**Ph.D. in “Life Course Research” – Socio-demographic curriculum**

**Academic Year 2024-2025**

**Random effects models for multilevel and longitudinal data**

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**Objectives**

The course introduces the theory and practice of random effects (mixed-effects) models for the analysis of multilevel data in both cross-sectional and longitudinal settings. Emphasis is placed on model specification and interpretation. The course covers random effects models for continuous responses and for categorical responses.

**Program**

*Monday 27/01/2025 10:00-13:00* (Instructor: Leonardo Grilli and Carla Rampichini):

– Basics of multilevel analysis

– The two-level linear model: specification and estimation

*Tuesday 28/01/2025 10:00-13:00* (Instructor: Leonardo Grilli and Carla Rampichini):

– Within, between and contextual effects

– Fixed vs random effects

*Wednesday 29/01/2025 10:00-13:00* (Instructor: Leonardo Grilli and Carla Rampichini):

– Complex multilevel structures

– The random effects logit model: specification and interpretation

*Thursday 30/01/2025 10:00-13:00* (Instructor: Leonardo Grilli and Carla Rampichini):

– The random effects logit model: estimation and prediction

– Multilevel models for longitudinal data

**Suggested readings**

Grilli L., Rampichini C. (2018). A handful of critical choices in multilevel modelling. Boletín de Estadística e Investigación Operativa, 34 (1).

Hox J.J., Moerbeek M. and van de Schoot R. (2017). Multilevel Analysis: Techniques and Applications, Third edition, Routledge

Rabe-Hesketh S. and Skrondal A. (2022). Multilevel and longitudinal modeling using Stata, Fourth edition, Stata Corp.

Snijders T.A.B. and Bosker R.J. (2012). Multilevel Analysis: An introduction to basic and advanced multilevel modeling, Second edition, Sage.

**Requirements**

Basic knowledge of statistical inference, linear regression and logistic regression. Knowledge of Stata is helpful but not necessary (files with commands are always provided).