

# Health, Life Expectancy, and Mortality Patterns Among Immigrant Populations in the United States

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## ABSTRACT

**Background:** The US immigrant population has grown considerably in the last three decades, from 9.6 million in 1970 to 32.5 million in 2002. However, this unprecedented population rise has not been accompanied by increased immigrant health monitoring. In this study, we examined the extent to which US- and foreign-born blacks, whites, Asians, and Hispanics differ in their health, life expectancy, and mortality patterns across the life course.

**Methods:** We used National Vital Statistics System (1986-2000) and National Health Interview Survey (1992-1995) data to examine nativity differentials in health outcomes. Logistic regression and age-adjusted death rates were used to examine differentials.

**Results:** Male and female immigrants had, respectively, 3.4 and 2.5 years longer life expectancy than the US-born. Compared to their US-born counterparts, black immigrant men and women had, respectively, 9.4 and 7.8 years longer life expectancy, but Chinese, Japanese, and Filipino immigrants had lower life expectancy. Most immigrant groups had lower risks of infant mortality and low birthweight than the US-born. Consistent with the acculturation hypothesis, immigrants' risks of disability and chronic disease morbidity increased with increasing length of residence. Cancer and other chronic disease mortality patterns for immigrants and natives varied considerably, with Asian Immigrants experiencing substantially higher stomach, liver and cervical cancer mortality than the US-born. Immigrants, however, had significantly lower mortality from lung, colorectal, breast, prostate and esophageal cancer, cardiovascular disease, cirrhosis, diabetes, respiratory diseases, HIV/AIDS, and suicide.

**Interpretation:** Migration selectivity, social support, socio-economic, and behavioural characteristics may account for health differentials between immigrants and the US-born.

*La traduction du résumé se trouve à la fin de l'article.*

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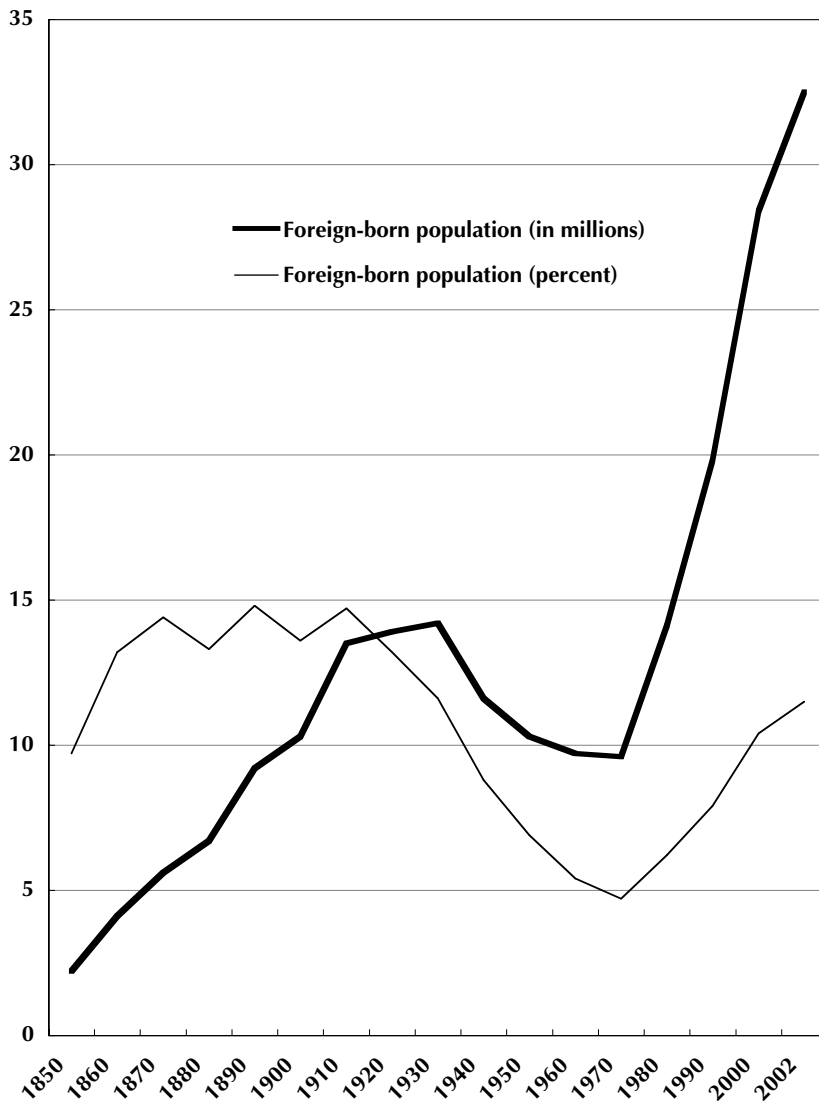
The United States (US) immigrant population has grown considerably in the last three decades, from 9.6 million in 1970 to 32.5 million in 2002.<sup>1</sup> Immigrants now represent 11.5% of the US population, the highest percentage in seven decades (Figure 1).<sup>1-3</sup> The rapid increase in the immigrant population since 1970 reflects large-scale immigration from Latin America and Asia.<sup>1-5</sup> More than half of all US immigrants are from Latin America and over a quarter of all immigrants hail from Asia. Europeans, who accounted for the majority of immigrants before 1965, currently represent 14% of the total US immigrant population.<sup>1</sup>

The unprecedented rise in the US immigrant population has not been accompanied by an increase in monitoring health and mortality patterns among immigrants of various ethnic and national origins.<sup>6-8</sup> Most national surveillance data systems in the United States do not routinely report health statistics by immigrant status. For surveillance databases that include immigrant/nativity status as a data item, analyses of immigrant health statistics by socio-economic, demographic, and health services characteristics are hampered by the unavailability of the appropriate population denominator data and/or by an incomplete reporting of immigrant status. Moreover, the substantial ethnic, cultural, and linguistic diversity of the current US immigrant population poses a special challenge to the systematic monitoring of data on immigrant health and well-being.

