Research on the migrant mortality advantage typically ignores age variations. For the most part, mortality ratios for foreign-born vs. native-born individuals are documented over open-ended or broad age groups\(^1\text{-}^5\). This lack of age detail is due in part to the increasing reliance on Cox proportional hazard models which make the assumption that relative risks are constant over age. Poisson regression models that simply control for age (i.e., age-adjusted risk ratios), or comparison of life expectancies, also hide possible age variations in mortality ratios.

As a result of this lack of age detail, conclusions about the existence and scale of the migrant mortality advantage are often made without any reference to age. This gives the impression that relative to the native-born population, migrants exhibit a mortality risk ratio that remains constant over age. Likewise, theories and explanations for migrant relative mortality are discussed with little or no reference to age. For example, when discussing the role of migrant selection at entry for explaining the migrant mortality advantage, little or no reference is made to the fact that migrant selection may be very different, say, between a 10-year old individual who migrated to a receiving country through family reunification, a 25-year old unmarried individual who migrated for work-related reasons, or an older individual who may join children living abroad\(^6\text{-}^7\). Data quality explanations are also often discussed as if they operated equally at every age, even though such explanations may not be equally relevant at all ages.

In reality, relative migrant mortality may vary greatly over age. Certain migrant groups who, on average, exhibit a mortality advantage, have been shown to exhibit excess mortality at certain ages. This is the case, for example, of certain migrant groups in France\(^8\). Even if risk ratios remain consistently below 1.00, there can be a large amount of variation, as shown in a study of foreign-born Latinos in the US\(^9\). It is clear from these examples that mortality risk ratios calculated over broad age groups can hide a large amount of age variation.

It is important to document age patterns of relative migrant mortality, because such age variation can be informative about the underlying mechanisms explaining why the mortality of migrants differ from that of non-migrants. For example, if migrant selection at entry is the main explanation for the migrant mortality advantage and if its effects on mortality tapers with duration of stay in the host country, we would expect the migrant mortality advantage to be smaller at the ages where there is little in-migration or at the ages where most migration is the product of family reunification. That is, migrant selection at entry is expected to produce a specific age pattern of mortality ratios which may not appear in the data, even if the overall mortality ratios are consistent with this explanation. Rather than testing hypotheses for the migrant mortality advantage in reference to overall levels of relative mortality, it is critical to test...
such hypotheses in reference to age variations in these relative risks. So far, there has been no attempt in the literature to accomplish this task in a systematic and comprehensive manner.

In this paper, we will first examine typical age variations in foreign-born vs. native born mortality ratios, using data from France and the US. Our methodological approach will rely on unlinked death registration and census data, by sex and region/country of origin, by five-year age group from ages 5-9 until ages 85-89, for the period 2000-2010. (The age group 0-4 will be ignored due to the small number of foreign-born individuals at these ages.) We focus here on unlinked census and death registration data, rather than on linked data sets, because this analysis requires large numbers of foreign-born individuals in order to detect age variation of relative migrant mortality by sex and country of origin with a sufficient level of precision. We will calculate mortality ratios by region/country of origin to examine the extent to which age patterns follow regularities or are highly specific to the region/country of origin.

Second, we will examine each of the four main hypotheses that have been proposed in the literature for explaining the migrant mortality advantage: (1) data quality issues; (2) migrant selection at entry; (3) migrant selection at exit; and (4) cultural effects. For each explanation, we will discuss expectations as to whether it should generate an increase, a decrease, or no change in relative mortality over the life course. Whenever possible, these expectations will be substantiated by additional data documenting underlying mechanisms for age variation, including information on the age pattern of in- and out-migration and on the age pattern of mortality in countries of origin.

Finally, typical age patterns of migrant relative mortality found in France and the US will be examined in light of the theoretical framework discussed above. We will discuss which explanations are consistent with observed age patterns, and which explanations are not. We will pay particular attention to explanations that are consistent with overall risk ratios but that do not hold once age variation in risk ratios is taken into account.

Preliminary results for the entire foreign born population in France and the US in 2000, shown in Figure 1, suggest that migrant relative mortality ($nM_{\text{Foreign-Born}} / nM_{\text{Native-Born}}$) varies with age according to some regularities. Even though the level of migrant relative mortality is quite different in the US vs. France, both countries exhibit a similar age pattern of relative mortality, with a fast decline in the risk ratio from age 15 to about age 45, followed by a gradual increase in the risk ratio, from age 45 until about age 80. These regularities suggest that similar underlying mechanisms are operating in both countries. Age patterns by country/region of origin will confirm whether such regularities apply to all foreign born individuals, or whether patterns vary greatly by country/region of origin.
Figure 1
Mortality Ratios of Foreign-born vs. Native-born populations ($n_{x}^{\text{Foreign-Born}}/n_{x}^{\text{Native-Born}}$) in France and the US, Males, 2000

Source: Unlinked death registration and census data.
References


