Not Just How Long, But How Unequal:
Historical Trends in Lifespan and Lifespan Variation by Social Class in Sweden

Marcos Castillo & Martin Dribe

marcos.castillo@ekh.lu.se

martin.dribe@ekh.lu.se

Abstract

This study examines long-term trends in lifespan inequality—the variation in ages at death—across social classes in Sweden, focusing on cohorts born between 1841 and 1920. While life expectancy reflects the average length of life, lifespan inequality captures how predictable survival is and reveals an additional layer of social disparity. Using the Swedish Death Index (1815–2022) and linked full-count censuses (1880–1950), we analyze cohort lifespan after age 40 to isolate adult mortality patterns. We measure lifespan inequality using life disparity, also known as average years of life lost to death, which provides an intuitive measure expressed in years and can be decomposed by age. For men, life disparity declines from around 11.3 years in the earliest cohorts to roughly 10.5 years, while for women it falls from 10.9 to 9.6 years. Men consistently experience higher lifespan inequality than women across most cohorts. Among men, white-collar workers have the greatest inequality in the earliest cohorts, while farmers have the lowest levels throughout. Inequality generally declines across cohorts, but for those born after 1910, male life disparity stagnates and even increases slightly, except among higher white-collar workers. Among women, differences by social class are smaller and less consistent until the latest cohorts, when a clear gradient emerges with manual workers experiencing both shorter lives and larger disparity. Decomposition by age reveals that early-age deaths account for the majority of total life disparity across all groups and periods. By providing a long-term perspective on socioeconomic disparities in longevity and lifespan predictability, this paper shows that the contemporary double burden of low life expectancy and high lifespan disparity among disadvantaged groups is a relatively recent phenomenon and not a longstanding feature.

Paper for the European Population Conference, Bologna June 3-6, 2026

This study is part of the project "Unequal Lives: Socioeconomic Stratification, Life-Course, and Demography from Preindustrial Society to the Welfare State" (KAW 2023.0206, PI: Martin Dribe)

Introduction

Research on population health increasingly focuses not only on average life expectancy, but also lifespan inequality—the variation in ages at death—as a critical dimension of well-being and equity (e.g., Edwards 2011; Seligman et al. 2016; van Raalte et al. 2018; Permanyer and Scholl 2019). While life expectancy reflects the average length of life, lifespan inequality captures how predictable survival is, shaping both individual life planning and broader social disparities. A growing literature shows that disadvantaged socioeconomic groups live not only shorter lives but also more uncertain ones: a double disadvantage (van Raalte et al. 2012; van Raalte et al. 2014; Sasson 2016). Yet much of the existing evidence on socioeconomic differences in lifespan inequality is drawn either from the second half of the twentieth century or from settings where historical data are limited.

This gap in historical evidence matters because the mechanisms linking social class to lifespan inequality may differ fundamentally across different phases of epidemiological and economic development. In earlier periods, reductions in lifespan inequality stemmed mainly from declines in childhood mortality and young adult mortality, which compressed the distribution of death into older ages (Wilmoth and Horiuchi 1999). In contemporary high-income contexts, however, gains in longevity often come from survival improvements at older ages. Such gains may not reduce inequality, and, if concentrated among advantaged groups, may even widen disparities. In addition, the direction of socioeconomic gradients in mortality is known to have varied historically, with elite groups sometimes experiencing mortality disadvantages due to factors such as urban residence or occupational hazards (Edvinsson and Lindkvist 2011; Razzel and Spence 2006). Whether these inverted or weak gradients in average mortality were accompanied by similar patterns in lifespan inequality is unknown. Historical evidence can reveal whether the double burden observed in present-day low-status groups is a longstanding feature of unequal societies or a more recent phenomenon, and when stable socioeconomic hierarchies in lifespan predictability emerged.

In this study, we take advantage of Sweden's rich historical demographic data to provide a long-run perspective on socioeconomic differentials in both adult cohort lifespan and lifespan inequality, that is, the average and the dispersion of the distribution of ages at death. Sweden provides an exceptional case because of its uniquely rich demographic records spanning more than a century and its well-documented transition from an agrarian to an industrial society. A full socioeconomic gradient in adult mortality for both men and women emerged in Sweden only in the second half of the twentieth century (Bengtsson et al. 2020; Debiasi and Dribe 2020; Debiasi et al. 2024) and was clearly visible for male cohorts born after 1910 (Dribe and Eriksson 2025). For earlier cohorts, born in the second half of the nineteenth century, there were instead reversed mortality differentials, with men in the highest social classes having the shortest adult life span (similar findings were made for contemporary Costa Rica by Rosero-Bixby and Dow 2009).

Using data from the Swedish Death Index, a comprehensive register of deaths in Sweden 1815–2022, linked to full-count censuses 1880–1950, we examine trends in average cohort lifespan and lifespan inequality across social classes for cohorts born 1841–1920. Specifically, we analyze cohort lifespan after age 40 by social class, in order to capture adult lifespan patterns beyond the influence of infant and child mortality. We measure lifespan inequality with life disparity but alternative measures yield similar results. Although the social and economic conditions for the later-born cohorts differ markedly from the earlier ones, comparing them allows us to trace how patterns evolved as Sweden underwent major demographic and institutional transformations and when the modern socioeconomic gradient in mortality emerged.

Our findings reveal patterns that differ markedly from contemporary ones. For men, we find an inverted gradient in the earliest cohorts, with elite groups experiencing both shorter lifespan and higher lifespan disparity than manual workers. Over time, class differences in both measures narrow substantially. For women, there is no stable class gradient in lifespan disparity until the latest cohorts, with patterns fluctuating across cohorts. The contemporary double burden of low life expectancy combined with high lifespan disparity emerges for the lowest classes only for the final cohorts born after 1900, suggesting this is a relatively recent phenomenon rather than a longstanding feature of social stratification.

Our study offers a uniquely long-term view of how social class has shaped both the length and certainty of life in a country with an early demographic transition and evolving patterns of social inequality. The findings challenge assumptions that contemporary patterns of socioeconomic inequality in lifespan variation have deep historical roots, revealing instead that stable gradients emerged relatively recently and followed gender-specific trajectories. This finding has implications for understanding whether health inequalities are inherent to social stratification or conditional on specific institutional and epidemiological contexts.

Background

There is no simple, universal, relationship between average lifespan and lifespan inequality. It has been suggested that mortality decline and increasing average lifespan lead to a rectangularization of the survival curve, as morbidity and mortality become concentrated at older ages (Fries 1980). It may seem obvious that such a mortality compression would reduce lifespan variability as lifespan increases, but it has been shown that the relationship depends on the detailed pattern of the mortality decline (e.g., Gillespie et al. 2014; Aburto et al. 2020). When the rate of mortality decline is rather similar across ages, average lifespan increases without much change in its variability. On the contrary, when infant and child mortality decreases faster than adult and old-age mortality, the variability in lifespan decreases as average lifespan increases (Wilmoth and Horiuchi 1999).

During the historical mortality transition, mortality often declined faster at younger ages than at older ages, which led to a common pattern of an inverse relationship between average lifespan and its variation (Smits and Monden 2009; Edwards 2011; Permanyer and Scholl 2019; van Raalte et al. 2018; Vaupel et al. 2011; Aburto et al. 2020). Since 1950, however, trends in lifespan variability have varied between developed countries even though life expectancy has consistently increased (Edwards and Tuljapurkar 2005; Gillespie et al. 2014; Smits and Monden 2009). This is at least partly a result of a weaker association between life expectancy and variability in age at death when conditioning on surviving childhood (Permanyer and Scholl 2019).

In recent years, trends have reversed in many contexts with an increased variability in ages at death, at least when excluding deaths early in life and conditioning upon surviving to late childhood or adulthood (e.g., Edwards 2011; van Raalte et al 2018; see also Permanyer and Scholl 2019). One reason for this is the widening differentials between population groups, e.g., by education, income, or social class (van Raalte et al. 2012). Another reason is mortality increases at young adult ages (Gillespie et al. 2014) related, for example, to drugs, accidents, and suicides, what Case and Deaton (2020) labeled "deaths of despair". More specifically, the trends in lifespan variation depend on the relative change in mortality between younger and older ages around a threshold age, which changes as life expectancy changes. Increases in life expectancy mean that the young-old threshold also increases (Gillespie et al. 2014; Aburto et al. 2020). The patterns are also linked to different causes of death in different age groups, which means that causes that are important for mortality in younger adult ages will drive changes in variability (Seligman et al. 2016). Hence, in order to promote equality in lifespan within a population, reducing lifespan variability requires targeting especially mortality at younger adult ages, and hence the causes contributing the most to these deaths.

It has also been highlighted in previous research that variation in age at death often differs between subgroups, for example, by education, class, or income (e.g., van Raalte et al. 2018). Such differences are linked to variations in the age- and cause-specific death distributions, as discussed above. Population groups with relatively higher mortality at younger ages have higher variability. In contemporary developed societies, possible causes behind such group differences in lifespan variability are related to lifestyle, accidents, suicide, and similar factors leading to premature mortality (e.g., Edwards and Tuljapurkar 2005; van Raalte et al. 2011; van Raalte et al. 2014). In contrast, differences in average lifespan between countries are more driven by differences at higher ages, where most of the deaths occur (van Raalte et al. 2011). These insights suggest that the age pattern of mortality, not just its overall level, shapes both the extent and the socioeconomic distribution of lifespan inequality.

In an early study on Russian men between 1979 and 1989, i.e., in the decade leading up to the fall of the Soviet Union, Shkolnikov et al. (2003) found that the lowly educated had a smaller increase in adult life expectancy and less of a decline in lifespan variability than men with medium and higher education. Since then, similar findings have been made for other developed countries in the period after 1970.

In Finland, adult life expectancy increased in all social classes between 1971 and 2010, but differences between classes widened as the increase was faster in higher classes than in lower classes. At the same time, adult lifespan variation only declined in the non-manual classes, while it remained more or less unchanged for the manual workers. The patterns were similar for men and women. These diverging trends were driven by trends in early-adult mortality, especially related to external causes of death (van Raalte et al. 2014). Also, when comparing lifespan variation at the same levels of life expectancy (in different years for different classes), manual workers had higher lifespan variation than the non-manual. The trends in life expectancy and lifespan variation were very similar for income quintiles and educational groups in Finland in the same period (van Raalte et al. 2018).

The trends in Denmark between 1986 and 2014 closely resemble the ones in Finland (Bronnum-Hansen 2017). Adult life expectancy increased in all income quartiles, but differentials widened as the increase was faster in the top quartile than in the bottom quartile. Disparity in lifespan declined in the top three quartiles but increased somewhat in the lowest quartile, leading to large increases in the differences in lifespan variability across income groups, and especially between the top and bottom quartiles.

In the United States, between 1990 and 2010, educational differences in adult life expectancy also widened, and among white men and women without a high-school degree life expectancy even declined in this period (Sasson 2016). Lifespan inequality increased for white men and women without a college degree but decreased for college graduates. For Black men and women, the patterns were somewhat different, with an increase in life expectancy for all educational groups and a decrease in lifespan variation except for those with high-school degrees.

Finally, in Spain between 1960 and 2015, adult life expectancy increased across education groups while lifespan variability declined only for those with secondary and higher education (Permanyer et al. 2018).

Hence, existing research for developed countries clearly shows marked trends in SES differences in both adult life expectancy and in the variability in age at death. The general pattern is one where life expectancy increases across the board, but faster in higher-status groups than in lower status groups, leading to widening SES differences in life expectancy. Over time, lifespan variability has mostly declined in medium and high-status groups, while it has often stayed constant or even increased in the low-status groups. In terms of overall inequality, this gives rise to a double burden for the lower-status groups, having both the lowest average life expectancy and the most variable one (van Raalte et al. 2018). This is important because a higher variability implies greater uncertainty about age at death, with implications for decisions across the life course. Higher variability is also a sign of greater heterogeneity in the health of the population group, with relatively more premature deaths, often related to adverse lifestyles, poor mental health, and high risks of accidents.

Based on these contemporary findings, van Raalte et al. (2014) proposed three scenarios for how lifespan variation might evolve by socioeconomic status over time: diffusion (compression spreads downward across classes with a lag), divergence (compression proceeds only for the highest groups), and stagnation (class differences persist without systematic change). These scenarios provide a useful framework for understanding recent trends, but they rest on the implicit assumption that a stable socioeconomic hierarchy in lifespan variation has existed historically and that recent patterns represent intensifications or modifications of longstanding inequalities. Whether this assumption holds for populations undergoing the historical mortality transition, and whether the same mechanisms operate across different phases of economic development and welfare state formation, remains an open empirical question that historical evidence can help address.

The increasing awareness of the importance of monitoring lifespan inequality, together with SES differences in mortality and life expectancy, has so far not spurred similar research for historical contexts. While there is a growing body of research on SES differences in mortality historically (see, e.g., Luque de Haro 2024 for a review) there are no studies analyzing lifespan variability before 1960, and most studies are for much later periods.

Measuring lifespan inequality

Life inequality can be measured using different indicators of the distribution of ages at death, including the standard deviation, interquartile range, Gini coefficient, Theil index, and life disparity, among others (Willmoth and Horiuchi 1999; Shkolnikov et al. 2003; van Raalte et al. 2014). These measures differ in two main dimensions. First, some are absolute measures, such as the standard deviation and interquartile range, which register no change in inequality if all ages at death shift upward by the same amount. Others are relative, or scale-invariant, measures, such as the Gini coefficient and Theil index, which remain unchanged if all ages at death increase by the same proportion (Edwards 2011; Permanyer and Scholl 2019). This distinction matters because absolute and relative measures can disagree on trends when the average age at death changes: the relative measures may decline simply because the mean rises, even if the absolute spread remains constant (Edwards 2011). Second, measures differ in their sensitivity to mortality changes at different sections of the age-at-death distribution (van Raalte and Caswell 2013). There is no gold standard for measuring lifespan inequality, but the high correlation between measures means that broad conclusions tend to be similar regardless of the indicator chosen (van Raalte et al. 2014; Wilmoth and Horiuchi 1999).

In this study, we use life disparity ($e^{\dagger}$) as our primary measure of lifespan inequality. Life disparity, also known as average years of life lost to death, is defined as the average remaining life expectancy at the age at death, weighted across all ages by the life table death distribution (Zhang and Vaupel 2009). Unlike relative measures such as the Theil index or Gini coefficient, life disparity is expressed in years and is sensitive to the absolute spread of ages at death. When death is highly variable, some individuals die well before their expected age at death, contributing many lost life-years to the measure. As ages at death become more concentrated, the gap between each individual's actual and expected remaining life diminishes, and life disparity approaches zero. If everyone were to die at the same age, remaining life expectancy at death would be zero, and so there would be no life disparity (van Raalte et al. 2014). This is of course, true also for other measures of lifespan variation. Life disparity has a clear and intuitive demographic interpretation, which makes it readily comparable across social classes, populations, and time periods and accessible beyond technical demography, since many measures of variability are more difficult to communicate than metrics of average levels (van Raalte et al. 2018).

