



The “Hispanic mortality paradox” revisited: Meta-analysis and meta-regression of life-course differentials in Latin American and Caribbean immigrants' mortality

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ABSTRACT

The literature on immigrant health has repeatedly reported the paradoxical finding, where immigrants from Latin American countries to OECD countries appear to enjoy better health and greater longevity, compared with the local population in the host country. However, no previous meta-analysis has examined this effect focusing specifically on immigrants from Latin America (rather than Hispanic ethnicity) and we still do not know enough about the factors that may moderate the relationship between immigration and mortality. We conducted meta-analyses and meta-regressions to examine 123 all-cause mortality risk estimates and 54 cardiovascular mortality risk estimates from 28 publications, providing data on almost 800 million people. The overall results showed that the mean rate ratio (RR) for immigrants vs. controls was 0.92 (95% CI, 0.84–1.01) for all-cause mortality and 0.73 (CI, 0.67–0.80) for cardiovascular mortality. While the overall results suggest no immigrant mortality advantage, studies that used only native born persons as controls did find a significant all-cause mortality advantage (RR, 0.86; 95% CI, 0.76–0.97). Furthermore, we found that the relative risk of mortality largely depends on life course stages. While the mortality advantage is apparent for working-age immigrants, it is not significant for older-age immigrants and the effect is reversed for children and adolescents.

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1. Introduction

A large body of studies has suggested that immigrants may be healthier and experience lower mortality rates than non-immigrants in their country of origin and native-born residents in their country of destination. More specifically, many have reported a “Hispanic mortality paradox,”¹ where immigrants from Latin America and Caribbean countries to various Western countries

enjoy similar or better health outcomes and lower mortality rates compared with local populations in host countries. This phenomenon has been documented in the United States (Fang et al., 1996; Palloni and Arias, 2003, 2004), Australia (Young, 1986), and various Western European countries (Khlal and Darmon, 2003; Klinthall and Lindstrom, 2011; Mackenbach et al., 2005; Regidor et al., 2009). In addition, studies from Canada (DesMeules et al., 2005), the Netherlands (Mackenbach et al., 2005; Stirbu et al., 2006), and the United Kingdom (Balarajan and Bulusu, 1990; Marmot et al., 1984a; Wild et al., 2007) found lower mortality rates for Caribbean migrants compared to the native-born populations in these receiving countries. Caribbean immigrants to these countries are racially/ethnically diverse and include, in addition to Hispanics, individuals of Afro-Caribbean, Asian Indian, and Chinese descent (Cervantes-Rodriguez et al., 2009; Foner, 1998; Lindsay, 2001). As such, the Hispanic mortality paradox may extend to non-Hispanic migrants from Latin America and the Caribbean.

The apparent immigrant mortality advantage is paradoxical for a

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¹ The literature often uses Latin American and Hispanic interchangeably. Both terms are socially constructed ethnic labels used to designate individuals of either of Spanish descent or from Latin America and the Caribbean. Latin Americans have diverse national origins, cultures, and racial backgrounds (Rodriguez, Saenz and Menjivar, 2008). We use the “Hispanic mortality paradox” when referring to the literature that directly employed this term. The present study, in contrast, looks only at immigrants from Latin America and the Caribbean.

number of reasons. First, most Latin American and Caribbean immigrants to Western countries tend to originate from less developed countries, where they were likely to grow up in an environment with higher health risks (for example, due to the quality of water or the presence of toxic elements in food) compared with the native population in developed nations (Davey-Smith et al., 2000; Klinthall and Lindstrom, 2011). Second, lower socioeconomic status has often been linked to poorer health, greater morbidity, and a higher risk of mortality. Immigrants in general, and Latin American and Caribbean immigrants more specifically, tend to have a lower socioeconomic status. Language barriers can also create difficulties in accessing high-status employment and adequate healthcare. It is therefore surprising that they would nevertheless enjoy lower mortality rates (Abraido-Lanza et al., 1999; Klinthall and Lindstrom, 2011). Finally, from a stress perspective, immigration may be detrimental to health because it may be associated with a culture shock and with greater physical distances from family and friend support networks (Guillot et al., 2011; Popham and Boyle, 2011).

While multiple studies have documented the immigrant mortality paradox, questions still abound regarding the validity of the data on which such studies rely and the pervasiveness of the phenomenon across various geographical locales, different racial/ethnic groups, and sociodemographic characteristics. Indeed, some studies have reported a lack of association or even a reverse association between immigration from Latin American and Caribbean countries and mortality risks (Maxwell and Harding, 1998; Rosenwaike, 1987; Stirbu et al., 2006; Uitenbroek and Verhoeff, 2002). Such contrasting results suggest the need for a meta-analysis that may help in assessing the current state of knowledge.

