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Temporal change to self-rated health in the Swiss population from 1997 to 2012: the roles of age, gender, and education

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ABSTRACT

Objectives: Our study aimed to describe the temporal changes in self-rated health status (SRH) from 1997 to 2012 in adults aged 25 to 84 residing in Switzerland, with a view to identifying groups at risk for declining health.

Study design: Secondary analysis of population-based cross-sectional health surveys.

Methods: Data were collected from the cross-sectional, population-based, five-year Swiss Health Survey, from 1997, 2002, 2007 and 2012. A total of 63,861 individuals' data were included. Multilevel mixed-effect logistic regression analysis was employed to estimate the probability of very good and good health within the framework of a hierarchical cross-classified age-period-cohort model (HAPC), adjusting for education level, gender, civil status, smoking status and body mass index.

Results: Individuals with higher education were substantially more likely than those with primary education to report good SRH (OR = 2.12; 95% CI = 1.93–2.33 for secondary education and OR = 3.79; 95% CI = 3.39–4.23 for tertiary education). The education effect depended on birth cohort and age: higher proportions of good SRH were reported by secondary (8%–17%) and tertiary (10%–22%) compared with primary educated individuals from the 1940 birth cohort onward; the proportion of secondary/tertiary (compared to primary) educated people reporting good SRH increased with age (by 10/11% at 45–50 years and 25/36% at 80–84 years). Gender health equality was achieved by the 1955 (primary educated) and 1960 (secondary educated) birth cohorts, while these women overtook men in reporting good SRH from the 1975 birth cohort onward. Tertiary educated younger women were significantly less likely to report good SRH than men but parity was achieved at around pension age. Similarly, gender inequality in those with primary and secondary education reduced in the younger ages to not be significant at around age 55, with women overtaking men from age 65.

Conclusions: Younger birth cohorts with lower education levels appear most vulnerable in terms of their SRH. The education effect cumulatively increases when attaining incrementally higher education levels. While women report lower health than men, gender inequality in SRH has declined and even reversed over time and is substantially linked to differences in educational status. Swiss public health strategies should particularly target

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the younger adults with only primary school education of both genders; for women, to combat health burdens in their early life, and men, to mitigate issues in their later life.

Introduction

Education and health are purportedly the predominant characteristics of human capital, affecting productivity, well-being and wealth, both individual and societal.[1] As such, a vast literature has been dedicated to understanding the interactions between these important socioeconomic markers. Education and health associate overwhelmingly positively with each other and are similarly influenced by common factors like genetics, social background and secular change; whether their relationship is causal has long been debated.[1] Numerous cross-sectional studies show that educational attainment is associated with self-reported health (SRH)[2–7] and the United Nations have found that educational attainments precede improved health status in cross-country comparisons.[8] The fundamental theoretical model is that higher education leads to improved health literacy and behaviours. Moreover, longitudinal studies suggest a cumulative advantage of education, i.e. education's positive effect on health increases with incremental educational level attainment and as people age.[9–11] Here, education affords the development of abilities early in life that encourage individuals to pursue and lead health-optimising lifestyles. Furthermore, the effect of education has been shown to strengthen across birth cohorts[9] with the health gap between educational levels increasing with age.[12] However, other longitudinal studies suggest that education is rarely associated with temporal changes to SRH,[13] and such conjecture continues to provide motivation for further exploration toward better understanding any variables that may influence their interaction.

Health-related gender inequality has been widely documented, revealing an interesting paradox in socioeconomically developed countries[14–17]; men have shorter age-specific life expectancy than women,[15,18,19] yet women have shorter morbidity-free life expectancy, and poorer SRH.[19,20] The literature explores gender differences in terms of biology, behaviour and psychological traits throughout the life course, alongside considerations of social organisation, and socioeconomic wealth.[1,3,9,13,16,18,21] Many claim socioeconomic status to be the foundation for gender inequalities in health and particularly education and employment status.[22–25] Yet, surprisingly few studies examine the interaction between gender and education relating to SRH, and particularly over time.

Previous Swiss studies have examined mortality/morbidity and education status based on self-reported surveys and accounting for various socioeconomic factors; however, the studies examining SRH (rather than mortality) have tended to focus on representative cross-sectional populations from a single year. As far as we are aware, only one study provides insight into life course and cohort temporal changes of SRH in relation to combined covariates.[13] However, while challenging the finding that education is associated with SRH over the life course, the Cullati et al. study is limited by a relatively small cross-sectional sample over an 8-year timespan. We, therefore, aimed to build upon this and other studies of the Swiss population by exploring temporal change (over 15 years) to SRH in a large cross-sectional sample; in particular, we were interested in the relationship between gender and education level, and changing gender inequality over this time period.

Methods

Study design

The study is a secondary analysis of population-based cross-sectional health surveys carried out in 1997, 2002, 2007, and 2012 in Switzerland.

Study population and data

The Swiss Health Survey (SHS) undertaken by the Swiss Federal Statistical Office (SFSO) is a nationwide survey on health status, health service utilisation and health-related behaviour. The SHS employs telephone interviews and subsequent written questionnaires; it was first conducted in 1992 and is repeated every 5 years. For each survey year, a multistage probability sample is drawn of the permanent resident (including foreign nationals) population in Switzerland after stratification by the three predominant language/geographic regions (German, French and Italian). Samples include individuals aged 15 years or above living in private households and excluding those living in institutions, i.e. hospitals, homes for the elderly, prisons, monasteries and military barracks; only subjects conversant in any of the three languages are surveyed. Data were collected and administered by the SFSO under the regulation of the Federal Statistics Act (FSA) of 1992, which is a framework of law dedicated to federal data collection, data protection and data security. Participants provide informed consent, which accommodates all future use of the data for research (FSA, 1992).

For our study, we obtained SHS data for the years 1997, 2002, 2007 and 2012 with respective net sample sizes of $n = 13{,}004$, $n = 19{,}706$, $n = 18{,}760$ and $n = 21{,}597$. Corresponding non-response rates were 31.2%, 36.1%, 33.8% and 46.9%. The comparably higher non-response in the 2012 survey has been attributed to the inclusion of selected households without available telephone contact data, i.e. households without fix net telephone line. Excluding the latter, non-response was 38.8% and therefore in the range of previous survey waves. The SHS includes similarly constructed expansion weights for each survey wave. Weights comprise calibration factors that take into account the