

# The Demography of Kinship

EDSD Course syllabus

Last updated: April 20, 2023

European Doctoral School of Demography (EDSD)  
Barcelona, April 24-29, 2023

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## 1 Introduction

### 1.1 Course description

Kinship is a fundamental property of human populations and a key form of social structure. Demographers have long been interested in the interplay between demographic change and family configuration. This has led to the development of sophisticated methodological and conceptual approaches for the study of kinship, some of which are reviewed in this course.

### 1.2 Goals

The course will provide a succinct and practical introduction to kinship demography. By the end of the course, students will be familiar with the current state of the sub-field and the tools to conduct independent research in this area. The main goals of the course are to:

1. present a general overview of the current state of the field of kinship demography,
2. introduce the fundamentals of the formal demography of kinship, and
3. provide hands-on experience running models of kinship in R.

### 1.3 Lectures and exercises

The in-person course comprises independent reading, morning lectures, and ‘lab sessions’ some afternoons. There are required and optional readings each day. Students are expected to attend all lectures and practical sessions.

- All required readings can be downloaded from: <https://nextcloud.demogr.mpg.de/s/LoiF9zbE95ow7ge>.

A handout for the lab sessions can be found here: [http://alburez.me/EDSD\\_2023\\_kinship\\_demography/](http://alburez.me/EDSD_2023_kinship_demography/). There is no exam; only a final assignment which needs to be turned in at the end of the week (see Section 2).

## Schedule

- Lectures take place between 09:30 and 11:00 (Monday-Wednesday)
- Lab sessions:
  1. Tuesday, 11:30-13:30
  2. Wednesday, 11:30-13:30
  3. Thursday, 09:30-11:00 and 11:30-13:30

### 1.4 Hardware and software

Lab sessions will be in R ( $\geq 4.0.2$ ). Students are required to bring a laptop for the lab sessions. Participants should install the following packages from CRAN: `devtools`, `tidyverse`, `ggh4x`, `data.table`, and `fields`. The packages `DemoKin` and `rsocsim` need to be installed from GitHub; see guidelines in the course's website: [http://alburez.me/EDSD\\_2023\\_kinship\\_demography/](http://alburez.me/EDSD_2023_kinship_demography/).

## 2 Final assignment

The assignment should be completed in groups that will be defined at the start of the course.

### 2.1 Description

You will use data on kinship structures to benchmark formal models of kinship. Figure 1 shows the empirical distribution of kin for the 2017 population of Sweden based on registry data.<sup>1</sup> Note that the figure includes female and male kin and that the sex of Focal is not specified (i.e., it is the average of all male and female individuals in the registers). You can download the data to reproduce Figure 1 from [https://github.com/alburezg/EDSD\\_2023\\_kinship\\_demography/tree/main/data](https://github.com/alburezg/EDSD_2023_kinship_demography/tree/main/data).

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<sup>1</sup>Kolk, M., Andersson, L., Pettersson, E., & Drefahl, S. (2021). The Swedish Kinship Universe – A demographic account of the number of children, parents, siblings, grandchildren, grandparents, aunts/uncles, nieces/nephews, and cousins using national population registers. *Stockholm Research Reports in Demography*, 28. <https://doi.org/10.17045/sthlmuni.17704988.v1>

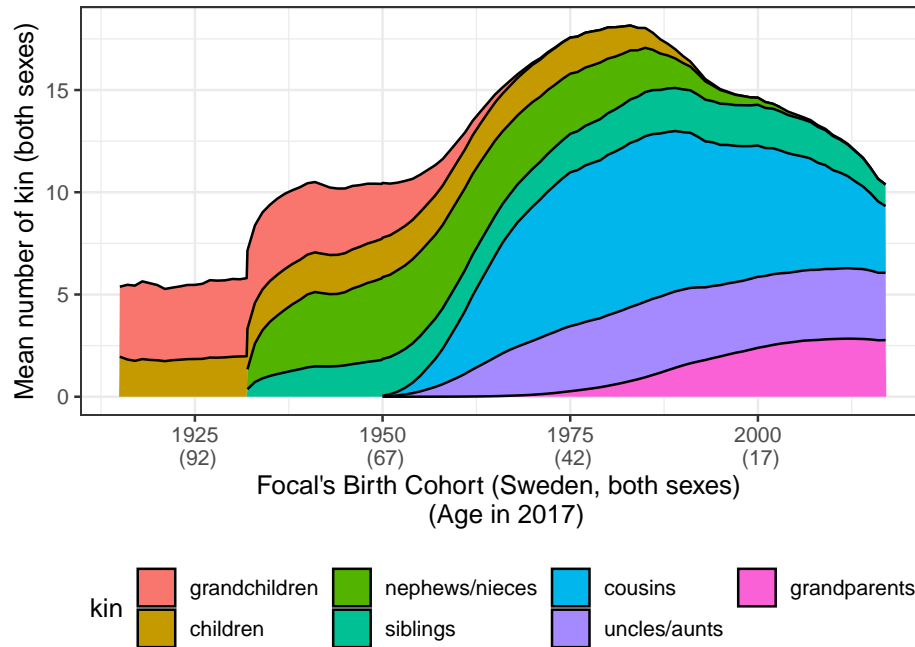


Figure 1: Average number of kin for the entire 2017 population of Sweden according to Kolk et al. (2021) using data from population registers. Kin counts refer to female and male relatives.

