

# How do early-life conditions shape health age profiles late in life?

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- We investigate how health dynamics late in life varies with early-life conditions
- Better early-life conditions are associated with better health outcomes
- Education as well as current income and wealth are important mediating factors of this relationship

## 1. Health profiles and early-life conditions

The change in the demographic structure of the population poses concerns on the sustainability of public programmes of health care, as the increase in the number of older people is likely to increase the demand for care services. Understanding how health patterns evolve with age and whether their trends differ by the socioeconomic conditions experienced during the life cycle might help in predicting how demand for care services will evolve.

A growing economic literature has focused on the long-run consequences of the early stage of the life cycle and investigated the effect of the socioeconomic status of individuals during their childhood on several adult outcomes, such as earnings (Brunello et al., 2017), cognitive and non-cognitive skills (Cunha et al., 2010) and health conditions (Mazzonna, 2014). These studies point out a significant role played by socioeconomic conditions during childhood on human capital accumulation for children and, thus, on adult socioeconomic outcomes. This chapter contributes to the literature by examining the impact of early-life conditions not only on the health *status*, but also on its *dynamics* in late stages of the life cycle.

We describe early-life conditions by a multidimensional index based on a battery of indicators designed to describe the socioeconomic context in which respondents grew up. Building upon the SHARE and SHARELIFE questionnaires, we focus on the socioeconomic background of respondents at the age of 10. Our multidimensional indicator for early-life conditions considers whether parents were alive, their education, the number of books at home, the number of rooms per capita and other relevant accommodation characteristics. As for the current health status of respondents, we use alternative measures. We focus on overall health self-assessment, an objective indicator of physical health, as well as on the score in the EURO-D scale for mental health.

Further, we investigate to what extent the long-run influence of early-life conditions on health of older individuals is indirect, i.e. mediated by the current individual and household characteristics (see, e.g., Bengtsson and Broström, 2009). Empirically, we assess whether the characteristics of the socioeconomic status during childhood remain significantly associated with health late in life once conditioning on education and current socioeconomic status indicators (e.g. household

composition, household income and wealth measures). Analysing these patterns provides evidence about the channels according to which childhood conditions can shape health late in life and informs policy makers about the intergenerational consequences of public policies designed to improve the social and economic inclusion of individuals.

We find that socioeconomic status in childhood is positively correlated with health in late life. This association holds for both physical and mental health, and is stronger for females than for males. In most cases, it remains stable over the age range we consider. We find evidence that this effect is mostly indirect, i.e. mediated by socioeconomic status in adulthood. This suggests that an individual grown up in bad conditions is penalized in terms of education, income and wealth over the life cycle and this leads to worse old age health. A small direct effect however remains, suggesting that childhood circumstances partly act as an indelible imprinting on individuals' health.

## 2. Data and variables

The sample includes respondents aged between 50 and 80 years old, living in countries that participated in all SHARE waves, namely Austria, Belgium, Denmark, Germany, France, Italy, Spain, Sweden and Switzerland. After excluding respondents with missing information on relevant variables, we end up with 85,519 observations referring to 15,502 women and 12,643 men.

As anticipated in the previous section, we focus on three different outcome variables, measuring current physical and mental health. We draw current health indicators from waves 1, 2, 4, 5 and 6. The first health indicator considered is the self-assessed overall health status, which takes values 1 (poor) to 5 (excellent). To have an objective assessment of individual's physical health status, we construct an indicator combining information on Activities of Daily Living (ADLs), Instrumental Activities of Daily Living (IADLs), mobility limitations and chronic diseases (we consider only the chronic condition items included in all waves). Our objective physical health indicator is the weighted sum of individual outcomes with respect to these health indicators. Weights are defined by running a principal component analysis. We assigned to each indicator a weight derived from the corresponding item in the first principal component. The objective physical health indicator is standardized to lie between 0 (worst physical health) and 1 (best physical health). We also consider mental health status, which is measured by the EURO-D indicator. The EURO-D indicator counts the number of mental diseases suffered by individuals. For comparability with the other health measures considered, we reversed its scale and standardized its range between 0 and 1, where 0 indicates worst mental health and 1 indicates best mental health.

To investigate the impact of early-life conditions on health dynamics later in life, we exploit a unique characteristic of the SHARE dataset, which in SHARELIFE (wave3 and wave7) and in SHARE (wave5 and wave 6) collects information about family background during childhood along with several well-established measures.

