Assignment 1

Jonas Schöley

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1. Register at http://www.mortality.org/.
2. Download single year, single period death counts and exposures for a country of your choice.
3. *For each year in the data*, calculate life expectancy at birth[1] and the coefficient of variation of the life-table distribution of deaths.

You can calculate the coefficient of variation for a life-table as

$$\widehat{\text{CV}} = \frac{\sqrt{\sum_{x=0}^{\omega} {}_nd_x(\overline{x} - e_0)^2}}{e_0} = \frac{\sqrt{\sum_{x=0}^{\omega} {}_nd_x(x + {}_na_x - e_0)^2}}{e_0},$$

with ${}_na_x \approx 0.5n_x$.

(Bored? How about fitting a spline to the ℓ_x values of the life-table using `splinefun()` and use the continuous formula 7 with the fitted spline and numerical integration (`integrate()`) to calculate the Gini coefficient? No pressure though.)

4. Show the relationship among life-expectancy and the coefficient of variation of the life-table distribution of deaths. What do you see? If you have an explanation for the relationship I would be interested in reading about it.

References

Preston, Samuel. 2001. *Demography. Measuring and Modeling Population Processes.* Blackwell Publishers.

[1] See Preston (2001, 49, Box 3.1)