UNSD-AITRS Regional Workshop on the Integration of Statistical and Geospatial Information

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National Census Geography

Some lessons learned and future challenges in European countries

SAPIENZA
UNIVERSITÀ DI ROMA

Dr ROBERTO BIANCHINI

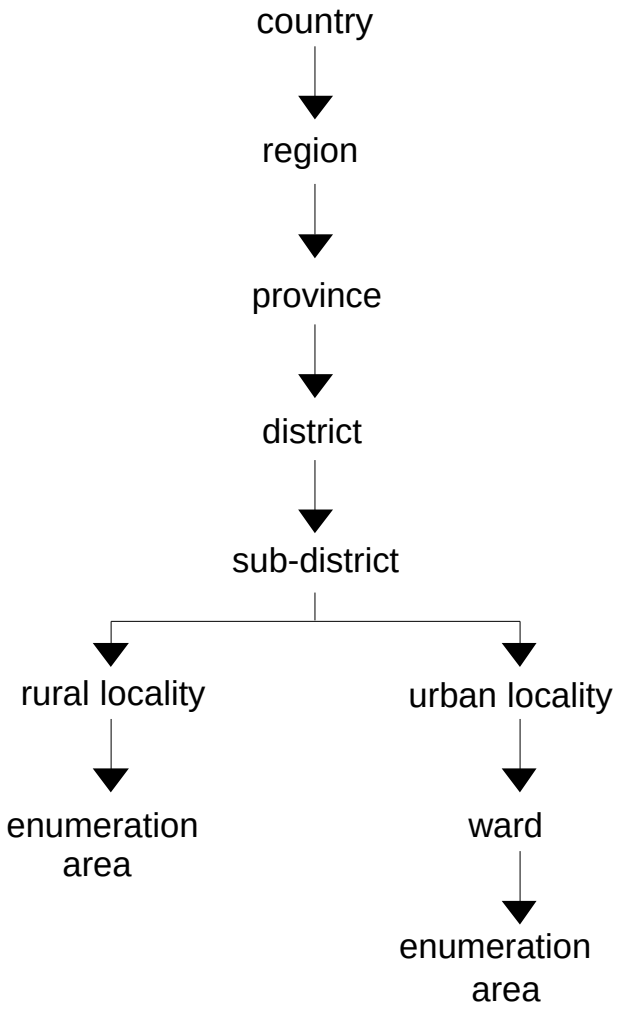
Interuniversity Research Center for Sustainable Development
Population, Health and Geographic Information Systems Section