In this study, we examine the extent to which US- and foreign-born blacks, Asians, Hispanics, and non-Hispanic whites in the United States differ in their health and mortality patterns across the life course, using three large federal data systems: National Vital Statistics System (NVSS), National Health Interview Survey (NHIS), and US Decennial Census. We examined nativity differentials for a variety of measures: life expectancy, infant mortality rate (IMR), low birthweight (LBW), activity limitation, chronic disease prevalence (morbidity), number of bed disability days, and mortality from major causes of death.

## DATA AND METHODS

Data for life expectancy and mortality analyses came from the mortality compo-



**Figure 1.** Number and percentage of foreign-born population in the United States, 1850-2002

Source: Schmidley D. *The Foreign-Born Population in the United States: March 2002*. Current Population Reports, P20-539. Washington, DC: US Census Bureau, 2003

ment of the NVSS.<sup>9</sup> To compute stable death rates and life expectancy estimates, nine years of mortality data from 1986-1994 were pooled. Population denominator data by age, sex, race/ethnicity, and nativity came from the 1990 US Decennial Census.<sup>10-12</sup> Death rates were age-adjusted by the direct method using the 2000 US population as standard.<sup>9</sup> We computed average annual rates of mortality from all-causes combined, and from all major cancers and causes of death: lung, colorectal, stomach, prostate, breast, cervical, esophageal, and liver cancers; and cardiovascular diseases (CVD), respiratory diseases, cirrhosis, diabetes, suicide, homicide, and unintentional injuries. Life expectancy estimates were calculated via the standard

life table methodology by converting observed age-specific death rates into life table probabilities of dying.<sup>13</sup> The 1998-2000 data on IMR and LBW were derived from the natality component of the NVSS.<sup>14,15</sup> Logistic regression models that account for complex sampling designs were fitted to the 1992-1995 NHIS data to estimate relative risks of chronic disease prevalence, bed disability, and activity limitation among 39 ethnic-immigrant groups after adjustment for a variety of socio-economic and demographic factors.<sup>16-20</sup> The NHIS is a national sample household survey in which data on socio-economic, demographic, behavioural, morbidity, health, and health care characteristics are collected via personal household interviews.<sup>21</sup> The

survey uses a multistage probability design and is representative of the civilian non-institutionalized population of the United States. Detailed descriptions of the NVSS and NHIS have been provided elsewhere.<sup>9,21,22</sup>

## RESULTS

During 1986-1994, male and female immigrants had on average 3.4 and 2.5 years longer life expectancy at birth than did the US-born (Figure 2). Black and Hispanic immigrant men and women had, respectively, 9.4, 4.3, 7.8, and 3.0 years longer life expectancy than their US-born counterparts. Chinese, Japanese, and Filipino immigrants, however, had lower life expectancy than their US-born counterparts. Immigrants had, respectively, 18% and 27% lower LBW and infant mortality rates during 1998-2000, with Chinese and Koreans experiencing the lowest LBW and infant mortality risks (30% and 52% lower, respectively) compared to their US-born counterparts (Table I). Consistent with the acculturation hypothesis, risks of disability and chronic disease morbidity during 1992-1995 among immigrants of various ethnic backgrounds, although significantly lower than those for the US-born non-Hispanic whites, increased with increasing duration of residence in the United States. For example, compared to US-born non-Hispanic whites of similar socio-economic backgrounds, the risk of chronic medical condition was, respectively, 69%, 56%, and 37% lower among recent Chinese immigrants (those who immigrated to the US in the previous 15 years), long-term Chinese immigrants (those who immigrated to the US more than 15 years previous), and US-born Chinese (Table II).

