

Estimation and Preliminary Results of Poverty Mapping for Latvia

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Content

History of SAE in Statistics Latvia

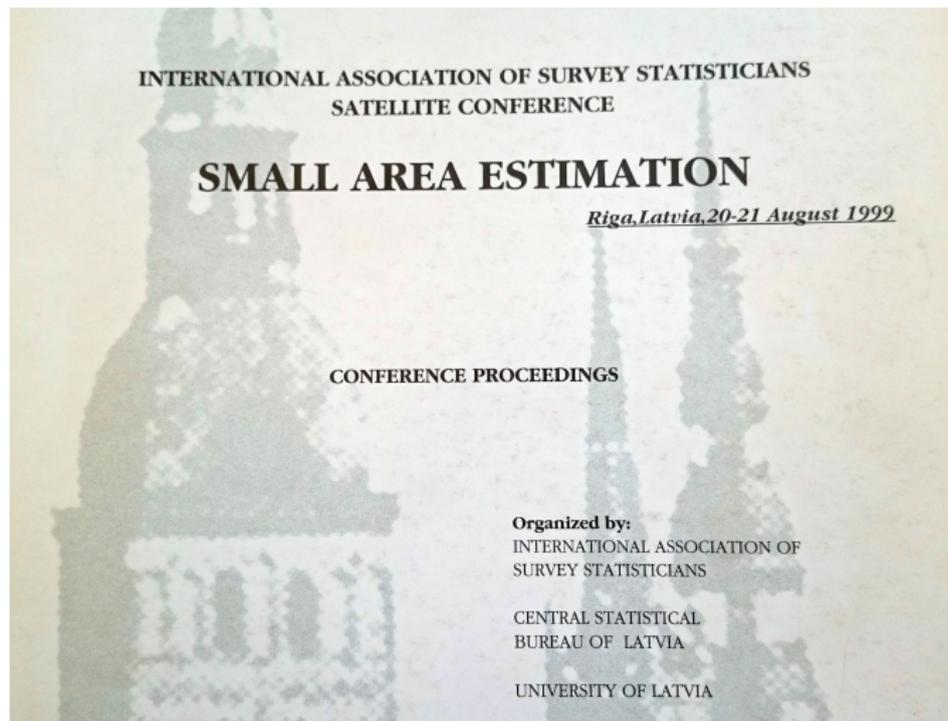
Preliminary estimates and results

Conclusions

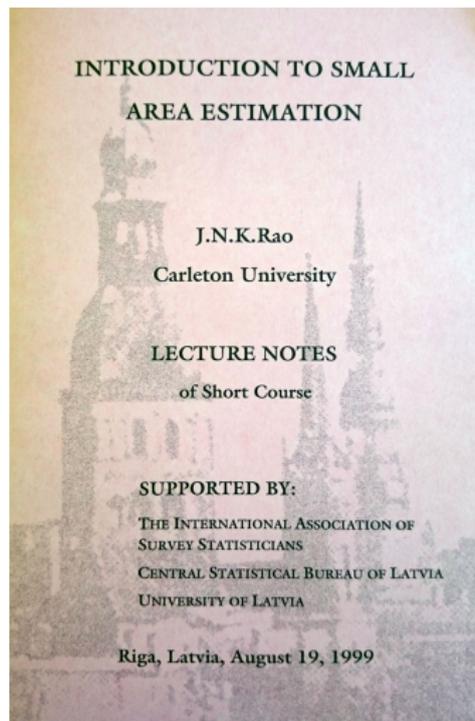
History of SAE in Statistics Latvia

1999 ... 2011 ... 2015+

1999



1999



2000–2010

...

2011

- ▶ Small area estimation – Training on the job
- ▶ Riga, CSB, 12–15 September 2011
- ▶ Stefano Falorsi, Fabrizio Solari (ISTAT)
- ▶ ESSnet project on Small Area Estimation

2012–2014

...

