

Variance estimation for complex survey data and microsimulation

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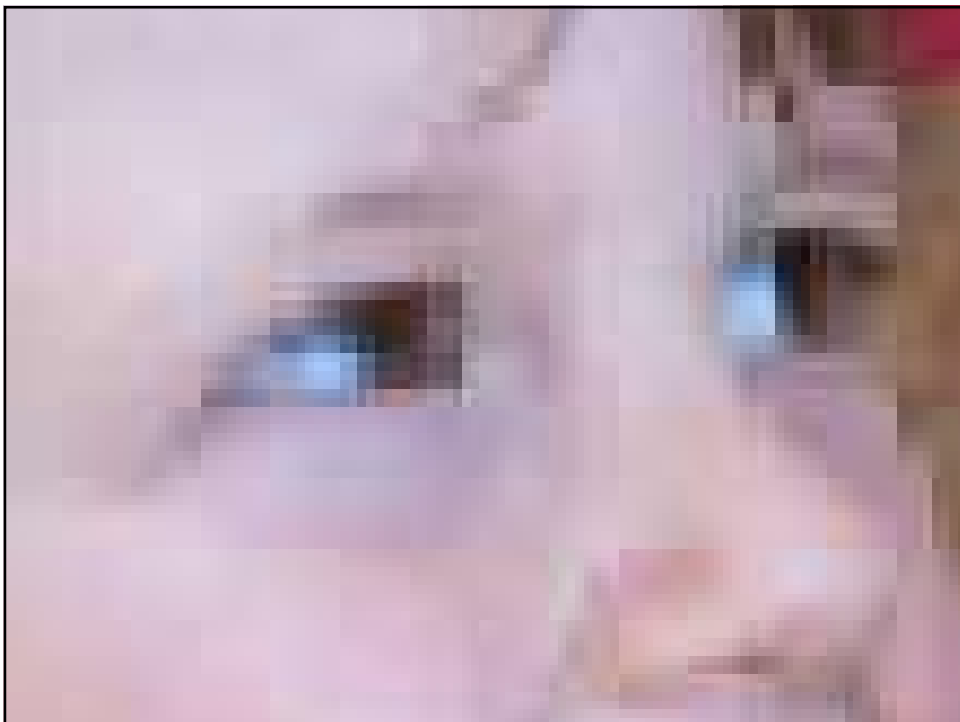
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Introduction

- Statistics & samples are a powerful tool
 - Need limited number of observations
 - Point estimate *and* estimate of precision

However, without an estimate of its precision, a point estimate is pointless...

- ... at least for evidence-based policy-making



Introduction

Key messages

1. If estimates are based on samples -> estimate and report SEs, CIs & p-values
2. Always take as much as possible account of sample design when estimating SEs, CIs & p-values
3. Never delete observations from the dataset
4. Never simply compare confidence intervals

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Introduction

Setup of the training

- Some concepts and theory
- Hands-on exercises, based on synthetic data that reflect real situations in EU-SILC
- Focus is on necessities for practical implementation
- Targeted to diversified audience (statistical competences, knowledge of statistical software)
- Assume some familiarity with analysis of survey data
- Complementary to standard courses

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Introduction

Focus on getting variance estimates right

Steps in applied survey data analysis

| Step | Activity |
|------|--|
| 1 | Definition of the problem & objectives |
| 2 | Understanding the sample design |
| 3 | Understanding design variables, constructs, and missing data |
| 4 | Analysing the data |
| 5 | Interpreting and evaluating results |
| 6 | Reporting estimates and inferences |

Source: Heeringa et al., 2010, p. 9.



Introduction

DAY 1

- 1/ Sampling variance and Total survey error
 - 2/ Determinants of the sampling variance
 - 3/ Estimating the sampling variance & EU-SILC sample design
 - 4/ Ultimate cluster approach and EU-SILC sample design variables
- Exercises

DAY2

- 5/ subpopulations & comparisons of samples / simulations /...
- Exercises
- 6/ Conclusion; feedback



Introduction

Background materials

- Handouts
- Do-files & exercises
- <https://timgoedeme.com/eu-silc-standard-errors/> (papers, do-files, csv-files)
- Heeringa, S. G., West, B. T., & Berglund, P. A. (2010). Applied Survey Data Analysis. Boca Raton: Chapman & Hall/CRC.
- <http://www.isr.umich.edu/src/smp/asda/>
- Groves, R.M., Fowler, F.J.J., Couper, M.P., Lepkowski, J.M., Singer, E. and Tourangeau, R. (2009), Survey Methodology (Second edition), New Jersey: John Wiley & Sons.

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