

Differences in Healthy Life Expectancy between Migrants and Natives in Germany: a Multistate Life Table Approach

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Introduction

Migration and population ageing intersect to shape the health profile of older adults in Germany. While migrants often exhibit longer life expectancy (LE) than natives, a phenomenon known as the Migrant Mortality Advantage (MMA), they also tend to report poorer health. This paradox of living longer but in worse health poses a challenge for understanding the processes underlying morbidity and mortality inequalities in ageing societies. The combination of a growing stock of older migrants and the health demands associated with ageing makes understanding these dynamics crucial for public health and social policy. Most previous studies have relied on the Sullivan method to estimate healthy life expectancy (HLE), which combines age-specific mortality and prevalence of poor health to estimate the average number of years lived in good health. However, this method assumes stationary prevalence, no recovery, and identical mortality for healthy and unhealthy individuals, assumptions rarely met in reality. To address these limitations, we apply a multistate life table approach to the German sample of the Survey of Health, Ageing and Retirement in Europe (SHARE). This method allows explicit modelling of transitions between health states and death, producing less biased estimates of HLE and decomposing the differences between natives and migrants. Our research question is: to what extent do life expectancy (LE) and healthy life expectancy (HLE) at age 50 differ between migrant and native women in Germany, and how do the different transitions between health statuses and death contribute to these differences?

Data and Methods

We used data from waves 4 to 7 of SHARE (2012–2018), which provide harmonised, longitudinal information on health, socioeconomic conditions, and mortality for adults aged 50 and over in Europe. To minimise the impact of the COVID-19 pandemic, we excluded later waves. The analysis focuses on women residing in Germany, classified as migrants if born outside the country. The analytic sample includes 9,624 person-years after excluding respondents with missing information on self-rated health (SRH) or migration status.

Health was measured through SRH, categorised into two states: healthy (excellent, very good, or good) and unhealthy (fair or poor). Death was treated as an absorbing state. Transitions between states were estimated using multinomial generalised additive models (GAMs) with penalised B-splines for age, including covariates for origin health state and migration status. Transition probabilities were derived separately for native and migrant women and used as input for discrete-time multistate life tables implemented in the R package *dtms* (Dudel & Li, 2024). We calculated life expectancy in

healthy (HLE), unhealthy (ULE), and total (LE) states at age 50. Differences in expectancies were decomposed by age and transition type, i.e. incidence (healthy→unhealthy), recovery (unhealthy→healthy), and death, using the continuous-change decomposition method of Horiuchi et al. (2008).

Results

For the sake of space in this extended abstract, we limit our findings to women. The results for men are similar. Table 1 presents the estimated healthy (HLE), unhealthy (ULE), and total life expectancy (LE) at age 50 for native and foreign-born women. Foreign-born women have a slightly higher total life expectancy than their native counterparts (33.1 vs. 32.3 years), but they spend a smaller fraction of these years in good health (13.2 vs. 15.9 years).

	HLE	ULE	LE
Native	15.94	16.34	32.28
Foreign-born	13.16	19.91	33.08

Table 1 : Healthy Life Expectancy (HLE), Unhealthy Life Expectancy (ULE) and total Life Expectancy (LE) for women by migration background in Germany. The estimate correspond to the average between the two possible initial states at age 50.

Source: own computations, data from SHARE

Figure 1 shows the transition probabilities over age. With increasing age, the probability of remaining healthy declines, while transitions to poor health rise until age 90 until they are overcome by death. Mortality probabilities from both health states follow the expected exponential increase with a significant gap between healthy and unhealthy individuals. Migrant women exhibit slightly lower mortality but higher incidence rates and lower recovery rates, reflecting their mortality advantage and morbidity disadvantage.

