



Sample design of Portuguese National Health Examination Survey

I.Kislaya¹, B.Nunes¹, R.Roquette¹, S.Namorado¹, C.Matias Dias¹

¹ Department of Epidemiology, National Health Institute Doutor Ricardo Jorge, IP, Lisbon, Portugal

INTRODUCTION

Portuguese National Health Examination Survey 2013-2016 (INSEF) is a cross-sectional population-based study representative at regional (7 Regions) and national level that aims to expand knowledge on health status, health determinants and health inequalities.

It is developed by the National Health Institute Doutor Ricardo Jorge (INSA) in cooperation with five Regional Health Administrations and the Regional Health Offices of the Autonomous Regions of the Azores and Madeira and the Norwegian Institute of Public Health.

The survey encompasses:



INSEF target population comprises community-dwelling individuals aged between 25 and 74.

1ST STAGE SAMPLING IMPLEMENTATION

386 PSUs were created. Minimum size of PSU was established as 1000. In each region PSUs were stratified in rural and urban with allocation proportional to the population weight (14 strata).

For 86% of PSUs selection probabilities were lower than 0.2. Higher variation of selection probabilities was observed for Alentejo, Algarve, Madeira and Azores.

49 PSUs were selected at national level (7 by region).

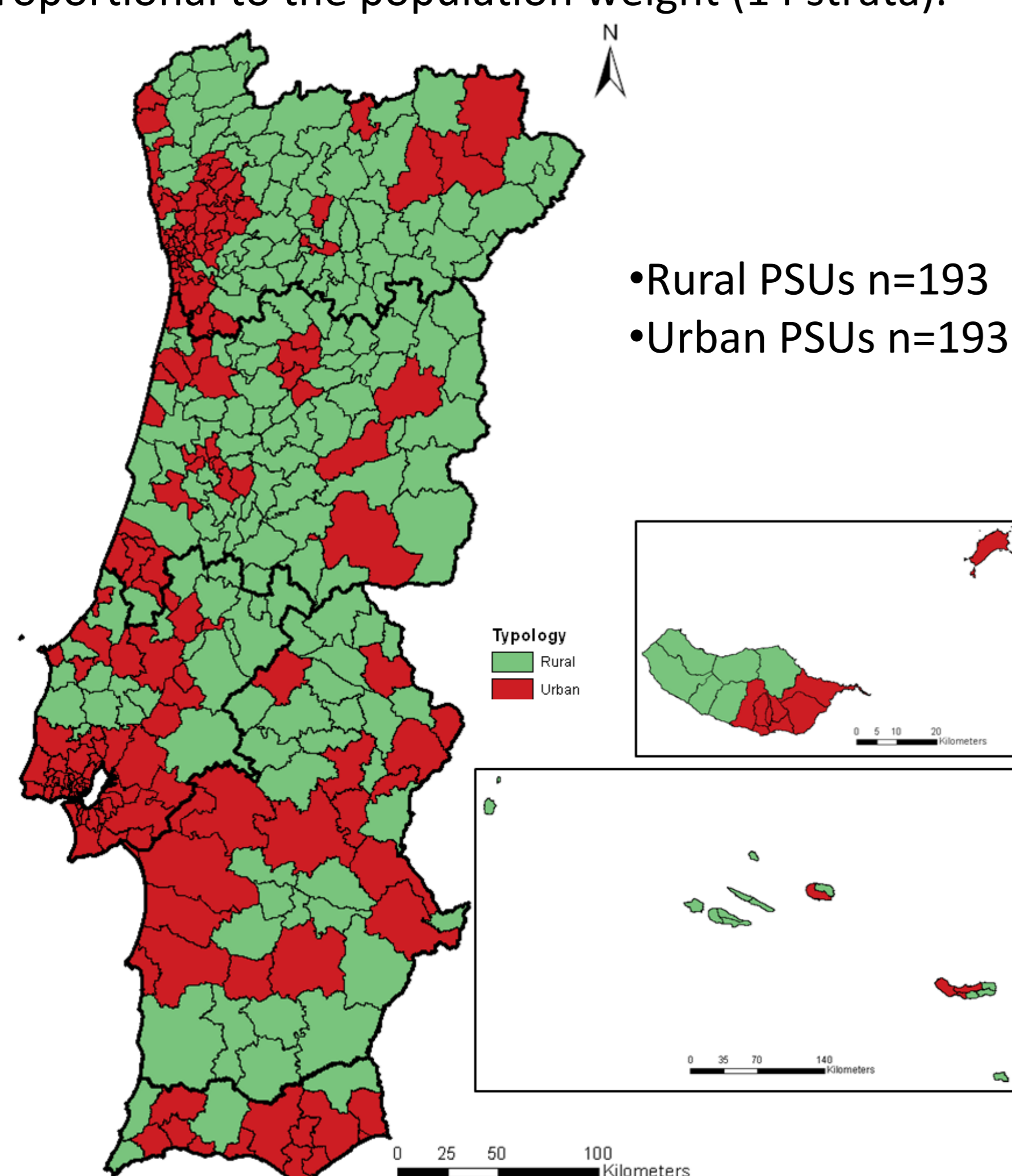


Figure 1. Typology of PSUs

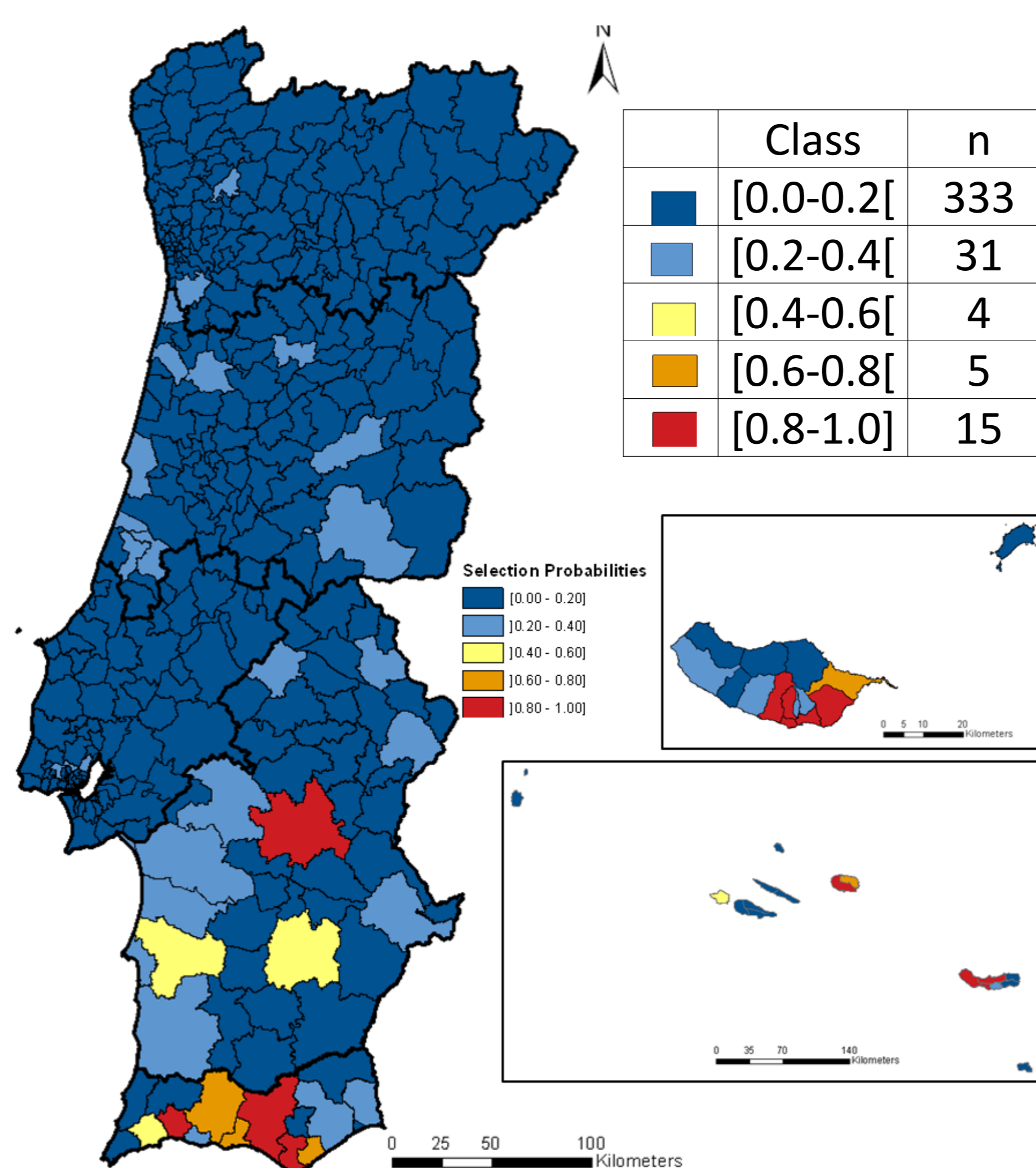


Figure 2. 1st stage selection probabilities

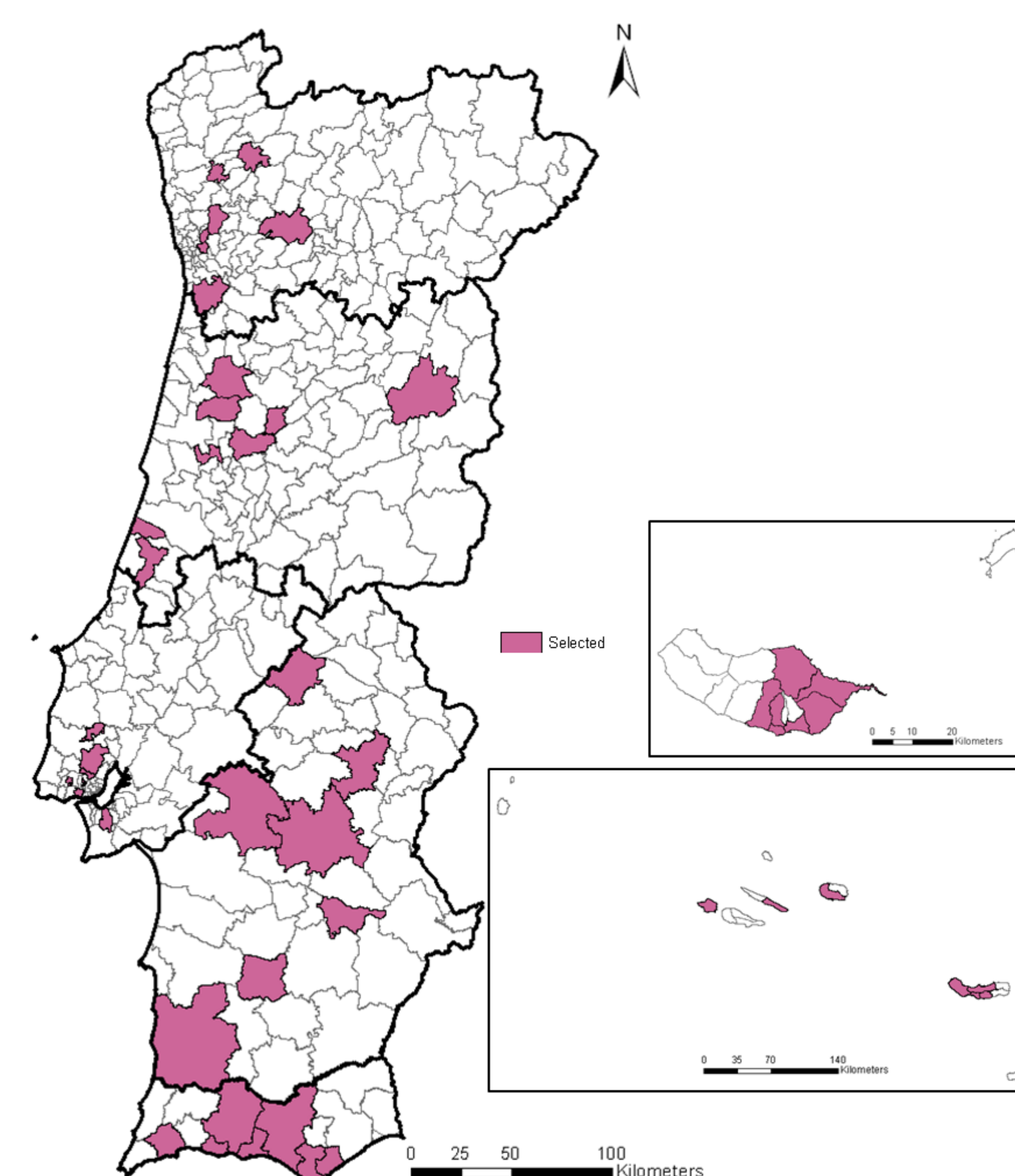


Figure 3. Selected PSUs

2ND STAGE SAMPLING IMPLEMENTATION

For each selected PSU the sampling frame was screened for eligibility in terms of residence.

The contact information needed for the recruitment was incomplete for 2.0%-40.7%, so cross-validation with the National Mail Post Office database and other health registries was performed.

Although it was planned to select a fixed number of SSUs in each PSU, Bernoulli sampling method was adopted to account for the sampling frame imperfections and the different responses rates expected at regional level.