2015

- ▶ The need for more detailed statistics is growing
- ▶ Mārtiņš Miglinieks “Small Area Estimation for the Analyses of Poverty Risk” (bachelor thesis in mathematics)
- ▶ Budget for position in Mathematical Support Division devoted to SAE development
- ▶ Estimation of poverty by administrative territories

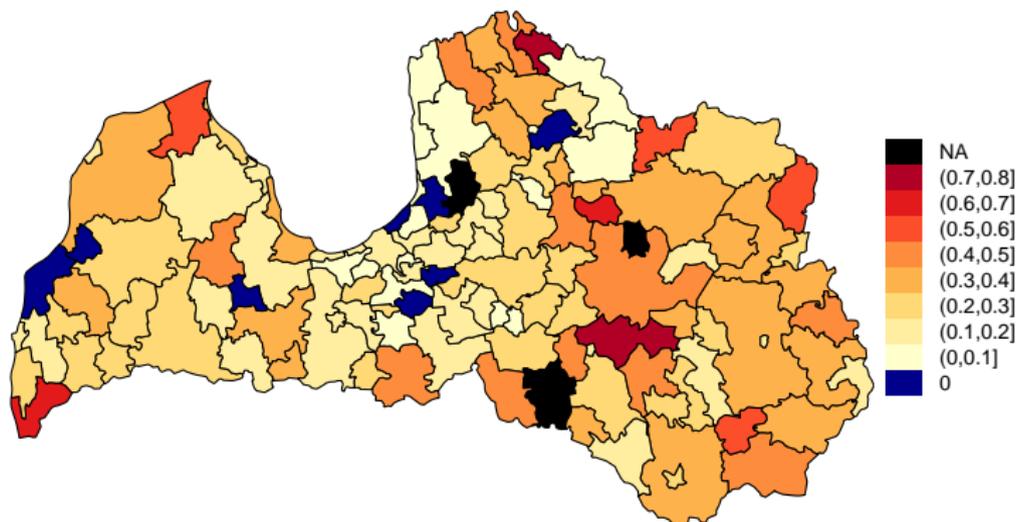
2016

- ▶ The World Bank project starts in August 2016
- ▶ Preliminary SAE results (poverty):
 - ▶ presented at SAE 2016 conference (Maastricht)

Aim

- ▶ At-risk-of-poverty rate
- ▶ by administrative territories (LAU2)
- ▶ 2011 (population census year)

Direct estimates

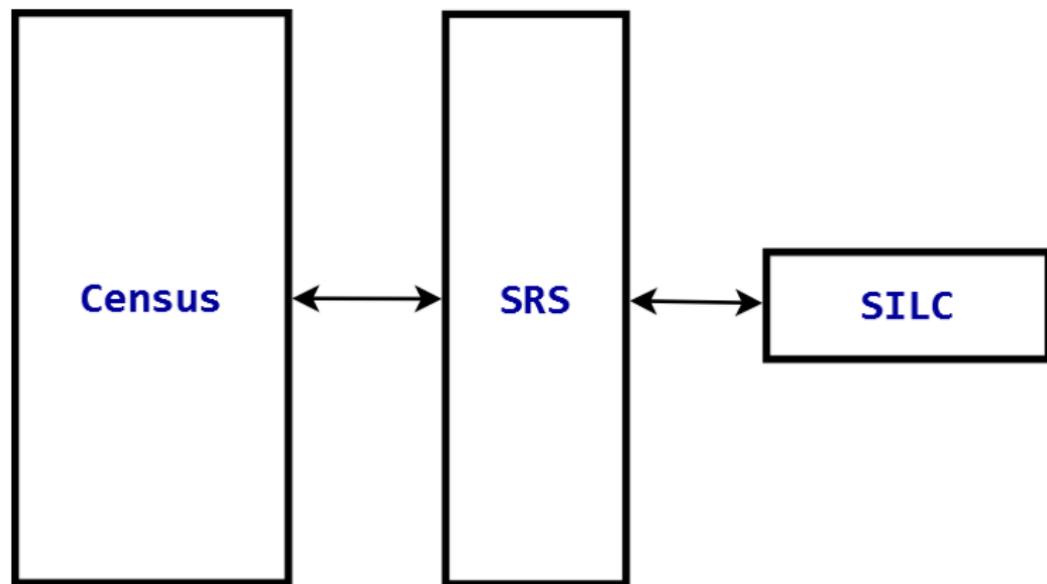


Data

- ▶ EU-SILC
- ▶ Population Census 2011
- ▶ Income data from the State Revenue Service