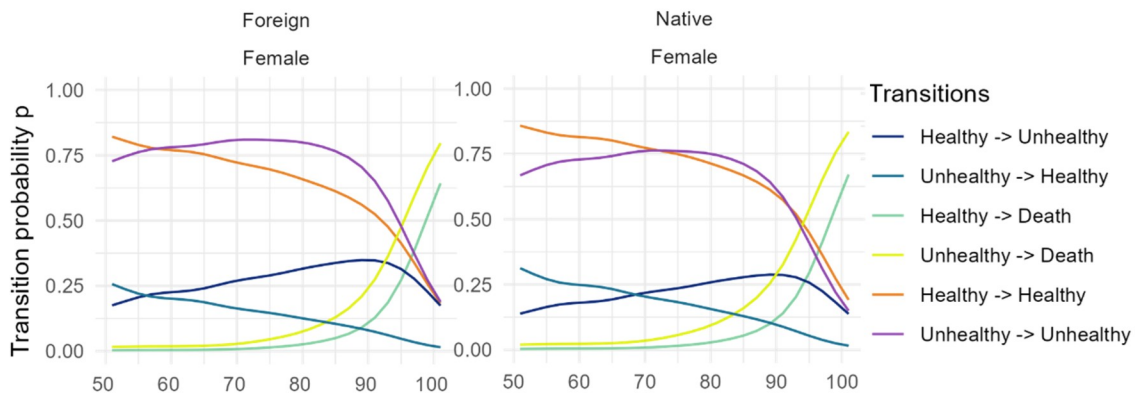


Figure 1: Predicted transition probabilities from a multinomial-logistic generalised additive model with p-splines

Source: own computations, data from SHARE

The decomposition analysis (Figure 2) reveals that foreign-born women's shorter HLE is explained for two thirds by higher incidence (−1.92 years) and for half by lower recovery (−1.43 years). Differences in mortality, particularly among unhealthy individuals (which could be influenced by selective return migration in case of imperfect mortality follow-up), contribute positively but modestly to narrowing this gap. These inequalities weigh particularly heavily in the years below retirement but are consistent across all ages. The migrant disadvantage in terms of recovery seems to peak around age 60.