Given our focus on social class differences, the sensitivity profile of the chosen measure deserves particular attention. Socioeconomic inequalities in lifespan variation tend to be driven by differences in early-adult mortality (van Raalte et al. 2014), and measures differ in how strongly they respond to deaths at different ages (van Raalte and Caswell 2013). Life disparity does not disproportionately weight early-age deaths compared to other dispersion indices, meaning that any social class patterns we identify are unlikely to be artifacts of the chosen metric. As a sensitivity check, we also compute the standard deviation and the Theil index to verify that our conclusions hold under both an alternative absolute and a relative measure of lifespan inequality.

Finally, importantly for our analysis, life disparity can be decomposed by age. This allows us to separate the contributions of mortality at different ages to overall lifespan inequality. In particular, it is possible to identify a unique threshold age that divides deaths into those that compress the age-at-death distribution and those that expand it (Zhang & Vaupel 2009). This property is valuable for our analysis because we can assess if changes in lifespan inequality across cohorts and social classes were driven by shifts in early-adult mortality or by changes at older ages, a distinction the literature has shown to be central to understanding trends in lifespan variation (Gillespie et al. 2014; van Raalte et al. 2014; Wilmoth & Hirouchi 1999).

Data

To analyze lifespan inequality by social class, we utilize the SCANDI-Links v.2 (Castillo et al. 2025) to link population censuses, which provide occupational data, with the Swedish Death Index (SDI). The SDI is a comprehensive register covering all deaths in Sweden from 1815 to 2022 (Federation of Swedish Genealogical Societies 2023; SwedPop 2024), providing the exact dates of birth and death required to compute precise ages at death. By drawing directly from these complete records, our analysis ensures that our baseline estimates reflect the full mortality experience of the Swedish population.

The Swedish censuses provide the occupational information needed to assign social class. Women are assigned a social class based on their own recorded occupation or, when unavailable, the occupation of their spouse. Unlike censuses constructed through enumerator questionnaires, the Swedish historical censuses were compiled from parish records meticulously maintained by local clergy and collected every ten years by the Central Bureau of Statistics. The full-count censuses of 1880, 1890, 1900, and 1910 have been digitized by the Swedish National Archives and are made available through SwedPop (2024), which also codified the occupations into HISCO codes (Van Leeuwen et al. 2002). The 1930 census has not been completely digitized by the Swedish National Archives, however, it currently covers slightly more than 83 percent of the population.[1] The 1950 census has been digitized by Arkiv Digital and made available through SwedPop. Because occupational status is typically settled by around age 40, we observe each individual's occupation near that age, specifically at ages 30 to 39. For cohorts born 1841–1880, occupational information comes from the decennial censuses of 1880, 1890, 1900, and 1910. The 1930 census covers cohorts born 1901–1910. For the last cohorts, those born 1911–1920, we draw occupational information from the 1950 census. The coverage implies that we miss information for the cohorts born 1881–1890, as well as for cohorts born 1901–1910.

Record linkage

Since the historical censuses do not contain consistent personal identifiers, linking individuals between censuses and to the SDI requires a record linkage procedure. The SCANDI-Links ver. 2.0 (Castillo et al. 2025) match individuals across sources first using the following time-invariant characteristics: year of birth, sex, and parish of birth. For records sharing these blocking variables, a similarity score is computed for first and last names using the Jaro-Winkler distance, which quantifies string similarity on a scale from 0 (no similarity) to 1 (exact match), giving greater weight to differences at the beginning of the names, where transcription errors are less common. A match is declared only when a single candidate exceeds a threshold score of 0.85,[2] no other candidate falls within a buffer of 0.05 points, and the match is mutually exclusive, that is, each individual in one dataset is the unique best match for the corresponding individual in the other, and vice versa. This mutual exclusivity requirement is central to avoiding false positives. For the 1950 census, direct linkage via personal identification numbers, introduced in Sweden in 1947, makes the procedure straightforward for the vast majority of the observations.

The high quality of Swedish archival sources makes this record-linkage procedure exceptionally reliable. Historically, birth years were recorded with great precision, name spellings remained consistent, and the parish of birth was documented at a granular geographic level.[3] The Swedish Death Index (SDI) relies on similarly detailed parish-level

[1] Digitization rates for the 1930 census vary across regions, with the missing observations not believed to be systematically concentrated in any particular segment of society.

[2] This threshold balances the number of successful links against accuracy. For full details on the linkage methodology and validation, see Castillo et al. (2025).

[3] The 1930 census does not yet have coded birth parishes, so these locations are only available as unharmonized text strings. To obtain a parish code and perform the record linkage, we assigned a code to each parish by matching these strings against the Swedpop reference tables. When no direct match could be found in the Swedpop tables, we searched for the same parish name in older censuses to find a match with some minor manual harmonization.

records. To address the fact that children and women could carry multiple potential last names, such as patronymics, father's name, mother's name, or spouse's name, all plausible alternatives are included in the matching algorithm. Evaluation metrics confirm the robustness of the linking process. For census-to-SDI links, the share of adults at age 40 who are successfully linked ranges from approximately 60 to 82 percent for the name-based matching, and 96 percent for the 1950 census to SDI linking.[4] Disagreements between links are rare, representing less than one percent of all links, and are resolved by removing the affected observations entirely to preserve data integrity.

Social class scheme

The Swedish historical censuses do not contain information on income or wealth, so we therefore measure socioeconomic status by social class based on occupation, which is recorded for all individuals in each census and has been widely used in previous historical research on mortality, fertility and social mobility (e.g., Dribe and Eriksson 2025; Bengtsson et al. 2020). Occupations are coded using the Historical International Standard Classification of Occupations (HISCO; Van Leeuwen et al. 2002) and then classified into social classes using a modified version of the HISCLASS scheme (Van Leeuwen and Maas 2011).[5] We distinguish six groups: (1) higher white-collar workers, comprising professionals and senior managers; (2) lower white-collar workers, including clerks and lower-level non-manual occupations; (3) skilled manual workers, such as craftsmen and artisans; (4) farmers and fishermen; (5) lower-skilled manual workers, covering semi-routine manual occupations; (6) unskilled manual workers, including laborers and domestic servants. The farmers represent a category that is heterogeneous in terms of landholding and economic standing, ranging from smallholders to large landowners (particularly in the early cohorts), and is best treated as a group unto itself rather than positioned straightforwardly within a linear hierarchy. Apart from farmers, the scheme is broadly hierarchical in terms of income and status, with white-collar workers at the top and unskilled manual workers at the bottom. Individuals without an identifiable occupation are excluded from the social class analysis.

Consequently, we successfully assigned standardized parish codes to over 99 percent of digitized individuals with a recorded Swedish birth parish.

[4] Table A1 in the Appendix presents the linkage rates by census year.

[5] The occupational strings in the 1930 census have not yet been coded to standardized HISCO codes. We follow the same approach as with parish of birth, first matching occupational strings to the reference tables available through SwedPop, and where no direct match is found, we search for the same string in the earlier censuses where HISCO codes had already been assigned. After some manual harmonization of the remaining unmatched entries, this procedure yields valid HISCO codes for over 96 percent of individuals with a registered occupation.

Estimating life disparity

To compute life disparity, we first construct cohort life tables by cohort and sex and, for the social class analysis, by social class. Although our data would in principle allow life tables for single birth cohorts, we aggregate individuals into five-year birth cohorts to increase the statistical precision of the age-specific death rates and to produce smoother age-at-death distributions, following the approach used by van Raalte et al. (2014) for period data. This is particularly important for the smaller social class subgroups, where single-cohort estimates could be subject to considerable random variation. From the life table, life disparity conditional on survival to age 40 is calculated as:

$$e_{40}^{\dagger} = \frac{\sum f(x) \cdot e(x)}{l_{40}}$$

where *f(x)* is the number of life-table deaths at age x, *e(x)* is the remaining life expectancy at age x, and l_{40} is the number of survivors at age 40. In sum, the formula takes each age at which death occurs, records how many years of life the individual could have expected to live at that age, and averages this quantity over all deaths (van Raalte et al. 2014).

We condition on survival to age 40 to focus on adult lifespan variation and to avoid the large influence that infant and child mortality exert on overall measures of lifespan variation. Even small levels of early-life mortality can have a disproportionate effect on the moments of the age-at-death distribution, masking the dynamics of adult mortality that are the focus of our analysis (Edwards and Tuljapurkar 2005; van Raalte et al. 2012). Second, and more specific to our study, we need social class to be reliably established. Social class measured too early in adulthood may not yet reflect an individual's settled position, whereas by age 40, occupational status is largely stable (van Raalte et al. 2014; Torche 2015). Since our census linkage provides occupation at or near this age, conditioning on survival to age 40 ensures consistency between the population at risk and the population for which social class is defined.

A potential concern is that conditioning on survival to age 40 might introduce selection bias, as those who survive to this age may be a healthier or otherwise a non-random subset of their birth cohort. This is a common limitation in studies of adult lifespan variation, and there is no straightforward way to avoid it when social class can only be observed in adulthood (van Raalte et al. 2012; van Raalte et al. 2014). Several considerations suggest that this selection is unlikely to substantially affect our results. First, for most of the cohorts in our study, survival to age 40 was high, limiting the scope for differential selection.[6] Second, we replicate our main analyses conditioning on survival to age 30, which captures a larger share of the original birth cohort, and find that the results are qualitatively unchanged. Third, our primary interest lies in trends and social class differences rather than absolute levels, so selection bias would only distort our conclusions if selective survival differed systematically across cohorts or classes in ways that correlate with life dispersion. The sharply different patterns we find between men and women, who face similar pre-40 selection, make this unlikely.

Results for the full population

The full Swedish Death Index includes 6,163,107 individuals, 3,014,611 men and 3,184,496 women. It represents all individuals born in Sweden between 1841 and 1920 who survived to at least age 40 and died in Sweden before 2023. We use these data to analyze average lifespan and life disparity for the whole population.[7]

Average age at death

Figure 1 plots the average age at death for men and women across birth cohorts from 1841–1845 to 1916–1920. The pattern confirms what has been established in prior work on Swedish adult mortality: longevity increased substantially and continuously over this period for both sexes (Dribe and Eriksson 2025). The gains for women were even larger in absolute terms and steeper in their timing. Women consistently outlived men throughout the period, and the gap between the sexes widened noticeably from around the 1881–1885 cohort onward, as female longevity began to accelerate relative to male longevity. This divergence reflects well-documented patterns in the development of the sex gap in mortality during the twentieth century.

Figure 1

Life disparity

Figure 2 presents life disparity conditional on survival to age 40, our primary measure of lifespan inequality. A higher value means that deaths are more spread out across ages,

[6] For those who survived to age 15, more than 85 percent survived to age 40 in the cohorts with higher mortality and up to 95 percent for the last cohorts (own calculations not shown in the paper).

[7] In the Appendix Figures A1–A4, we replicate these results using the full linked sample in place of the complete SDI.

producing greater uncertainty in the timing of death for individuals in that cohort. The figure reveals a clear long-run decline in life disparity for both men and women, but the trajectory is not uniform across time or between sexes, and several features deserve careful attention.

Figure 2

For men, life disparity starts at around 11.3 years in the earliest cohorts and declines gradually but persistently through the cohorts born in the 1870s and 1880s. The pace of decline then accelerates from around the 1886–1890 cohort onward, reaching a plateau in the cohorts born around the turn of the century. Strikingly, male life disparity does not continue to fall for the last cohorts: those born in 1911–1915 and 1916–1920 show a slight uptick. This reversal in the final cohorts is a notable departure from the otherwise monotonic trend.

Women's life disparity follows a different path. Starting at around 10.9 years in the 1841–1845 cohort, it changes little through the cohorts born up to roughly 1871–1875, even showing a slight increase in that cohort group. This flatness or mild rise stands in sharp contrast to the steady decline already visible for men over the same period. Beginning with cohorts born in the late 1880s, however, female life disparity starts to fall, and the pace of decline becomes dramatic for the later cohorts. By the 1916–1920 cohort, women's life disparity had fallen to approximately 9.6 years, well below the level for men at the same time and the lowest value recorded in the entire series.

Two broader patterns emerge from Figures 1 and 2. First, rising average longevity and falling life disparity went together across all cohorts for both sexes, consistent with the compression of mortality into older ages that is expected as populations move through the epidemiological transition. Second, the pace of change in average longevity and in life disparity was not identical: women gained more in average longevity in the later cohorts, and their life disparity also fell more steeply, suggesting that for women the benefits of the later stages of the health transition were concentrated in a way that simultaneously extended life and made its timing more predictable. For men, by contrast, the modest upturn in life disparity for the final cohorts hints that the growing social stratification of male mortality began to pull the distribution of ages at death apart even as average longevity continued to rise.

Decomposition of life disparity by age

A key advantage of life disparity as a measure of lifespan variation is that it can be decomposed into different age ranges. In principle, the total disparity can be decomposed into contributions from any set of age intervals chosen, for instance, into decade-long ranges or broad life-course stages. We adopt the decomposition by the threshold age, $a^\dagger$, derived analytically by Zhang and Vaupel (2009), which is determined entirely by the mortality conditions of each population and cohort. This threshold has a clear and theoretically grounded interpretation: it is the unique age that separates death with a compressing effect on the distribution of ages at death from those with an expanding effect.

Specifically, deaths occurring before $a^\dagger$ reduce life disparity: they are early relative to the typical age at death, and eliminating them would concentrate the distribution of ages at death into a narrower range, compressing lifespan variation. Deaths occurring after $a^\dagger$ have the opposite effect: they occur late relative to the average, and eliminating them would widen the distribution even more and hence increase disparity. In other words, the threshold age divides mortality into a compressing component, driven by early deaths, and an expanding component, driven by deaths at old age. The overall level of life disparity is the sum of these two parts, and changes over time in total life disparity can therefore be attributed to shifts in either or both components. Importantly, the threshold $a^\dagger$ is not fixed, and it generally sits just below the average remaining life expectancy at the starting age, so it will rise as longevity increases. This means that what counts as an "early" death is defined relative to prevailing conditions: a death at age 70 may have been an old-age death in an earlier, higher-mortality period, but an early death by the standards of later cohorts with larger longevity. Using $a^\dagger$ as the dividing point, therefore, ensures that the decomposition reflects the internal structure of mortality rather than an imposed categorization, and it allows the early and old-age disparity boundary to change naturally as longevity changes across cohorts and groups (van Raalte et al. 2014).

