positive, at least after legal permanent residence and for men, but we cannot rule out the possibility that migration gains—such as freedom gains—are high, outweighing both migration stress and the possible negative effect of U.S. exposure.

Finally, those immigrants who claim New York City as their first home after admission to legal permanent residence are more highly positively selected on health than their fellow immigrants who settle elsewhere. Moreover, they are less likely to report having experienced visa depression than other immigrants. However, they are neither thinner nor fatter than the rest of the cohort.

These results are obtained from a survey conducted soon after admission to legal permanent residence. It will be important to track change in the health of surveyed individuals with the passage of time. Visa stress, already ended for most of the cohort, will end for all with the removal of conditionality restrictions. Migration stress presumably will run its course, if it has not already done so for some cohort members. The effects of U.S. exposure—positive or negative—will continue for those in the cohort who remain in the United States, and it will be possible to assess whether, and how, growth in U.S.-specific skills enables immigrants to extract greater health benefits and mitigate health hazards.

Endnotes

1. The abbreviation LPR denotes both legal permanent resident and legal permanent residence. The context should make clear whether reference is to a person or to a status.

2. Immigration figures refer to the total non-IRCA (Immigration Reform and Control Act) legalization number of new LPRs (see the Immigration and Naturalization Service's *2001 Yearbook*, Table 4; its earlier iterations; and 2004 data posted on the *Yearbook of Immigration Statistics* website).

3. New York State is the second-leading state of intended residence for new LPRs (after California) and the New York metropolitan area is the second-leading metro area (after the Los Angeles-Long Beach area). At the turn of the twentieth century, New York was the leading intended state of residence, followed by Pennsylvania, Illinois, and Massachusetts. (See the Immigration and Naturalization Service's/ Office of Immigration Statistics' *Statistical Yearbooks* for further detail and the Dillingham Commission Reports for historical information.)

4. Following official terminology, we use "immigrant" interchangeably with "legal immigrant" and "legal permanent resident alien." Legal immigrants have the right to reside permanently in the United States, to engage in most occupations, to sponsor the immigration of certain relatives, and, after completing a residency requirement, to become citizens of the United States. Besides legal immigrants, there is a large set of legal nonimmigrants who have temporary residence visas; legal temporary visas provide for legal residence for a temporary period and for a specific purpose. Examples of nonimmigrants include foreign students, tourists, and a variety of workers, including representatives of foreign news media, computer specialists, athletes, and entertainers. Additionally, there are individuals in the United States illegally who qualify for neither legal permanent residence nor legal temporary residence or who have violated the terms of a legal temporary visa. Both legal temporary residents and illegal migrants may be desirous of attaining legal permanent residence.

5. A few other classes of individuals are also exempt from numerical restriction, some as a permanent feature of U.S. law (such as American Indians born in Canada and children born abroad to alien residents), others under temporary provisions (such as the special three-year program in effect in 1992-94 for spouses of aliens legalized under the Immigration Reform and Control Act of 1986). Additionally, special legislation has permitted refugees previously admitted with temporary documents to adjust to permanent resident status outside the numerical limitations.

6. For a succinct description of U.S. visa allocation law, see the U.S. Citizenship and Immigration Services' and State Department's websites, in particular, the Office of Immigration Statistics' *Yearbook of Immigration Statistics* and the State Department's *Visa Bulletin*. For elaboration from a social science perspective, see Jasso, Rosenzweig, and Smith (2000).

7. The number of persons admitted as refugees is set annually by the President in consultation with Congress; the ceiling has fluctuated in the range of 75,000 to 100,000. The diversity lottery program was begun in fiscal year 1987 on a trial basis and made a part of U.S. immigration law under provisions of the Immigration Act of 1990.

8. Registry provisions allow for the adjustment to LPR of persons who have resided continuously in the United States since a given target date; currently, that date is set at January 1, 1972. Cancellation of removal, together with the kindred suspension of deportation provisions in effect before 1997, similarly provide for adjustment to LPR.

