Liliana Calderon

Sujet de thèse (Titre provisoire) :

Family Constellations over Time: Modelling and Estimating Past, Present and Future Kinship Networks

Encadrants : Emilio Zagheni (main supervisor MPIDR), Martin Kolk ,(main supervisor Stockholm University) Diego Alburez-Gutierrez (PHDS mentor MPIDR) et Sunnee Billingsley (co-supervisor Stockholm University)

This PhD dissertation studies the transformation of kinship networks over time combining demographic microsimulation, empirical register data and formal demographic methods.

Paper 1 uses SOCSIM microsimulation and Swedish fertility and mortality data (1751-2022) to analyse three main sources of biases inherent in ascendant genealogies: selection in direct lineages, incomplete reconstruction of family trees, and missing information on subpopulations. Comparing demographic measures derived from 'fully-recorded' and 'bias-infused' synthetic populations, we find that including only direct ancestors leads to an underestimation of total fertility rate (TFR) (c.a. −42%) and an overestimation of life expectancy at birth (e0) (c.a. +33%) over the whole period. However, after including direct ancestors' offspring, TFR became overestimated (c.a. +21%) while e0 overestimation was limited to +1.8%. Our study shows that the completeness of the family trees is essential for obtaining accurate demographic estimates based on genealogies.

Paper 2 assess the correspondence in size and structure of kinship networks derived from empirical and microsimulated data. We compare the number of kin from grandparents to grandchildren for the Swedish population (cohorts 1915-2017), estimated based on contemporary Swedish population registers (Kolk et al., 2023) and the SOCSIM microsimulation programme. Our study shows that mean numbers and distributions of most kin are similar across both sources. The microsimulation produces slightly lower numbers of kin for cohorts unaffected by truncation in the registers, but better accounts for kin of early cohorts that are under-registered due to missing parent-child links, conditioning on survival or migration. Our assessment of the accuracy of synthetic kinship networks may serve as a reference for research using microsimulation to study kinship in other contexts.

Paper 3 will perform a systematic comparison between the main two types of kinship models: demographic microsimulation with SOCSIM and matrix kinship models, considering the stable and the dynamic settings of both models over the period 1950-2100. It will compare their characteristics and assumptions, data requirements, outputs (particularly mean numbers and age distribution of kin) and their sensitivity. It will conclude by comparing the estimates on a particular dynamic, such as ageing or kin loss.

Paper 4 will use demographic microsimulation to explore how kinship networks have changed and will change (1751-2100) through the demographic transition (from grapevine to beanpole

family structures) focusing on a particular kinship configuration, such as multigenerational families.

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