* reference period for all data is 2011

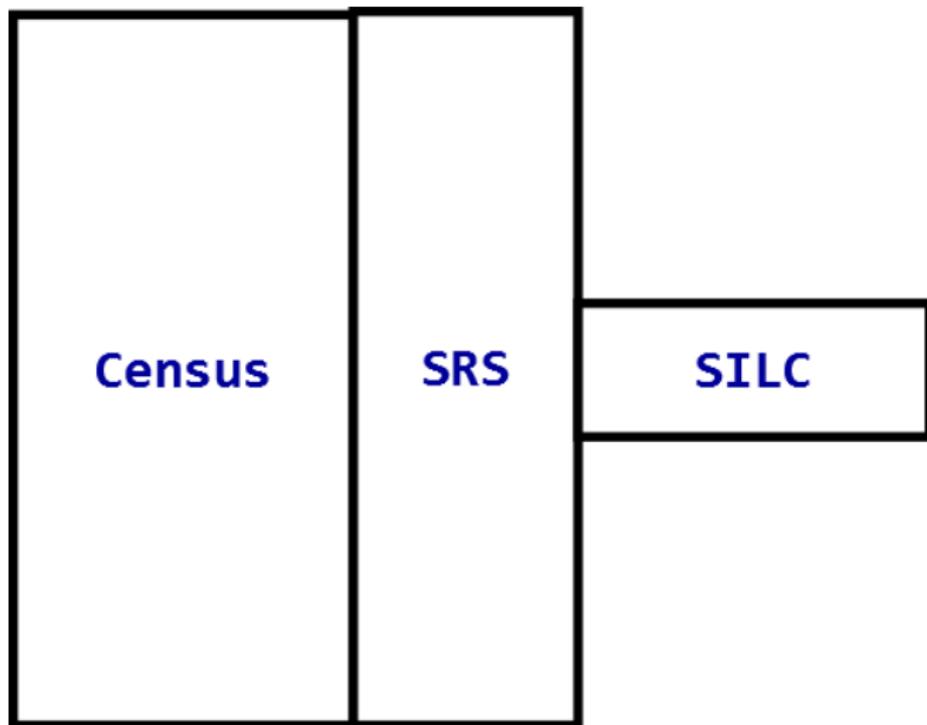
Data



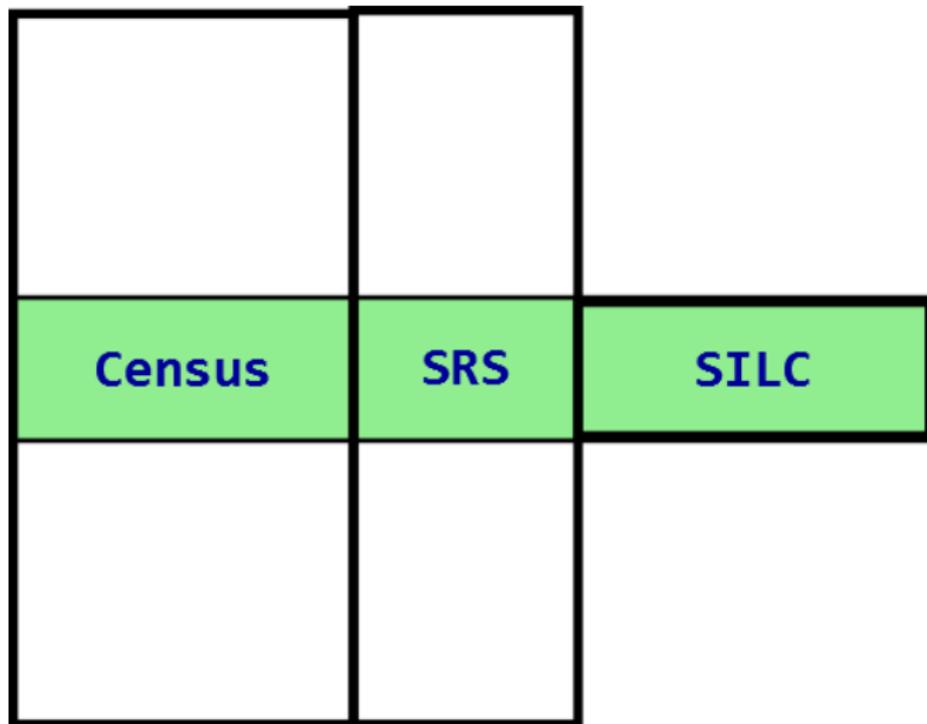
Estimation

- ▶ At-risk-of-poverty rate is a proportion of persons under the poverty line
- ▶ Model for (EU-SILC) equalised income