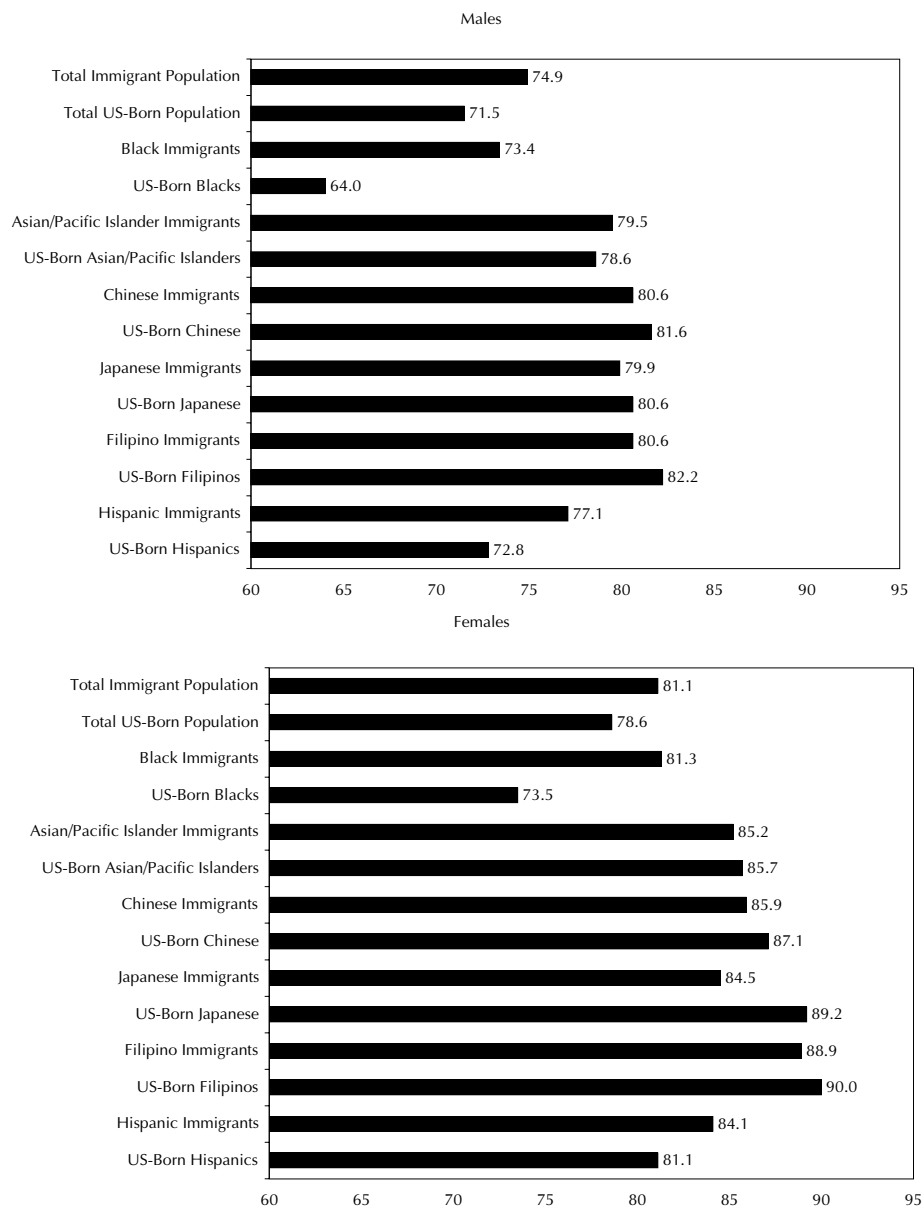
Cancer and other chronic disease mortality patterns for immigrants and the US-born also varied considerably (Tables III and IV). Black male and female immigrants had at least 35% lower total cancer mortality than US-born blacks. However, Chinese male immigrants and Japanese female immigrants had, respectively, 35% and 25% higher total cancer mortality than their US-born counterparts. Black immigrants had 69% lower lung cancer mortality than US-born blacks. On the other hand, Chinese male immigrants and

Japanese female immigrants had, respectively, 51% and 42% higher lung cancer mortality than their US-born counterparts. Stomach cancer mortality was almost twice as high for immigrants, especially Chinese immigrants, as for the US-born. Liver cancer mortality was substantially higher for immigrants, with Chinese immigrant men and Japanese immigrant women in particular experiencing three times higher mortality than their US-born counterparts. While prostate cancer mortality was generally lower among immigrants, Filipino immigrants had a 3.1 times higher mortality rate than US-born Filipinos. Breast cancer mortality was substantially lower among immigrants, with Chinese, Japanese, and black immigrant women experiencing, respectively, 35%, 34%, and 30% lower mortality than their US-born counterparts. Compared to the US-born women, cervical cancer mortality was substantially higher among Asian/Pacific Islander (API) immigrants, especially Japanese immigrant women, who had 146% higher mortality than US-born Japanese women.

Compared to the US-born, CVD mortality was significantly greater among Japanese and Filipino immigrants. It was at least 34% lower among black immigrants and at least 12% lower among Hispanic immigrants. Immigrants overall had significantly lower mortality from cirrhosis, diabetes, and respiratory diseases. While black and Hispanic immigrants had substantially lower suicide rates, Japanese and Chinese men and women had, respectively, 59%, 44%, 125%, and 95% higher suicide rates than their US-born counterparts. The homicide rate was 65% greater among immigrant men than among US-born men, with the risk being 120% and 38% higher for API and Hispanic immigrant men, respectively. Although tuberculosis, viral hepatitis, and other infectious disease mortality was higher among API immigrants, HIV mortality was at least 11% lower among the overall immigrant population and at least 48% lower among API immigrants compared to the US-born population.

**INTERPRETING IMMIGRANT HEALTH PATTERNS**

Health, life expectancy, and mortality patterns for immigrants and the US-born vary



**Figure 2.** Life expectancy at birth (average lifetime in years) by ethnicity and immigrant status, United States, 1986-1994

The total number of deaths used to calculate life expectancies for various ethnic-immigrant groups in the order shown above were as follows. **Males:** 833,439; 9,216,544; 35,048; 1,257,464; 76,959; 34,343; 22,609; 4,790; 4,292; 14,464; 22,686; 2,804; 55,694; 83,266; **Females:** 889,255; 8,507,940; 28,180; 1,053,740; 57,881; 23,190; 16,858; 3,382; 8,873; 8,941; 11,309; 1,766; 38,945; 54,496. Source: National Vital Statistics System, 1986-1994.

considerably in the United States. Overall, immigrants have better perinatal and adult health, and lower disability and mortality rates than the US-born. While mortality from several major causes was significantly lower for black and Hispanic immigrants than for US-born blacks and Hispanics, mortality rates were generally higher among Chinese, Japanese, and Filipino immigrants compared to their US-born counterparts. Ethnic-nativity patterns in health also vary by cause of death and by

other health outcomes.<sup>23-29</sup> Better overall health among immigrants and variations in nativity and country-of-birth patterns in morbidity and cause-specific mortality have also been observed for Canada.<sup>30-40</sup>