For this first exercise, you should use **DemoKin** to replicate Figure 1. Concretely:

- Run four iterations of the kinship model:
  - One-sex model; time-invariant rates; approximate male kin using GKP factors
  - One-sex model; time-variant rates; approximate male kin using the androgynous assumption
  - Two-sex model; time-invariant rates
  - Two-sex model; time-variant rates; assume demographic stability before 1968
- Using the model outputs, answer:
  - How well do your models approximate the kin counts reported by Kolk et al. (2021)? Justify your answer using quantitative measures (max 250 words and 4 figures)
  - Based on this exercise, discuss the advantages and drawbacks of using formal models to quantify kinship (max 250 words)

## Data

- Mortality data can be obtained from <https://www.mortality.org/>
- Fertility data are available from <https://www.humanfertility.org> and (including for males) <https://www.fertilitydata.org/>

## Handing in the assignment

Assignments (one per group) should be sent by email to the instructor **before midnight of Friday, April 28**. You should hand in the following files:

1. An .RMD file with all your code and answers to the exercise questions
2. A compiled .pdf of your markdown file showing all the code
3. All input data needed to replicate your code

## 3 Lecture Plan

### 3.1 Monday, April 24: Introduction to kinship demography

#### Required reading

- Alburez-Gutierrez, D., Barban, N., Caswell, H., Kolk, M., Margolis, R., Smith-Greenaway, E., Song, X., Verdery, A. M., & Zagheni, E. (2022). *Kinship, Demography, and Inequality: Review and Key Areas for Future Development* (preprint). SocArXiv. <https://doi.org/10.31235/osf.io/fk7x9>

### 3.2 Tuesday, April 25: The formal demography of kinship

#### Required reading

- Caswell, H. (2019). The formal demography of kinship: A matrix formulation. *Demographic Research*, 41, 679–712. <https://doi.org/10.4054/DemRes.2019.41.24>

#### Optional reading

- Goodman, L. A., Keyfitz, N., & Pullum, T. W. (1974). Family formation and the frequency of various kinship relationships. *Theoretical Population Biology*, 5(1), 1–27
- Keyfitz, N. (2005). The Demographic Theory of Kinship. In *Applied Mathematical Demography* (pp. 370–398). Springer
- Song, X., & Caswell, H. (2022). The Role of Kinship in Racial Differences in Exposure to Unemployment. *Demography*, 59(4), 1325–1352. <https://doi.org/10.1215/00703370-10057831>
- Caswell, H. (2020). The formal demography of kinship II: Multistate models, parity, and sibship. *Demographic Research*, 42, 1097–1146. <https://doi.org/10.4054/DemRes.2020.42.38>
- Caswell, H., & Song, X. (2021). The formal demography of kinship. III. kinship dynamics with time-varying demographic rates. *Demographic Research*, 45, 517–546
- Caswell, H. (2022). The formal demography of kinship IV: Two-sex models and their approximations. *Demographic Research*, 47, 359–396. <https://doi.org/10.4054/DemRes.2022.47.13>

### 3.3 Wednesday, April 26: Kinship microsimulations

#### Required reading

- Alburez-Gutierrez, D., Mason, C., & Zagheni, E. (2021). The “Sandwich Generation” Revisited: Global Demographic Drivers of Care Time Demands. *Population and Development Review*, 47(4), 997–1023. <https://doi.org/10.1111/padr.12436>

### Optional reading

- Wachter, K. W. (1997). Kinship resources for the elderly. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 352(1363), 1811–1817. <https://doi.org/10.1098/rstb.1997.0166>
- Snyder, M., Alburez-Gutierrez, D., Williams, I., & Zagheni, E. (2022). Estimates from 31 countries show the significant impact of COVID-19 excess mortality on the incidence of family bereavement. *Proceedings of the National Academy of Sciences*, 119(26), e2202686119. <https://doi.org/10.1073/pnas.2202686119>
- Hammel, E., Hutchinson, D., Wachter, K., Lundy, R., & Deuel, R. (1976). *The SOCSIM Demographic-Sociological Microsimulation Program: Operating Manual*
- Margolis, R., & Verdery, A. M. (2019). A Cohort Perspective on the Demography of Grandparenthood: Past, Present, and Future Changes in Race and Sex Disparities in the United States. *Demography*, 56(4), 1495–1518. <https://doi.org/10.1007/s13524-019-00795-1>
- Zagheni, E. (2011). The Impact of the HIV/AIDS Epidemic on Kinship Resources for Orphans in Zimbabwe. *Population and Development Review*, 37(4), 761–783. <https://doi.org/10.1111/j.1728-4457.2011.00456.x>

### 3.4 Thursday, April 27: Lab session using DemoKin

Students are encouraged to work on their assignments (see Section 2).

### Required reading

- Kolk, M., Andersson, L., Pettersson, E., & Drefahl, S. (2021). The Swedish Kinship Universe – A demographic account of the number of children, parents, siblings, grandchildren, grandparents, aunts/uncles, nieces/nephews, and cousins using national population registers. *Stockholm Research Reports in Demography*, 28. <https://doi.org/10.17045/sthlmuni.17704988.v1>
- Caswell, H. (2022). The formal demography of kinship IV: Two-sex models and their approximations. *Demographic Research*, 47, 359–396. <https://doi.org/10.4054/DemRes.2022.47.13>

### Optional reading

- Andersson, L., & Kolk, M. (2022). *Kinship and Socioeconomic Status: Social Gradients in Frequencies of Kin Across the Life Course in Sweden* (preprint). SocArXiv. <https://doi.org/10.31235/osf.io/brcxt>