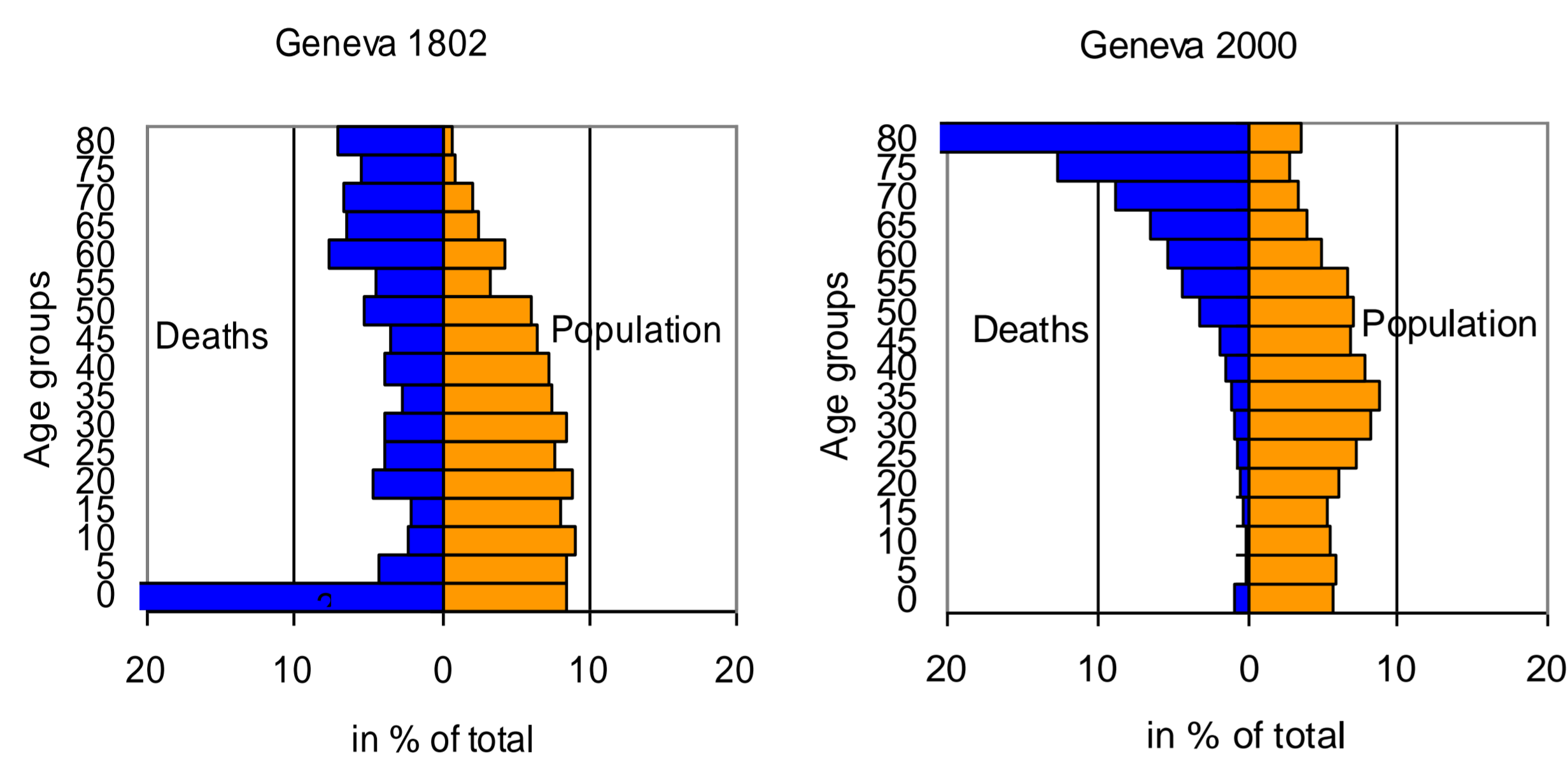


Swiss educational dynamics in mortality compression 1990/3 – 2000/3

Background

The transformation of human mortality is among the most significant achievements of historical modernization. As shown for the city of Geneva, the age (and cause of death) pattern of mortality in industrialized countries have been radically transformed – an evolution known as the "epidemiological transition" (Omran 1971). In the 18th Century, infectious diseases constituted the dominant causes of mortality and primarily affected children. With the sanitary and medical revolutions at the end of the 19th, however, survival to adulthood increased and average durations of life considerably lengthened through 1950. If life expectancy continued to increase later on, the evolution was much slower and flatter, since improvement of mortality conditions concerned primarily older ages (above 65). People indeed increasingly died from degenerative and man-made diseases. Since they are now depicted and controlled early in age, deaths could be increasingly delayed at older ages (Olshansky and Ault 1986).



Researchers therefore question the extent to which deaths can be postponed in age. According to Fries (1980), there is a biological limit of the human life span: the rise of the age at death gets harder to achieve the more life expectancy reaches this finite limit. Therefore, as morbidity (i.e. chronic diseases and senescent) is postponed, mortality will progressively be compressed around the mean age at death implying a rectangularisation of the survival curve: a cohort lives longer until a finite limit but then dies out in a very short age interval. This hypothesis also implicitly implies the disappearance of socioeconomic differentials in mortality.

Evidence for Switzerland confirmed a sustained compression of mortality in the same time as longevity increased (Cheung et al. 2009). In the 1990s, however, average durations of life continued lengthening but mortality compression stagnated.

Data

Swiss National Cohort database (SNC), a follow up study of mortality covering the exhaustive population in Switzerland

Constructed through deterministic and probabilistic record linkage of Census-enumerated individuals in 1990 or 2000 with death certificates for the following decade, respectively

Method

Period life tables for 1990-1993 and 2000-2003 according to educational level (Secondary I or less, Secondary II, Tertiary).