A number of explanations have been suggested for higher life expectancy, better health, and lower mortality among immigrants. First, people immigrating to the United States or Canada may be healthier than those who remain in their countries of origin. This is referred to as the “healthy

TABLE I

Infant Mortality Rate per 1,000 Live Births and Percent Low Birthweight (LBW) Among Major Ethnic-Immigrant Groups, United States, 1998-2000

Ethnic-Nativity Group	Number of Infant Deaths	Infant Mortality Rate	Number of LBW Infants	% LBW		Rate Ratio Infant Mortality	Rate Ratio % LBW
				US-Born†	Foreign-Born†		
Total Population	69,165	7.28	745,112	7.86	reference	reference	
Total Population	12,842	5.29	155,770	6.42	0.73*	0.82*	
Non-Hispanic White	1,649	4.47	21,774	5.91	0.77*	0.89*	
Non-Hispanic Black	1,839	10.21	17,758	9.92	0.74*	0.73*	
Asian or Pacific Islander	2,141	4.66	33,293	7.26	0.70*	0.91*	
Chinese	275	3.36	4,076	4.98	0.82	0.70*	
Japanese	49	3.19	1,102	7.19	0.71*	0.90*	
Filipino	415	5.55	6,108	8.19	0.77*	0.93*	
Asian Indian‡	294	4.60	5,989	9.38	0.62*	0.95	
Korean‡	107	4.14	1,244	4.82	0.48*	0.88	
Vietnamese‡	178	4.33	2,698	6.57	0.75	0.94	
Hispanic	7,112	5.05	82,167	5.84	0.78*	0.80*	
Mexican	5,003	4.98	55,039	5.48	0.80*	0.82*	
Puerto Rican	497	8.10	5,729	9.34	1.00	0.99	
Cuban	92	3.94	1,512	6.47	0.85	0.94	
Central and South American	1,335	4.75	17,722	6.31	0.83*	0.89*	

\*  $p < 0.05$ . Rate ratio = ratio of rate for immigrants in each ethnic group to that for the corresponding US-born group.

† US-born are those born in the 50 states and the District of Columbia. Foreign-born are those born outside these territories.

‡ Infant mortality rate and percent low birthweight for Asian Indians, Koreans, and Vietnamese were based on data for 11 states: CA, HI, IL, MI, MO, NJ, NY, TX, VA, WA, WV.

Source: National Vital Statistics System.

immigrant effect” or positive immigrant selectivity.<sup>6,7,27,28,31-34</sup> Second, immigrants possess more favourable health-enhancing behavioural profiles, such as lower rates of smoking, drinking, obesity, and better diet. This has been observed for both Canada and the United States.<sup>6-8,24,30,31,34,41,42</sup> Third, immigrants may have higher levels of social and familial support and social integration compared to the US-born.<sup>6-8</sup> Fourth, socio-economic characteristics might partly account for the health differentials. Although immigrants are generally better educated, they have higher unemployment and poverty rates and lower rates of health insurance coverage than the US-born.<sup>1,6,7</sup> However, previous studies as well as the results in Table II indicate only a modest contribution of socio-economic factors in explaining nativity differentials.<sup>6-8,24,27,28</sup> Fifth, macro-level societal factors, such as racial/ethnic discrimination, social segregation, and labour market discrimination may play a part, especially when explaining the relatively poorer health status and socially disadvantaged position of US-born blacks relative to other groups.<sup>6,7,43</sup>

Last, inconsistencies in the coding of immigrant status in the numerator (mortality) and denominator (population) data may contribute to the reported life expectancy and mortality differentials between immigrants and the US-born. However, longitudinal cohort studies in the United States have produced mortality

patterns consistent with the cross-sectional findings of this study.<sup>6,7,27</sup>

Differentials in infant mortality and mortality from many chronic diseases, such as cancer and CVD as shown in Tables I, III, and IV, may partly reflect inequalities in health care access and utilization between immigrants and the US-born. Recent data show that immigrants are more likely to be without health insurance coverage than the US-born (31.6% versus 11.9% in 2000).<sup>44</sup> The rate of non-coverage is even higher among immigrants who are not naturalized (41.3%) and Hispanic immigrants (54%).<sup>7,44</sup> Recency of immigration is also associated with lower rates of health insurance coverage and use of preventive health services, such as mammogram, colorectal, and prostate cancer screening.<sup>45,46</sup> Low use of medical services by immigrants has also been observed in Canada and Australia – the countries with free, universal health care access.<sup>34</sup> Moreover, some ethnic-immigrant groups may receive inferior health care, including cancer screening and treatment, because of cultural and linguistic barriers and potential ethnic discrimination.<sup>7,43</sup>

#### DIRECTIONS FOR FUTURE RESEARCH

Vital records and other administrative health databases generally do not contain several key immigration-related variables,

such as duration of residence or recency of immigration, parental nativity status, citizenship/naturalization status, refugee status, and English language proficiency, all of which may affect both immigrant health and its determinants.<sup>6,7</sup> Sample surveys can be a good source for facilitating in-depth analyses of these characteristics and other factors that influence immigrant health; however, they are not particularly useful for monitoring the health of many immigrant groups who represent a small proportion of the total population. Vital records, cancer registries, and other disease surveillance systems are important for identifying significant health problems and disease risks among various ethnic-immigrant groups and for monitoring changes in their health status over time. Clearly, such surveillance databases need to be strengthened and augmented with additional information on the immigration process. The data systems that link records from the major national population surveys with vital records and disease registries are particularly useful in this regard. Two national databases that use record linkages of population surveys with administrative sources, such as the National Death Index (NDI) and population-based cancer registries, are the US National Longitudinal Mortality Study and NHIS-NDI which have previously been used to assess immigrant health and mortality patterns.<sup>6,7,27,47,48</sup> With the continuation of long-term mortality