Overview

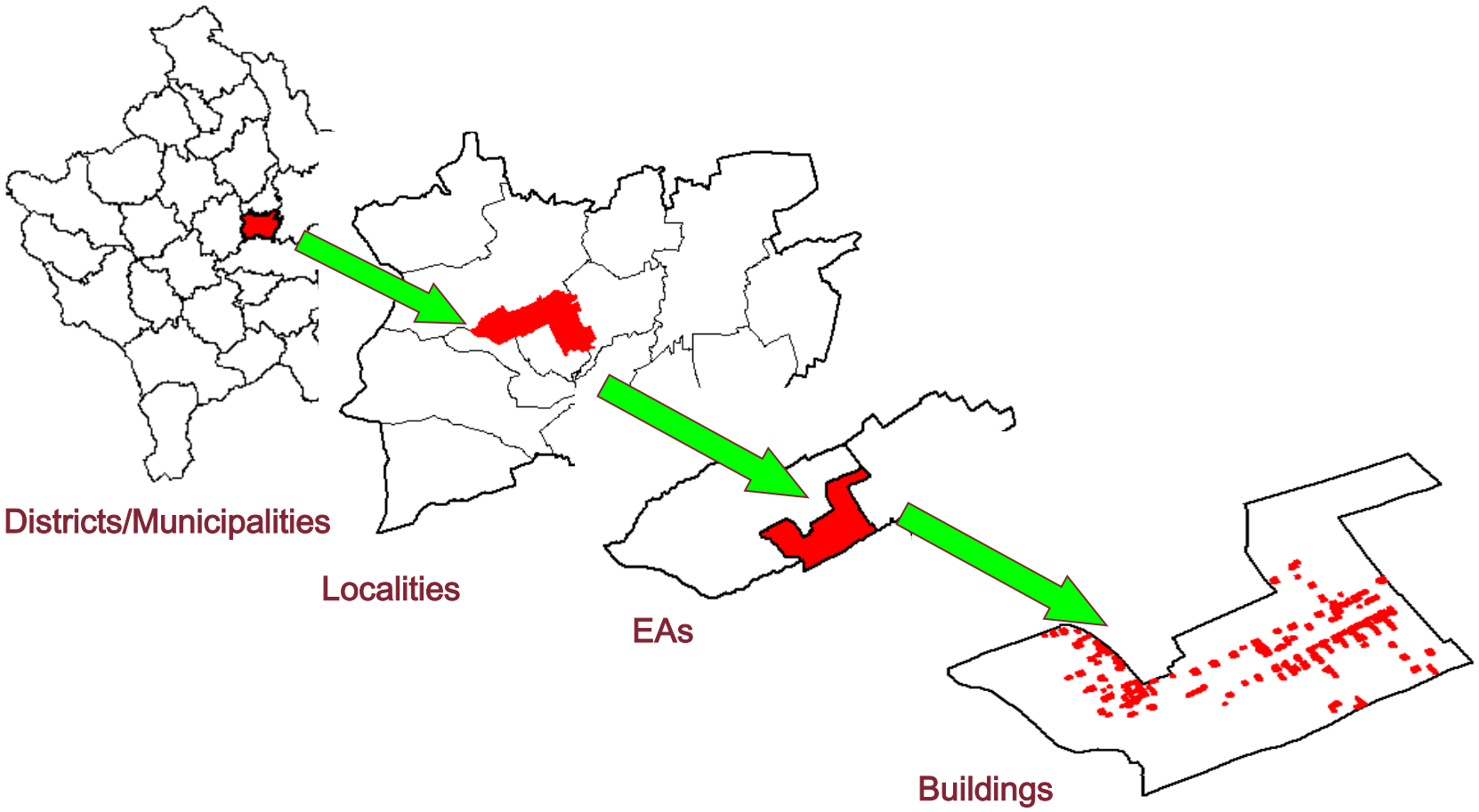
- Definition of national census geography
- Criteria to delineate EAs
- Census methodology
- Traditional – Combined - Register-based censuses
- Geospatial information in traditional and combined censuses
- Geospatial information in register-based censuses
- Traditional versus Register
- A flexible and complex census geography
- Grid versus administrative maps

Definition of national census geography

- The administrative areas for which census data will be reported, and for some of them, disseminated
- List of all administrative, geographic and statistical units in the country, with their relationships
- Consists of a hierarchy of administrative and non-administrative units
- Every country has its own specific administrative hierarchy