For our analysis, we decompose life disparity conditional on survival to age 40 into its early-age and old-age components for each five-year birth cohort and separately for men and women. To summarize how the balance between these two components changed over time, Figure 3 shows the share of total life disparity that can be attributed to early-age deaths, that is, deaths occurring before the threshold age $a^\dagger$, by cohort and sex for the full Swedish population. Across the entire period, early-age deaths account for the majority of total life disparity for both sexes, showcasing that adult lifespan variation in historical Sweden was driven predominantly by deaths occurring before the threshold age rather than by variation at old ages. For men, there is a downward trend until about the turn of the century, after which an upward trend dominates. For women, the pattern is more stable though erratic. For most years, the early-age share is slightly higher for men than for women.

Figure 3

Figure 3 reveals that the trends in the early-age share of life disparity broadly mirror, and help explain, certain patterns in total life disparity seen in Figure 2. For men, the early-age share declines gradually from the earliest cohorts to the birth cohorts 1896–1900, after which it stagnates and then rises for the final cohorts. This increase in the early-age share is consistent with the increase in total male life disparity seen in Figure 2, suggesting that the reversal in overall disparity for men born after 1900 was driven at least in part by a relative increase in deaths occurring before the threshold age rather than solely by greater variation at older ages. For women, the early-age share declines from the first cohorts to the birth cohorts 1861–1865, a movement that corresponds to the modest reduction in total female life disparity seen in Figure 2 over the same period. For women born from 1861 onward, the early-age trend is elevated again and stays rather consistent, except for a brief dip for cohorts born 1881–1890. The overall female life disparity, however, showed an increase and stagnation for cohorts born from 1861 to 1890, after which the steady decline started. This pattern suggests that the reduction in overall disparity was not driven exclusively by a contraction in early-age deaths but likely reflects a broadly based compression across both age components, rather than one component being dominant.

To complement Figure 3, panels A and B in Figure 4 present the absolute levels of the early-age and late-life components separately, which allows us to assess how many years of disparity each component contributes and how they change over time. For early-life disparity, men started at higher levels than women in the earliest cohorts, and the levels declined for both sexes over the period, though for women the decline was faster, which explains the crossing of the two series and the ultimate female advantage in total life disparity seen in Figure 2. Late-life disparity declined more modestly for both sexes, and the two tracked each other rather closely for most of the period, confirming that the bulk of the overall reduction in life disparity came from the compression at younger ages and not at older ages. A notable exception is a rise in female late-life disparity around the 1866–1880 cohorts, which corresponds to the stagnation in total female life disparity visible in Figure 2 over the same period, suggesting that it was old-age mortality becoming more dispersed, rather than any change in premature mortality, that temporarily interrupted the female compression trend. The mild upturn in total male life disparity for the final cohorts is also clarified here: it originates in the early-age component, while late-life disparity continued to decline, pointing once again to premature mortality as the driving force.

Social class differences

Distribution by cohort and sex

Table 1 presents the distribution of social class for men and women across the five censuses used in the analysis. The changes follow a pattern consistent with Sweden's broader structural transformation over the period. For men, farmers and unskilled workers, the two largest groups in 1880 declined substantially to become among the relatively smallest groups in 1950. These contractions were offset by growth in the white-collar and skilled categories. The female distribution follows a broadly similar trajectory, though it differs in the relative weight of the lower-skilled category, which remained the largest group for women throughout the period. Importantly, the pace of change across adjacent censuses is gradual rather than abrupt, meaning that each social class retains a sufficiently stable composition over time to support a meaningful comparison of lifespan outcomes across cohorts.

Table 1

Average age at death by social class

Panels A and B in Figure 4 present the average age at death conditional on surviving to age 40, by social class, for men and women, respectively. The trends confirm the findings of Dribe and Eriksson (2025) using the same data. For men, the most important feature is a pronounced social gradient that reverses over the period. In the earliest cohorts, farmers lived the longest, while higher and lower white-collar workers had the shortest lives of all groups. By the final cohorts, this ranking largely inverted: higher white-collar workers surpassed all other groups, while skilled, lower-skilled, and unskilled workers clustered together at the bottom of the gradient. Farmers remained near the top throughout.

For women, differences in average age at death across social classes were considerably smaller to begin with and more stable. In the earliest cohorts, all groups clustered with no clear gradient. A positive gradient in favor of white-collar women gradually emerged from around the 1866–1870 cohort onward and widened over time, so that by the last cohort studied, a clear gradient was evident, with the lowest social classes at the bottom.

Figure 5

Life disparity by social class

Panels A and B in Figure 6 show life disparity by social class for men and women, respectively. The general downward trend visible in Figure 2 for the full population is largely reproduced within each social class, but the levels, timing, and pace of decline differ considerably across groups.

Figure 6

For men, in the early cohorts, there were pronounced differences in life disparity by social class, with a gap larger than one year between the social classes with the highest (lower white-collar workers) and lowest (farmers) life disparities. Skilled, unskilled, and lower-skilled workers fell in the middle of the distribution in that order, while higher white-collar workers completed the ranking with a life disparity close to that of the lower-skilled workers. For the following birth cohorts, a downward trend was visible for most social classes, accompanied by a slight convergence, until around the cohorts born in 1866–1870. An exception was the higher white-collar class, which instead surpassed lower white-collar workers to become the class with the highest life disparity by that cohort, and widened that gap further in the following cohort. From that point onward, a broadly parallel downward trend prevailed across all social classes until the cohorts born at the end of the century. For the last two cohorts, however, life disparity stagnated or increased for virtually all social classes, corresponding to the increase in overall male life disparity seen in Figure 2. Notably, the only group not to follow this pattern was higher white-collar workers, who also recorded the largest average age at death in the final cohorts. Throughout the entire period, farmers displayed the lowest life disparity of any group, and by the last cohorts, a clear gap to the remaining classes had opened up, as the other social groups converged toward a life disparity of around 10.5 years.

For women, life disparity across social classes was much more compressed. In the earliest cohorts, all groups clustered between roughly 10.8 and 11.2 years, with higher white-collar women recording the highest disparity and no consistent ordering among the remaining classes. A mild increase in disparity around the 1871–1880 cohorts was visible across most groups, echoing the pattern seen in Figure 2 for the full female population and confirming that this episode was not confined to any particular social class. From roughly the 1876–1880 cohort onward, a broad and sustained decline in life disparity affected all social classes simultaneously, with no group diverging markedly from the general trend. By the final cohorts, however, a clearer pattern emerged in which social class differences became more pronounced. The gradient in life disparity followed an inverse order relative to the average age at death for those cohorts: the classes living the longest—farmers and the two white-collar classes—had the lowest life disparity, while those with the shortest average age at death—skilled, lower-skilled, and unskilled workers—had the highest. The gap between the social class with the highest and the one with the lowest life disparity, although widening, remained considerably more compressed than that observed among men at any birth cohort.

Taken together, the class-specific patterns in life disparity reveal that the overall decline in lifespan uncertainty documented in Figure 2 was driven by broadly shared improvements across social classes rather than by any single class. Farmers consistently displayed the lowest life disparity throughout the period and, among men, also the highest average ages at death for most cohorts. It is worth noting, however, that the farmer group became increasingly homogeneous over the period as Sweden's structural transformation reduced the internal diversity of agricultural occupations, which likely contributed mechanically to the compression of life disparity within that group.

Among men, the convergence in life disparity across classes by the later cohorts coincided with a reversal of the longevity ranking. The stagnation and mild increase in overall male life disparity seen in Figure 2 for the final cohorts appears to be a broad-based phenomenon, with the notable exception of higher white-collar workers. This suggests that the forces behind that increase were not concentrated in any one segment of the male population but operated across the social structure more generally. Among women, where the class gradient in longevity was more stable, and the gradient in life disparity remained weak until the last cohorts, the lowest social classes faced a double burden, enduring both the shortest average ages at death and the greatest life disparity. This is particularly relevant considering the lower-skilled group was the largest among women. The experience of women in the later cohorts appears to follow the more conventional pattern expected from the rectangularization of the survival curve, whereby groups that live longer also tend to die more predictably.

The main results are robust to alternative measures of lifespan variation. The results are presented in Figures A5–A7 in the Appendix. Using the Theil index yields qualitatively identical patterns for both men and women across all social classes. Results using the standard deviation are also broadly consistent, though this measure assigns greater weight to deaths at the extreme right tail of the distribution. As survival curves rectangularize and a growing subset of the population reaches very advanced ages, deaths become increasingly distant from the mean, raising the standard deviation even as life disparity declines. For the measures conditional on survival to age 30, shown in Figures A8–A9 in the Appendix, the results are consistent for the early and middle cohorts, though the two most recent cohorts should be interpreted with caution, as a over 10 percent (11.4 percent) had not yet died by the end of the observation window in 2022, representing individuals with particularly high longevity.

Decomposition by age and social class

Figure 7 shows the share of total life disparity that can be attributed to deaths occurring before the threshold age, $a^{\dagger}$, by social class and cohort, for men (panel A) and women (panel B). Consistent with the pattern documented for the full population in Figure 3, early-age deaths account for the majority of total life disparity within every social class and across the entire period for both sexes.

For men, the share of early-age disparity was highest among higher white-collar workers in the earliest cohorts, declined in the middle cohorts, and then rose again in the last two cohort groups. This trajectory mirrors the patterns in total life disparity for that group, suggesting that the temporary increase in their life disparity, visible in Figure 6, was driven disproportionately by a relative increase in deaths occurring before the threshold age. Farmers, who had the lowest total life disparity throughout, tended to have among the lower shares attributed to early-age deaths, indicating that their advantage in life predictability reflected a more broadly compressed age distribution, not just fewer premature deaths. For the remaining classes, the early-age share declined gradually throughout the middle cohorts and rose again in the final cohorts, consistent with the slow decline and subsequent mild increase in total life disparity seen for those groups in Figure 6.

For women, the trajectory of the early-age share across cohorts and classes was less uniform than for men. In the earliest cohorts, higher white-collar women again stand out with the highest share, while the remaining are clustered together at lower shares. Higher white-collar women saw their share decline relatively steeply through the middle cohorts before increasing in the final cohorts, a pattern similar to that of their male counterparts. Among lower white-collar and skilled women, the share remained relatively stable for the early and middle cohorts, before rising in the last cohorts. Farmers, lower-skilled, and unskilled women show a modest decline through the middle cohorts, with an increase visible for those groups, too. An important distinction of the female decomposition is that the rise in the early-age share for the last cohorts is visible across virtually all social classes, despite the fact that the total female life disparity continued to decline over the same period. This suggests that the ongoing compression of total disparity for the later female cohorts was achieved largely through reductions in late-life disparity rather than further declines in premature mortality, and that this pattern was shared across all social classes.

Figures 8 and 9 present the absolute levels of early age (panel A) and late-life (panel B) disparity by social class, for men and women, respectively. This division allows us to separate these two components more directly. For men, virtually all of the social class differentiation in total life disparity is concentrated in the early-age component. The patterns closely track the differences in total disparity documented in Figure 6. Late-life disparity, by contrast, shows no real differentiation across social classes throughout the period, with all classes following a modest downward trend. For women, the early-age figures reinforce the picture of greater compression across social classes relative to men, with no stable hierarchy emerging across the early and middle cohorts, consistent with the patterns in total female life disparity discussed above. For the final cohorts, however, where a gradient in total female life disparity becomes visible, it does not seem possible to attribute it solely to the early age component. Both early-life and late-life disparity contribute to the emergence of the gradient, with farmers and white-collar women recording lower values in both components relative to manual workers, while the two components work in a partially offsetting direction for some groups in between. In sum, for men, premature mortality was the primary channel through which social class shaped lifespan variation. For women, the emergence of a social class gradient in lifespan disparity in the later cohorts does not appear to be simply a story of the higher social classes experiencing fewer premature deaths. Instead, the gap between social classes in the last cohorts reflected compression on both sides of the distribution.

Discussion

In this study, we examined how both the length and the predictability of adult life evolved across social classes in Sweden for cohorts born between 1841 and 1920. Our findings at the overall population level fit broadly within what Wilmoth and Horiuchi (1999) described as the rectangularization of the survival curve. Over the 80 cohorts studied, average age at death conditional on survival to age 40 rose for both sexes, while life disparity fell, so that Swedes born in 1916 to 1920 lived longer on average than their 1841 to 1845 counterparts and died within a narrower age range. In this sense, the basic prediction of the compression hypothesis held for Sweden over the long run: the survival curve after age 40 became more rectangular over the period. Nonetheless, our findings also revealed that this rectangulization was gendered, uneven, and marked by periods in which average longevity and lifespan dispersion moved in different directions.

Conditional on survival to age 40, life disparity ranged from roughly 11.3 years down to 10.5 for men, and from 10.9 to 9.6 for women. Van Raalte et al. (2014), the main comparative benchmark using period life disparity by social class, report values in the range of 10 to 14 years for Finland, 1971 to 2010, conditional on age 31, with roughly a one-year gap between manual and upper nonmanual males.

For men, life disparity fell gradually from the earliest cohorts and then stagnated, with a slight reversal for the last two cohort groups. For women, life disparity did not change much until the cohorts born in the late 1870s, after which it fell sharply. The decomposition of life disparity by age makde clear why. Across the entire period and for every social class, the majority of life disparity originated in deaths occurring before the threshold age $a^{\dagger}$ and not at advanced ages. This is an important finding, as much of the contemporary concern about old age mortality in high-income countries has been that further longevity gains at advanced ages may widen lifespan inequality (Van Raalte et al. 2018).

When looking at social class, a significant finding relates to the mild increase in male life disparity for the cohorts born after 1910. When compared to the findings of Dribe and Eriksson (2025) that the modern socioeconomic gradient in male adult mortality first becomes visible for these same cohorts, the reversal in the life disparity decline can be seen as an additional aggregate measure of the modern mortality gradient, with a rise in average longevity driven by the advantaged, combined with a widening spread of premature deaths concentrated among the less advantaged. Higher white-collar men were the one group that did not suffer an increase in life disparity, consistent with this argument. The early cohort patterns showed an opposite trend, as higher white-collar men in the 1840s had the shortest lives and the highest life disparity of any class, while farmers had the longest and most predictable lives. The inversion of the gradient points toward a historically specific behavior as the mechanism: the diet, tobacco and alcohol use, and sedentary work associated with the elite in nineteenth century Sweden translated to mortality risks that shifted as the chronic-disease and occupational hazard profile of Swedish society was changed by industrialization (see discussion in Dribe and Eriksson 2025).