**TABLE II**

**Multivariate Logistic Regressions† Showing Adjusted Relative Risks of Chronic Disease Morbidity, Bed Disability Days, and Activity Limitation Among Major Ethnic-Immigrant Groups, United States, 1992-1995 (N = 324,117)**

Ethnic-Nativity Group‡	Chronic Disease Prevalence			≥ 1 Bed Disability Days			Activity Limitation		
	Odds Ratio	95% CI Lower	95% CI Upper	Odds Ratio	95% CI Lower	95% CI Upper	Odds Ratio	95% CI Lower	95% CI Upper
Non-Hispanic Whites									
US-born	1.00	Reference		1.00	Reference		1.00	Reference	
Recent immigrants	0.63	0.57	0.71	0.74	0.68	0.82	0.70	0.61	0.79
Long-term immigrants	0.78	0.74	0.82	0.87	0.82	0.93	0.81	0.75	0.87
Non-Hispanic Blacks									
US-born	0.84	0.81	0.88	0.82	0.79	0.85	0.98	0.94	1.02
Recent immigrants	0.45	0.39	0.51	0.54	0.47	0.61	0.38	0.30	0.47
Long-term immigrants	0.62	0.52	0.75	0.70	0.60	0.81	0.68	0.57	0.82
Chinese									
US-born	0.63	0.50	0.79	0.70	0.54	0.89	0.41	0.26	0.65
Recent immigrants	0.31	0.27	0.35	0.40	0.35	0.47	0.24	0.19	0.30
Long-term immigrants	0.44	0.34	0.56	0.58	0.46	0.74	0.36	0.25	0.52
Japanese									
US-born	0.73	0.66	0.81	0.89	0.77	1.02	0.61	0.51	0.72
Recent immigrants	0.24	0.16	0.35	0.61	0.47	0.80	0.24	0.12	0.48
Long-term immigrants	0.53	0.39	0.72	0.71	0.52	0.97	0.46	0.28	0.76
Filipinos									
US-born	0.80	0.61	1.06	0.81	0.64	1.04	0.93	0.61	1.42
Recent immigrants	0.44	0.36	0.54	0.56	0.49	0.65	0.36	0.25	0.52
Long-term immigrants	0.61	0.51	0.72	0.73	0.61	0.87	0.72	0.54	0.96
Asian Indians									
Long-term immigrants, US-born	0.57	0.43	0.75	0.73	0.53	0.99	0.68	0.48	0.95
Recent immigrants	0.47	0.38	0.58	0.53	0.44	0.65	0.44	0.30	0.65
Koreans									
Long-term immigrants, US-born	0.50	0.39	0.64	0.66	0.52	0.84	0.46	0.31	0.67
Recent immigrants	0.38	0.28	0.50	0.43	0.36	0.52	0.37	0.26	0.52
Vietnamese									
Long-Term Immigrants, US-born	0.50	0.38	0.66	0.69	0.46	1.03	0.27	0.15	0.46
Recent immigrants	0.47	0.37	0.59	0.49	0.41	0.59	0.58	0.45	0.73
Other Asian/Pacific Islanders									
US-born	0.92	0.49	1.74	0.86	0.54	1.38	1.10	0.41	2.94
Recent immigrants	0.43	0.32	0.58	0.49	0.40	0.60	0.44	0.30	0.64
Long-term immigrants	0.65	0.46	0.93	0.81	0.63	1.04	0.67	0.42	1.09
All Other Ethnic Groups									
US-born	0.69	0.63	0.76	0.81	0.74	0.89	0.88	0.79	0.99
Recent immigrants	0.51	0.41	0.63	0.58	0.47	0.71	0.45	0.34	0.59
Long-term immigrants	0.62	0.49	0.79	0.77	0.60	0.97	0.83	0.61	1.13
Mexicans									
US-born	0.70	0.67	0.73	0.81	0.77	0.86	0.71	0.67	0.75
Recent immigrants	0.27	0.24	0.30	0.30	0.27	0.33	0.24	0.21	0.28
Long-term immigrants	0.46	0.43	0.50	0.50	0.47	0.55	0.50	0.46	0.55
Puerto Ricans									
US-born	0.84	0.75	0.95	0.89	0.80	0.98	0.85	0.74	0.98
Recent immigrants	0.99	0.83	1.19	0.72	0.61	0.86	1.01	0.81	1.26
Long-term immigrants	0.80	0.72	0.90	0.96	0.84	1.10	1.07	0.95	1.21
Cubans									
US-born	0.74	0.59	0.93	0.82	0.68	0.99	0.78	0.58	1.05
Recent immigrants	0.59	0.48	0.72	0.41	0.32	0.51	0.56	0.41	0.77
Long-term immigrants	0.80	0.73	0.87	0.76	0.67	0.87	0.75	0.64	0.88
Central/South Americans									
US-born	1.02	0.94	1.11	1.02	0.92	1.13	0.90	0.79	1.01
Recent immigrants	0.42	0.39	0.47	0.49	0.45	0.54	0.38	0.34	0.44
Long-term immigrants	0.61	0.55	0.68	0.67	0.60	0.75	0.57	0.49	0.66

† To account for the complex sampling design of NHIS, SUDAAN software was used to estimate standard errors and confidence intervals. Odds ratios were adjusted for age, sex, marital status, family size, place and region of residence, education, employment status, and family income. CI = confidence interval

‡ US-born are those born in the 50 states and the District of Columbia. Immigrants refer to those born outside these territories. American Indians and Hawaiians were excluded because almost all of them are US-born. A majority of Asian Indians, Koreans, and Vietnamese are recent immigrants; because of small numbers, long-term immigrants and US-born individuals were combined. Recent Immigrants were those who immigrated to the US less than 15 years previous. Long-term immigrants were those who had been in the US 15 years or longer. The categories for Central/South Americans also include all other Hispanics.