While a number of narrative literature reviews have been performed on this subject (e.g. Markides and Eschbach, 2005; Palloni and Morenoff, 2001; Vang et al., 2015), we are unaware of any quantitative meta-analysis that examined the relationship between Latin American and Caribbean immigration to OECD countries and mortality. Former meta-analyses in this field have looked at the relationship of immigration with suicide rates (Voracek and Loibl, 2008) and of Chinese immigration to the West with coronary heart disease (Jin et al., 2015). Closer to the design of the current study, Ruiz et al. (2013) conducted the first quantitative meta-analysis of the Hispanic mortality paradox. They compared Hispanics in the United States (both immigrants and non-immigrants) to other racial groups and found a 17.5% lower mortality rate for the Hispanic population.

In the current study, we extend these research efforts in three important ways. First, we focus on immigrants from Latin America and the Caribbean rather than Hispanics as an ethnic group, as we believe that the process of immigration itself needs to be isolated from other demographic population characteristics. Moreover, by examining Latin American and Caribbean migrants, we can assess whether the Hispanic mortality advantage is applicable to ethnically diverse migrant populations from the region. Second, we examine immigration to multiple Western countries, rather than only to the United States, seeking to test whether immigrants' mortality risks differ by host country. Finally, and importantly, we use sub-group meta-analyses and meta-regression techniques to explore moderating factors in the relationship between immigration and mortality. DesMeules et al. (2005) note that current research on the health of immigrant subgroups tends to be piecemeal, with individual studies often reporting on only one or a few sub-groups at a time (e.g. a specific age group of immigrants residing in a specific locale).

Meta-analysis and meta-regression techniques allow us to leverage recurring differences between the sampling frames already examined in a large range of existing studies. This analytic

design therefore enables direct tests of multiple potential mediating and moderating factors. In addition to country of origin and destination, we are therefore able to assess basic demographic moderators, such as age and gender. Importantly, our analytic strategy allows us to compare different studies in terms of their choice of comparison group and whether they utilized national mortality records. Importantly, we find that such study design characteristics often explain why some previous research has reported an immigrant mortality advantage, while others report weak or non-existing relationships.

2. The immigrant mortality paradox: theoretical explanations

The literature offers a few prominent explanations for the commonly-reported "Hispanic mortality advantage." We extend these explanations to address the Latin American and Caribbean immigrant mortality advantage. According to Abraido-Lanza et al. (1999), these explanations may be divided into two broad categories. The first category assumes that the lower mortality rates do not reflect actual differences in health and mortality, but rather are the result of data artifacts, such as reporting bias, and migratory factors such as selective in- and out-migration. The second class of explanations proposes that study findings may in fact reflect an actual difference in health and mortality rates between immigrants and native-born populations. For these, health/mortality differences results from variations between immigrants and non-immigrants in factors such as genetic racial resilience, nutrition, health behaviors, and social support networks. We elaborate on each of these approaches below.

Palloni and Arias (2004) efficiently summarize the major problems related to reporting and data bias that may lead to an illusion of an immigrant mortality advantage. They suggest three likely data artifacts that may produce the appearance of an advantage: (1) problems in ethnic identification on death certificates, (2) misreporting of ages (some immigrants tend to overstate their age, leading to a depression of mortality rates in older ages), and (3) the mismatching of records, leading to downward biases in mortality rates.

Another mechanism that may explain immigrants' health and mortality advantages is the selective nature of international migration. Selection can occur at the individual and at the state level (Vang et al., 2015). At the individual level, scholars have suggested two main hypotheses, the "healthy migrant effect" for initial migration and "Salmon Bias" for return migration. The former postulates that individuals who are healthy and can withstand the journey are more likely to migrate (Palloni and Arias, 2004; Sorlie et al., 1993; Kimbro, 2009). The latter suggests that some foreign-born individuals return to their country of origin following morbidity, which artificially lowers mortality rates (Abraido-Lanza et al., 1999; Turra and Elo, 2008). As for state-level selection, many receiving countries impose selective admission policies for immigrants, which generally favor individuals with host language proficiency, higher education, professional skills, and good health (Chiswick et al., 2008; Gushulak, 2007; Llacer et al., 2007).

While data bias and selective migration explanations seem quite plausible, some scholars have argued that the immigrant mortality advantage cannot be fully accounted for by these tendencies (Palloni and Arias, 2004; Razum et al., 2000). They suggest that the mortality advantage for Latin American and Caribbean immigrants may also be the result of various factors that differentiate immigrants from host-country natives. These factors may include genetic racial resilience (Abraido-Lanza et al., 1999; Ruiz et al., 2013; Voracek and Loibl, 2008) and various social and cultural characteristics (Palloni and Arias, 2004).

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