Parental loss from drugs and firearms

Methodological points

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Contents

Matrix Kinship model

Kin: parents

- Cause-specific (drugs, firearms, other) mortality (Caswell, Margolis, and Verdery 2023)
  - Track parents' deaths by age and cause
- Two-sex: male fertility = shifted female fertility (Schoumaker 2019)
- Time-variant rates (2000-2020)

Model run independently on each ethnic group (Hispanic, Black, White)

- $\boldsymbol{F_t}$ is the $(\omega \cdot \omega)$ fertility matrix, in year t. The first row contains the fertility rates at the different ages.
- $\tilde{\boldsymbol{U_t}}$ is a block-matrix containing the survival probabilities and cause-specific probabilities of dying, in year t.
- ω is the highest age group + 1, here 86.

Boundary conditions of the parents' dynamic

In Figure 1, color code is

- boundary condition 1
- boundary condition 2

- dynamic of the age distribution of parents

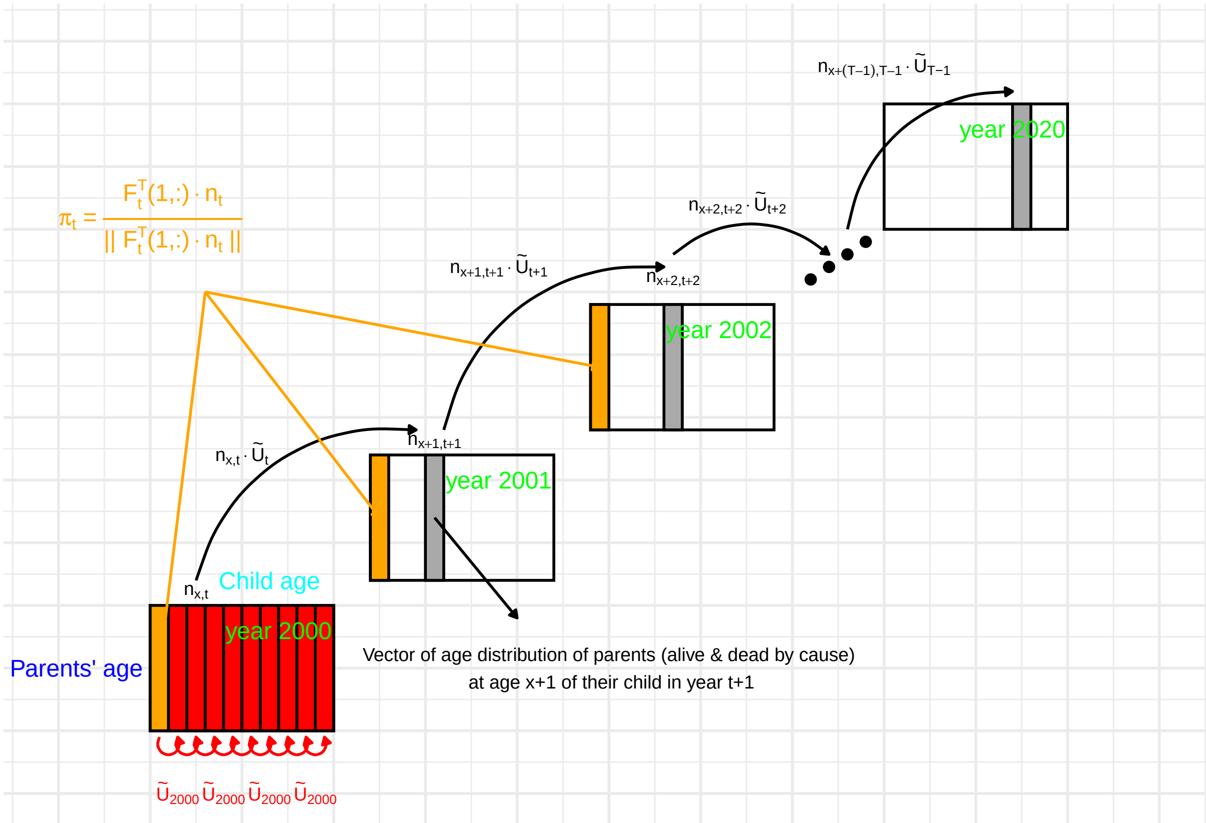

Figure 1: Boundary conditions of the parents' dynamic

Boundary condition 1

Focusing on parents means that fertility enters the model only through the first boundary condition: the age distribution of parents at the birth of their child (π_t).

Currently, the kin dynamics consists of a full two-sex model ($\boldsymbol{F_t^f}$ and $\boldsymbol{F_t^m}$). Male fertility rates = shifted female fertility rates. The shift is equal to the difference in the mean age at childbearing between the two sexes. The shifts are modeled with a linear model over the years (data from the UN Demographic Yearbook).

- Sensitivity analysis: use female fertility rates to compute both female and male age distribution at the birth of their children.

Boundary condition 2

In order to start the dynamics, we assume that the earliest vital rates have been operating for a long period before the year 2000. This means that in order to obtain the vector of the age distribution of parents at age x of their child in the year 2000, we assume

$$\boldsymbol{n_{x,t=2000}} = \boldsymbol{\tilde{U}}^{x}_{t=2000} \cdot \boldsymbol{\pi_{t=2000}}$$

This assumption might not correctly reflect the age distribution of parents at different age of their child (i.e different cohorts) in the year 2000.

Ideally, we would like to be able to correctly reflect any cohort of parent that could have a child aged less than 18 years old, in the year 2000 or after. Hence, the best would be to be able to start the dynamic in the year 1983. FIGURE?

- From the supplementary materials of Verdery and Margolis (2017)
  - Use life expectancy for Black and White estimated by Health Statistics (US et al. (2016) for the period 1980-1999 and convert these into survival probabilities using the Coale-Demeny Model West Life Tables (or modeling methods). This leads to focus only on two ethnic groups.
  - Found birth data from CDC starting in 1950.
  - Need population counts by ethnic group from the year 1983

Number of children losing a parent

Uncertainty in estimates

Monte-Carlo simulation using Chiang method and do similarly as in UN Bayesian population projection

Parents are shared: overestimation?

Mx of Fx having the biggest impact for Black: K-K decomposition

References

Caswell, Hal, Rachel Margolis, and Ashton M Verdery. 2023. "The Formal Demography of Kinship v: Kin Loss, Bereavement, and Causes of Death." *PAA Conference 2023*.

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Verdery, Ashton M, and Rachel Margolis. 2017. "Projections of White and Black Older Adults Without Living Kin in the United States, 2015 to 2060." *Proceedings of the National Academy of Sciences* 114 (42): 11109–14.