Source: Derived from the National Health Interview Survey (NHIS), 1992-1995.

follow-up, these longitudinal databases hold much promise for analyzing temporal immigrant mortality patterns and for conducting research on social determinants of immigrant mortality.

Future research needs to examine more directly the impact on changes in immi-

grant health of the acculturation process, a process by which immigrants adopt the values, attitudes, beliefs, practices, and lifestyle characteristics of the native-born.<sup>6,7</sup> In the case of both Canada and the United States, acculturation plays a major role in modifying the social, health, and behav-

ioural characteristics of immigrants, particularly of non-European immigrant groups, which generally leads to a decrease in their health and mortality advantage over time.<sup>7,28,30,34,35</sup> Studies have often used duration of residence since the time of immigration as a proxy measure of accul-

**TABLE III**  
Average Annual Age-adjusted Death Rates for Major Causes of Death by Nativity/Immigrant Status and Race/Ethnicity, US Men, 1986-1994

Cause of Death (ICD-9 Codes)	Total Population			Black			Asian/Pacific Islander			Chinese			Japanese			Filipino			Hispanic		
	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio
All-Cause Mortality	1232.07	0.41	ref.	1687.57	1.56	ref.	758.88	6.13	ref.	623.24	10.46	ref.	681.58	6.85	ref.	611.75	23.32	ref.	1052.03	4.71	ref.
All-Cause Mortality Infectious diseases Excluding HIV/AIDS (001-041,046-139)	1034.68	1.11	0.84*	1029.80	6.64	0.61*	735.80	2.82	0.97*	708.20	5.05	1.14*	758.62	14.17	1.11*	684.58	4.57	1.12*	827.26	3.89	0.79*
HIV/AIDS (042-044)	15.55	0.14	0.94*	22.89	1.00	0.64*	16.56	0.42	1.32*	16.34	0.78	1.56*	15.51	2.22	1.44*	13.03	0.63	1.47*	14.19	0.53	0.67*
Cancer (140-208)	16.38	0.15	0.89*	37.76	0.85	0.75*	3.17	0.13	0.39*	2.53	0.23	0.28*	6.26	0.98	1.67*	16.75	0.82	1.47*	21.63	0.43	0.58*
Esophagus (150)	228.80	0.54	0.81*	231.33	3.33	0.58*	171.14	1.34	0.92*	187.30	2.48	1.35*	188.03	7.77	1.06	140.21	2.08	1.32*	176.30	1.87	0.81*
Stomach (151)	4.55	0.07	0.61*	5.53	0.50	0.32*	4.10	0.21	0.70*	4.86	0.41	0.87	7.60	1.61	1.53*	2.45	0.27	0.62	3.49	0.27	0.64*
Colorectal (153-154)	13.20	0.13	1.61*	17.28	0.91	1.03	14.67	0.39	0.78*	14.62	0.71	2.19*	29.56	3.08	1.26	4.94	0.38	1.65*	9.63	0.44	0.67*
Liver and intrahepatic bile duct (155)	27.41	0.19	0.90*	22.86	1.07	0.62*	17.36	0.44	0.69*	22.17	0.89	1.24*	23.18	2.73	0.86	15.62	0.69	1.05	15.39	0.56	0.70*
Lung and bronchus (162)	8.53	0.10	1.72*	8.84	0.59	1.12	18.55	0.40	2.32*	22.67	0.77	3.03*	13.11	2.02	1.91*	9.71	0.53	1.48*	7.08	0.38	0.83*
Prostate (185)	58.87	0.28	0.64*	39.37	1.33	0.31*	45.03	0.68	0.90*	55.92	1.36	1.51*	40.95	3.69	1.02	36.62	1.04	0.91	43.76	0.93	0.92*
Diabetes (250)	31.14	0.20	0.80*	66.74	1.95	0.88*	15.77	0.46	0.79*	10.85	0.70	0.74*	16.73	2.27	0.85	20.04	0.80	3.09*	24.01	0.74	0.90*
Major cardiovascular diseases (390-448)	18.71	0.16	0.87*	27.46	1.17	0.72*	14.50	0.41	0.76*	14.43	0.75	1.14	12.08	1.83	0.78	12.61	0.62	0.85	23.85	0.71	0.68*
Respiratory diseases (460-519)	463.60	0.75	0.88*	412.30	4.59	0.64*	321.89	1.96	0.99	290.14	3.42	0.99	314.39	9.20	1.11*	334.39	3.20	1.63*	325.89	2.61	0.81*
Chronic liver disease and cirrhosis (571)	93.85	0.35	0.77*	76.16	2.06	0.62*	81.75	1.04	1.11*	89.86	2.00	1.47*	92.28	4.84	1.25*	69.72	1.50	1.32*	74.96	1.31	0.78*
Unintentional injuries (E800-E949)	13.78	0.13	0.87*	11.33	0.62	0.48*	7.09	0.25	0.96	5.73	0.41	1.45*	8.63	1.68	1.23	5.01	0.38	0.89	17.96	0.52	0.48*
Suicide (E950-E959)	49.84	0.26	0.91*	45.90	1.21	0.61*	33.53	0.55	1.17*	23.36	0.89	1.27*	34.48	2.53	1.49*	29.26	1.14	1.14	55.44	0.81	0.99
Homicide (E960-E978)	15.60	0.13	0.72*	8.88	0.42	0.68*	9.85	0.25	0.94	8.06	0.46	1.44*	16.64	2.05	1.59*	7.05	0.42	0.86	12.88	0.40	0.80*
	21.96	0.15	1.65*	51.24	0.85	0.84*	9.17	0.22	2.20*	5.33	0.31	1.90*	4.07	0.89	1.53	6.12	0.47	2.26*	31.28	0.48	1.38*

