When migration wears you down: insights on health decline from Italy

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Introduction

International migration is increasingly recognized as a major determinant of health inequalities across Europe (Rechel et al., 2013). Migrants' health trajectories reflect a complex interplay of factors operating before departure, during the migration journey, and after settlement in the host country. Understanding how migrants' health evolves across these phases is crucial for identifying mechanisms of health advantage or disadvantage and for informing public health and integration policies. However, this task remains challenging due to limited longitudinal and pre-migration health data.

Despite having lower socioeconomic status and facing greater barriers to healthcare access (Allegri et al., 2025), migrants often exhibit better health and lower mortality rates than native-born populations (Ruiz et al., 2013). Several mechanisms have been proposed to explain this advantage. The *healthy immigrant effect* suggests positive health selection (McDonald & Kennedy, 2004; Wallace & Wilson, 2019; Ichou & Wallace, 2019), while the *salmon bias effect* attributes it to selective return migration among less healthy individuals. A further explanation, the *data artefact effect*, links apparent advantages to inaccuracies in population and mortality data (Wallace & Wilson, 2022). Nonetheless, evidence indicates that the health advantage persists even when accounting for these biases (Di Napoli et al., 2021; Wallace & Wilson, 2022).

The health advantage, which is usually more pronounced upon arrival, is not permanent. Over time, the health of migrants tends to deteriorate (Loi & Hale, 2019). This phenomenon is known as the 'exhausted migrant effect' (Bollini & Siem, 1995). This decline is mainly caused by three factors (Beiser, 2005). First, negative acculturation in health (Abraido-Lanza et al., 2006; Riosmena et al, 2013): migrants often abandon the protective health behaviours of their cultures of origin and adopt unhealthy habits, such as a poor diet, inactivity, smoking and drinking (Riosmena et al., 2013). This leads their health to align with that of the native population (Kennedy et al., 2015; Loi & Hale, 2019; Loi et al., 2025). Second, resettlement stress: health deteriorates due to challenges such as precarious employment, unemployment, poor housing, limited social networks and restricted access to healthcare and low health literacy (Wilkinson & Marmot, 2003; Allegri et al., 2025). Third, the interaction between personal characteristics (e.g. genetic predispositions) and environmental factors (e.g. discrimination, language barriers, homesickness and loss of community) experienced by migrants (Cela & Barbiano di Belgiojoso, 2021; Loi et al., 2025) further affect migrants' health.

Building on this background, the present study investigates the *exhausted migrant effect* among migrants in Italy using data from the MIGHTY Survey (2025). It examines changes in self-rated health, comparing migrants' health before migration from the country of origin with health at the time of the interview. Although the cross-sectional nature of the data and potential recall bias, this study provides rare insight into migrants' pre-migration health, offering new evidence on migrants' health trajectories and the mechanisms underlying health deterioration over time among migrants in Italy.

Data and Methods

The data comes from a cross-sectional survey (MIGrants' HealTh and healthcare access in ItalY - MIGHTY) carried out between November 2024 and February 2025 in two Italian Regions: Lombardy (NUTS - ITC4) and Marche (NUTS- ITI3). The questionnaire investigates different aspects of health (physical and mental health, prevention, dental health and lifestyle) and healthcare access or barriers for foreign population, as well as their personal characteristics. The sampling has been selected adopting the Center Sampling Methodology which is a statistical sampling method tailored for surveys targeting hard-to-reach populations and contexts lacking adequate sampling frames to cover the entire population, including irregular and naturalized immigrants (Baio et al., 2011). The target population are individuals aged 18 or older having a foreign-citizenship (included undocumented) or foreign-born with Italian citizenship. The survey has been conducted using CAPI and the LimeSurvey platform. For further details of the survey see the available documentation[1].

