

Estimating Working Life Expectancy using German health insurance data – Advantages and Limitations

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Background

Increasing life expectancy and ageing populations are putting strain on public pension systems. In many countries, policies have been taken to reduce this burden by extending working lives and raising the ratio of economically active to the inactive population (1). Against this background, monitoring the development of working life expectancy (WLE) over time becomes increasingly important. Furthermore, it is essential to examine the extent of the social inequalities in WLE and whether these inequalities have widened or narrowed over time.

Previous studies on trends in WLE are mostly based on survey data. As in other European countries, previous research has shown that WLE in Germany increased during the last decades (2-4). However, the number of studies examining the development of WLE in Germany remains limited, especially with respect to socioeconomic differences. This is mainly because official statistics do not report mortality by socioeconomic characteristics. Against the backdrop of population ageing and prolonged working lives, more research is needed on whether the extra years in work are spent in good or poor health.

Health insurance data are increasingly used and provide an additional database to analyse WLE and the related social inequalities. The data contain a wide range of health information, which allow the results on WLE to be linked to different health outcomes in later studies. Therefore, it is important to explore how health insurance data can be used and contribute to the current state of research.

The aim of this paper is to analyse time trends in WLE based on the data of a large German health insurance provider and to discuss the advantages and challenges of using this type of data. Furthermore, it is examined whether the data are suitable for calculating WLE by socioeconomic characteristics and what limitations have to be taken into account.

In more detail, the study is guided by the following questions:

- How did working life expectancy in men and women develop over time?
- How does the general level and the time trends in working life expectancy compare to findings based on previous studies?
- How large are social inequalities in working life expectancy based on the insurance data and what limitations apply?

Methods

This study is based on data of the AOK Niedersachsen, a large German statutory health insurance provider. Approximately one third of the total population of the Federal State Lower Saxony is insured with the AOKN. For this paper, the data of all insured men and women aged 18 to 69 is used.

Changes in WLE over time were assessed by comparing three time periods: 2006-2008, 2011-2013, and 2016-2018. The age and sex distribution of the AOKN population is comparable with the total German population, while individuals with higher incomes and with higher degrees of occupational qualification are underrepresented (5). Statutory health insurance data are collected for accounting purposes and contain longitudinal data on insurance histories, medical procedures, diagnoses, and mortality. Furthermore, employment and unemployment periods are coded as well as other socioeconomic characteristics, e.g. educational level and income. Due to the longitudinal character of the data, each piece of information can be linked to a specific period or date in the insurance history. This allows to determine the order of employment and unemployment episodes and therefore to identify employment histories within the individual insurance period. Based on these data, the insurance population can be divided into labour force (employed and unemployed individuals) and the economically inactive population (non-labour force).

WLE was calculated using multistate life tables based on three states (labour force, non-labour force, and death) and four transitions: 1) non-labour force to labour force, 2) labour force to non-labour force, and the two competing transitions 3) non-labour force to death, and 4) labour force to death. Based on this model, WLE for males and females is calculated at age 18 and 50 in order to capture trends in younger and older working-age for each of the three time periods 2006-2018, 2011-2013, and 2016-2018. In order to provide a first insight into the differences in WLE by socioeconomic position, WLE for the middle period was calculated by educational level. The level of education was assessed by the highest school-leaving qualification achieved, distinguishing between two groups of average years of schooling completed (9 to 11 years (low) and 12 to 13 years of schooling (high)).

Preliminary results

Based on the health insurance data, clear increases in WLE were found at age 18 as well as for age 50. This holds for both sexes, with increases being stronger in females than in males. Similar to previous studies, the WLE in women is considerably lower than in men in both age groups. These differences reduced over time as WLE increased more strongly in women.

Furthermore, preliminary results indicate that WLE differs substantially by educational group. While WLE is higher for women with higher education than for women with lower education across the full age range (18 to 69 years), these inequalities vary more strongly with age among men. WLE at age 18 is highest among low-educated men. These difference reverse from the mid-20s onwards, with higher-educated men at age 50 having higher WLE than lower-educated men at the same age.

Strengths and Limitations

The data contain detailed longitudinal information on employment and unemployment episodes that can be used to identify employment histories within the respective observation period. In addition, the data are not subject to health-related non-response, which may occur in survey studies and can affect the calculation of WLE. However, the data also have limitations that need to be taken into account, e.g. due to differences in the socioeconomic composition between the respective insurance population and the general population or insurance provider operating in specific regional areas only (e.g. a specific federal state). In addition, the definitions of the labour force frequently used in the

previous studies (6) based on survey data cannot be completely transferred. For example, the data do not contain information on whether unemployed persons are actively seeking for employment or are available to the labour market in the short term. Compared to previous studies on time trends in WLE, the general level of WLE is lower, especially in women. This may be explained by differences in socioeconomic structure between the insurance population and the general population and due to differing definitions of labour force. However, with respect to the development of WLE over time, the results largely agree with those of previous studies indicating increases in both sexes with increases being stronger in women than in men. Furthermore, preliminary results suggests that the data may be an appropriate data source to calculate WLE by education.

The most important potential of using health insurance data can be derived from the large amount of information on the health status of the insured individuals. This may also allow to analyse trends in Healthy Working Life Expectancies in future studies, e.g. based on specific diseases often associated with early labour market exits. This can complement existing research and help to understand the role of time-related trends in health in the development of working life expectancy over time.

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