The female patterns were, however, structurally different. For most of the period, female life disparity showed no stable class hierarchy. Groups were tightly bunded, their ordering shifted from cohort to cohort, and differences across classes were far smaller than among men. A conventional class gradient in female life disparity only became visible for the cohorts born roughly after the turn of the century, in which a double burden was clear for women in the lowest social classes, who lived the shortest lives and suffered the largest uncertainty of death. Importantly, when the gradient appeared, it spanned both the early-age and old-age components, unlike the male gradient, which was concentrated in premature deaths. The findings for women have two implications. First, the class differences in female lifespan dispersion in Sweden are historically recent, not a longstanding feature that has widened as with the average age at death. Second, changes in the welfare state and the industrial labor market had different effects on the mortality distribution of men and women during the later part of the period studied.

Previous research suggests three scenarios for how lifespan variation evolves by socioeconomic status (van Raalte et al. 2014): diffusion, divergence, and stagnation. The Swedish historical evidence does not cleanly fit any of these scenarios. For most of the period, the male pattern is better described as convergence from an inverted gradient. The female pattern is even harder to fit into these frameworks, since all three scenarios presuppose a stable class ordering that the Swedish female data lack for most of the period. The implication is that the scenarios derived from late-twentieth-century cross-sections do not capture the full historical range of ways in which social structure and mortality dispersion can interact.

An important feature should be given to farmers, as they consistently display the lowest male life disparity throughout the period and remain among the lowest in the female gradient that emerges in the final cohorts. This characteristic can reflect a favorable occupational and dietary profile, but it also reflects the progressive homogenization of the farmer category in Swedish industrialized society: a narrowing group implies a narrowing variance in exposures and, mechanically, in ages at death.

Our study contributes to the economic history of living standards by showing that the predictability of adult life, not only its length, was shaped by social class in ways that changed fundamentally across the period of Swedish industrialization and early welfare-state formation. Taking lifespan inequality alongside life expectancy, therefore, reveals a history of adult mortality that average longevity alone does not capture.

References

Aburto, J. M., Villavicencio, F., Basellini, U., Kjaergaard, S., & Vaupel, J. W. (2020). Dynamics of life expectancy and life span equality. *Proceedings of the National Academy of Sciences* 117(10): 5250–5259.

Bengtsson, T., Dribe, M. & Helgertz, J. (2020). When did the health gradient emerge? Social class and adult mortality in southern Sweden, 1813–2015. *Demography* 57(3): 953–977.

Bronnum-Hansen, H. (2017). Socially disparate trends in lifespan variation: A trend study on income and mortality based on nationwide Danish register data. *BMJ Open* 7: e014489.

Case, A., & Deaton, A. (2020). *Deaths of Despair and the Future of Capitalism*. Princeton: Princeton University Press.

Castillo, M., Dribe, M. & Eriksson, B. (2025). The Swedish Censuses and Death Index Links (SCANDI-Links), ver. 2.0. *Lund Papers in Economic Demography* 2025:1.

Debiasi, E., & Dribe, M. (2020). SES inequalities in cause-specific adult mortality: a study of the long-term trends using longitudinal individual data for Sweden (1813–2014). *European Journal of Epidemiology* 35: 1043–1056.

Debiasi, E., Dribe, M. & Brea-Martinez, G. (2024). Has it always paid to be rich? Income and cause-specific mortality in southern Sweden 1905–2014. *Population Studies* 78(2): 181–201.

Dribe, M. & Eriksson, B. (2025). The long-term development of the mortality gradient: Socioeconomic differences in adult life span of Swedish cohorts 1841–1920. *Population and Development Review* 51(3): 1170–1204.

Edwards, R. D. & Tuljapurkar, S. (2005). Inequality in life spans and a new perspective on mortality convergence across industrialized countries. *Population and Development Review* 31(4): 645–674.

Edwards, R. D. (2011). Changes in world inequality in length of life: 1970–2000. *Population and Development Review* 37(3): 499–528.

Edvinsson, S., & Lindkvist, M. (2011). Wealth and health in 19th century Sweden. A study of social differences in adult mortality in the Sundsvall region. *Explorations in Economic History* 48(3): 376–388.

Fries, J. F. (1980). Aging, natural death, and the compression of morbidity. *New England Journal of Medicine* 303(3): 130–135.

Gillespie, D. O. S., Trotter, M. V., & Tuljapurkar, S. D. (2014). Divergence in age patterns of mortality change drives international divergence in lifespan inequality. *Demography* 51: 1003–1017.

Luque de Haro, V. A. (2024). Social inequalities in adult mortality across Europe (18th-21st centuries): A critical analysis of theories and evidence. *Economics and Human Biology* 55: 101438.

Permanyer, I. & Scholl, N. (2019). Global trends in lifespan inequality: 1950–2015. *PLoS ONE* 14(5): e0215742.

Permanyer, I., Spijker, J., Blanes, A., & Renteria, E. (2018). Longevity and lifespan variation by educational attainment in Spain: 1960–2015. *Demography* 55: 2045–2070.

Razzel, P., & Spence, C. (2006). The hazards of wealth: Adult mortality in pre-twentieth-century England. *Social History of Medicine* 19(3): 381–405.

Rosero-Bixby, L., & Dow, W. H. (2009). Surprising SES gradients in mortality, health, and biomarkers in a Latin American population of adults. *Journal of Gerontology: Social Sciences* 64B(1): 105–117.

Sasson, I. (2016). Trends in life expectancy and lifespan variation by educational attainment: United States, 1990–2010. *Demography* 53(1): 269–293.

Seligman, B., Greenberg, G. & Tuljapurkar, S. (2016). Equity and length of lifespan are not the same. *Proceedings of the National Academy of Sciences* 113(30): 8420–8423.

Shkolnikov, V. M., Andreev, E. E, & Begun, A. Z. (2003). Gini coefficient as a life table function: computation from discrete data, decomposition of differences and empirical examples. *Demographic Research* 8 (11): 305–358.

Smits, J., & Monden, C. (2009). Length of life inequality around the globe. *Social Science & Medicine* 68:1114–1123.

SwedPop (2024). Version 3 of harmonised data in SwedPop [dataset]. https://doi.org/10.48524/SWEDPOP-V3-0.

Torche, F. (2015). Intergenerational mobility and equality of opportunity. *European Journal of Sociology* 56(3): 343–371.

van Leeuwen, M. H., & Maas, I. (2011). *HISCLASS: A historical international social class scheme.* Leuven: Leuven University Press.

van Leeuwen, M. H., Maas, I., & Miles, A. (2002). HISCO: *Historical international standard classification of occupations.* Leuven: Leuven University Press.

van Raalte A. A., Caswell H. Perturbation analysis of indices of lifespan variability. *Demography*, 50(5): 1615–1640.

van Raalte, A. A., Kunst, A. E., Deboosere, P., et al. (2011). More variation in lifespan in lower educated groups: evidence from 10 European countries. *International Journal of Epidemiology* 40: 1703–1714.

van Raalte, A. A., Kunst, A. E., Lundberg, O. et al. (2012). The contribution of educational inequalities to lifespan variation. *Population Health Metrics* 10: 3.

van Raalte, A. A., Martikainen, P. & Myrskylä, M. (2014). Lifespan variation by occupational class: Compression or stagnation over time? *Demography* 51(1): 73–95.

van Raalte, A. A., Sasson, I. & Martikainen, P. (2018). The case for monitoring life-span inequality. *Science* 362(6418): 1002–1004.

Vaupel, J. W., Zhang, Z., & van Raalte, A. A. (2011). Life expectancy and disparity: An international comparison of life table data. *BMJ Open* 2011(1): e000128.

Wilmoth, J. R. & Horiuchi, S. (1999). Rectangularization revisited: Variability of age at death within human populations. *Demography* 36(4): 475–495.

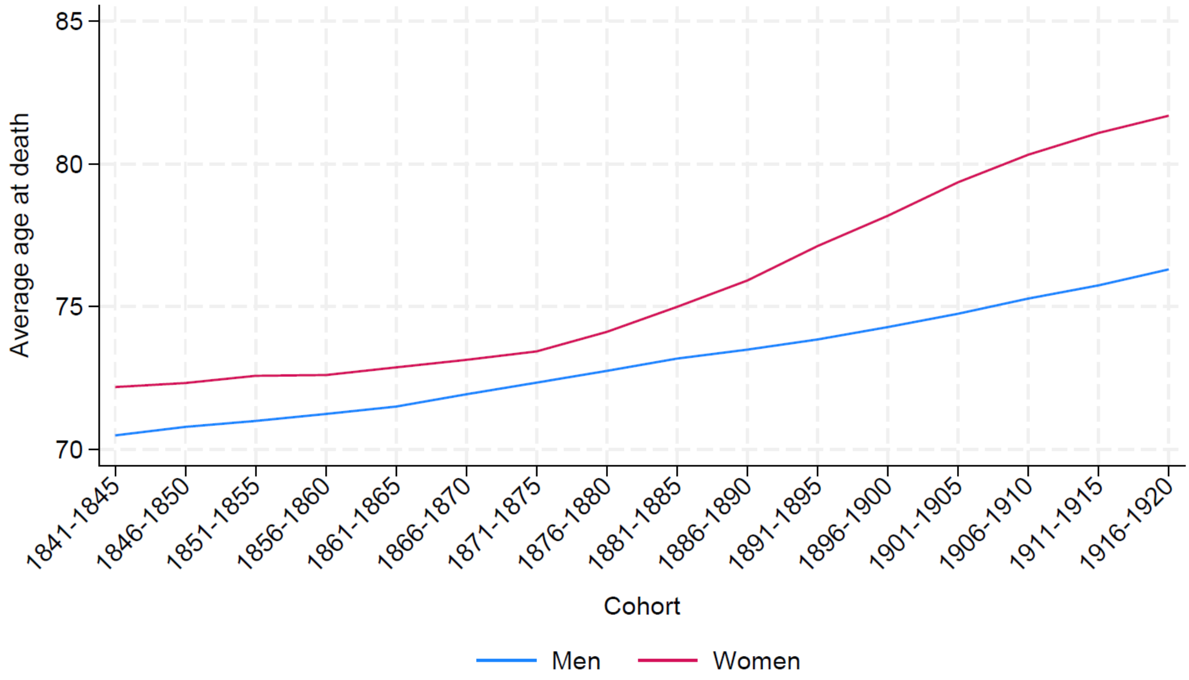


Figure 1. Average age at death conditional on survival to age 40 by birth cohort and sex, Sweden 1841–1920.
Source: SDI.

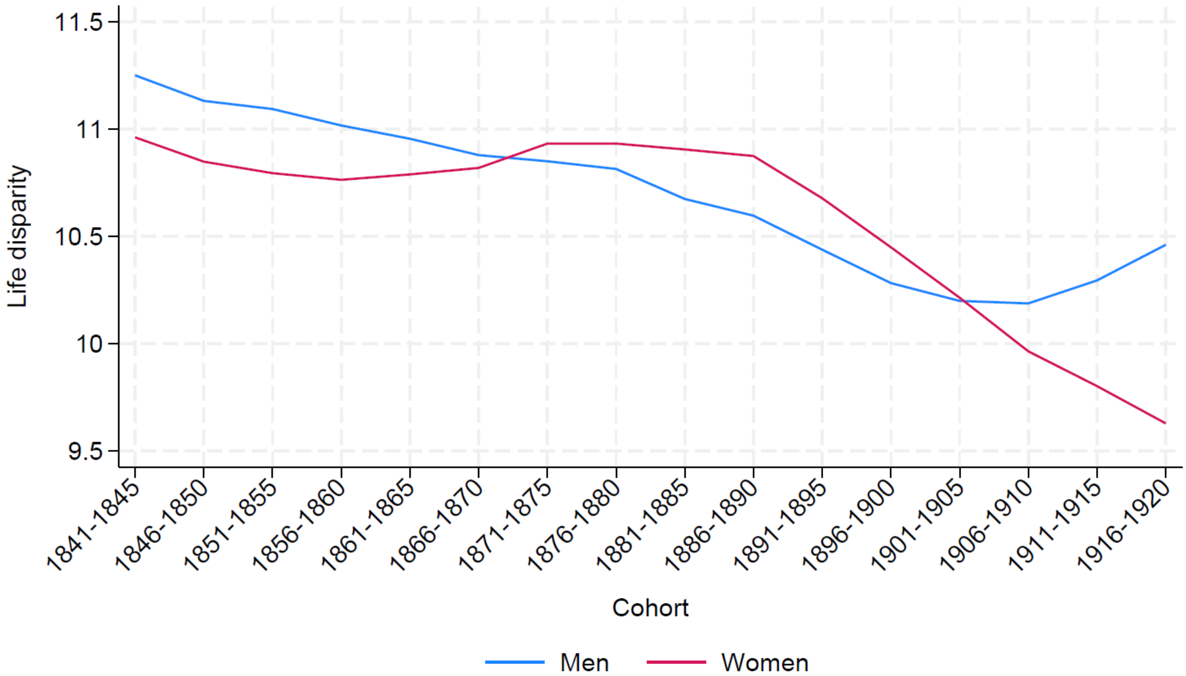
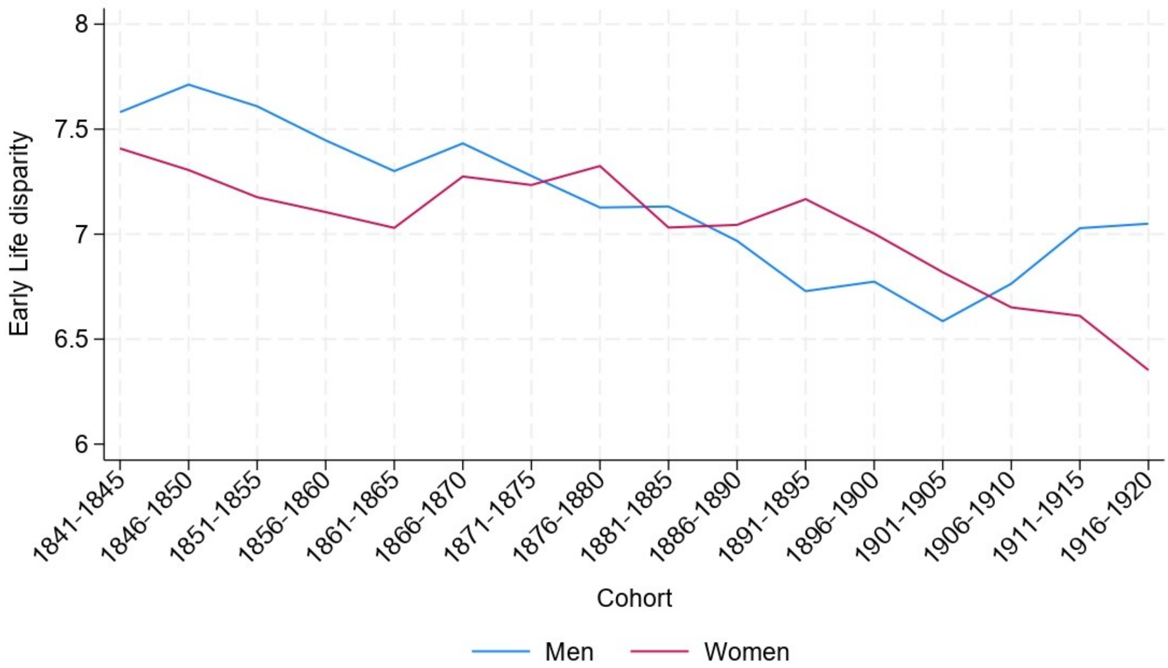


Figure 2. Life disparity conditional on survival to age 40 by birth cohort and sex, Sweden 1841–1920.
Source: SDI.