† Death rates are per 100,000 population and are age-adjusted by the direct method to the 2000 US standard population. SE = standard error. Rate ratio = ratio of cause-specific mortality rate for immigrants to that for the US-born. ref = reference category. \*p<0.05.

‡ US-born are individuals born in the 50 states, District of Columbia, Puerto Rico, and other US territories. Immigrants refer to those born elsewhere. Hispanic mortality data are for the 1989-91 period and are based on deaths to residents of 48 states and District of Columbia. For Connecticut, Louisiana, and Virginia, 1991 Hispanic deaths multiplied by a factor of 3 were used. Oklahoma and New Hampshire did not include Hispanic origin information on their death certificates during 1989-91. Oklahoma and New Hampshire together accounted for only 0.43% of the total US Hispanic population in 1990.

Mortality data for the other major Asian groups such as Asian Indians, Koreans, and Vietnamese were only available from 1992 onwards and for seven selected states. However, the rates could not be calculated for these groups because of lack of appropriate denominator data.

Source: National Vital Statistics System.

turation. However, more direct measures of acculturation, such as ethnic-cultural identity, social networks, language use, dietary preference, and acceptance by own group or the majority group, need to be considered.<sup>7,49</sup> Besides acculturation, other competing hypotheses such as "cultural pluralism," whereby groups retain significant ethnic and social ties to their cultural heritage, also need to be examined when explaining the better health status of some immigrant groups (e.g., second generation Asian and Hispanic subgroups in the United States).<sup>50</sup>

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TABLE IV

Average Annual Age-adjusted Death Rates† for Major Causes of Death by Nativity/Immigrant Status and Race/Ethnicity, US Women, 1986-1994

Cause of Death (ICD-9 Codes)	Total Population			Black			Asian/Pacific Islander			Chinese			Japanese			Filipino			Hispanic		
	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio	Rate	SE	Rate Ratio
All-Cause Mortality	763.73	0.26	ref.	993.08	0.95	ref.	474.28	3.64	ref.	416.30	7.89	ref.	384.19	4.55	ref.	375.24	16.58	ref.	628.00	3.07	ref.
All-Cause Mortality	670.86	0.73	0.88*	621.14	3.83	0.63*	472.54	2.09	1.00	454.99	3.59	1.09*	515.85	7.63	1.34*	370.64	4.17	0.99	516.50	2.61	0.82*
Infectious diseases Excluding HIV/AIDS (001-041,046-139)	10.76	0.10	0.93*	15.48	0.61	0.65*	9.77	0.30	1.17*	9.15	0.52	1.49*	10.56	1.20	1.70*	7.52	0.56	1.11	8.84	0.35	0.68*
HIV/AIDS (042-044)	1.89	0.05	0.81*	11.02	0.43	1.03	0.40	0.05	0.52*	0.28	0.08	0.26*	0.51	0.21	1.31	9.66	0.72	1.11	1.72	0.12	0.27*
Cancer (140-208)	150.39	0.37	0.85*	132.92	1.72	0.65*	106.73	0.93	0.88*	112.86	1.71	1.04	132.25	3.95	1.25*	78.80	1.68	0.94	114.60	1.22	0.84*
Esophagus (150)	1.43	0.04	0.77*	1.38	0.18	0.32*	1.10	0.10	1.69*	1.20	0.19	2.03*	1.60	0.48	2.71*	0.92	0.21	-	0.92	0.11	0.66*
Stomach (151)	7.11	0.08	1.92*	8.99	0.48	1.24*	9.06	0.28	1.02	7.97	0.46	1.91*	17.35	1.42	1.81*	3.27	0.36	0.96	5.32	0.26	0.77*
Colorectal (153-154)	18.97	0.13	0.91*	15.30	0.60	0.58*	11.46	0.31	0.74*	14.68	0.63	1.11	19.30	1.56	1.21	7.47	0.52	1.01	11.45	0.39	0.84*
Liver and intrahepatic bile duct (155)	8.53	0.10	1.72*	3.95	0.30	1.21*	6.96	0.24	1.98*	6.81	0.42	1.69*	8.84	0.98	2.82*	3.12	0.33	3.85*	4.38	0.24	1.24*
Lung and bronchus (162)	22.55	0.14	0.60*	11.58	0.52	0.31*	18.45	0.40	0.85*	24.42	0.80	1.10	21.24	1.58	1.42*	11.33	0.62	0.51*	12.88	0.41	0.73*
Breast (174)	26.63	0.16	0.81*	26.49	0.73	0.70*	12.72	0.28	0.63*	12.42	0.53	0.65*	11.54	1.02	0.66*	12.84	0.56	0.80	18.11	0.48	0.85*
Cervix uteri (180)	3.72	0.06	1.05*	5.83	0.34	0.72*	3.90	0.16	1.83*	3.11	0.26	1.47	2.95	0.45	2.46*	2.96	0.27	0.89	4.24	0.21	1.02
Diabetes (250)	16.71	0.12	0.86*	27.04	0.83	0.65*	13.10	0.35	0.80*	11.35	0.57	0.91	13.14	1.36	1.25	11.61	0.71	0.68	23.67	0.58	0.71*
Major cardiovascular diseases (390-448)	328.47	0.49	0.95*	298.62	2.73	0.66*	219.13	1.49	1.05*	205.86	2.51	1.06	229.59	5.20	1.44*	181.63	3.05	1.51*	236.28	1.82	0.88*
Respiratory diseases (460-519)	52.47	0.20	0.80*	35.48	0.96	0.63*	42.02	0.67	1.12*	42.28	1.17	1.32*	43.88	2.13	1.29*	32.29	1.35	1.36*	43.16	0.80	0.81*
Chronic liver disease and cirrhosis (571)	6.30	0.08	0.89*	4.69	0.31	0.46*	3.74	0.17	1.15	2.48	0.26	1.43*	5.91	0.77	1.80*	1.75	0.22	0.59	8.01	0.32	0.67*
Unintentional injuries (E800-E949)	20.12	0.17	0.88*	16.94	0.66	0.65*	18.91	0.40	1.49*	15.53	0.66	1.60*	18.41	1.46	1.78*	13.78	0.79	1.26	17.08	0.48	0.87*
Suicide (E950-E959)	4.33	0.07	0.88*	1.59	0.15	0.69*	4.84	0.17	1.55*	6.37	0.38	1.95*	6.80	0.77	2.25*	1.59	0.18	1.36	2.07	0.14	0.73*
Homicide (E960-E978)	3.90	0.07	0.97	6.88	0.35	0.54*	3.28	0.14	1.66*	2.37	0.30	1.19	2.17	0.37	1.54	2.31	0.24	1.18	4.05	0.20	0.88*