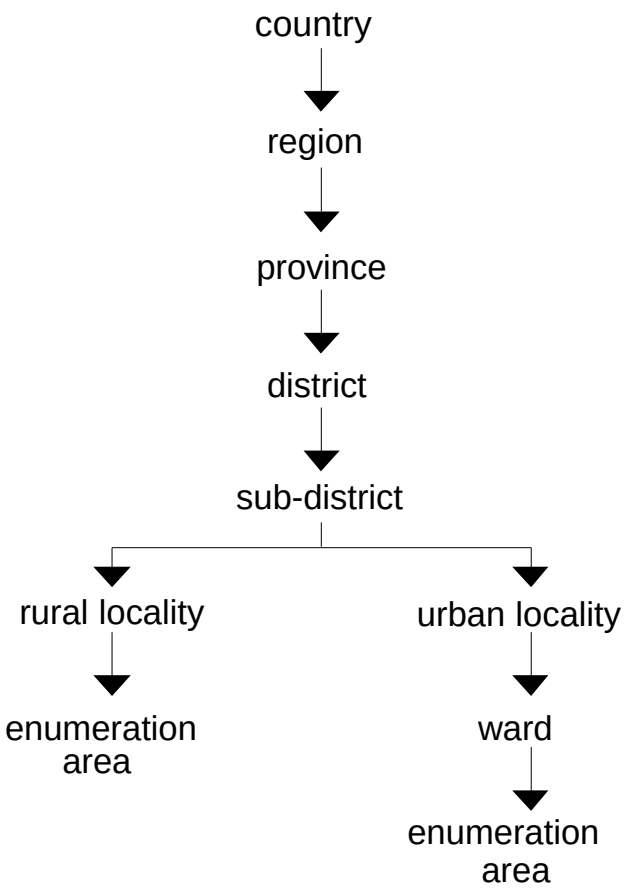


Definition of national census geography - example of the hierarchical system

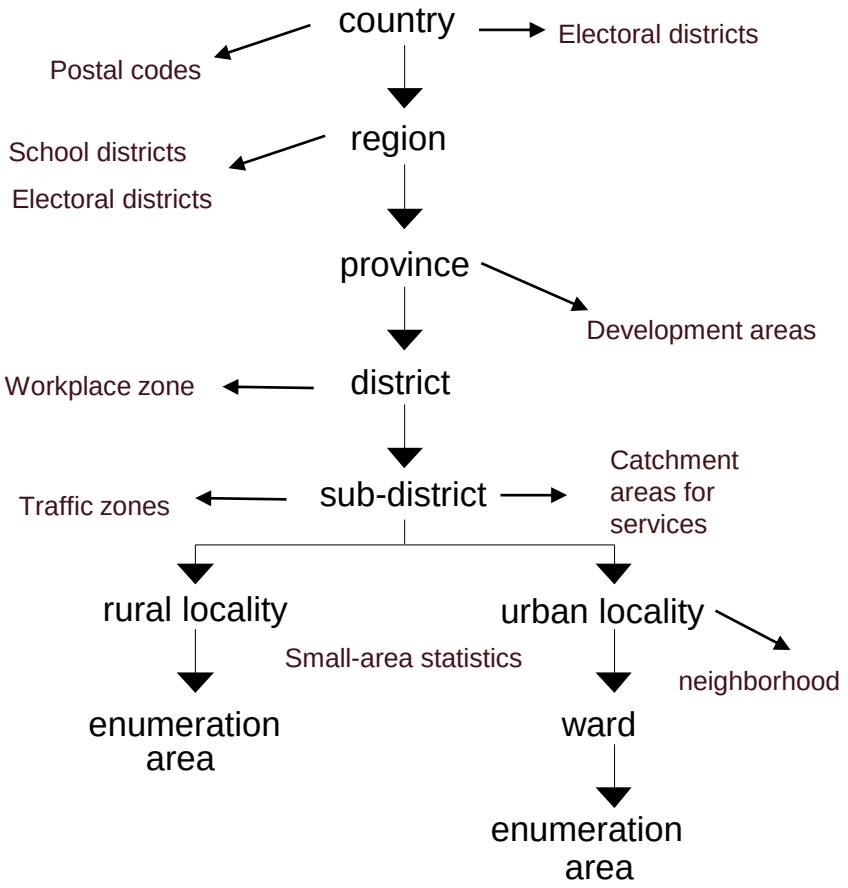


Definition of national census geography

Simple census geographic



Complex census geographic



Criteria to delineate EAs

- **Be mutually exclusive and exhaustive with associated unique ID codes**
- **Have easily identifiable boundaries on the ground**
- **Be consistent with the administrative hierarchy**
- **Be consistent with statistical and geographic entities**
- **Be of approximately equally sized population**
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- **Be small enough and accessible to be covered by an enumerator**
- **Be large enough to guarantee data privacy**
- **Be useful for other types of data collection activities.**

Example of an EA map

ID building code or address
(to be reported on the census forms)

EA boundaries

Boundaries of adjoining EAs

ID codes of the EA
(to be reported on the census forms)

Census methodology

Which census geography for which census method?

- Traditional?
- Combined?
- Register-based census?