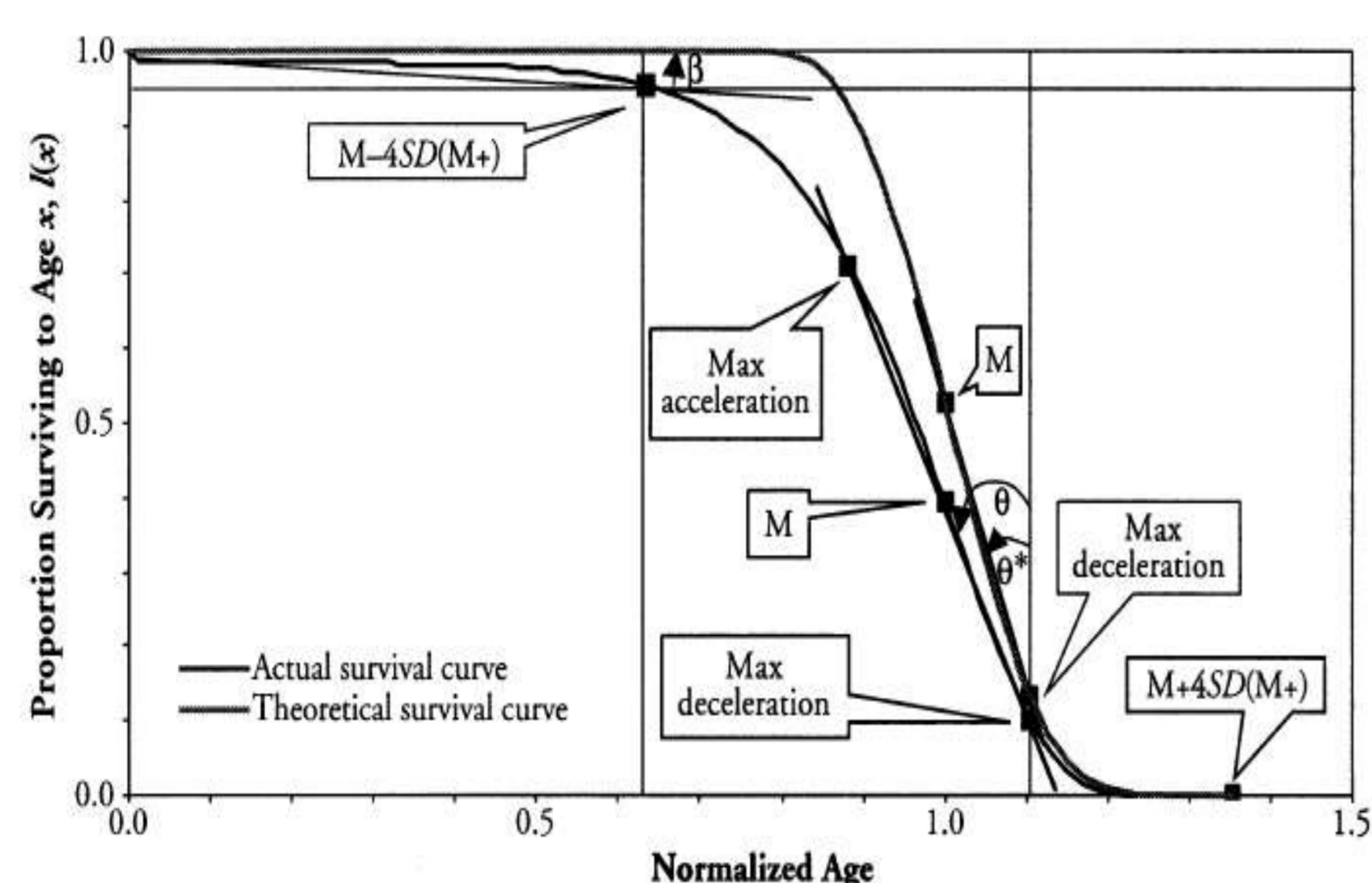
Descriptive indicators of the survival curve and decomposition of differences in life-expectancy.

Modal age at death (M), an indicator of **longevity**: "normal", or, most frequent life span (only ageing-related mortality), i.e. age at mode of the distribution of life-table deaths

Variation in "normal" ages at death (SD(M+)): standard deviation of ages at death above the modal age, i.e. range of normal age at death (M +/-3SD(M+))

Verticalization of the survival curve: **concentration/compression** of ages at death around the "normal" age (steepness of l_x function in the region of

M): θ angle of diagonal line between age of maximum acceleration and age of min deceleration of l_x function ($\theta=90$, then everybody dies at modal age; $\theta=00$, nobody dies) (Cheung et al. 2005; Eakin and Witten 1995).



Research question:

Does mortality compression differ by educational groups and do differential trends in the 1990s account for the stagnation at the national level?

Static inter-group test:

