



POLITECNICO
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Analyzing Italian fertility trends

Exploring the causes of Italy's newborns plunge

Mancinelli, Marchesin, Sisti, Venanzi

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Main dataset

- For each year in 2002-2021 and for each Italian province, the presented data are the newborns every 1000 woman of the same age (from 17 to 50)

Covariates

- Socio-economic indices on the same spatio-temporal structure

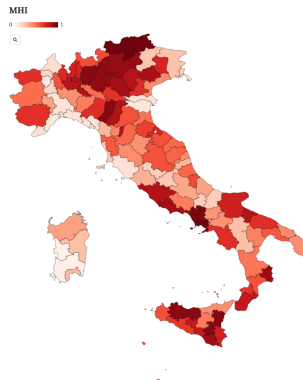


Figure: MHI index on total newborns divided by province

- Explore the variability of the rates in the spatio-temporal structure
- Find the best covariates that describe the variability and quantify their impact
- Examine the effects on fertility rates of major events
- Try to predict the trend in the following years

- Introductory analysis: projecting the 3D space into 2D spaces
- Find the best mathematical framework for this specific type of data
- Non-parametric inference for functional data:
 - ▶ permutation tests
 - ▶ semi-parametric regression
 - ▶ conformal prediction