

# The contribution of educational expansion and changes in mortality by educational attainment groups on trends in life expectancy and lifespan variation in selected European countries

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## Abstract

Educational expansion has been important in increasing life expectancy, but its contribution to lifespan variation changes is unclear. From a demographic and public health perspective, studying lifespan variation alongside life expectancy provides a more complete picture of mortality by reflecting the inequality in the length of life and the heterogeneity in population health. Addressing the educational expansion on both mortality outcomes helps us to have a deeper understanding of the effect of population compositional changes on mortality. For that reason, we assessed the contribution of educational expansion (P-effect) and mortality changes (M-effect) by three educational groups to changes in life expectancy at age 30 ( $e_{30}$ ) and lifespan variation ( $e_{30}^{\dagger}$ ) in England and Wales, Finland, and Italy (Turin) over the years 1975-2015, by performing a decomposition analysis. We used individual-linked administrative mortality data by sex, country, and single calendar years, which does not suffer from numerator-denominator biases. Educational expansion contributed simultaneously to increasing  $e_{30}$  and reducing  $e_{30}^{\dagger}$ , for all age groups studied. The contribution of educational expansion to changes in  $e_{30}$  was rather similar across the different populations studied (6% to 21%) but considerably different for changes in  $e_{30}^{\dagger}$  (10-20% to 60-80%). Over time the contribution of the P-effect increased. Mortality changes among the low educated contributed the most to increases in  $e_{30}$ , and counterbalanced the declines in  $e_{30}^{\dagger}$ . Our analysis reveals that educational expansion is important for obtaining not only longer average lifespans but also more equal lifespans. The observed growing importance of educational expansion over time, implies that educational expansion will also likely influence future mortality progress.

**Keywords:** Trends in Life expectancy, lifespan variation, educational expansion, socio-economic inequalities in mortality, Europe.