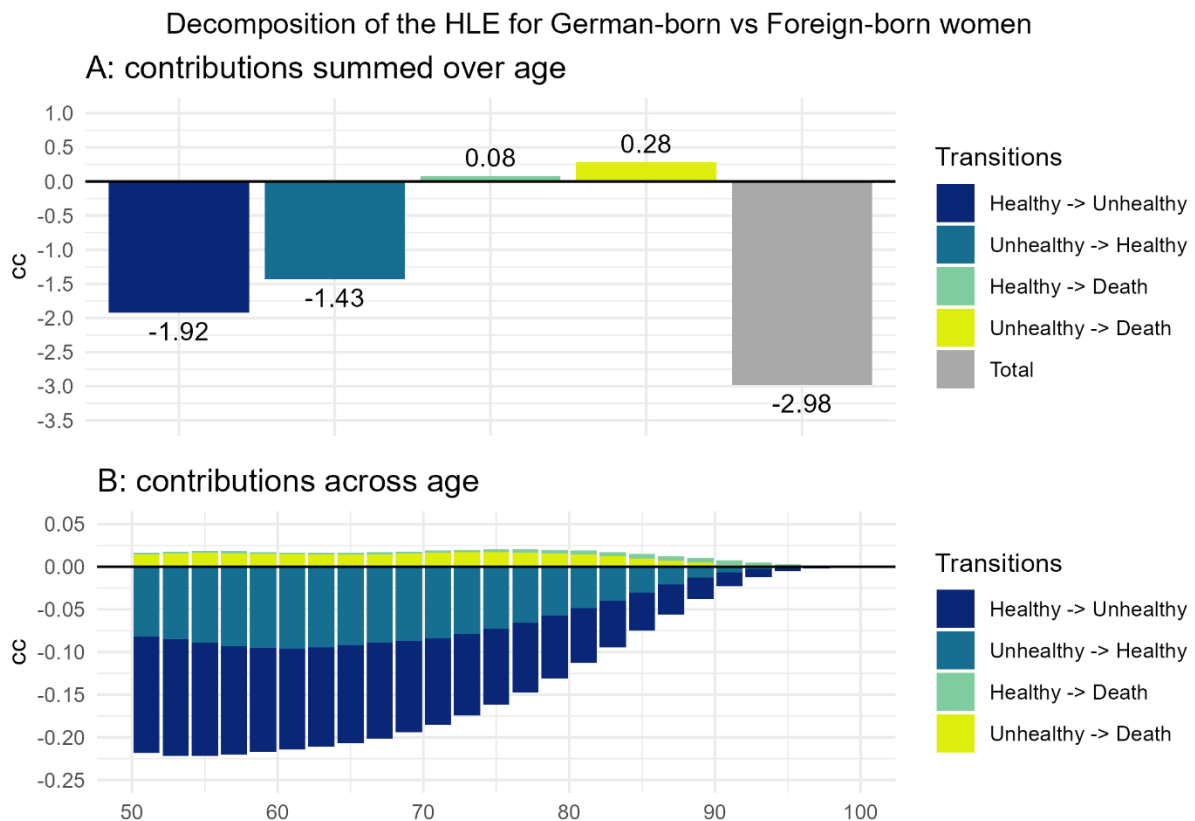


Figure 2: Decomposition of Healthy Life Expectancy for women
Source: own computations, data from SHARE

Discussion and Conclusion

Our findings provide new evidence on the duality of migrant health in Germany: a mortality advantage but a morbidity disadvantage. As expected based on previous studies, migrants live slightly longer than natives but spend a higher proportion of their later years in poor health. This aligns with findings from other European countries (Reus-Pons et al., 2017; Solé-Auró & Crimmins, 2008). Thanks to the use of multistate life tables, we were however able to study the contribution of each transition type to this paradox. In that respect, the decomposition analysis shows that higher risks of health deterioration (incidence) and lower recovery rates explain relatively equally the difference in HLE, while lower mortality among unhealthy migrants explains their survival advantage.

These results suggest that post-migration conditions, such as socioeconomic inequalities, occupational exposures, discriminations, and limited access to preventive healthcare, play a greater role than selective migration or return migration in explaining the paradox of simultaneous migrant mortality advantage and migrant morbidity disadvantage. The healthy immigrant and salmon bias hypotheses are insufficient to explain longer durations in poor health. Instead, cumulative disadvantage across the life course may better account for prolonged unhealthy life expectancy.

From a policy perspective, the findings underscore the need to tailor healthcare and prevention strategies to older migrant women, particularly regarding chronic disease management and recovery. Reducing exposure to adverse working and living conditions, improving access to rehabilitation and mental health care, and addressing language barriers in healthcare systems could, for instance, help mitigate these disparities.

References

- Abraído-Lanza, A. F., Dohrenwend, B. P., Ng-Mak, D. S., & Turner, J. B. (1999). The Latino mortality paradox: A test of the 'salmon bias' and healthy migrant hypotheses. *American Journal of Public Health*, 89(10), 1543–1548.
- Dudel, C., & Li, P. (2024). *dtms – An R package for discrete-time multistate models*. <https://github.com/christiandudel/dtms>
- Horiuchi, S., Wilmoth, J. R., & Pletcher, S. D. (2008). A decomposition method based on a model of continuous change. *Demography*, 45(4), 785–801.
- Reus-Pons, M., Kibele, E. U. B., Janssen, F., & Strand, B. H. (2017). Differences in healthy life expectancy between migrants and non-migrants in three European countries over time. *International Journal of Public Health*, 62(5), 531–540.
- Solé-Auró, A., & Crimmins, E. M. (2008). Health of immigrants in European countries. *International Migration Review*, 42(4), 861–876.