9. A small number of family-sponsored and employment-based immigrants may self-petition. These include, in the case of family visas, spouses and children of deceased or abusive U.S. citizens and legal permanent residents, and, in the case of employment visas, investors and individuals of great renown. For further detail, see the requisite forms: Forms I-130, I-140, I-360, and I-526, available on the U.S. Citizenship and Immigration Services' website.

10. Additional "joint" sponsors may be brought in if the visa sponsor cannot fulfill the support requirement alone. For details, see the I-864 affidavit of support package of forms on the U.S. Citizenship and Immigration Services' website.

11. Moreover, as we show, individuals subject to both visa stress and migration stress may experience them at different times. For example, consider adjustees who have spent many years in the United States as legal nonimmigrants before applying for LPR; migration stress for them may have ended long before the onset of visa stress.

12. Notice how such a study will require new vocabulary; the U.S. citizen "newcomers" are not "immigrants" as that term is almost universally used.

13. For a discussion of migration and visa stresses, see Kasl and Berkman (1983) and Vega and Amaro (1994). Illustration of these stresses is plentiful. For example, the website of an immigration law

firm begins with the following description of visa stress: "Immigrating to the United States is a complicated procedure that can cause tremendous stress for the individual wishing to immigrate. MacKenzie-Hughes, LLP is the area's premier immigration law firm, and we work hard to smooth the process and minimize the anxiety for our clients" (<http://www.imm-usa.com>). And the stresses may be even greater for illegal migrants, who must live partly in the shadows and face threats of deportation. Other components of visa stress include the constraints on international travel, which may cause family hardships (U.S. Immigration and Naturalization Service 1992).

14. As noted above, for some categories of immigrants, the trajectory would be somewhat different. For refugees, visa stress may end at the time of the temporary (nonimmigrant) admission, while for conditional immigrants (spouses of U.S. citizens who have been married for less than two years, and investors), visa stress may not end until removal of the conditionality restrictions two years later.

15. Among immigrants in the nationally representative New Immigrant Survey Pilot who were employed in the United States at the time of the baseline round and who had worked abroad within the past ten years, earnings gains were substantial: on average, they were $10,306 for men (a 68 percent increase) and $6,146 for women (a 62 percent increase). (Gains are denominated in dollars based on estimates of the country-specific purchasing power of the currencies from the Penn International Comparisons Project [Summers and Heston 1991].)

16. For elaboration of the relationship between income and health, see Smith (1999).

17. Note that recent changes in the law, as well as the new climate in the wake of the September 11 attacks, raise the possibility that visa stress does not end until naturalization. Indeed, even with naturalization, the immigrant is not completely safe, for unlike native-born citizens, an immigrant can be denaturalized and deported (for cause). Further thought is needed in order to modify the model presented in this paper to accommodate the possibility of lifelong, albeit possibly mild, visa stress.

18. Note that among illegal migrants, a net positive combined effect of migration stress and U.S. exposure would attenuate the decline, while a net negative effect would exacerbate it.

19. It is not possible to insert a full set of country-specific fixed effects, because a nontrivial number of countries (26 out of 168) are represented by a single immigrant. Our solution is to include the continent dummies plus ten country dummies.

20. Estimates of origin-country skill prices are based on recent work that uses information on immigrant earnings in the last origin-country job before immigration and in the first U.S. job after immigration, expressed in PPP-adjusted figures (Summers and Heston 1991), together with country characteristics such as schooling levels and school quality (based on Barro and Lee [1993]) and GDP (Jasso and Rosenzweig 2005).

21. All descriptive statistics are based on weighted data, adjusting for the over- and undersampling of the design.

22. Initial residence is the address to which new immigrants request that their green card be mailed.

23. Indeed, the proportion who suffered harm in the origin country was larger by almost 3 percentage points among men than among women—8.3 percent versus 5.5 percent.

24. Such a result would echo the findings of sociologists and psychologists a quarter-century ago on the multiple stresses associated with both entering puberty and shifting to a new school at the same time (Simmons and Blyth 1987).

25. It is illuminating to recall that Simmons and Blyth's (1987) insight into the effects of reaching puberty and transitioning to middle school at the same time was also gender-specific.

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