

# Healthy Shared Lifetime by Birth Cohort and Socioeconomic Status in Denmark

Amanda Martins de Almeida<sup>1</sup>

<sup>1</sup>Kinship Inequalities Research Group, Max Planck Institute for Demographic Research

## Abstract

Individuals spend time together with their relatives during the life course. For example, the years during which an individual overlaps with their mother start counting when they are born and stop counting when either they or their mother dies. I call this the ‘intergenerational shared lifetime’: the time in which members of multiple generations overlap. Changes in mortality and fertility influence a population’s kinship structure; e.g., if longevity increases and fertility remains unchanged, children will share more time with parents and grandparents. However, whether this shared lifetime is spent in good health is still unknown. Here, I propose to add a health component to the measurement of shared lifetimes. This Healthy Shared Lifetime builds on the existing healthy life expectancy and unhealthy life expectancy measures. I aim to estimate time that an individual can expect to live alongside parents and grandparents in a healthy or unhealthy condition. Thus, I use a retrospective approach, from children to parents and grandparents, using Danish Register Data and The National Danish Health Survey. Looking at differences in population subgroups, I apply the measures to different individuals’ socioeconomic status (SES) to investigate differences in healthy shared lifetime. I expect to find a positive association between SES and a healthy shared lifetime with relatives.

**Keywords** multigenerational exposure; healthy shared lifetime; kinship

## 1 Introduction

Family network serves as significant source of support, resources, and socialization for individuals. However, variations among individuals may occur, resulting in differences in presence and availability of kin, that can affect how individuals benefit from this network. This difference between individuals is known as kinship inequalities. The dynamic of kin availability and generation overlap represent a set of kin inequality (Alburez-Gutierrez et al, 2022). Investigating variations in kinship network between groups is an important attempt to approach how those differences can play a role for individual outcomes.

The number of living kin that an individual has is determined by demographic processes, such as mortality and fertility schedules. Here, I refer to an individual with a specified age and sex,

who can also be characterized by education, parity, health, marital status, and other factors as 'Focal'. Focal represents an average member of the population exposed to mortality and fertility schedules (Caswell, 2019). It is well known that fertility and mortality rates vary by socioeconomic status (SES), suggesting that the kin structure may change depending on the Focal individual's socioeconomic status. Consequently, we can expect different experiences in kin loss and availability based on SES, resulting in different kinship networks that may affect the provision of support.

Intergenerational shared lifetime, also known as multigenerational exposure, is the overlapping years between generations (Song & Mare, 2019). Which means the years two or more generations were alive and shared their lifetime. Demographic transitions in mortality and fertility influence the kinship structure; if longevity increases, children are expected to share more lifetime with parents and grandparents. However, if fertility is following the same path, in that case, rates are decreasing and the mean age at childbearing increasing, the shared lifetime between grandparents and their grandchildren could reduce over time, and the number of grandchildren as well. This simple example shows how changes in fertility and mortality schedules shape kinship structure and, consequently, shared lifetime between relatives.

I introduce a new dimension to the shared lifetime concept, adding the health component. Based on the healthy life expectancy (HALE) and unhealthy life expectancy (UHLE) measures, I propose the Healthy Shared Lifetime measure. In this study, I aim to estimate the average years Focal lived with parents and grandparents in a healthy or unhealthy condition. Thus, I use a retrospective approach, from Focal perspective, which means from children to parents and grandparents. Looking at differences in population subgroups, I apply the measures to different Focal 's socioeconomic groups to investigate differences in healthy shared lifetime by socioeconomic groups. Focal can be in one of the following three states at any given point of their life:

1. No overlapping: When Focal is born there is no shared lifetime with their children, or for example, when Focal 's grandparents are no longer alive, Focal don't share any lifetime anymore. In this scenario there is no overlapping years between Focal the kin.
2. Healthy shared lifetime: Focal and kin share years which are both in a healthy condition.
3. Unhealthy shared lifetime: It means at least one, Focal or kin, are in an unhealthy condition.