Figure 3. Percentual contribution of the early-life component of life disparity at age 40 by birth cohort and sex, Sweden 1841–1920.
Source: SDI.

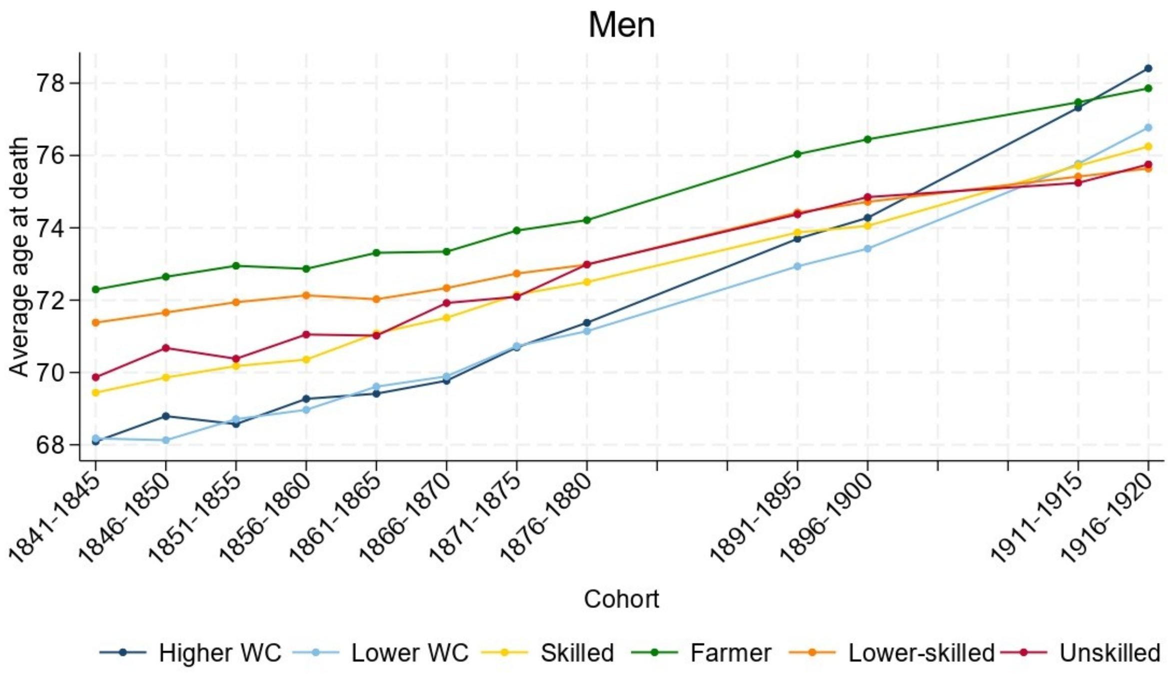
A. Early-life disparity



B. Late-life disparity

Figure 4. Early-life (panel A) and late-life (panel B) disparity at age 40 by cohort and sex, Sweden 1841–1920.
Source: SDI.

A. Men



B. Women

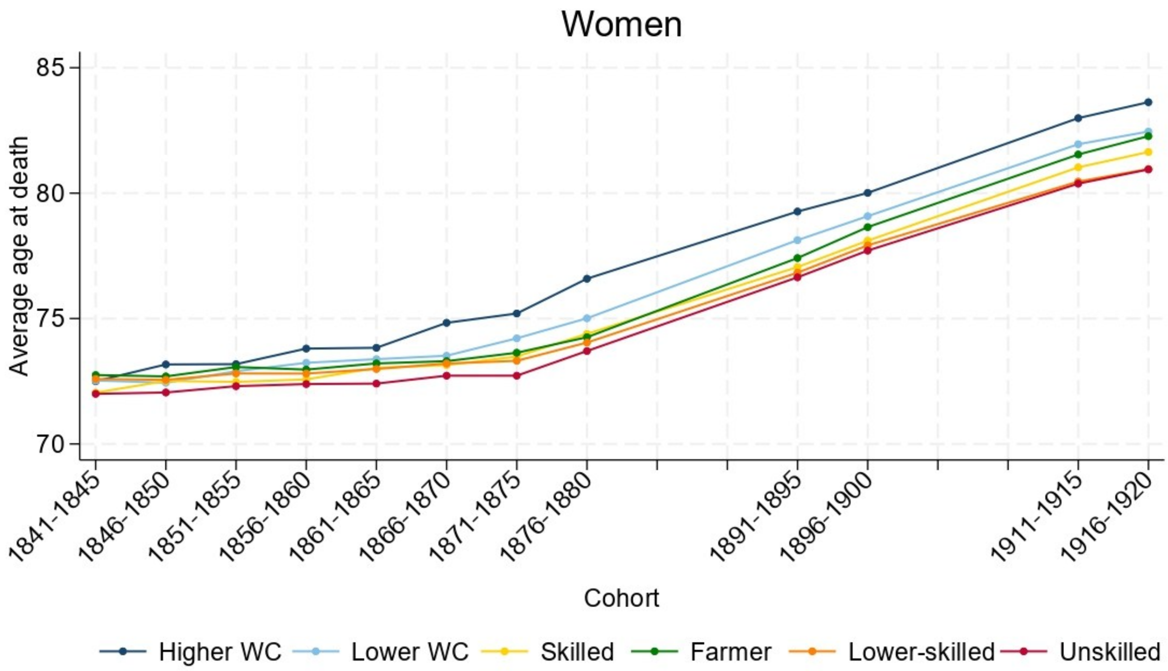
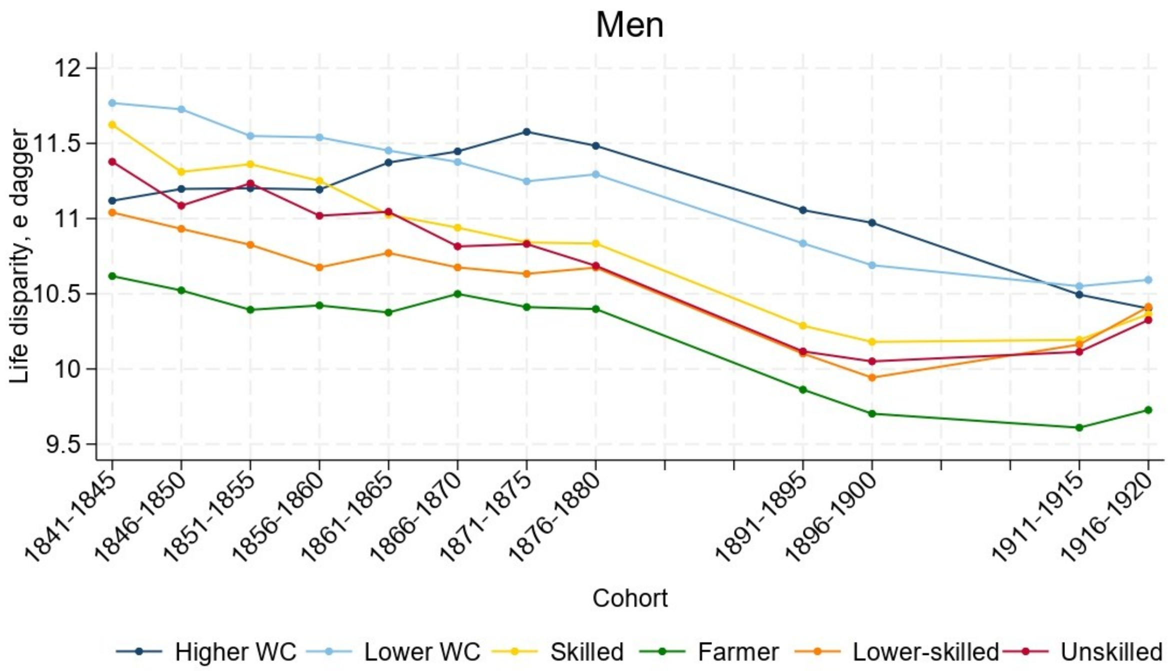


Figure 5. Average age at death conditional on survival to age 40 by birth cohort and social class for men (panel A) and women (panel B), Sweden 1841–1920.
Source: see text.

A. Men



B. Women

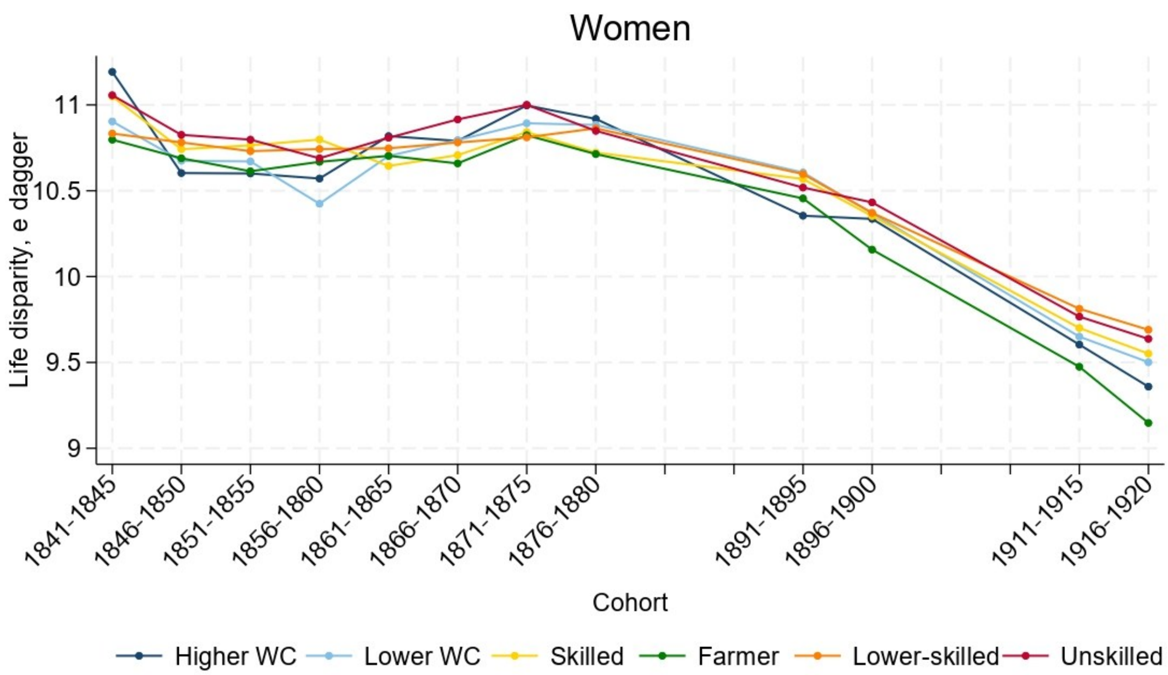
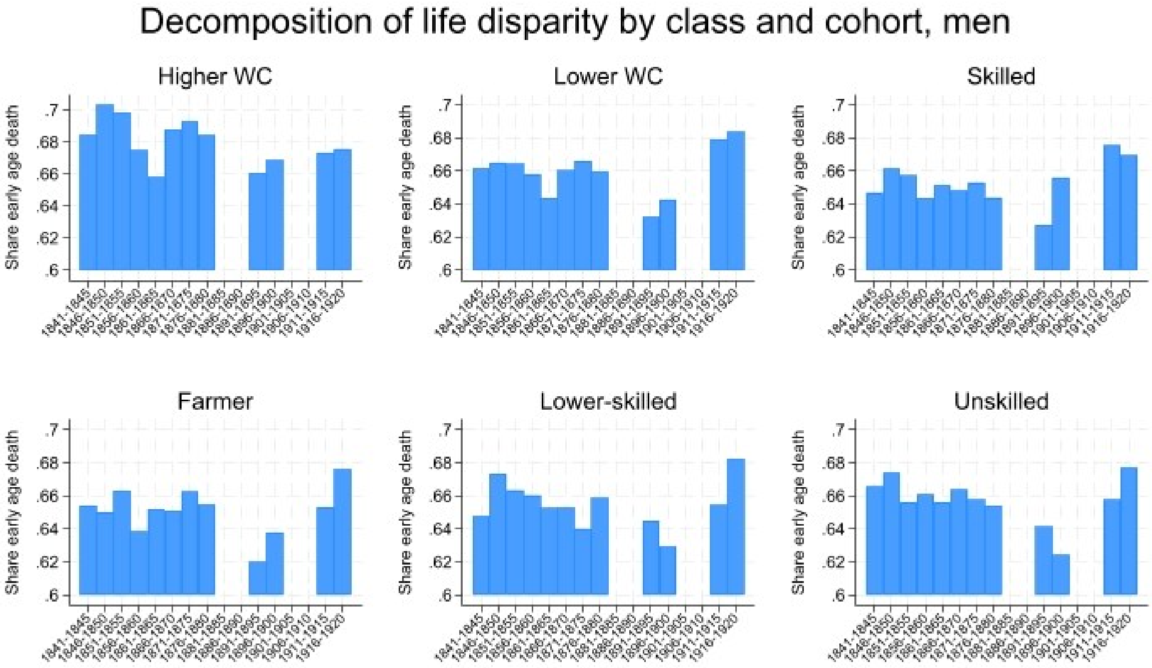


Figure 6. Life disparity conditional on survival to age 40 by birth cohort and social class for men (panel A) and women (panel B), Sweden 1841–1920.
Source: see text.