Traditional – Combined - Register-based censuses

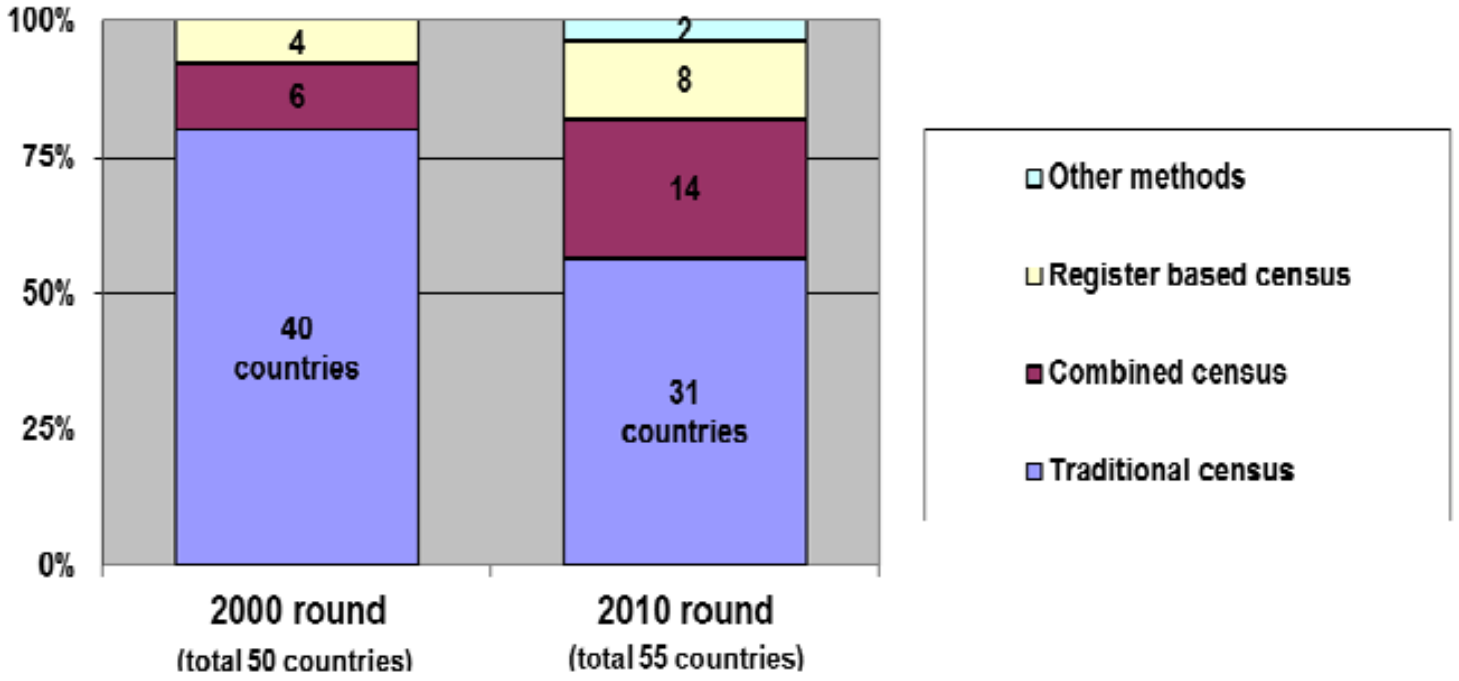
- Traditional census: field enumeration with no use of registers or administrative data – census geography for **planning, fieldwork, dissemination**
- Combined census: field enumeration associated to data from registers and/or other statistical surveys - census geography for **planning, fieldwork, dissemination**
- Register-based census: full use of registers and administrative data – census geography for **dissemination**

