

12-14 June 2023, online

EXPERT MEETING ON STATISTICAL
DATA COLLECTION – RETHINKING
DATA COLLECTION

RESPONDENTS AND NON RESPONDENTS TO POPULATION AND HOUSING CENSUS.

**SOME STRATEGIES FOR DATA COLLECTION DESIGN IN THE ERA OF
LOW RESPONSE RATE AND HIGH RESPONSE BURDEN.**

Manuela Bussola, Novella Cecconi, Elena Donati, [Linda Porciani](#)

Istat | Direzione centrale per la raccolta dati

The Permanent Population and Housing Census (PPHC) in Italy

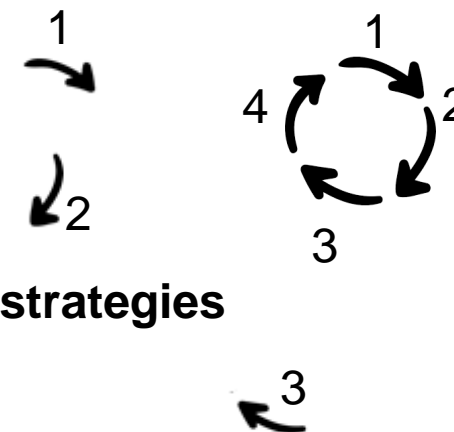
AIMS OF THE ANALYSIS

Finding some of the reasons behind the decrease of (CAWI) response rate

through the description of the profile of respondents / non respondents

to acquire elements for designing adaptive organizational and communication strategies to respondents

in order to increase the response rate, especially web response rate



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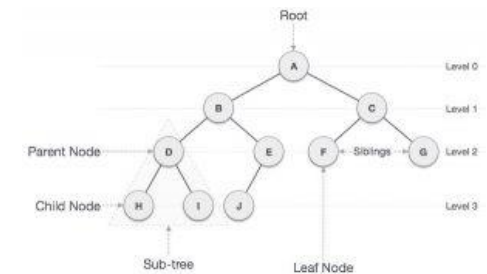
A **Decision tree model** for the profile of **respondents/non respondents**

Why a decision tree model?

The method allows to have a meaningful classification through homogenous predictors starting from a population very heterogeneous, such as the PPHC sampled households.

How the decision tree model was applied?

1. PPHC sampled households was divided into three macro aggregation (sampled, respondents and non respondents)
2. Each subpopulation is the object of a specific decision tree model
3. The classification algorithm is **CHI-squared** Automatic Interaction Detection (CHAID)



CHAID is a multiple segmentation techniques based on X^2 test.

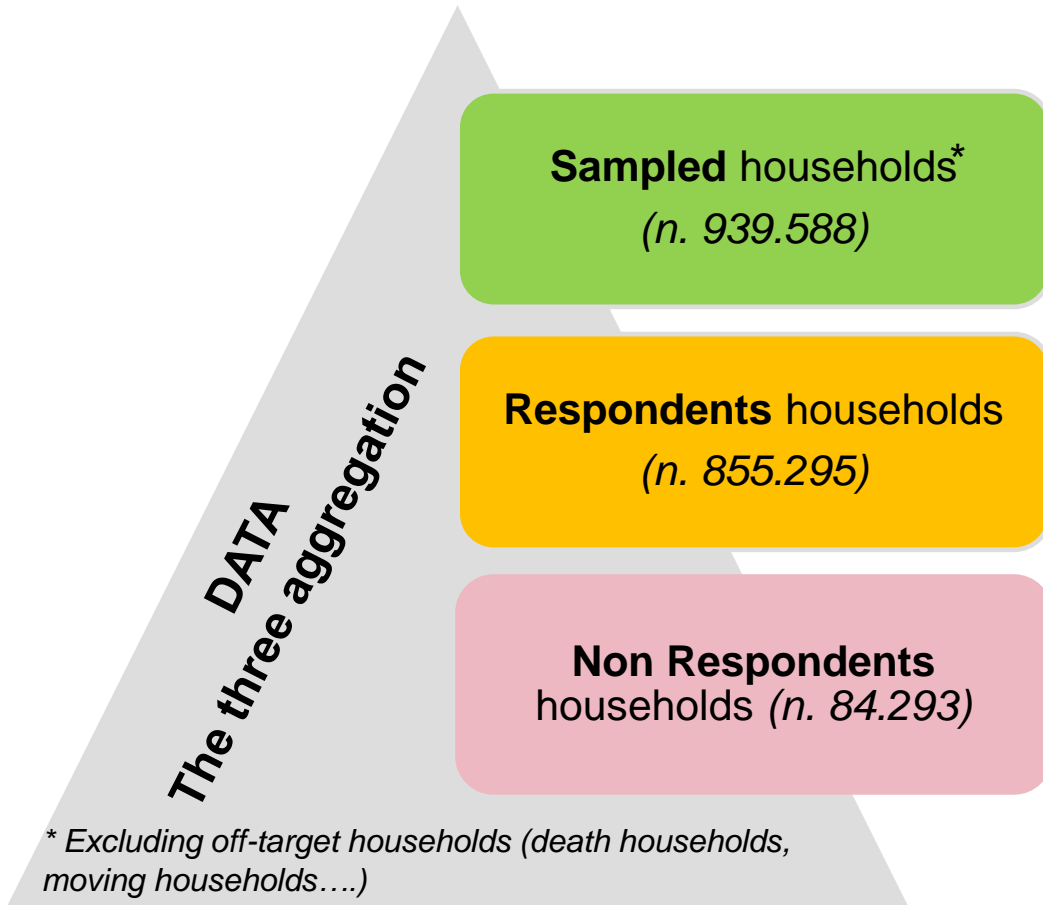
A contingency table (X^2 and p -value) was calculated for each explicative variable (by modalities) and dependent variable. The comparison between the minimum p -value (p -min) and the stop value (α , that is the maximum dimension of the tree or the maximum number of levels or the minimum frequency in a node) of a specific attribute X_i could be:

- $pmin < \alpha$; X_i is an included modality;
- $pmin > \alpha$; X_i is an attribute of a leaf.



A **Decision tree model** for the profile of **respondents/non respondents**

POPULATION AND DIMENSION OF ANALYSIS



CATEGORIES



HOUSEHOLD
Socio-demographic characteristics

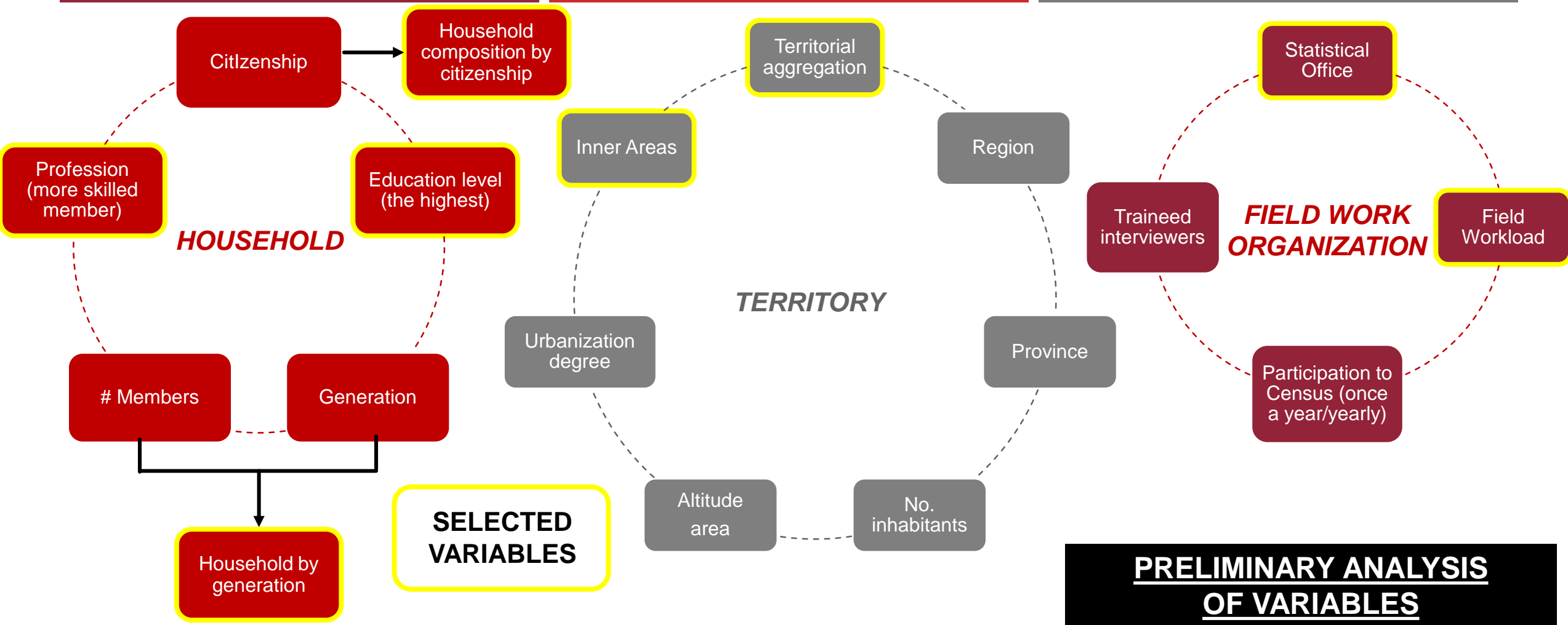


TERRITORY
Features of living places of households



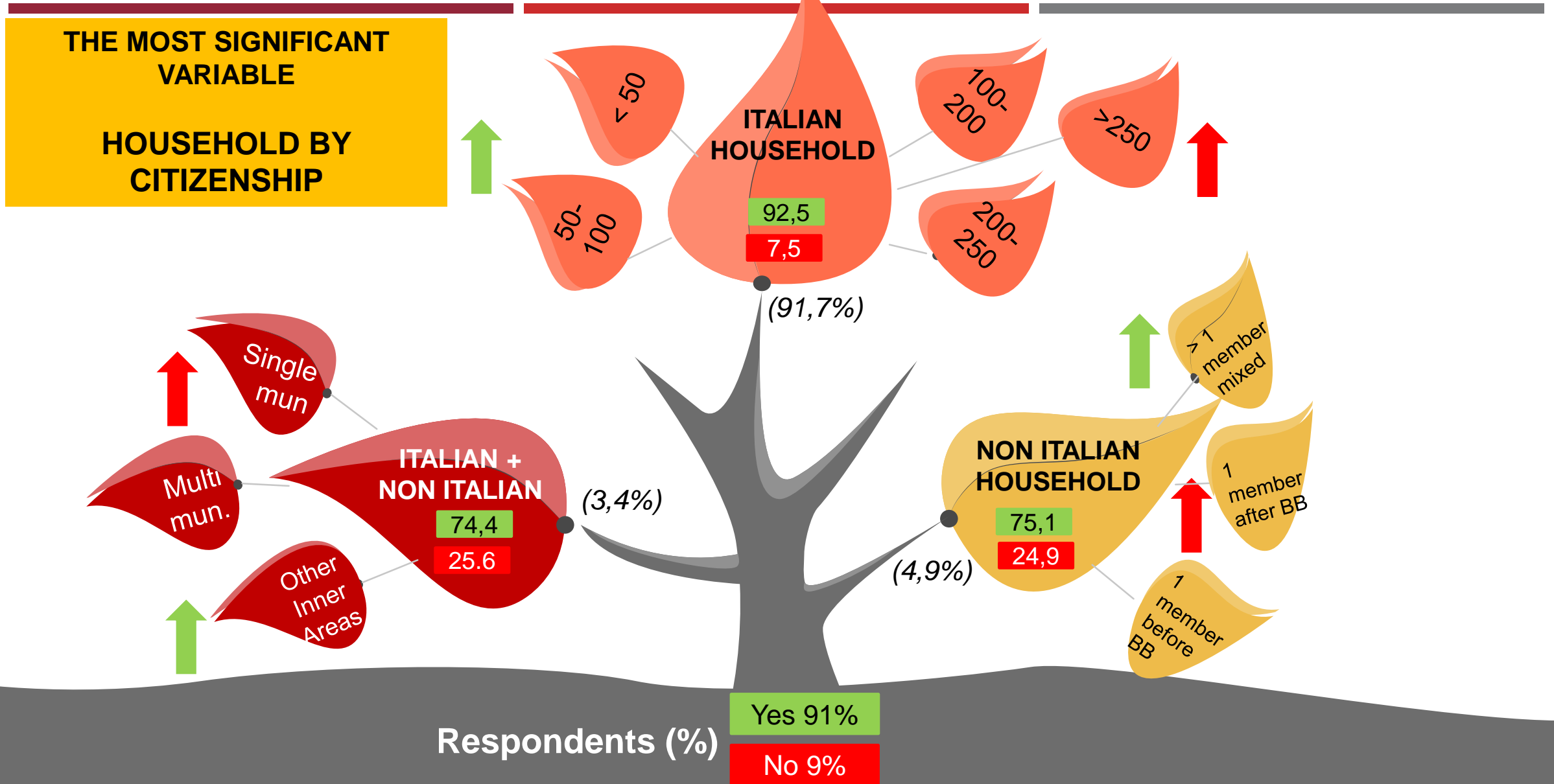
FIELD WORK ORGANIZATION
Internal organization of territorial census offices (Municipality)