In this paper, I aim to contribute expanding the existing body of literature on kinship inequalities in Denmark. For this, I investigate variations in kinship structure while incorporating the health component among socioeconomic groups in Denmark. I am to answer how many years do individuals live together with their relatives and how many of these years are spent in good health.

## 2 Method

The cohort life table will be used to estimate healthy and unhealthy life expectancy and person-years of shared lifetime from aggregate data. Figure 1 illustrates a hypothetical example. When Focal is born, her parents and grandparents are alive and in good health. However, during Focal’s lifetime, the health status of her relatives changes, transitioning into an unhealthy condition. T1 represents the healthy shared lifetime between Focal, her parents, and grandparents. In this context, it means that these three generations shared 5 years in good health during their lifetimes. Additionally, T2 represents the shared healthy lifetime between Focal and her parents. This implies that Focal and her parents jointly experienced 40 years of good health throughout their lifetimes. This example demonstrates how cohort life tables can be used to analyze overlapping years between generations adding healthy and unhealthy status.

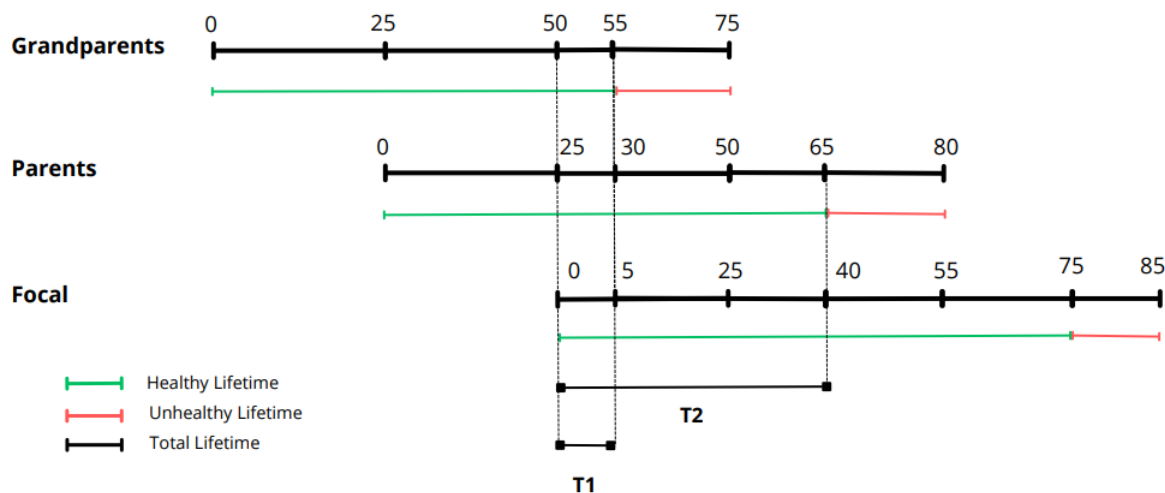


Figure 1: Healthy lifetime Focal shared with parents and grandparents

T1: healthy shared lifetime with grandparents and parents.

T2: healthy shared lifetime only with parents.

## 3 Data

For the kinship component I use Danish Register Data, constructing the kinship structure. Each family has a code number in the data set, which allows us to identify Focal’s parents and grandparents with collected data from the late 80s to the present. Focal’s socioeconomic status is available in data set as well. For the health component, I harmonize Danish Register Data and The National Danish Health Survey to identify the health condition of Focal and their relatives over the years. With this information, estimate healthy life expectancy (HALE) and unhealthy life expectancy (UHLE) and the average years lived with any grandparent or parent in a health condition by Focal’s birth cohort and socioeconomic status.

## 4 Expected findings

There are two expected findings: the first is that Focal's socioeconomic status is positively associated with a healthy shared lifetime with their kins. Thus, a Focal with higher socioeconomic status shares more years in a health condition with their parents and grandparents than a Focal with lower socioeconomic status. The second expected finding is that older cohorts, Focal with lower socioeconomic status, lives more time with an unhealthy kin. However, younger cohorts with higher socioeconomic status live longer because they have a higher life expectancy. Therefore, they live more years even with a longer unhealthy period.

## 5 References

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