- ▶ Prediction of income for all individuals in the population
- ▶ Computation of At-risk-of-poverty rate by territories

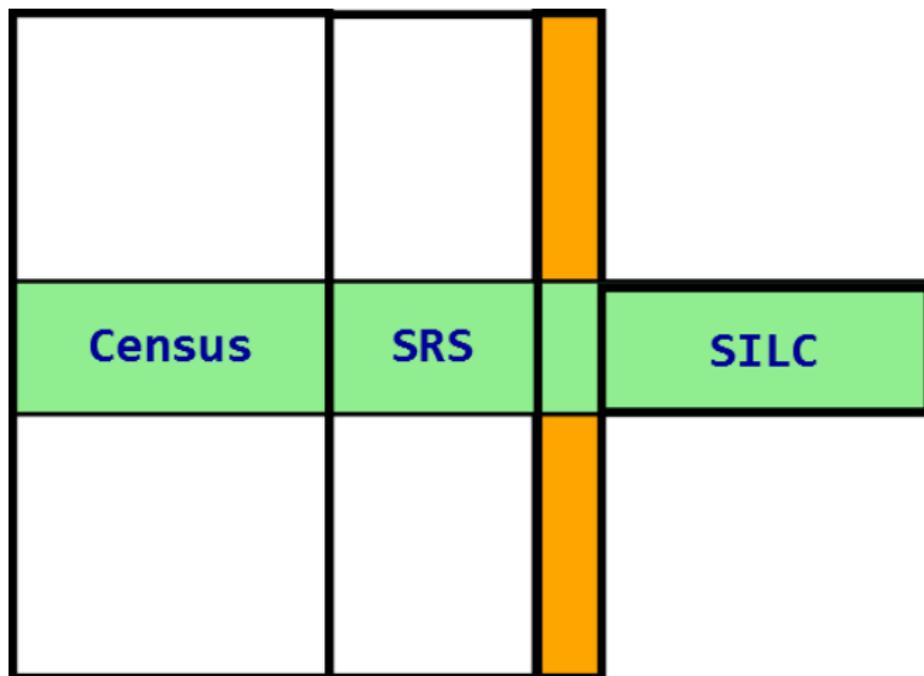
Estimation



Estimation



Estimation



EB method

Empirical best/Bayes (EB) method by Molina and Rao is used.