A. Men



B. Women

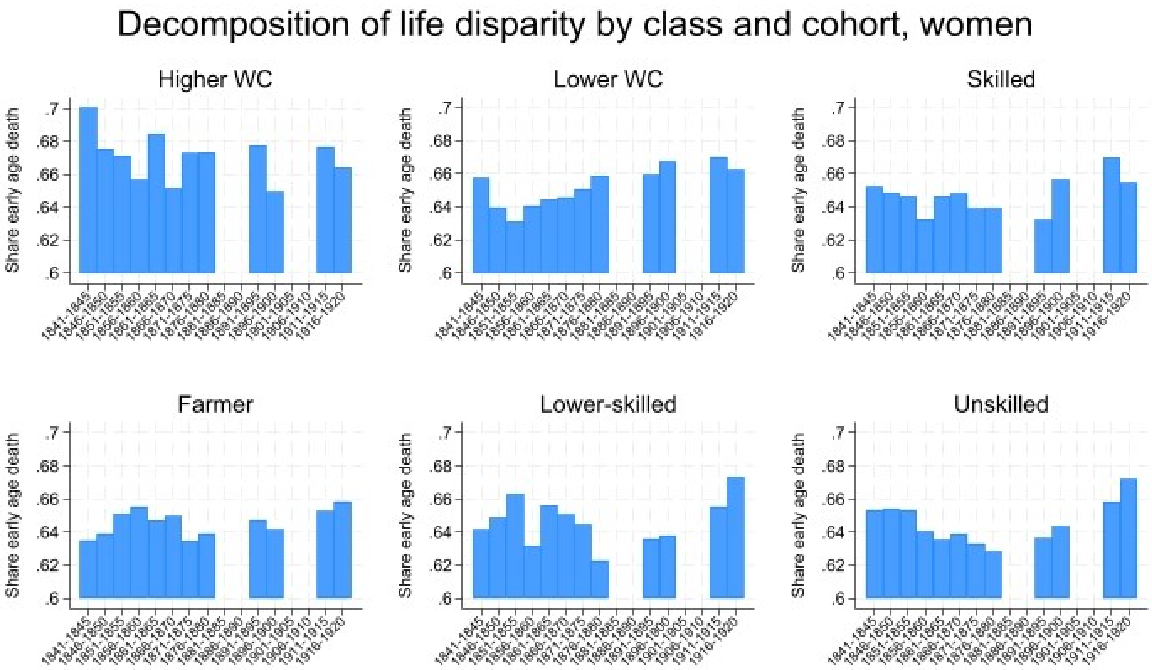
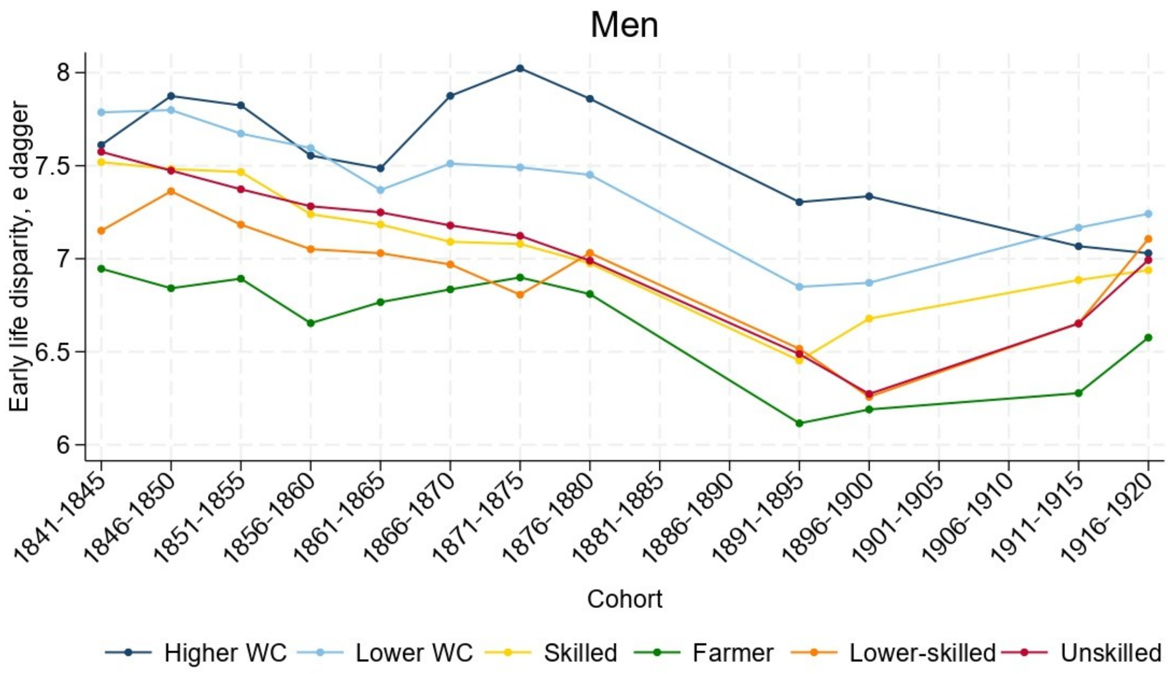


Figure 7. Percentual contribution of the early-life component of life disparity at age 40 by birth cohort and social class for men (panel A) and women (panel B), Sweden 1841–1920. Source: see text.

A. Early-life disparity



B. Late-life disparity

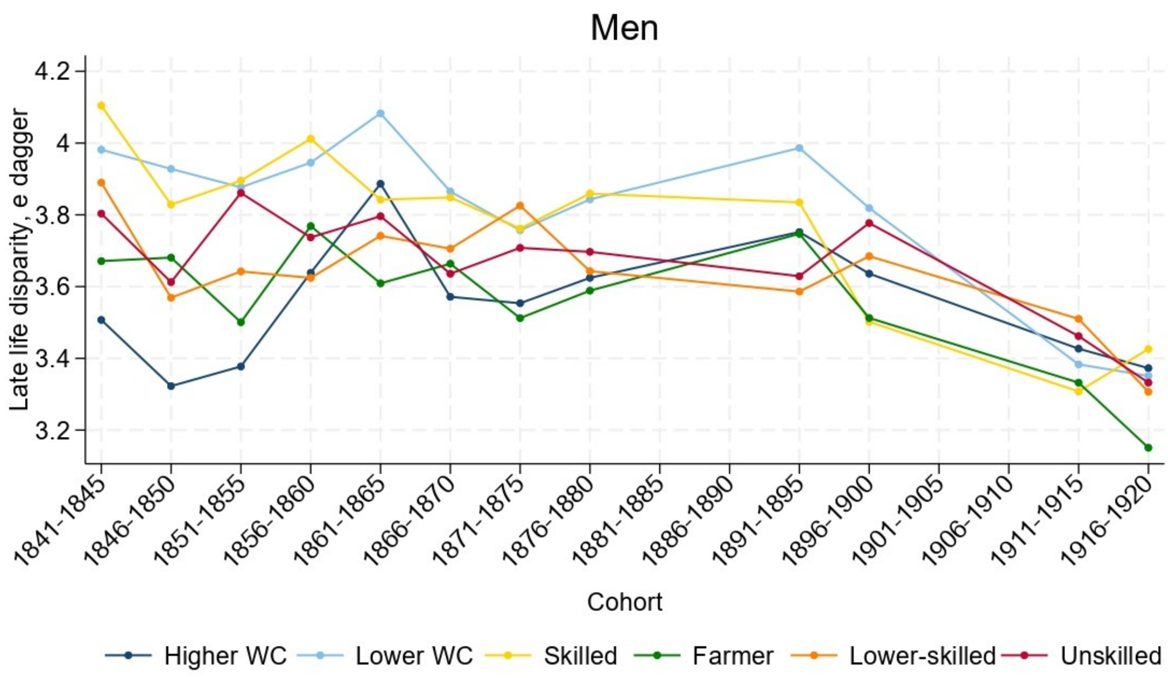
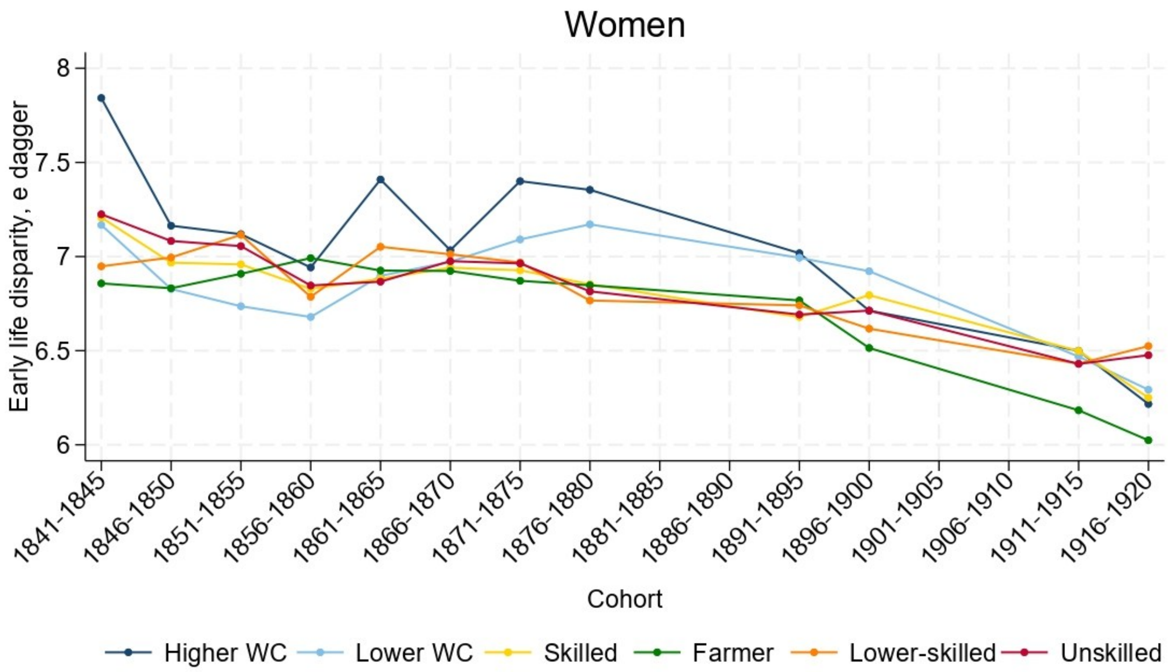


Figure 8. Early-life (panel A) and late-life (panel B) disparity at age 40 by birth cohort and social class for men, Sweden 1841–1920.
Source: see text.

A. Early-life disparity



B. Late-life disparity

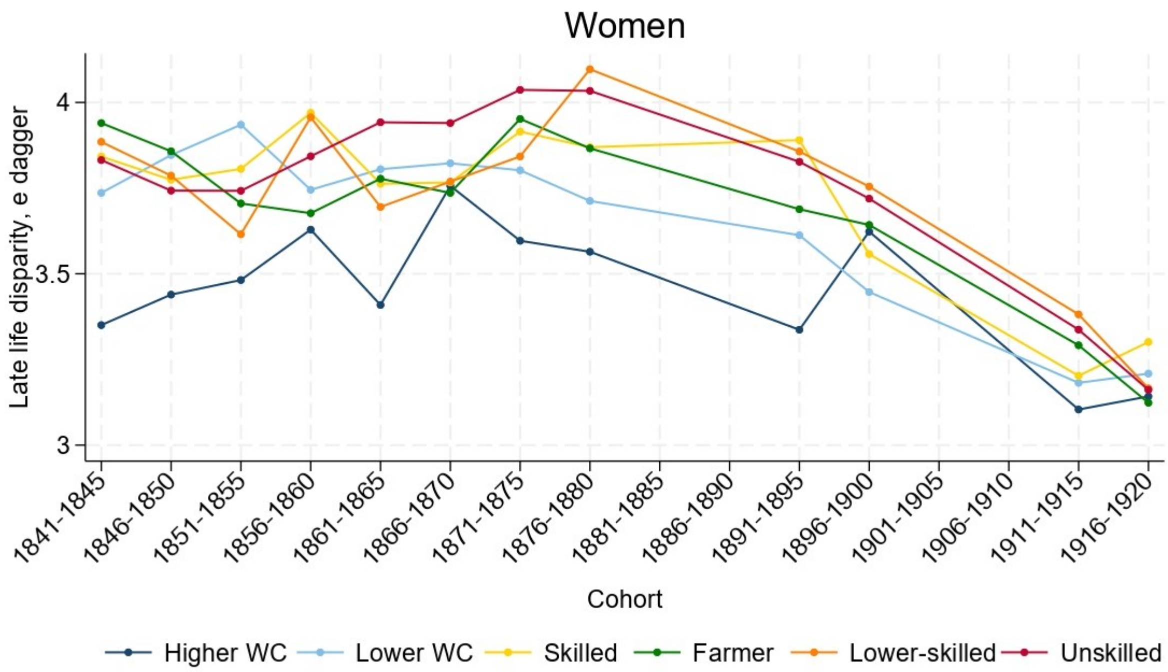


Figure 9. Early-life (panel A) and late-life (panel B) disparity at age 40 by birth cohort and social class for women, Sweden 1841–1920.
Source: see text.

Table 1. Distribution of men and women by social class and census year (linked sample).

	1880		1890		1900		1910		1930		1950	
	Obs	**%**	**Obs**	**%**	**Obs**	**%**	**Obs**	**%**	**Obs**	**%**	**Obs**	**%**
Men												
Higher white-collar	3359	2.36	3828	2.33	5421	2.85	6464	2.67	9500	3.62	38788	7.58
Lower white-collar	12403	8.71	16662	10.13	21821	11.46	31051	12.82	31681	12.06	98350	19.23
Skilled	16199	11.37	21920	13.33	29642	15.57	43154	17.82	39869	15.18	104418	20.42
Farmers	39207	27.52	38734	23.55	39900	20.95	44871	18.53	45670	17.39	45379	8.87
Lower-skilled	28661	20.12	34942	21.24	41578	21.84	58474	24.15	71240	27.12	135511	26.50
Unskilled	42648	29.93	48409	29.43	52057	27.34	58103	24.00	64734	24.64	89002	17.40
Total	142477	100.00	164495	100.00	190419	100.00	242117	100.00	262694	100.00	511448	100.00
Women												
Higher white-collar	2719	1.98	3395	2.12	4726	2.57	6299	2.82	12600	4.97	38632	7.96
Lower white-collar	9789	7.14	14585	9.11	20986	11.43	32482	14.57	38692	15.28	124174	25.59
Skilled	13607	9.93	18637	11.64	25455	13.87	36730	16.47	46930	18.53	90300	18.61
Farmers	36882	26.92	37355	23.32	38418	20.93	41454	18.59	44567	17.60	44326	9.13
Lower-skilled	44636	32.58	51017	31.85	56041	30.53	68187	30.58	75167	29.68	133967	27.61
Unskilled	29383	21.44	35171	21.96	37948	20.67	37847	16.97	35334	13.95	53886	11.10
Total	137016	100.00	160160	100.00	183574	100.00	222999	100.00	253290	100.00	485285	100.00

Source: see text.

