Impact of the Covid-19 epidemic on immigrant cause-specific mortality in Spain: a penalty beyond Covid-19

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Introduction & Background

Most immigrant groups show lower mortality than their native counterparts in Europe and the United States, despite a lower socioeconomic status. This fact, that has often been labeled as a "paradox" (Palloni & Arias 2004), is known as the Migrant Mortality Advantage (MMA). Its main cause is selection effects, as immigrants are not a random sample of the population in the country of origin, but are rather a selective group based on health, education and other characteristics (Feliciano 2020). Other factors contributing to the MMA could be negative selection at return (the so-called "salmon bias"), differential health behaviors or data artifacts.

However, immigrants typically have a higher vulnerability to infectious diseases (Bakhtiari 2022) that is rooted in their social status and the labor, residential and healthcare access conditions that it implies. In fact, during the first stages of the Covid-19 epidemic, immigrants showed higher increases in mortality than their native counterparts in many European countries, as well as in the United States (Paglino & Elo 2024). This disproportionate impact of the epidemic provoked a reduction, a disappearance or even a reversal of the migrant mortality advantage for certain immigrant groups (mainly of Sub-Saharan African origin) in a number of European countries (Aldea 2022, Khlat et al. 2022).

In Spain, immigrants from Africa, Asia and Latin America suffered more strenuous increases in all-cause mortality than the Spanish-born during the year 2020 (Aldea 2022). Though 2020 was the worst epidemic year in Spain (over 60 thousand Covid-19 deaths), there were more than 30 thousand Covid-19 deaths in both 2021 and 2022, and the number of excess deaths increased in 2022 respective to 2021 (44 vs. 32 thousands).

In light of this, this paper aims to help answer a number of research questions that may apply not only to Spain, but to immigrant mortality in Western countries more generally. First, whether immigrants have regained their pre-epidemic mortality advantage or, more generally, whether the Covid-19 epidemic constitutes a short episode, or rather a lasting disruption of immigrant mortality patterns. Second, how non-Covid-19 causes of deaths were impacted during the epidemic due to social and healthcare disruptions, and to what extent those impacts were different between immigrant and the natives. Finally, to inquire about the potential explaining mechanisms of differential mortality between immigrants and natives, using age, sex and cause of death decomposition.

Data & Methods

I use individual population records from the Spanish register from 2015 to 2023, which are exhaustive for residents in the country. Also, exhaustive individual death counts with cause of death from 2015 to 2022 were employed. Those include country of birth, place of death and residence, and cause of death according to ICD-10 classification. Both datasets (population and death records) are unlinked, so longitudinal analyses are not possible. Four principal groups of

countries of birth were considered for immigrants, partially determined by the composition of the immigrant population in Spain. Those are Europe, Morocco, Latin America, and the rest of Africa and Asia. Those groups were eventually further divided for some analyses.

I computed standardized death rates (SDR) and life expectancies (LE) at different ages by year, sex and group of countries of birth. Those were decomposed by age and cause of death contributions following the decomposition method introduced by Horiuchi et al. (2008).

Moreover, Poisson models were computed in order to obtain statistically robust estimates of mortality levels of immigrants relative to the native-born, but also variations in mortality within a group of origin and by cause of death.

Preliminary results

Increases in mortality of the Spanish-born during the epidemic period are almost solely due to Covid-19. All other causes of death are not significantly affected, save a slight decrease in respiratory diseases.

European immigrants suffer similar increases in mortality than the native-born during the epidemic period. They show no significant variations in relative mortality by the main causes of death, and mortality by Covid-19 does not differ notably from that one of the Spanish-born.

On the other hand, Latin American-born males and African-born males and females suffer life expectancy losses of more than 2.2 years (at 20 years old) during the epidemic period, compared to 0.8-0.9 years for the native-born. Generally, all non-European immigrant groups show higher Covid-19 mortality than the native-born at ages 40-59 and over 60 years old. This is also the case for Latin American immigrants at ages 20-39. This reduces or reverses mortality advantages for those groups.

There are notable increases in non-Covid-19 mortality relative to the native-born for non-European groups during the epidemic. Those include cardiovascular diseases for the Moroccan-born and the Asian-born, cancer for all non-European groups (particularly for African-born females), or endocrine diseases for Moroccan-born females and African-born males.

At ages 20-39, immigrants from Morocco, Africa and Asia suffer strong relative increases in mortality by external causes (Figure 1). Though this does not have a major effect on life expectancy at 20 years old (as it concerns relatively young ages), it disrupts mortality relative to the native-born for those immigrant groups at ages 20-39: the magnitude of the overall mortality disadvantage of the African-born is doubled (Figure 1), while the pre-epidemic mortality advantage of the Moroccan- and Asian-born is reversed.