† Death rates are per 100,000 population and are age-adjusted by the direct method to the 2000 US standard population. SE = standard error. Rate ratio = ratio of cause-specific mortality rate for immigrants to that for the US-born. ref = reference category

\* p<0.05. - denotes insufficient data.

‡ US-born are individuals born in the 50 states, District of Columbia, Puerto Rico, and other US territories. Immigrants refer to those born elsewhere. Hispanic mortality data are for the 1989-91 period and are based on deaths to residents of 48 states and District of Columbia. For Connecticut, Louisiana, and Virginia, 1991 Hispanic deaths multiplied by a factor of 3 were used. Oklahoma and New Hampshire did not include Hispanic origin information on their death certificates during 1989-91. Oklahoma and New Hampshire together accounted for only 0.43% of the total US Hispanic population in 1990.

Mortality data for the other major Asian groups such as Asian Indians, Koreans, and Vietnamese were only available from 1992 onwards and for seven selected states. However, the rates could not be calculated for these groups because of lack of appropriate denominator data.

Source: National Vital Statistics System.

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## RÉSUMÉ

**Contexte :** La population immigrante des États-Unis a enregistré une croissance sans précédent au cours des trois dernières décennies, passant de 9,6 millions de personnes en 1970 à 32,5 millions en 2002. Cette hausse ne s'est toutefois pas accompagnée d'une surveillance accrue de la santé des immigrants. La présente étude examine la mesure dans laquelle les tendances en matière de santé, d'espérance de vie et de mortalité diffèrent, au cours de la vie, chez les Noirs, les Blancs, les Asiatiques et les Hispaniques nés aux États-Unis et à l'étranger.

**Méthode :** Grâce aux données du National Vital Statistics System (1986-2000) et de la National Health Interview Survey (1992-1995), nous avons examiné les différences dans les résultats sanitaires selon le lieu de naissance. Ces différences ont ensuite été analysées par régression logistique et à la lumière des taux de mortalité rajustés selon l'âge.

**Résultats :** L'espérance de vie des immigrants, hommes et femmes, était plus longue de 3,4 et de 2,5 ans, respectivement, que celle de la population née aux États-Unis. Comparés à leurs homologues nés aux États-Unis, les immigrants noirs, hommes et femmes, avaient une espérance de vie plus longue de 9,4 et de 7,8 ans, respectivement, mais l'espérance de vie des immigrants chinois, japonais et philippins était plus courte. Dans la plupart des groupes d'immigrants, les risques de mortalité infantile et d'insuffisance de poids à la naissance étaient plus faibles que dans la population née aux États-Unis. Conformément à l'hypothèse de l'acculturation, les risques d'incapacité et de maladies chroniques chez les immigrants augmentaient avec la durée de leur établissement aux États-Unis. Les tendances de mortalité liée au cancer et à d'autres maladies chroniques chez les immigrants et les Américains de naissance variaient considérablement; par exemple, les taux de mortalité liés aux cancers de l'estomac, du foie et du col utérin étaient considérablement plus élevés chez les immigrants asiatiques que dans la population née aux États-Unis. Toutefois, chez les immigrants, les taux de mortalité liés aux cancers du poumon, du côlon et du rectum, du sein, de la prostate et de l'œsophage, aux maladies cardiovasculaires, à la cirrhose, au diabète, aux maladies respiratoires, au VIH/sida et au suicide étaient beaucoup plus faibles.

**Interprétation :** La sélection des immigrants, le soutien social et les caractéristiques socio-économiques et comportementales pourraient expliquer les différences de santé entre les immigrants et la population née aux États-Unis.