
1. Motivation

- Understanding of the present and future dynamics in human mortality
  - ‘mortality compression’ (convergence towards a single upper limit age at death) and ‘shifting’ (distribution-neutral shift with increasing life expectancy) hypotheses
- Uncertainty associated with larger lifespan inequality affects beliefs and behavior
- Study overall, adult and elderly mortality separately.

2. Age at death around the world

Data:
- Abridged life tables from the UN WPP (ages 0-100)
- Full population, adult population (15+), elderly population (65+).
- Time span: 1950-2015 in 5-year intervals, 195 countries

Graph: Changing distribution of deaths across regions of the world → ‘mortality compression’ or ‘shifting’?

3. Measuring and decomposing length of life inequality

Inequality measures

Relative: Theil index

\[ T_a = \frac{1}{n} \sum_{x=0}^{n-1} \left( \frac{x}{\mu_x} \right) \log \left( \frac{x}{\mu_x} \right) \]

Absolute: Variance

\[ V_a = \frac{1}{n} \sum_{x=0}^{n-1} (x - \mu_x)^2 \]

These two measures are additively decomposable into a within- and a between-country component

\[ I = I_w + I_b = I(x_1, \ldots, x_n) + \sum_{i=1}^{n} I_i \]

4. Lifespan inequality and longevity within countries

5. Global lifespan inequality and its components

6. Conclusions

- There has been a sustained decline in overall lifespan inequality
- Adult lifespan variability has also declined, but some plateaus and trend reversals have been identified
- Lifespan inequality among the elderly has increased virtually everywhere
- Most of the world variability in age-at-death can be attributed to within-country variability (around 90%)
- Our analyses suggest that the world seems to be facing a new challenge: the emergence of diverging trends in longevity and age-at-death inequality among the elderly around the globe.
- As larger fractions of the world population survive to more advanced ages, it will be necessary that national and international health planners recognize the growing heterogeneity that characterizes older populations.