We specifically exploit the following information: the number of books at home at age 10 (we create a variable equal to 1 for those with more than 10 books and 0 otherwise), the number of rooms per-capita (we create a variable equal to 1 if the number is equal or above the country median and 0 otherwise), plus some features of the family home at age 10 (whether it was equipped with central heating, an inside toilet, a fixed bath, cold running water and hot running water, each of them

treated as a separate dummy variable). We also use information on whether both parents were alive at age 10, and their education attainment (a dummy equal to 1 if at least one parent was highly educated, that is an education level classified with an ISCED code equal to 3 or higher).

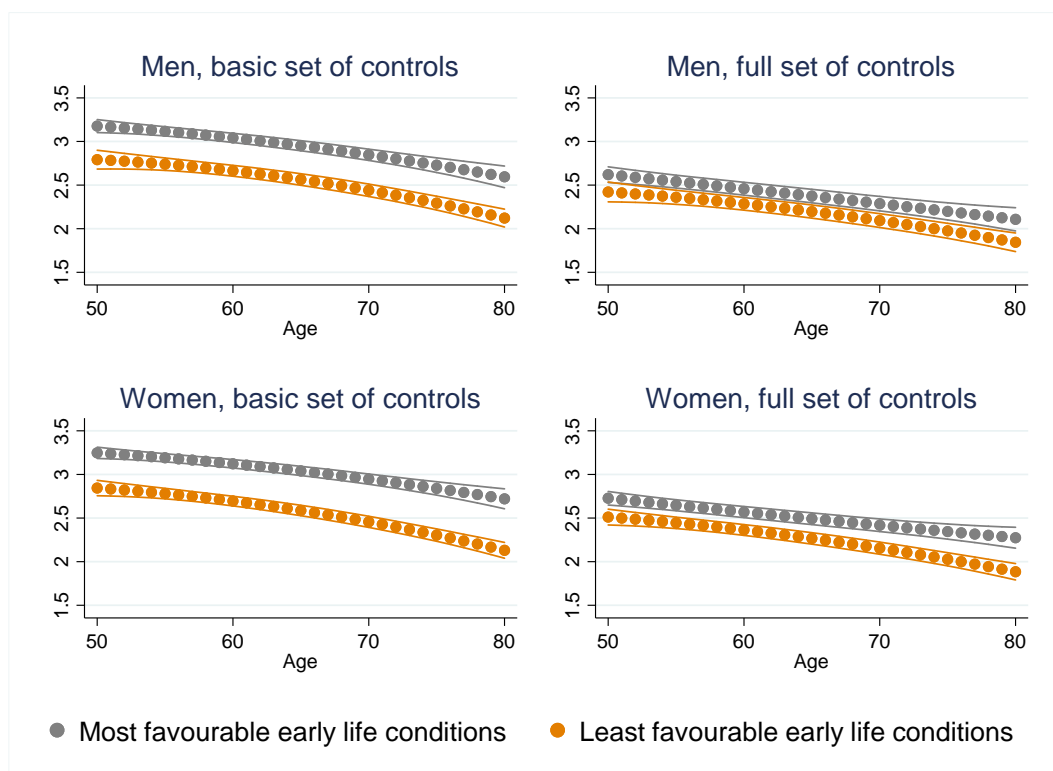
Our early-life conditions index is defined as the weighted sum of individual outcomes with respect to this battery of binary indicators, where weights are defined by a principal component analysis. The early-life condition indicator takes values between 0 (worst conditions) and 1 (best conditions). The country median of the index is lowest in Southern Europe (0.3 in Italy and Spain) and highest in Sweden, where the median is about 0.9. This evidence parallels the evidence by Mazzonna (2014) that shows cross-country heterogeneity in rooms per capita, accommodation facilities and books at home based on SHARELIFE.

### 3. Methods and Results

To examine the health dynamics of individuals late in life, we estimate the age profile of our three health indicators. Each current health measure is regressed on our early-life condition indicator, a second order polynomial of age and its interactions with the early-life condition indicator. Interaction terms play a crucial role in our identification strategy as they let the role of early-life conditions vary over age. We consider two alternative sets of control variables. The first set of controls (“basic set of controls”) includes a full set of country dummies and birth-cohort dummies. In the second set of controls (“full set of controls”) the set of covariates is augmented to reflect respondents’ socioeconomic status in adulthood. More specifically, we add: educational attainment dummies (ISCED level 0-2, 3-4 and 5-6), country-specific quartile dummies for household income and wealth as well as family current characteristics (household size, number of children and grandchildren). Each regression is run separately by gender. Standard errors are clustered at the individual level to account for the longitudinal dimension of the dataset. Different degrees of the age polynomial lead to unchanged findings.