A Decision tree model for the profile of respondents/non respondents

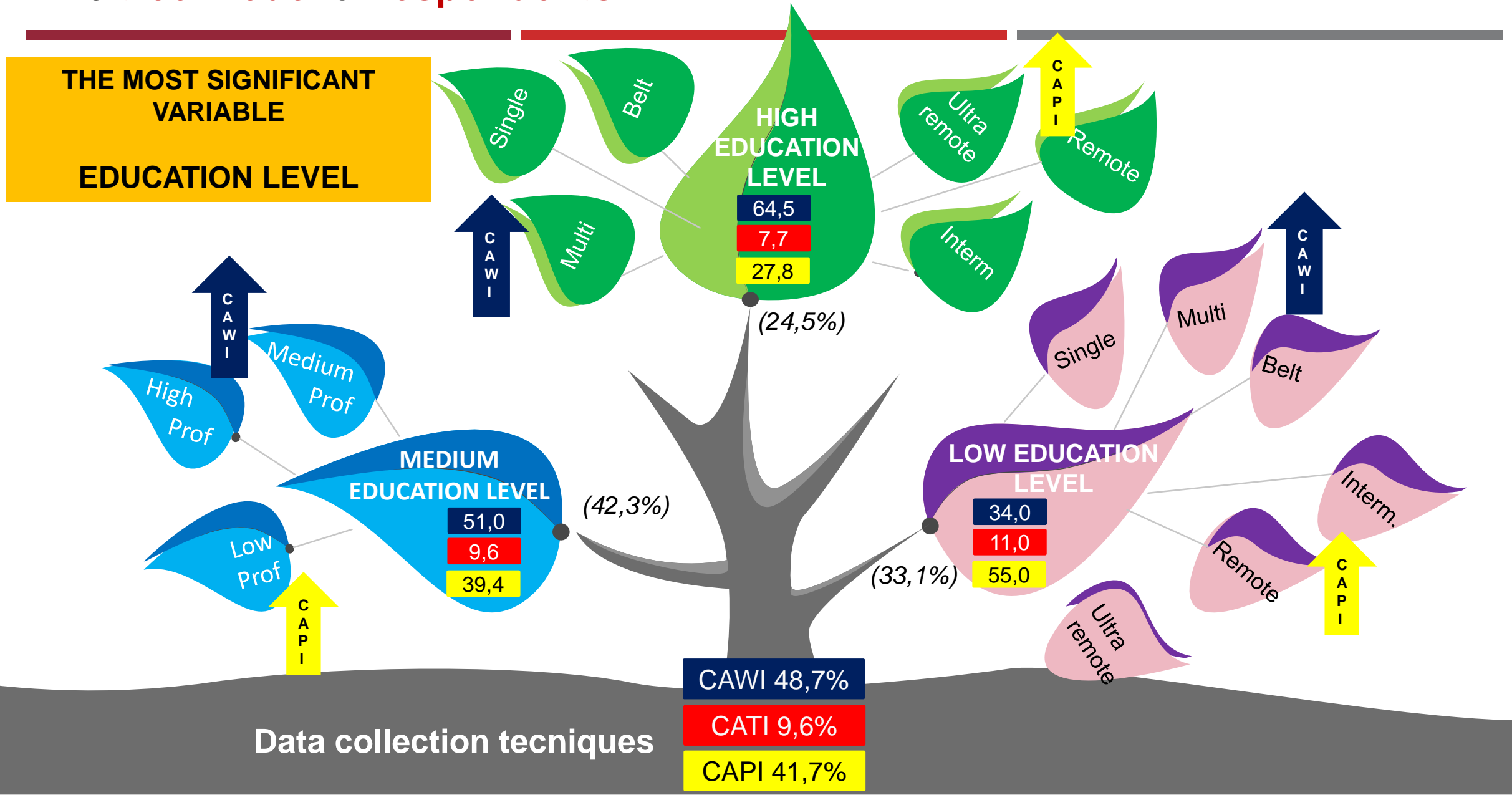


Other cross variables: Internet use | Institutions trustness | efficiency of postal solicits