Appendix

Table A1. Percentage of the population aged 30-39 in the censuses linked to the SDI.

Census year	Percentage
1880	60.19
1890	66.01
1900	72.35
1910	76.35
1930	82.14
1950	96.13

Source: see text.

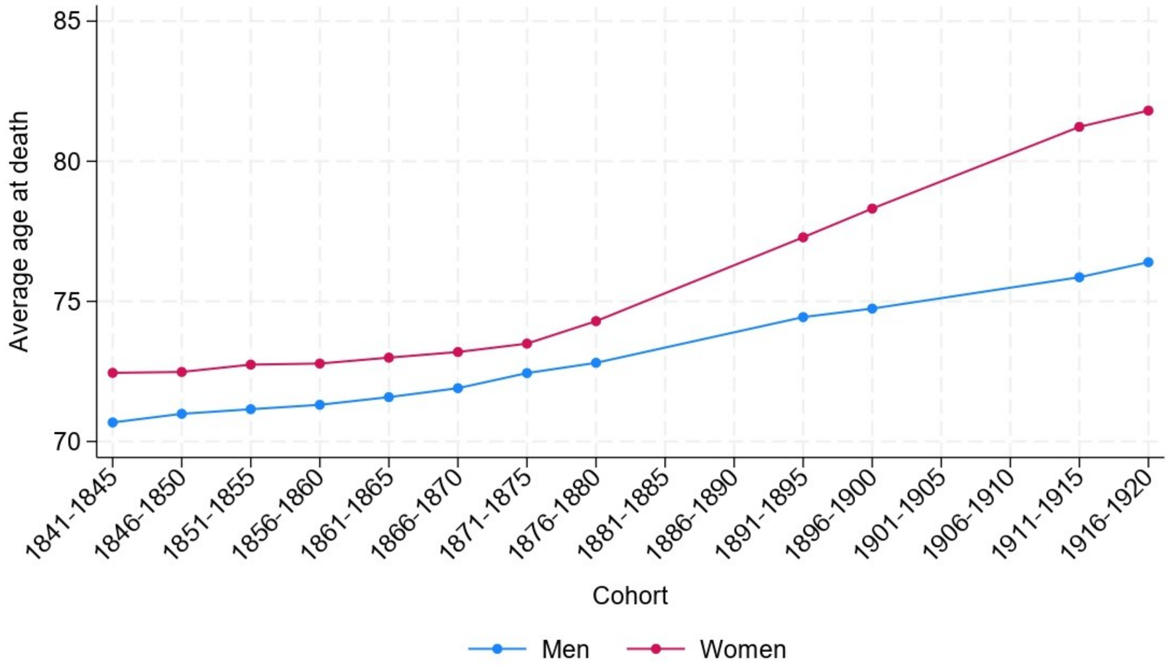


Figure A1. Average age at death conditional on surviving to age 40 using the linked sample, by cohort and sex, Sweden 1841-1920.

Source: see text.

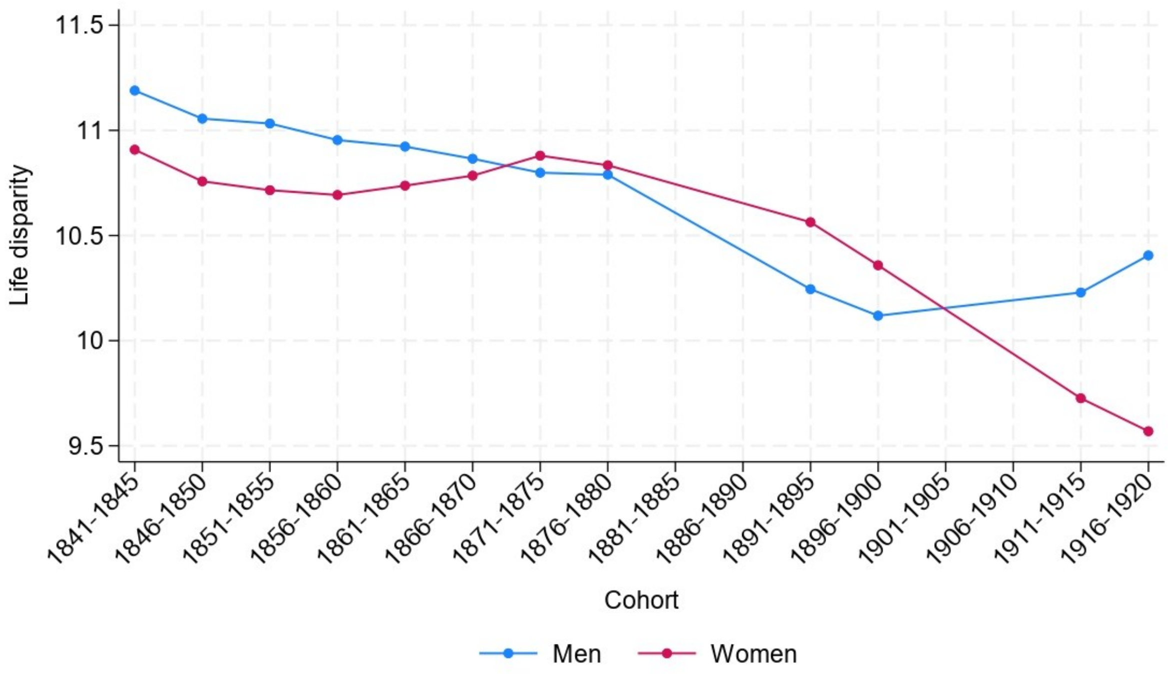


Figure A2. Life disparity conditional on surviving to age 40 using the linked sample, by cohort and sex, Sweden 1841-1920.

Source: see text.

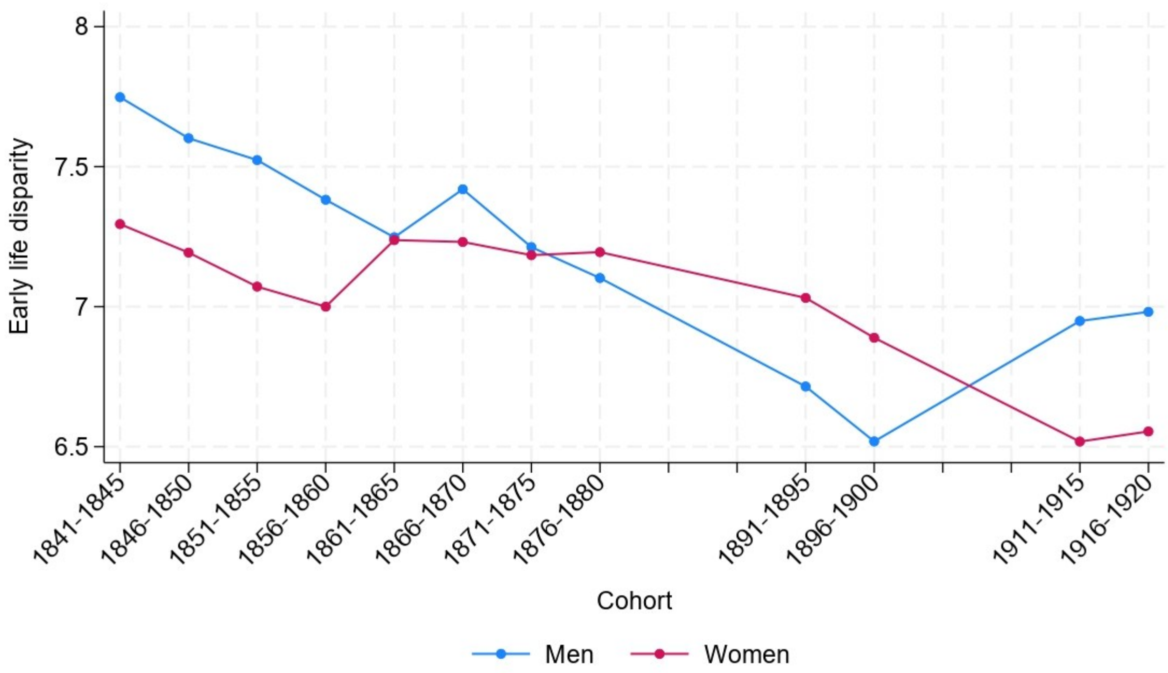


Figure A3. Early-life disparity conditional on surviving to age 40 using the linked sample, by cohort and sex, Sweden 1841-1920.

Source: see text.

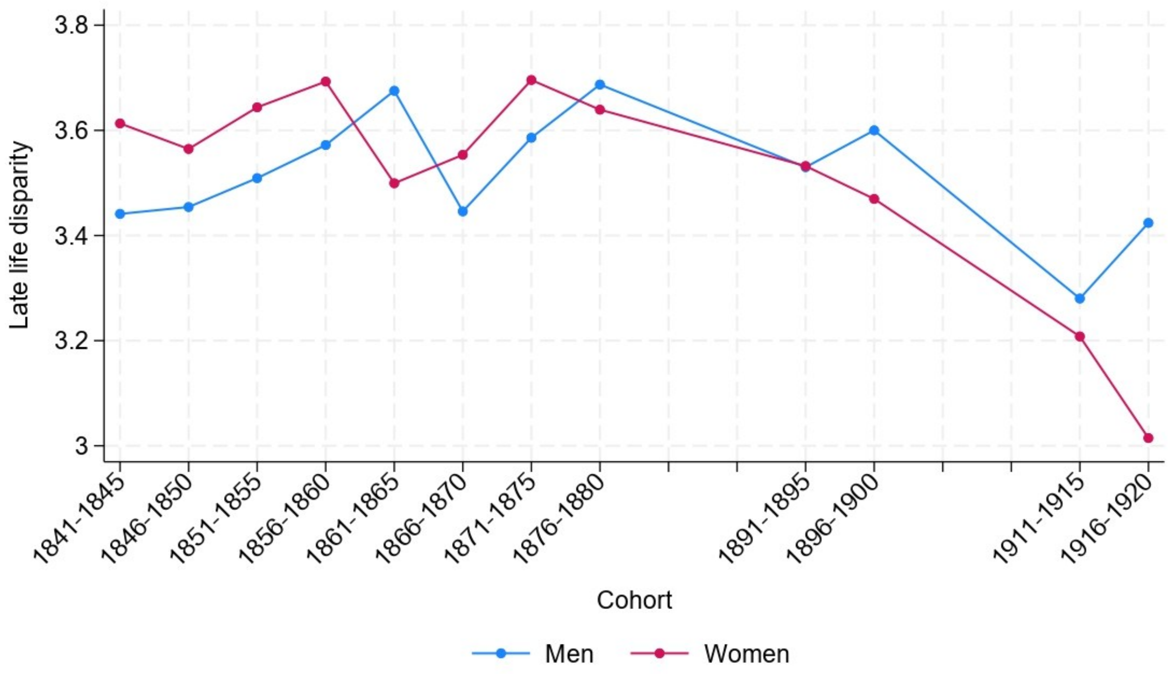
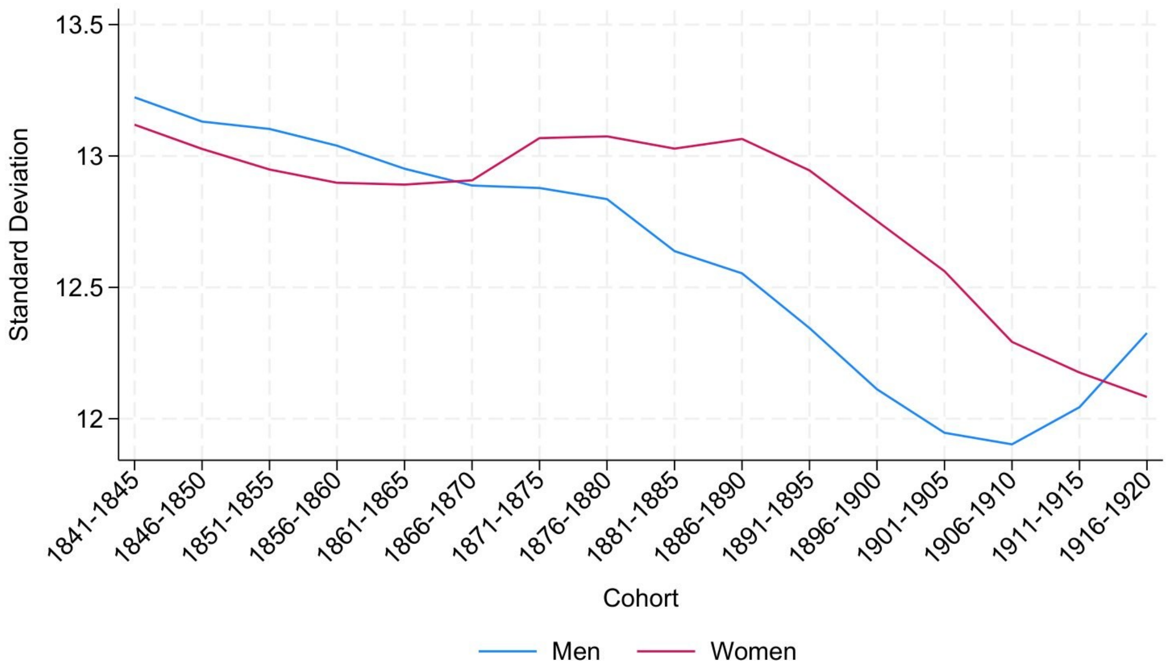


Figure A4. Late-life disparity conditional on surviving to age 40 using the linked sample, by cohort and sex, Sweden 1841-1920.

Source: see text.

A.