Based on the results from these regressions and holding the control variables fixed, we computed the age profile of each health outcome for individuals with the least and the most favourable early-life conditions (which implies to set our early-life condition indicator alternatively equal to 0 and 1). The predictions are plotted in Figures 1-3, which show the predicted (mean and 95% confidence interval) health-age profiles for respondents with, respectively, the most (grey dots and lines) or least favourable (orange dots and lines) early-life conditions. Each figure reports results for a specific health outcome by gender and by set of control variables used.

Fig. 1: Health age profiles: self-assessed overall health indicator

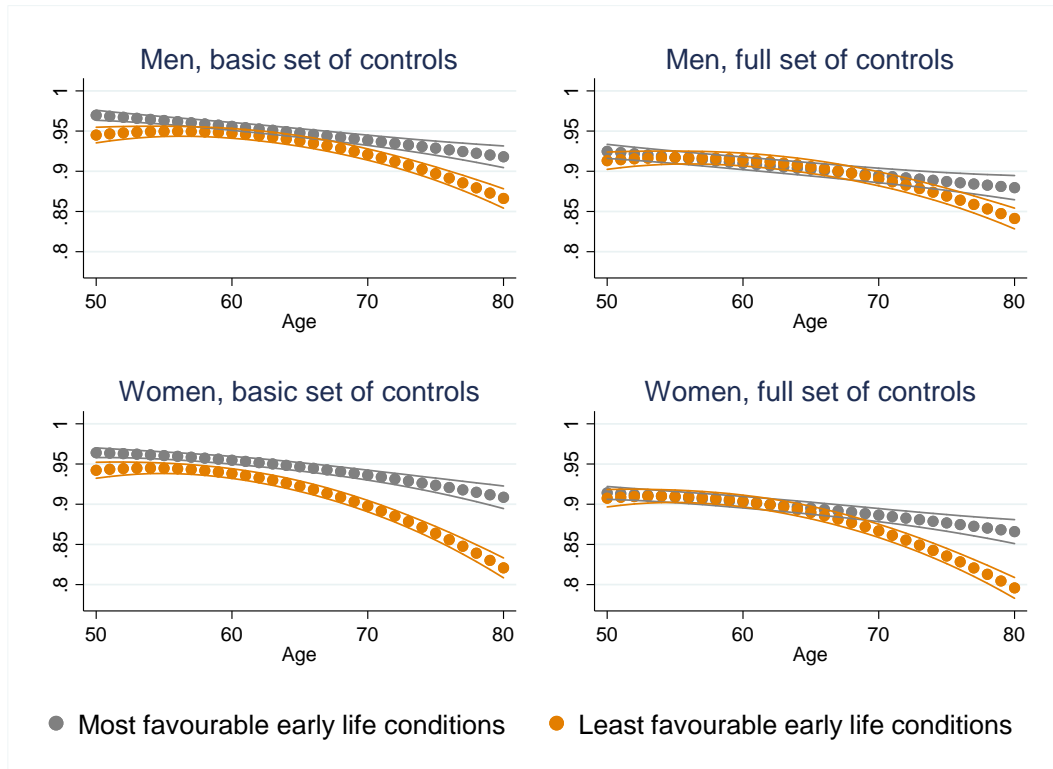


Source: Release 6.1.0 of wave 1, 2, 3, 4, 5 and 6, release 0 of wave 7.

Note: Solid lines indicate 95% confidence intervals.

Figure 1 illustrates the dynamics of self-assessed overall health. As expected, it declines after the age of 50 for both men (upper panels) and women (lower panels). Looking at the most parsimonious specification (left graphs in Figures 1), health status of individuals who experienced the worst early-life conditions is on average significantly lower with respect to respondents who grew up in the best socioeconomic environment. This pattern is confirmed throughout the age range considered. The distance between the groups, however, shrinks when we allow for the full set of controls, which includes the level of education and the position in the country-specific income and wealth distribution (right graphs in Figures 1). This evidence supports the hypothesis of a relevant role played by these variables in explaining heterogeneity in health over the life cycle, where adult socioeconomic status partially mediates the impact of early-life socioeconomic background.