To analyse changes in self-rated health over time, we apply a random-effects ordinal logistic regression. This approach was chosen because the dependent variable "self-rated health" (SRH) is measured on a 5-point scale (1 = very good, 5 = very bad), which is ordinal and does not assume equal distances between adjacent categories. Traditional paired nonparametric tests (e.g., Wilcoxon, McNemar) are useful for simple before/after comparisons but are not appropriate for this setting because they either collapse the outcome or implicitly treat differences as exchangeable; crucially, they do not address the ordinal nature of the outcome while simultaneously accounting for within-person correlation and covariates. To avoid assuming equal distances between adjacent categories (i.e., that the step from 1→2 equals 4→5), we use an ordinal regression framework that models cumulative probabilities on a latent health scale. Specifically, the random-effects ordinal logistic regression (1) respects the ordinal measurement by modelling cumulative logits, (2) explicitly accounts for non-independence of observations through a subject-level random intercept, and (3) does not require interval scaling of the categories. The model estimates the log-odds of reporting worse health as a function of time (pre-migration – *reference*, post-migration), age group (18-24 – *reference*, 25-34, 35-49, 50-64, 65+), sex (men – *reference*, women), marital status (single – *reference*, partnered, divorced/widowed), education (no/primary – reference, lower-/upper-secondary, tertiary), and duration of stay in the host country (<=10 years – *reference*, >10); the inclusion of random intercept captures unobserved, time-invariant heterogeneity across individuals. Model estimates are reported as odds ratios (OR); for sake of interpretation, we also compute adjusted predicted probabilities of reporting worse health, holding other factors constant.

Preliminary results

Table 1 presents the OR from a random-effects ordinal logistic regression model estimating the probability of reporting poor self-rated health (coded from 1 = "very good" to 5 = "very poor"). The model accounts for the ordinal nature of the dependent variable and repeated measures on the same individuals.

Table 1 shows that migration is strongly associated with increased odds of being in worse health, indicating a deterioration in health over time following migration. Results show also a clear age gradient: compared to young adults (18–24 years), older age groups show significantly higher odds of being in worse health categories. The effect is strongest for the elderly (65+ years). Women have higher odds of being in worse health categories compared to men. Results also show the protective effect of partnership over time, specifically, being married or cohabiting is associated with better

[1] https://github.com/QmLHS/Demography/tree/main/MIGHTY

health compared to being single. Furthermore, a strong educational gradient emerged: compared with individuals with no or only primary education, those with lower- or upper-secondary, or tertiary education had substantially lower odds of being in worse health categories. Duration of stay in the host country was not significantly associated with health status.

Finally, the model estimates four cut-points that define the boundaries between the ordered health categories. These cut-points represent the log-odds thresholds separating adjacent health categories for individuals at the reference levels of predictors. While they are not interpreted substantively, they are necessary for modelling the ordered outcome.

Table 1. Odds ratios from random-effects ordinal logistic regression of SRH

SRH		**OR**	**p-value**
Time (ref. Pre-migration)			
	Post-migration	3.20	0.000
Age group (ref. 18-24)			
	25-34	1.95	0.000
	35-49	3.68	0.000
	50-64	8.48	0.000
	65+	11.02	0.000
Sex (ref. Men)			
	Women	1.30	0.006
Civil status (ref. Single)			
	Married/Cohabiting	0.66	0.001
	Divorced/Widowed	1.23	0.262
Education (ref. No/Primary)			
	Lower-upper secondary	0.22	0.000
	Tertiary	0.11	0.000
Duration of stay (ref. <= 10 years)			
	> 10 years	0.94	0.687
		log-odds	**SE**
/cut 1		-0.99	0.233
/cut 2		2.55	0.240
/cut3		4.83	0.256
/cut4		6.74	0.297
ID			
var(_cons)		3.22	0.258

Note: OR greater than 1 indicate higher odds of being in a worse health category (given that 1 = very poor health and 5 = very good health).

Table 2. Predicted probabilities of self-rated health categories before and after migration

	Margin	**p-value**	**95% CI**	
Very good - pre-migration	0.43	0.000	0.408	0.443
Very good - post-migration	0.27	0.000	0.251	0.280
Good - pre-migration	0.44	0.000	0.430	0.459
Good - post-migration	0.49	0.000	0.479	0.508
Fair - pre-migration	0.10	0.000	0.094	0.111
Fair - post-migration	0.18	0.000	0.165	0.189
Bad - pre-migration	0.02	0.000	0.018	0.026
Bad - post-migration	0.05	0.000	0.042	0.056
Very bad - pre-migration	0.01	0.000	0.004	0.007
Very bad - post-migration	0.01	0.000	0.011	0.019

Note: Marginal effects derived from the random-effects ordinal logistic regression model. Probabilities refer to the likelihood of reporting each self-rated health category (1 = very bad, 5 = very good) before and after migration.

The results presented so far show the determinants of the change in the probability of worse health, but they do not directly provide the absolute probability of being in a specific health category. Using marginal predictions from the model, the probability of reporting worse health (categories 3,

4 or 5) increases after migration, highlighting that the overall likelihood of being in poorer health rises over time. These predicted probabilities complement the regression results by showing the absolute risk in each category, rather than only the relative odds.

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