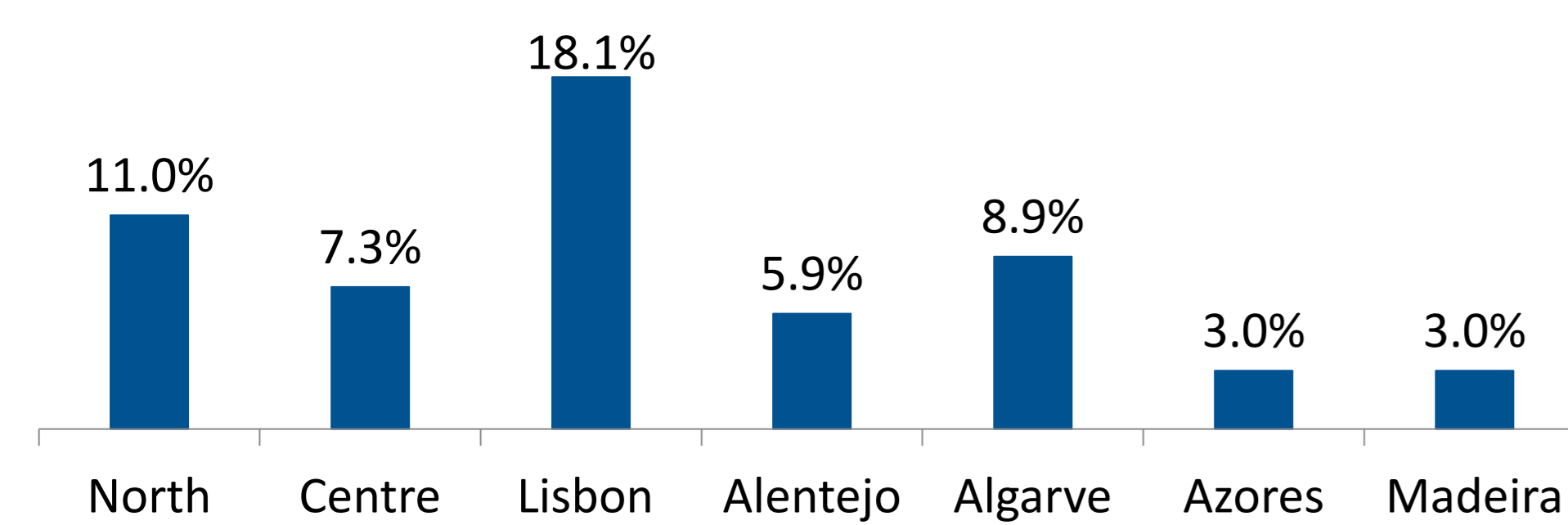


Figure 4. Percentage of out-of-scope units in the sampling frame

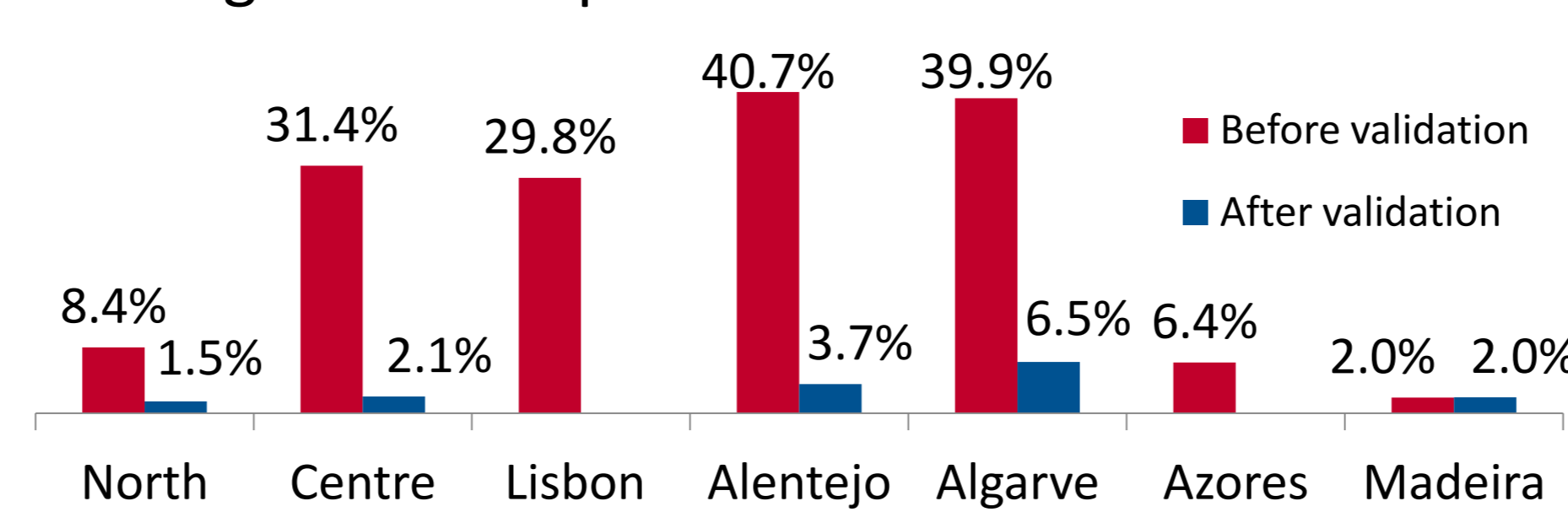


Figure 5. Percentage of units with missing contact in the sampling frame

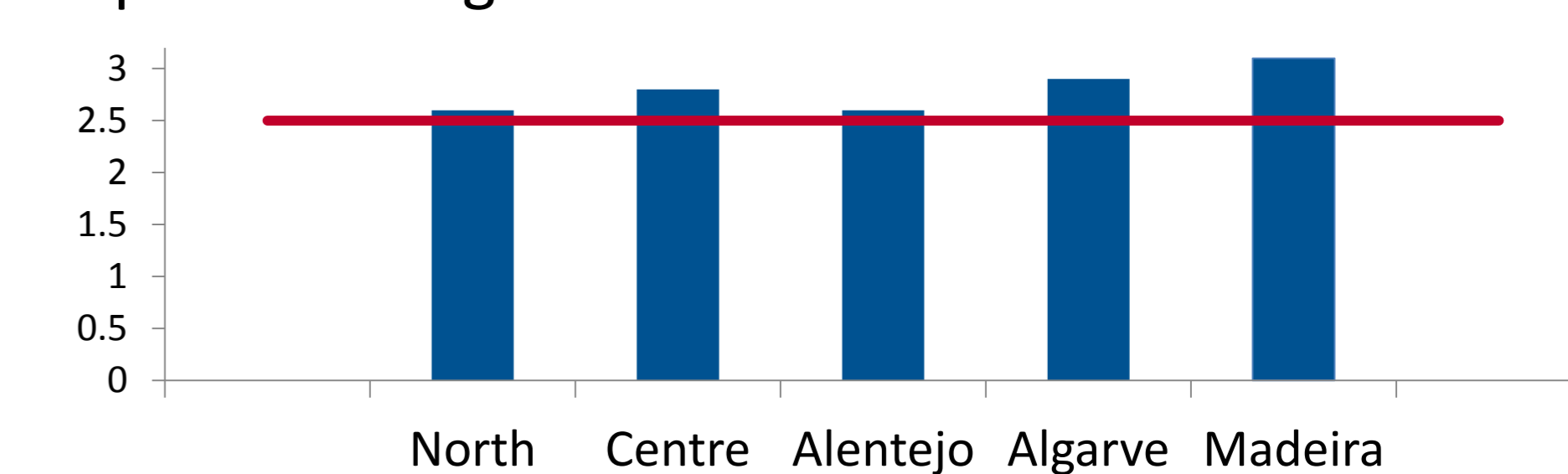


Figure 6. Oversampling factors applied by region

Individuals living abroad and out of catchment areas of PSUs were removed from the frame.

Validation procedures implemented at local level allowed to reduce missing data to 1.5-6.5%.

SSUs selection has been already performed for 30 PSUs. Higher oversampling factors were used for 19 PSUs.

CONCLUSIONS

Sampling frame quality and validation are extremely important to minimize survey errors and selection bias. Use of multiple sources of data is a good way to succeed in achieving the sampling goals in a health survey such as INSEF.

METHODS

- **Sample design:** two-stage stratified cluster sampling, with selection of geographical areas (PSUs) in the first stage and Individuals (SSUs) in the second stage. In the first stage sample was stratified by region and typology of urban area (TIPAU).
- **Sample size:** 600 individuals for each region (4200 at national level) to estimate an expected prevalence of 50%, with margin of error of $\pm 5\%$ at a 95% confidence level considering a design effect of 1.5.
- **Sampling frames:** 1st stage - Census data (2011) and TIPAU, 2nd stage - National Healthcare System Users registry.
- **Expected participation rate:** 40%, original sample size was inflated to 10500 do account for non participation (oversampling factor of 2.5).
- **Sampling procedure:** At the 1st stage PSUs were selected, with a probability proportional to the population size. At the 2nd stage SSUs were selected by simple random sampling.
- **Fieldwork:** February 2015 – December 2015.

FUNDING

The Portuguese National Health Examination Survey 2013-2016 (INSEF) is being developed as part of the project "Improvement of epidemiological health information to support public health decision and management in Portugal. Towards reduced inequalities, improved health, and bilateral cooperation", that benefits from a 1.500.000€ Grant from Iceland, Liechtenstein and Norway through the EEA Grants.