Fig. 2: Health age profiles: physical health indicator

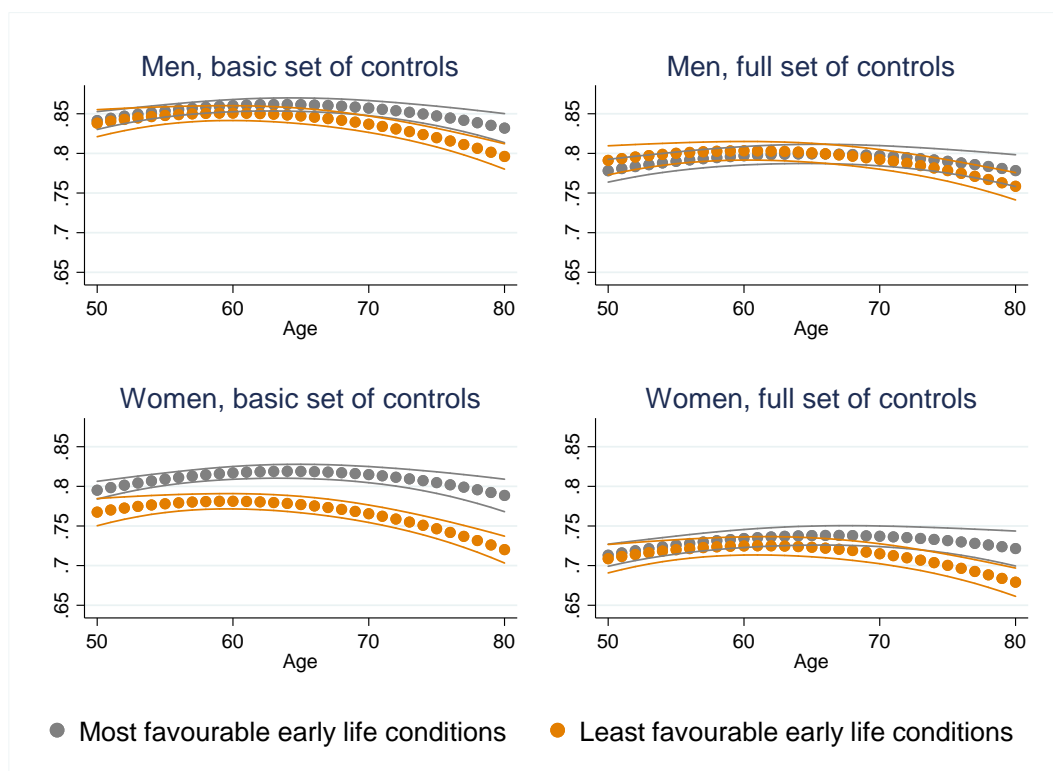


Source: Release 6.1.0 of wave 1, 2, 3, 4, 5 and 6, release 0 of wave 7.

Note: Solid lines indicate 95% confidence intervals.

Results in Figure 2 replicate the analysis considering the objective physical health indicator as outcome variable. The differences in the predicted health outcomes for men are narrower than in Figure 1 but still statistically significant. Individuals who experienced better early-life conditions enjoy better physical health outcomes late in life. For both genders, the difference between the two profiles becomes wider after a certain age, around 70 for men and 60 for women. After controlling for the richest set of covariates (right graphs in the figure), we find that the divergence between the two age profiles shrinks, and the age when it starts increasing is slightly postponed (to age 70 for men and 65 for women). Attrition related to mortality can affect the composition of our sample and our findings, inasmuch life expectancy depends on gender, education and, potentially, on early-life conditions.

Fig. 3: Health age profiles: mental health indicator



Source: Release 6.1.0 of wave 1, 2, 3, 4, 5 and 6, release 0 of wave 7.

Note: Solid lines indicate 95% confidence intervals.

Along with physical health, we also analyse the dynamic of mental health late in life. As it emerges from Figure 3, gender differences are more pronounced with respect to physical health. In line with previous literature (Riecher-Rössler, 2016), we find that women are more likely to experience worst mental health at each age. In addition, the divergence in the age profile of mental health between individuals who were exposed to good or bad early-life conditions is more pronounced in the female sample. As for the overall and physical health indicators, after controlling for adult socioeconomic conditions, the differences in the age profiles related to early-life conditions widely reduce.

#### 4. Conclusions

The evidence in this chapter supports the hypothesis that early-life conditions are powerful predictors of the health dynamics late in life. Individuals who grew up in a more favourable socioeconomic context are characterized by better physical and mental conditions late in life. This pattern appears to be largely explained by the positive effect played by more inclusive parental background in improving educational attainment as well as income and wealth outcomes of individuals over the life cycle. These results highlight the long-run effects of public policies:

promoting the social and economic inclusion of current generations improves their own lifetime well-being as well as the one of their offspring.

## References

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