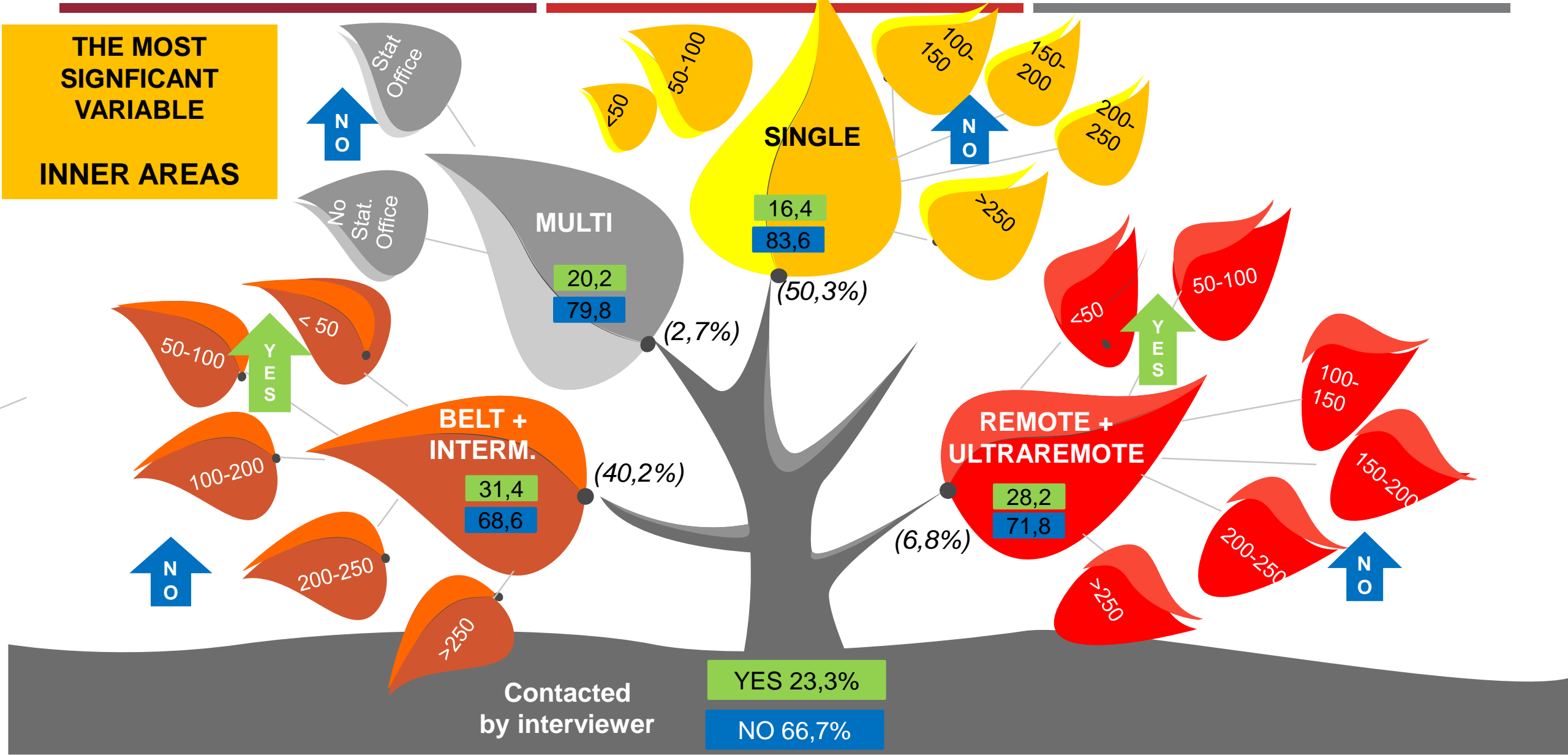
The tree model of sampled households



The tree model of respondents



The tree model of non respondents



Adaptive respondents/non respondents strategies in the survey process

PROFILES

POSSIBLE STRATEGIES

NON RESPONDENTS

- **1 member** Non Italian
- Living in **Single-Municipality** Service Center

RESPONDENTS

- **Italian** households
- **Low field workload**



- Improving the **collaboration with local foreigner associations**
- Starting the **data collection from 1 member households and non Italian households**
- **Reducing the field workload through the improvement of self-enumeration**

INTERVIEWER

- **Low educational level**
- Living in **remote** areas

SELF ENUMERATION

- **High educational level**
- Living in **Single-Municipality** Service Center
- **High professional status**



- **Improving the communication campaign** in remote areas focused to the self enumeration
- **Improving an additional technique, as smart questionnaire** (i.e. through a QR Code in the informative letter)

NOT CONTACTED

- Living in Single and Multi **Single-Municipality** Service Center
- **High field workload**

CONTACTED

- Living in **Belt areas**
- **Low field workload**



- **Reducing the field workload** through the improvement of self-enumeration
- **Making available the mobile phone numbers**
- Involving municipality census offices to **customize the communication campaign** at the local level

thanks

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