Traditional – Combined - Register-based censuses in UNECE Region*

COUNTRY	CENSUS METHOD
Albania	Traditional
Andorra	Register-based
Armenia	Traditional
Austria	Register-based
Azerbaijan	Traditional
Belarus	Traditional
Belgium	Register-based
Bosnia-Herzegovina.	Traditional
Bulgaria	Traditional
Canada	Traditional
Croatia	Traditional
Cyprus	Traditional
Czech Republic	Combined
Denmark	Register-based
Estonia	Combined
Finland	Register-based
France	Rolling
Georgia	Traditional
Germany	Combined
Greece	Traditional
Hungary	Traditional
Iceland	Combined
Ireland	Traditional
Israel	Combined
Italy	Combined
Kazakhstan	Traditional
Kyrgyzstan	Traditional
Latvia	Combined
Liechtenstein	Combined
Lithuania	Combined
Luxembourg	Traditional
Malta	Traditional
Monaco	Traditional
Montenegro	Traditional
Netherlands	Combined
Norway	Register-based
Poland	Combined
Portugal	Traditional
Republic of Moldova	Traditional
Romania	Traditional
Russian Federation	Traditional
San Marino	Traditional
Serbia	Traditional
Slovakia	Traditional
Slovenia	Register-based
Spain	Combined
Sweden	Register-based
Switzerland	Combined
Tajikistan	Traditional
FYROM - Macedonia	No census
Turkey	Combined
Turkmenistan	Traditional
Ukraine	Traditional
United Kingdom	Traditional
Uzbekistan	Mini-census

** Economic Commission for Europe, Paris, 6-8 June 2012*

Traditional – Combined - Register-based censuses in UNECE Region



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Traditional, Combined, Register-based censuses in Europe

In comparison to the 2000 census round:

- Less number of European countries conducted a traditional census in the 2010 round
- Larger number of European countries conducted a combined or a register-based census in the 2010 round
- **Census geography** more complex, and **geospatial tools** widely used by almost all UNECE countries

Expectations from register-based census

- Reduced costs
- Reduced burden of respondents
- Reduced time to produce census outputs
- Better coverage and quality of census data

Coverage and data quality depends on the quality of registers, including geospatial information

Conditions for register-based census

- Legal framework. Use of administrative data for statistical purposes, data protection
- **Registers**. Availability of comprehensive and reliable registers (population, **building/dwelling, addresses**)
- Institutional cooperation. Access to registers
- Acceptance from the people. Transparency
- Nationwide unique ID numbers. IDs for persons, business units, **dwellings, addresses with numbers**

Geospatial information in traditional and combined censuses

- Planning. Subdivision of the territory into administrative, geographic and statistical units, demarcation of EAs, preparation of census maps, coding scheme, development of spatial databases

- Fieldwork operations. Support for logistics, monitoring coverage

- Dissemination of census data. Thematic maps, production of geo-referenced census data, atlases, Web GIS

Geospatial information in traditional and combined censuses - common elements in the 2010 round in Europe

- **GIS tools** and spatial databases **widely used**
- Few countries used paper-based sketch maps
- More use of **addresses**
- More **geocoded data** and more **georeferencing**

Geospatial information in traditional and combined censuses - some lessons from the 2010 round

- In traditional and combined censuses, GIS improved census coverage, but analyses are needed for validation (PES and other evaluation methods)

- New availability of GIS infrastructures for statistics in many European NSOs: sample frames for household surveys, NSDI

- Base spatial infrastructure for future **building and dwelling registers, or addresses**?

Geospatial information in register-based censuses - some lessons from the 2010 round

- GIS used for registers of dwellings/buildings and for addresses
- GIS used for dissemination: point-based locations of buildings using map coordinates
- point-in-polygon analysis used to define statistical areas such as localities or settlements, urban/rural areas, catchment areas, postal codes, grid squares

Traditional versus Register or ...versus quality and cost reduction?

- No optimal census approach. It depends on the national context
- The objective should be quality and reducing costs

- Need to develop a complex national census geography ready to be used for any census method, including geocoding population by points
- **A main focus should be the improvement of census coverage**

A flexible national census geography

- To be used in traditional, combined, register-based censuses
- To be based on a complex and flexible system of administrative, geographic and statistical units
- To include a grid system for coding of buildings/addresses
- Use of nationwide unique ID numbers for addresses, buildings and dwellings

Benefits for the 2020 round:

- expected improvement of census coverage
- Improved potentialities to develop building and dwelling registers

