

# DSS Statistics Seminar

May 7, 2020, 2:00 p.m.

<https://meet.google.com/jkf-ipbi-jnp>

Integration of administrative sources and survey data through Hidden Markov Models for the production of labour statistics

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In recent decades, National Statistical Institutes have focused on producing official statistics by exploiting multiple sources of information (multi-source statistics) rather than a single source, usually a statistical survey. The growing importance of producing multi-source statistics in official statistics has led to increasing investments in research activities in this sector. In this context, one of the research projects addressed by the Italian National Statistical Institute (ISTAT) concerns the study of methodologies for producing estimates on employment rates in Italy using multiple sources of information, survey data and administrative sources. The data comes from the Labour Force (LF) survey, from the Permanent Census survey, both conducted by Istat, and from several administrative sources that Istat regularly acquires from external bodies. An integrated use of these sources requires the development of statistical methods for the evaluation and correction of measurement errors to guarantee the highest quality of statistical products. One proposed approach uses a Hidden Markov model to take into account the deficiencies in the measurement process of both surveys and administrative sources. The model describes a measurement process as a function of a time-varying latent state (in this case the employment category), whose dynamics is described by a Markov chain defined over a discrete set of states.



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## Seminar Series

# New challenges in Official Statistics

In recent decades, National Statistical Institutes moved toward producing official statistics by exploiting multiple sources of information. The relevance of multi-source statistics in such a context is becoming increasingly evident and it led to important research projects in the field. With this seminar series, we aim to give an up-to-date picture of current developments. The highlight will be on observed progress in the direction of using formal statistical models, and potential future areas of research.

The list of topics covered in the series is:

1. Data Integration and issues related to integrating information from different sources
2. Methods for population estimation with multisource data
3. Mixed mode data collection
4. Small area estimation
5. Seasonal adjustments

This is the first attempt to join forces from ISTAT and the department of Statistics to give access to the directions of current development and the definition of new areas of interest in official statistics.

The Organizers

Marco Di Zio, Danila Filipponi (ISTAT)

Marco Alfò, Giovanna Jona Lasinio, Roberto Rocci (Sapienza)

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