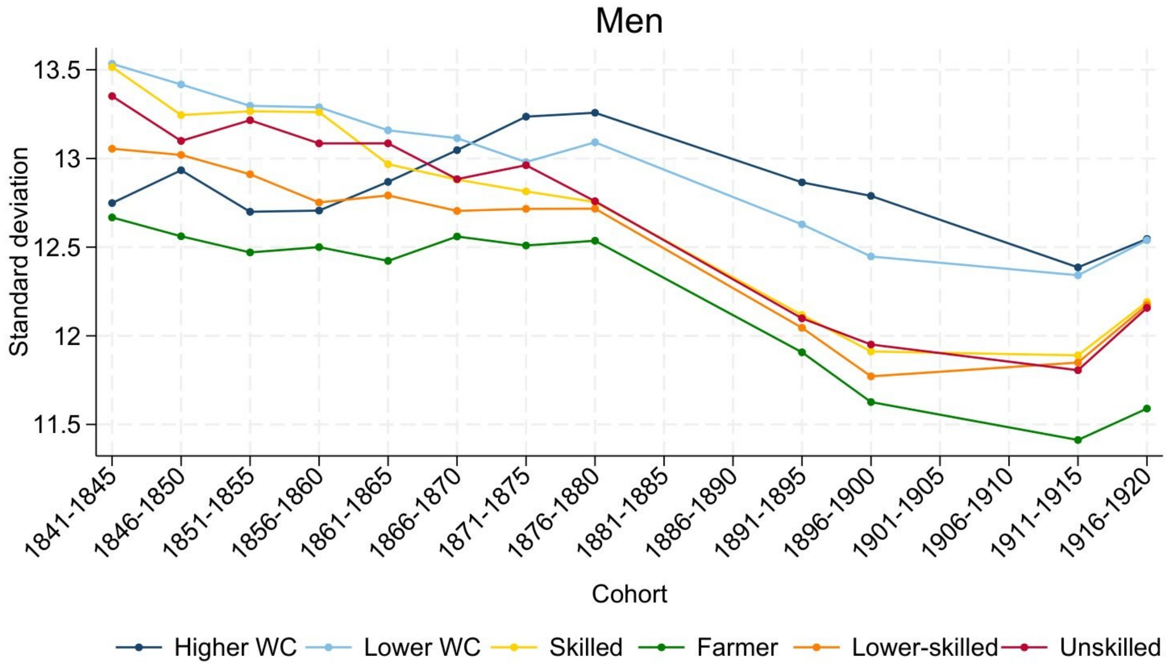


B.

Figure A5. Standard deviation (panel A) and Theil index (panel B) of lifespan conditional on survival to age 40 by birth cohort and sex.

Source: SDI.

A. Men



B. Women

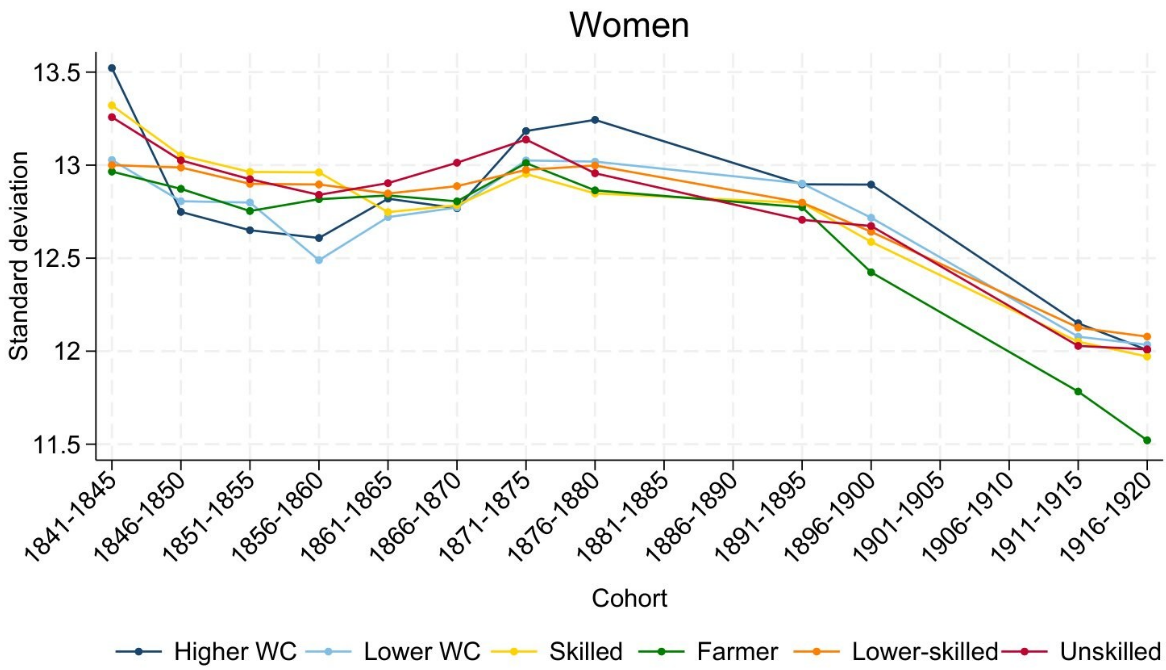
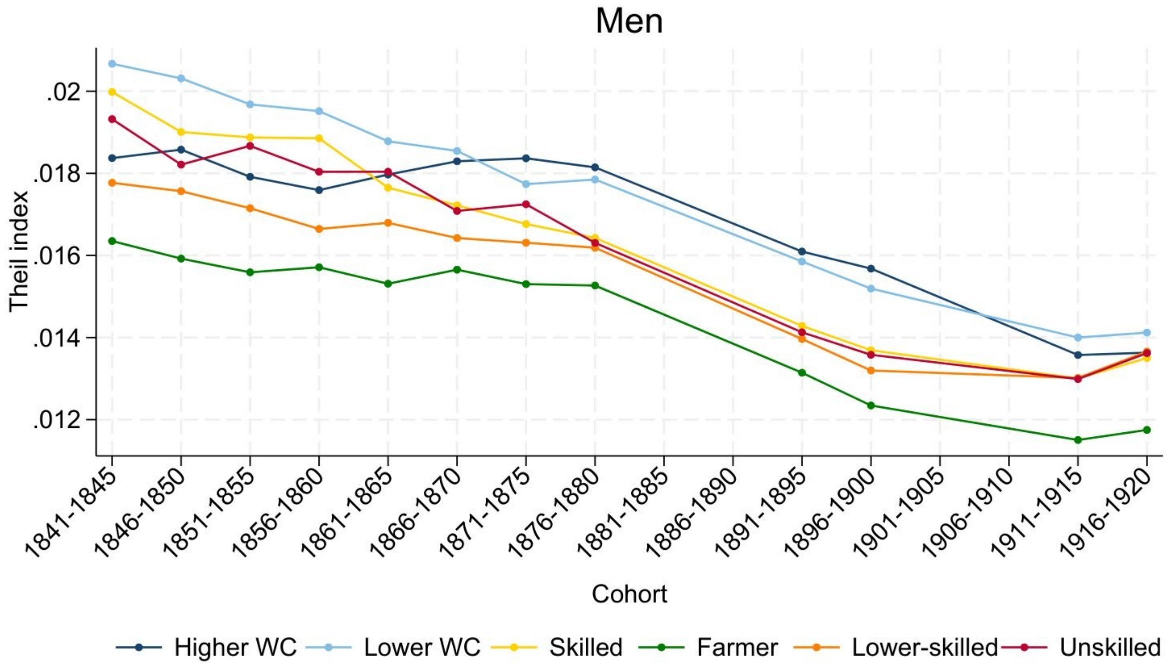


Figure A6. Standard deviation of lifespan conditional on survival to age 40 by birth cohort and social class, for men (panel A) and women (panel B).

Source: see text.

A. Men



B. Women

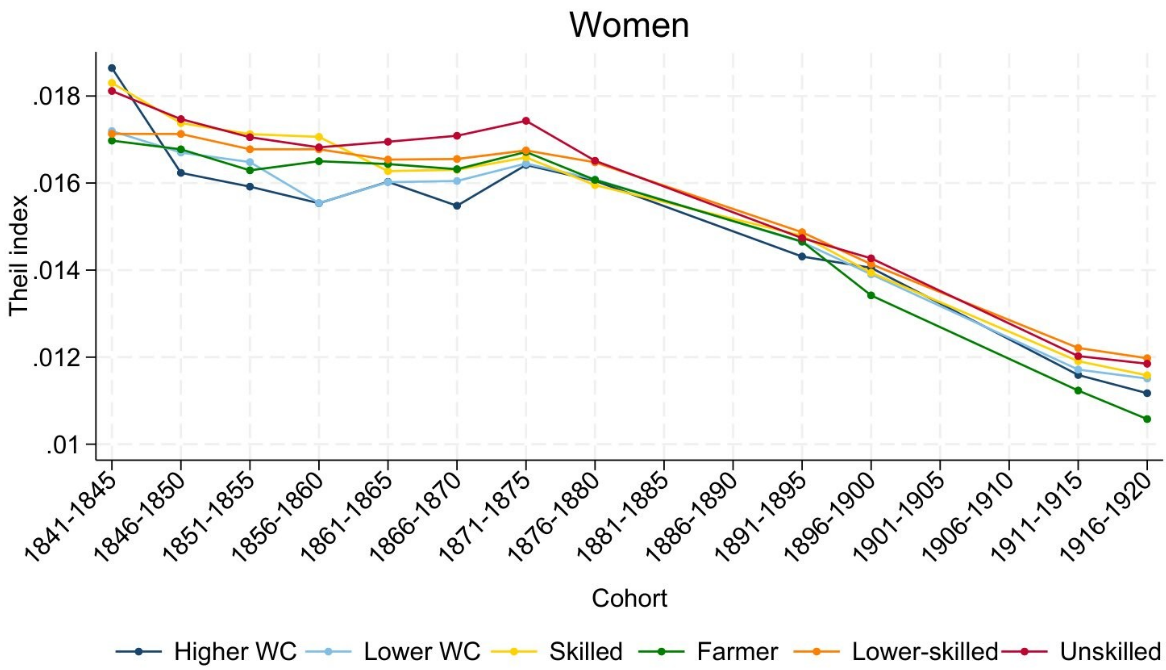


Figure A7. Theil index of lifespan conditional on survival to age 40 by birth cohort and social class, for men (panel A) and women (panel B).

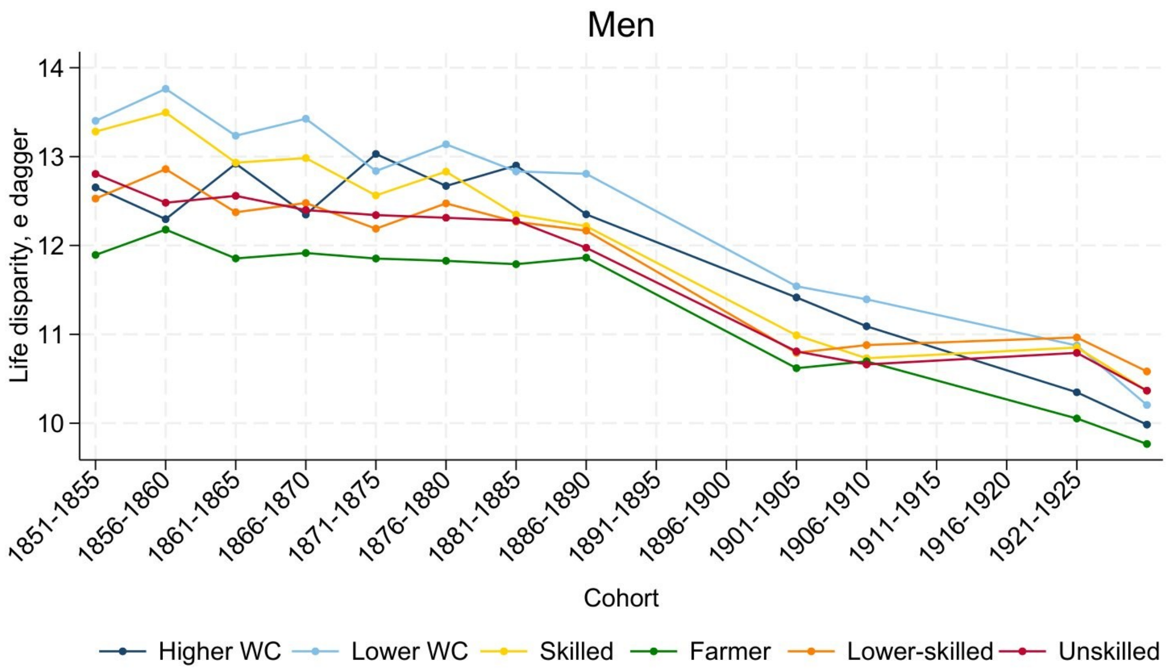
Source: see text.

Figure A8. Life disparity conditional on surviving to age 30, by cohort and sex, Sweden 1841-1920.

Source: SDI.

Note: mortality not fully completed for the last two cohorts.

A. Men



B. Women

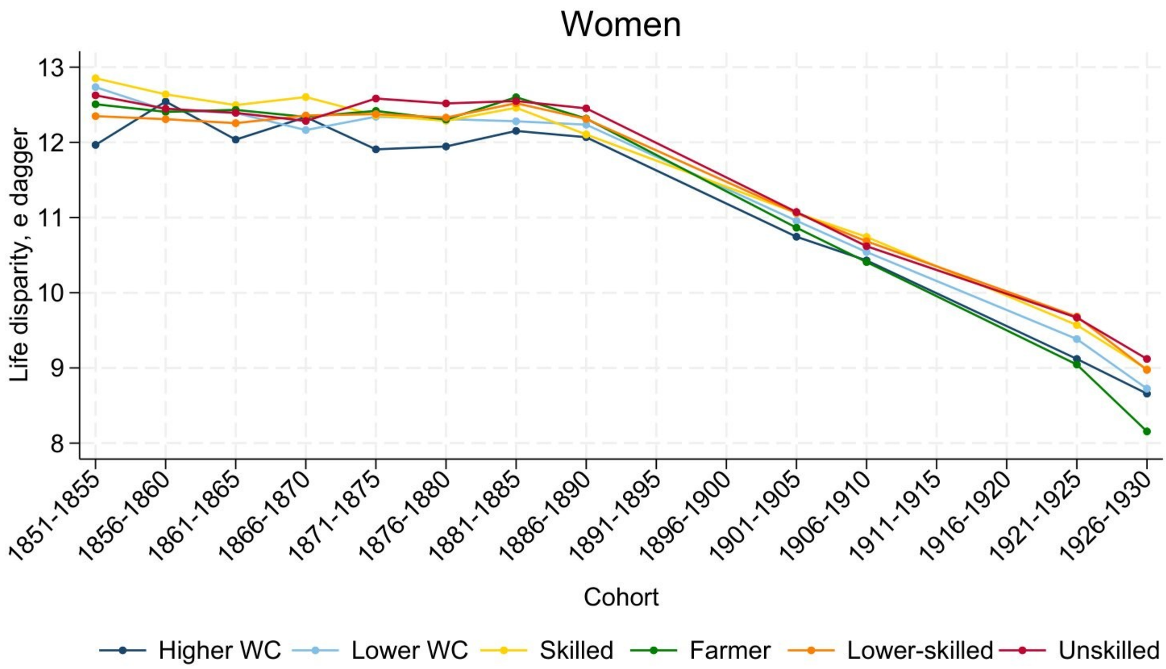


Figure A9. Life disparity conditional on surviving to age 30, by cohort and social class, for men (panel A) and women (panel B), Sweden 1841-1920.

Source: see text.

Note: mortality not fully completed for the last two cohorts.