$$Y_{dj} = \mathbf{x}'_{dj}\boldsymbol{\beta} + u_d + e_{dj},$$

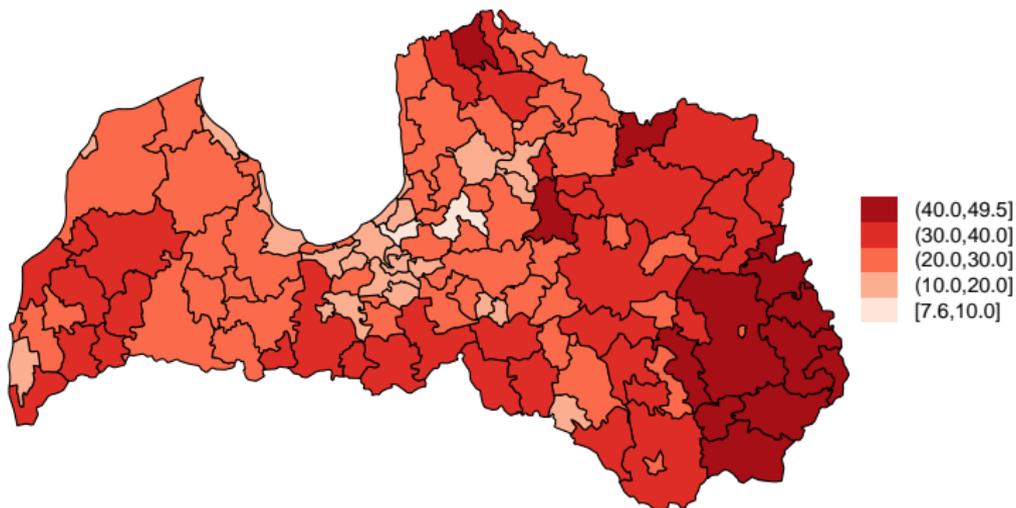
$$u_d \stackrel{iid}{\sim} N(0, \sigma_u^2),$$

$$e_{dj} \stackrel{iid}{\sim} N(0, \sigma_e^2)$$

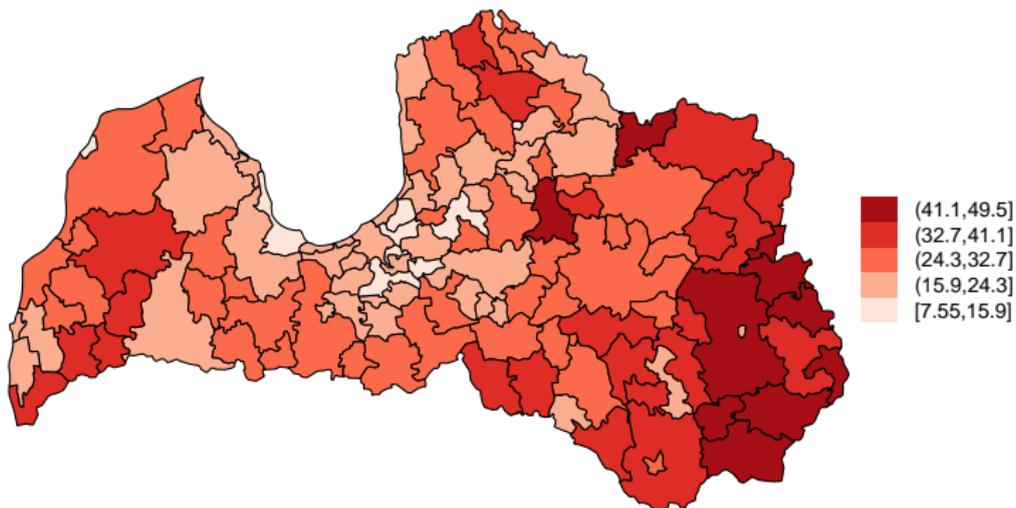
Some of explanatory variables

| | |
|-----------------------------------|---------------------------|
| Age | SRS income (transformed) |
| Sex | SRS benefit (transformed) |
| Country of birth | SRS pension (transformed) |
| Have lived abroad | Economic activity status |
| Language used at home | Employment status |
| Legal marital status | House built year |
| Education Level | Indoor flushing toilet |
| Attends school | Heating type of dwelling |
| Nationality | Dwelling is rented |
| In which country is the main work | Dwellings living area |

