Authors

José Manuel Aburto a,b

Ella Fegitz b,c

Ginevra Floridi d

a Department of Sociology & Leverhulme Centre for Demographic Science, University of Oxford.

b Interdisciplinary Centre on Population Dynamics, University of Southern Denmark.

c Please add your affiliation accordingly.

d Department of Global Health & Social Medicine, King’s College London.

**Recent exceptions of reductions in lifespan inequality** [Let’s do title at the end depending on how this evolves, suggestions are welcome]

Main text [1000 words]

**Life expectancy and lifespan inequality**

Improvements in life expectancy have long been a fundamental goal of every country, and the past century has witnessed exceptional progress in reducing mortality (Italian example, but shorter?).

A crucial question with social and public health implications for demographers and policy makers is how evenly shared these improvements are among individuals.

Life expectancy is a measure of the mean level of mortality. It expresses the average number of years a newborn is expected to live given the death rates at a point in time. Because it is an average, life expectancy does not show how large differences in length of life are among people: however, these can be substantial. Differences in lifespans are usually captured by a metric of variation or inequality in ages at death, such as the standard deviation or the Gini coefficient, and they are usually referred to by demographers as *lifespan inequality.* Lifespan inequality at the individual level tells us about how unpredictable the timing of death is. In other words, how long a newborn in an exceptionally violent country such as Syria will live is considerably more difficult to predict than it is for a baby born in contemporary Sweden, because lifespan inequality in Syria is much higher than it is in Sweden. This is important because, in making important life decisions, people are influenced by the mortality experience of those around them. Such decisions include whether and when to invest in education, migrate or buy a house, considering the uncertainty around one’s expected lifespan. At the societal level, lifespan inequality indicates how unevenly shared improvements in longevity are, and it has been described as the most fundamental of all inequalities. This is of utmost importance because resources to improve health in a country are limited, and their allocation becomes more difficult as deaths are more spread over different ages.

Lifespan inequality has decreased for most countries as life expectancy at birth increased. This dual advance is a major achievement of modern societies in giving better chances to survive to older ages to more people and it has triggered scientific interest among demographers. Numerous studies have looked at how higher levels of life expectancy usually correspond to lower levels of lifespan inequality. Limited attention, however, has been paid to how they change over time and what are the determinants of these changes. A recent article shows that changes of both life expectancy and lifespan inequality can be expressed as rates of progress in saving lives. How strong the relationship between increasing life expectancy and decreasing lifespan inequality is depends on where the progress is placed. The more lives saved at the youngest ages, the stronger the relationship is, especially when life expectancy is less than 70 years.

**Societal causes and implications of the (changing) relationship between life expectancy and lifespan inequality**

If both long lives and equal lifespans matter, we can think of the best possible scenario as one where people not only live longer, but also face progressively less uncertainty around when they will die. Research has shown that this has not always been the case as, in certain countries during specific periods, lifespan inequality has been shown to stall or even increase despite improvements in life expectancy. (José, examples? – e.g. This can be due to an increase in mortality at younger ages, for instance from violence…. Alternatively, it may be linked to mortality reductions at very old ages outpacing improvements in mid-life mortality…).

The weakening or reversal of the negative relationship between lifespan inequality and life expectancy means that, while people live longer on average, individuals also face greater uncertainty around when they will die. Studies have shown that, within a society, such increased uncertainty is likely to be concentrated among those from disadvantaged socioeconomic groups (reference?). This may have important consequences for the perpetuation of social inequality. For instance, faced with greater uncertainty about their own lifespan (as reflected in the experience of their peers), disadvantaged individuals may find it harder to make optimal savings and investment decisions, and this could further reduce their financial resources later in life. Moreover, greater lifespan inequality for disadvantaged groups may generate uncertainty around the timing of transfers, inheritances and bequests they are able to make to their children and grandchildren. Given the importance of these transfers for the recipients’ socioeconomic conditions, higher lifespan inequality may strengthen the transmission of disadvantage across generations.

As the [PNAS] study shows, while the relationship between life expectancy and lifespan inequality is generally negative across time and space, lifespans do not necessarily become more equal whenever life expectancy increases. In fact, the relationship depends on the ages at which mortality is reduced. This tells us that delaying the average age at death alone is not enough for guaranteeing a more equitable distribution of the length of life.

There is good reason to expect that the relationship between life expectancy and lifespan inequality will remain negative, since the threshold age under which mortality needs to be reduced increases with increasing life expectancy, giving more scope for saving early lives below such threshold age. However, an important message of recent research is that policies and interventions are able to affect this relationship, by reducing mortality at the ages that matter the most. In terms of policy interventions, one important question to ask is how different types of healthcare investments, such as preventive as opposed to end-of-life care, may relate to inequality in lifespans. Another important question is how the strength of the relationship between life expectancy and lifespan inequality varies across societies and periods characterized by different levels of social inequality. These are promising avenues for future research linking demographic phenomena to the broader societal context in which they take place.

**References**