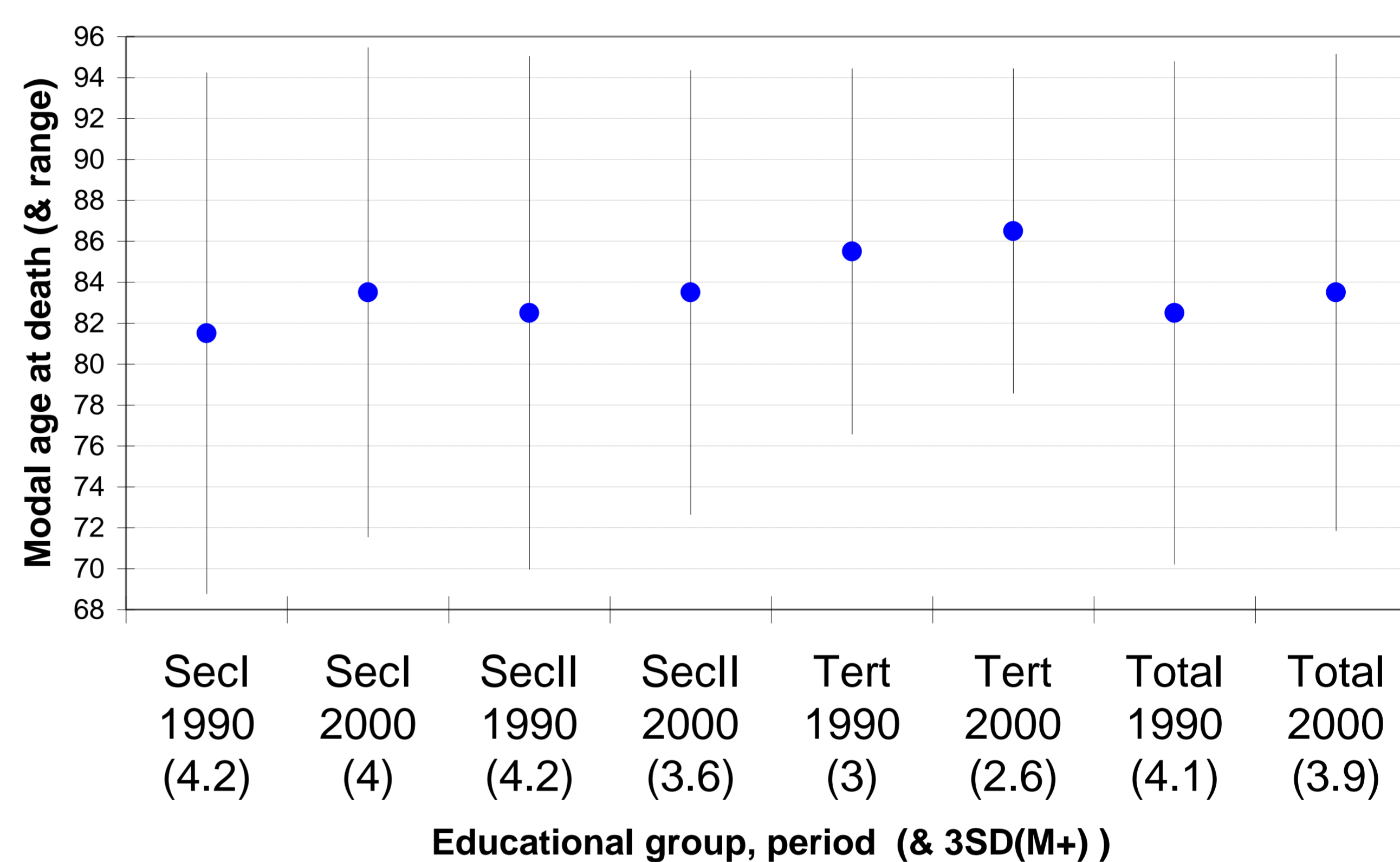
Is higher longevity associated with sharper mortality compression?

Dynamic test:

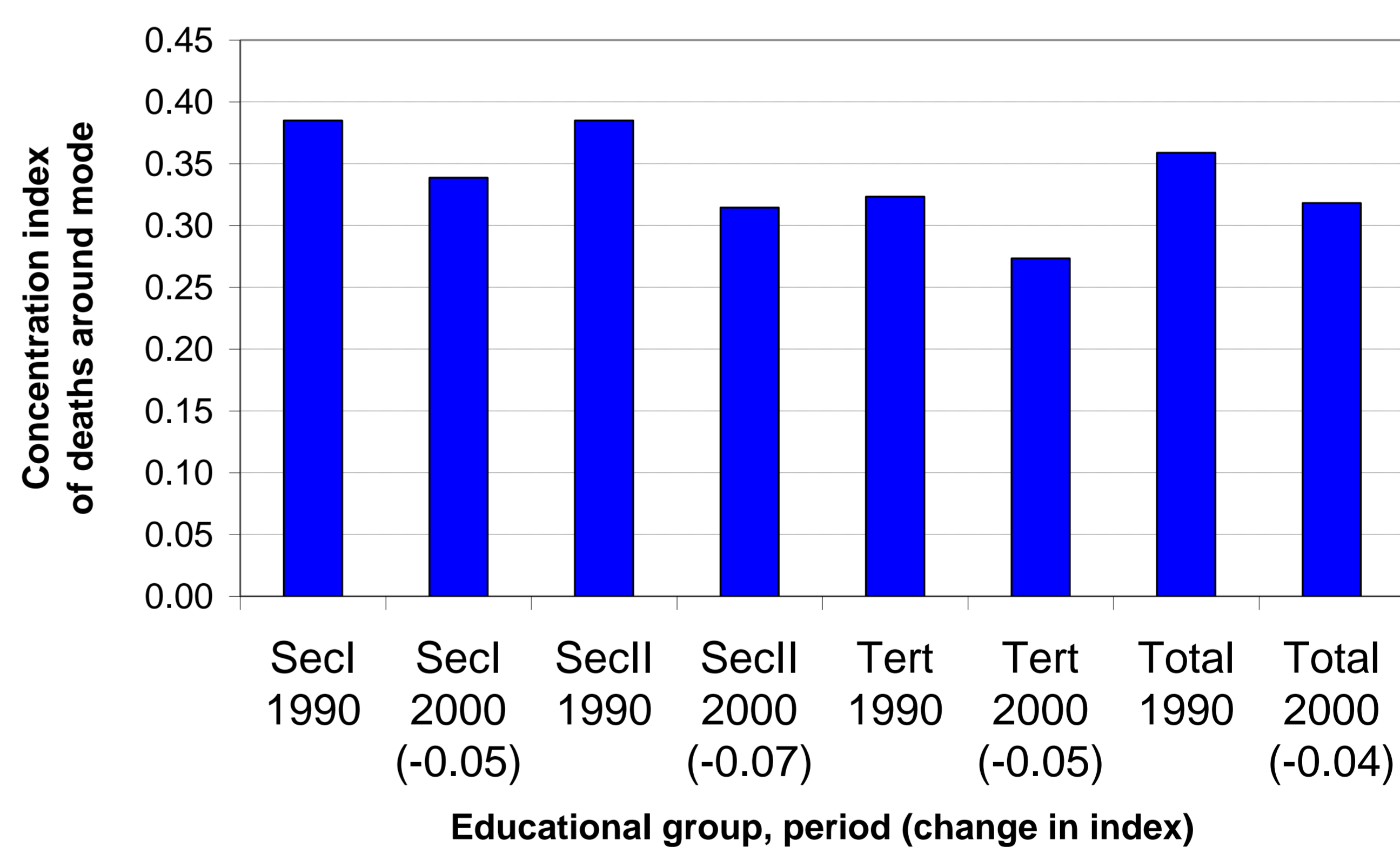
Is the increase (decrease) in longevity associated to an increasing (decreasing) compression of mortality for all educational groups?

Results

Catch up in longevity extension among lower skilled, males 1990/3 & 2000/3



... but similar trends in mortality compression by educational group



Discussion et conclusion

Sharper mortality compression is indeed associated with longest normal duration of life (i.e. higher vs lowest skilled)

- ⊗ Socioeconomic position influence risk behaviors (nutrition, smoking, drinking)
- ⊗ Cumulative effects on mortality at older ages.

Catch up in longevity between 1990/3 and 2000/3 among the lesser skilled, mainly because of decreasing mortality at younger retirement-ages.

Despite their different levels of longevity and mortality compression, all groups experienced a similar trend towards increasing compression

- Homogenizing effect of institutionalization ?

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