Discussion

The results suggest a double penalty for non-European immigrants compared to natives in terms of mortality during the Covid-19 epidemic. First, immigrants from Morocco, Africa, Asia, and Latin America suffered higher Covid-19 mortality than natives at ages starting from 40 years old. This higher impact of Covid-19 is noticeable as well for Latin American immigrants at ages 20 to 39.

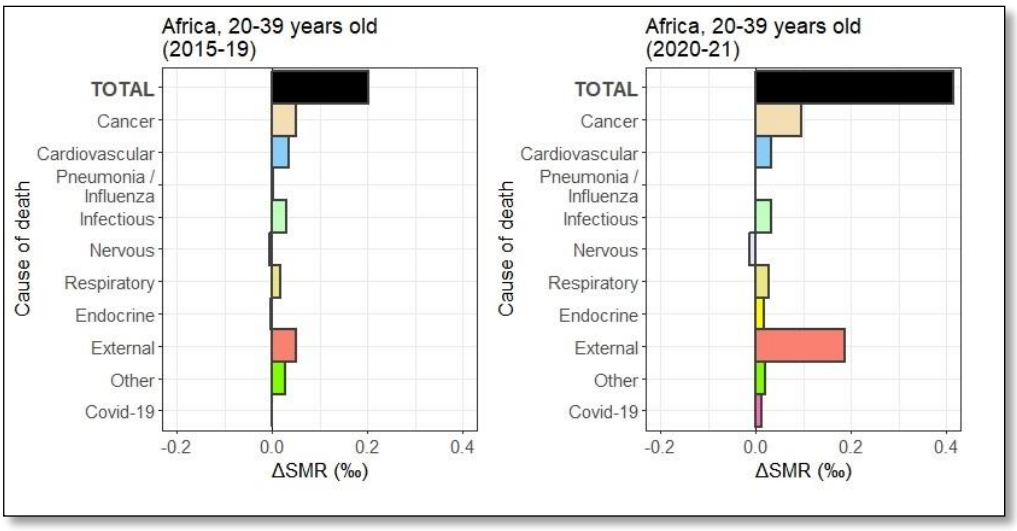

Figure 1. *Differences in age- and sex-standardized mortality rates between immigrants born in Africa (except Morocco) and the Spanish-born by cause of death. 2015-2019 (left) and 2020-2021 (right).*

Second, non-European immigrants suffered, during the epidemic period, increases in mortality relative to the natives at ages below 60 in other causes such as cancers, external causes, endocrine or cardiovascular diseases. The case of external causes at ages 20-39 within immigrants from Morocco, and Africa and Asia is particularly salient: those groups present an unprecedented and significant mortality disadvantage (all causes considered) at those ages in 2020-2022 due to the aforementioned disruption of external causes deaths. Moreover, at ages 40-59, all non-European groups of immigrants experienced a reduction in their advantage by cancer mortality during the epidemic period.

As a consequence, non-European immigrants have not retrieved their pre-epidemic mortality advantage as of 2022. All adult ages contribute to the persistency of these increased relative mortality levels starting from 2020.

These results are comparable to those from the United States for 2020 (Paglino & Elo 2024), in which immigrants experienced not only higher Covid-19 mortality than their native counterparts, but also saw their mortality advantage due to non-Covid-19 causes decrease. This could be partially due to underreporting of Covid-19 as the cause in death certificates, but also to changes in other non-Covid-19 causes.

Concerning Covid-19, the higher vulnerability of non-European immigrants can be explained by social factors leading to a higher risk of infection: higher presence among frontline workers, more use of public transportation, presence in densely populated areas and more crowded and intergenerational households (Gosselin et al. 2022). Though a higher prevalence of co-morbidities that could increase Covid-19 lethality has been reported in other countries among immigrant populations, the last National Health Survey in Spain does not indicate so. Although vaccination rates were high in Spain (80 % of the population was completely vaccinated at the end of 2021), some immigrants could have experienced problems to access it, as vaccination was conditional on being registered in the Social Security system.

The relative increase in some non-Covid-19 causes of death among young adult immigrants from Morocco, Africa and Asia might be the result of the set of social aftermaths of the epidemic, including severe lockdowns, curfews, and a rise in unemployment rates in specific sectors. In addition, access to healthcare for the prevention and treatment of non-Covid-19 morbid conditions might have been impacted by the epidemic, non-European immigrants typically experiencing more strenuous difficulties in healthcare access.

In summary, this paper points out the mortality burden of the epidemic for non-European immigrants in Spain, and their double social vulnerability. On one hand, their pre-epidemic social conditions increased their vulnerability to Covid-19. On the other, the social and healthcare crisis caused by the epidemic increased their mortality by non-communicable and external causes relative to the native-born.

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