The impact of smoking and other non-biological factors on sex differences in life expectancy: a comparative analysis of 39 industrialized countries, 1955-2009

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- Structured abstract—full paper available by request* -

Background: The aim of this paper is to investigate more deeply the role of smoking for sex differences in life expectancy in comparison to other non-biological factors. Based on the findings of previous studies we expect that populations differ mainly with respect to the time location inside the smoking epidemic model and the absolute number of years smoking contributes to the sex gap.

Data and methods: We decompose the sex differences in life expectancy into fractions caused by biological factors, smoking, and other non-biological factors. Estimates are produced for 39 industrialized countries for periods of five calendar years between 1950 and 2009. The impact of biological factors is estimated on the basis of mortality data for female and male Catholic order members from Germany between 1950 and 1970. Smoking-attributable mortality is estimated by the Peto-Lopez method. Data on causes of death and the population at risk were taken for each country from the WHO mortality database. Estimates for the impact of other non-biological factors are derived from the rest category of the estimates for the other two components and the overall sex difference in life expectancy.

Results: We find that the contribution of smoking to the extent of and the trend in the sex gap in life expectancy between the 1950s and today was different between countries. Whereas in some populations sex differences in life expectancy were predominantly driven by smoking, there is almost the same number of populations that show higher contributions of other non-biological factors with regard to the absolute sex difference, and a few with regard to the dynamic of the sex gap.

Conclusions: Smoking can indeed be seen as the main driver of the trend in sex differences in life expectancy for most populations, giving further support to the importance of the smoking epidemic model. However, our results reveal that the common view that smoking is also responsible for most of the sex difference itself does not hold in general.

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