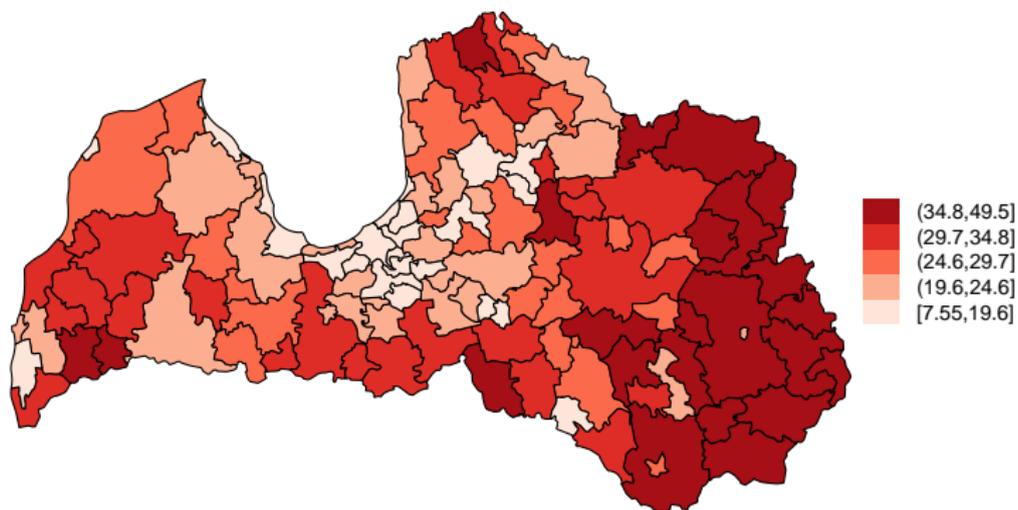
At-risk-of-poverty rate 2011 (provisional)



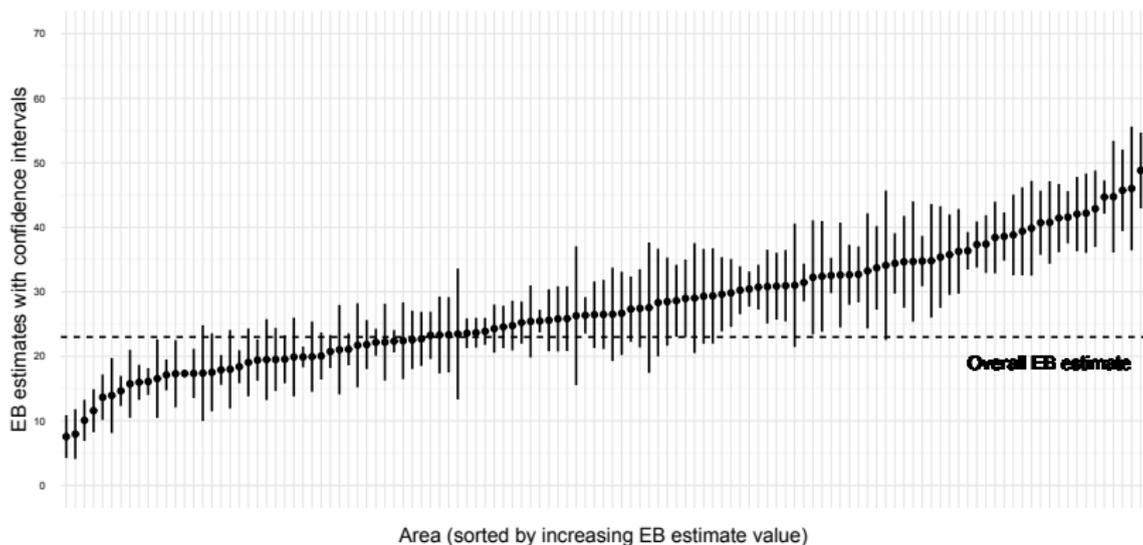
At-risk-of-poverty rate 2011 (provisional)



At-risk-of-poverty rate 2011 (provisional)



At-risk-of-poverty rate 2011 (provisional)



Conclusions

- ▶ Work in progress since 2015
- ▶ The first SAE results are available
- ▶ Dissemination of the results:
 - ▶ Mapping of the results
 - ▶ Ranking of areas by SAE results