

## OVERVIEW OF THE AMELI PROJECT

The goal to turn the EU into the most competitive and dynamic economy by 2010 demands a full benchmarking system to monitor policy performance and their impact on progress. For this reason, the European Commission has engaged in selecting, collecting and analysing a set of indicators that are published each year. The Stockholm European Council has further emphasised the need for effective, timely and reliable statistics and indicators. A main challenge is to develop indicators for the main characteristics and key drivers. An utmost important and challenging area to be measured is social cohesion.

Based on a clear definition of social cohesion, a universally-accepted high-quality and robust statistics to adequately measure social cohesion is required. Further, tools for measuring temporal developments and regional breakdowns to sub-populations of relevance will be of great importance. In order to measure social cohesion with Laeken indicators adequately while regarding national characteristics and practical peculiarities from the newly created EU-SILC, an improved methodology will be elaborated within AMELI. This will ensure that future political decision in the area of quality of life can be based on more adequate and high-quality data and a proper understanding of the Laeken indicators by the users. The study will include research on data quality including its measurement, treatment of outliers and nonresponse, small area estimation and the measurement of development over time.

A large simulation study based on EU-SILC data will allow a simultaneous elaboration of the methodology focusing on practical issues aiming at support for policy. Due to the fact that the Laeken indicators are based on a highly sophisticated methodology the project's outcome may also serve as a methodological complement for other FP7 projects in the area of indicators.

## PROJECT INFO

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<http://ameli.surveystatistics.net/>

## COORDINATION

### Ralf Münnich

University of Trier  
Faculty IV  
Dept. of Economic and Social Statistics  
Universitätsring 15, D-54286 Trier, Germany  
[muennich@uni-trier.de](mailto:muennich@uni-trier.de)

## PARTNERS

University of Trier



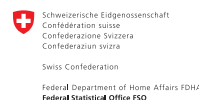
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Office of Germany



University of  
Applied Sciences  
Northwestern  
Switzerland



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Statistics Finland



University of  
Helsinki



Vienna University  
of Technology



Statistical Office  
of the Republic of  
Slovenia



Statistics Estonia



Socio-Economic Sciences  
and Humanities Research



## DESCRIPTION OF THE WORK PACKAGES (WPs)

**WP 1: LAEKEN INDICATORS** Compilation of the results from the studies already done for the Luxembourg Income survey, the ECHP, and EU-SILC. Review of the methods for precision assessment compiled within FP5 projects with special focus on Laeken-Indicators. The JRC-OECD studies on composite indicators regarding the Laeken indicators will also be reviewed. References on income distributions will be scrutinized from the point of view of statistical estimation, specifically for the estimation of poverty and inequality indices. Elaboration of a clear definition of social cohesion as an important basis for the AMELI research.

**WP 2: ESTIMATION** Review of the state-of-the-art methodology for the selected Laeken indicators in the given field; Extended methodology for small area statistics for the selected Laeken indicators, including investigation of extension to longitudinal study designs; Investigation of relative merits and practical applicability of design-based, model-assisted and model-based estimation procedures of the selected Laeken indicators focusing on accuracy properties of the estimators and on possible practical peculiarities (e.g. rare observations, data quality deficiencies etc.). Parametric income distribution estimation. Selections of income distribution models that give a satisfying fit to the equivalized income used in SILC and at the same time are tractable. Comparison of estimators: income distributions can suffer instability in the estimated parameters. Goodness-of-fit tests, characterization properties and study of the sensitivity of Laeken indicators to parametric assumptions. Use of mixture distributions to account for population subgroups.

**WP 3: VARIANCE ESTIMATION** Phase I: The state-of-the-art in variance estimation methodology with latest developments will be investigated and adequately summarized. The focus will be laid on methods, which include problems of the impact of nonresponse and imputation of missing values on indicator outcomes as well as evaluation for small groups such as for small area estimation of indicators.

Phase II: Based on the first results of the simulation study the state-of-the-art methodology will be examined to enable improvements of the methodology with respect to the applicability of the methods and the efficiency of the output.



**WP 4: ROBUSTNESS** The work package will summarise the state-of-the-art on robust estimation, outlier and influential value detection and robust imputation for the Laeken indicators as well as robust developments for small area estimation. In particular, it will use the results of the FP5 projects EUREDIT and EURAREA. These procedures will be described in detail, their properties will be discussed and recommendations on their use will be drafted. In particular the impact of the procedures on inequality indicators will be investigated. The criteria for the evaluation under simulation and the quality measures will be elaborated.

**WP 5: DATA QUALITY** Collection of data as input for the simulation study. In case of confidentiality constraints, adequate data generation methods will be applied, such as distributional and replication methods or mass imputation (cf. DAC-SEIS WP 3); Elaboration of EU-SILC metadata and quality reports. In connection with both items, peculiarities in the data will have to be investigated. Gathering relevant information as basis for the generation of large scale databases as input for investigating EU-SILC relevant methods.

**WP 6: SIMULATION** Survey data like the SILC data are often subdivided into several strata corresponding to certain geographical units. The relative weight reflecting these geographical units will be used as inclusion probabilities for the data generating process. Further relevant grouping structure is determined by variables like the number of households in each stratum, gender, and age. All these factors and their relative occurrences have to be determined first from the observed data and from results of WP 5. A Monte-Carlo simulation study has to be performed for testing the methods from WPs 2-4 under different conditions. The study will investigate the robustness of model assisted and model based methods as well as for parametric estimation methods in respect to important practical needs and needed relevant assumptions.

**WP 7: ANALYSIS** A template for the description of the results and of the necessary indications for their interpretation will be developed. The work package will start with the first round of simulations to develop a method of analysis. Synthesis tables and graphs of the final evaluations will be produced and the quality measures will be analysed. The results of the procedures under test will be compared with their theoretical properties. A thorough understanding of the conditions, the advantages and the limitations of the procedures will be developed and documented.

**WP 8: VISUALIZATION** Methods for displaying indicators considered within AMELI will be implemented in R as easy to grasp graphics. Based on the statistical software R, additional statistical summaries can be visualised. Exploratory tools and various visualisation methods will be adapted and implemented in R. The goal of these tools is the detection of the missing data mechanisms, and the identification of outliers and values that are influential to statistical analyses. Indicators which are available on geographical units can be visualised in maps as well. The corresponding maps from several countries will be stored as objects in R. Indicators can then be visualised in maps easily. Additional tools regarding prior items will be considered.

**WP 9: SUPPORT OF POLICY** Elaboration of the policy needs (Lisbon goals) and their statistical implications. The AMELI team expects to have exchange with policy makers or the relevant boards in order to ensure the best possible basis for the AMELI research. Recommendations and sensitisation concerning the use of Laeken indicators. The work package will carefully interact on the one hand with the methodological work packages 2, 3, and 4 (serves as input) and on the other hand with the simulation study and analysis (output).

**WP 10: FINAL REPORT** The final report will be split in three parts. The first report will draw together policy-relevant results from all nine research WPs. The report will present and interpret the analysis results of WP 7 and their political impacts, and make recommendations for future policy use. The second report will focus on technical and methodological issues and provide a detailed overview of the project methodology and significant results from the project.