A flexible and complex census geography - Example

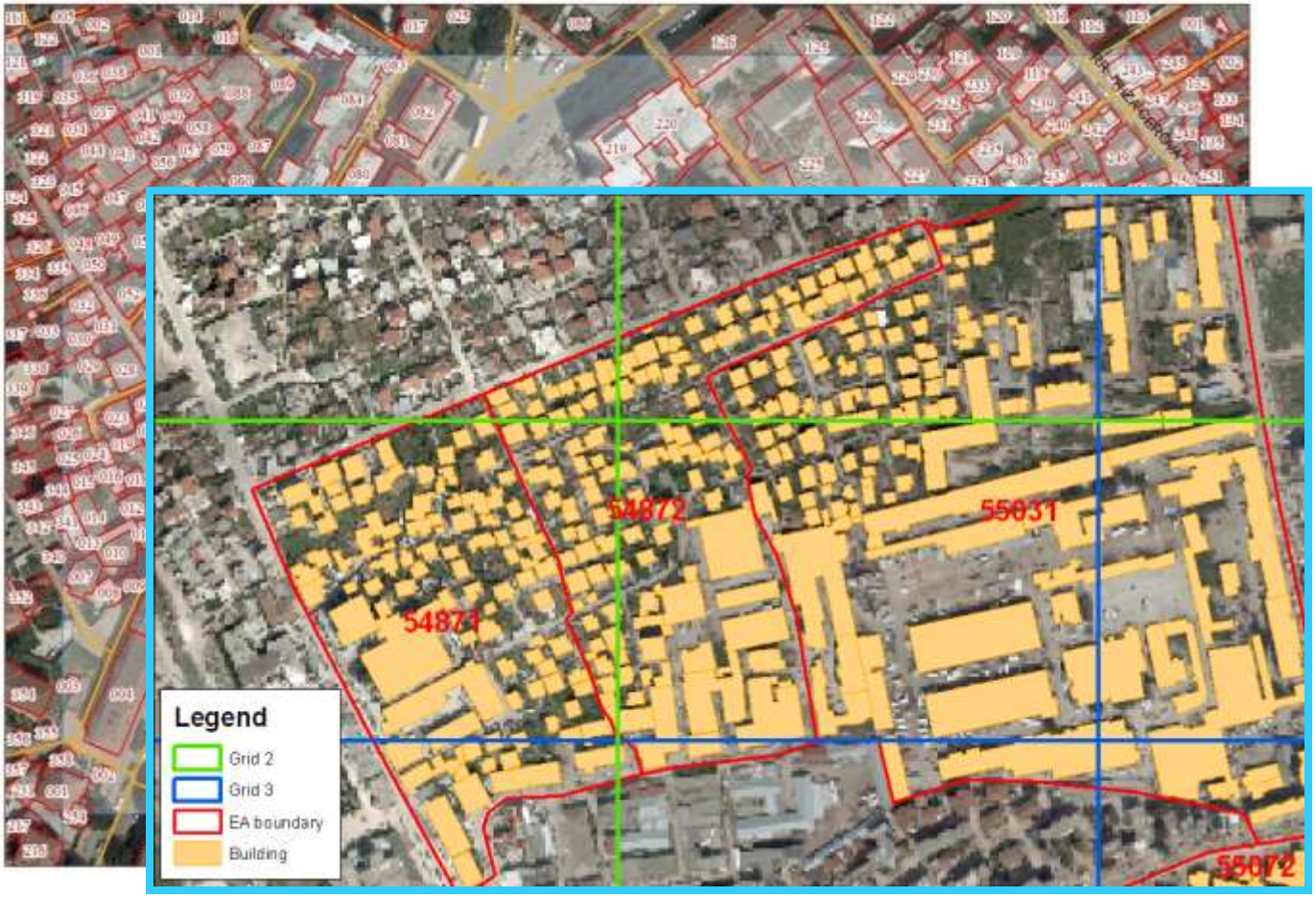
Geocoding approach:

Buildings coded by grid cell (UTM) and by EA or by address

Dwellings coded by building entrance or by building centroids

Advantages:

- **coding scheme not dependent on administrative unitschanges and flexibility to aggregate census data by EA and/or grid for dissemination**



Grid versus administrative maps - Example

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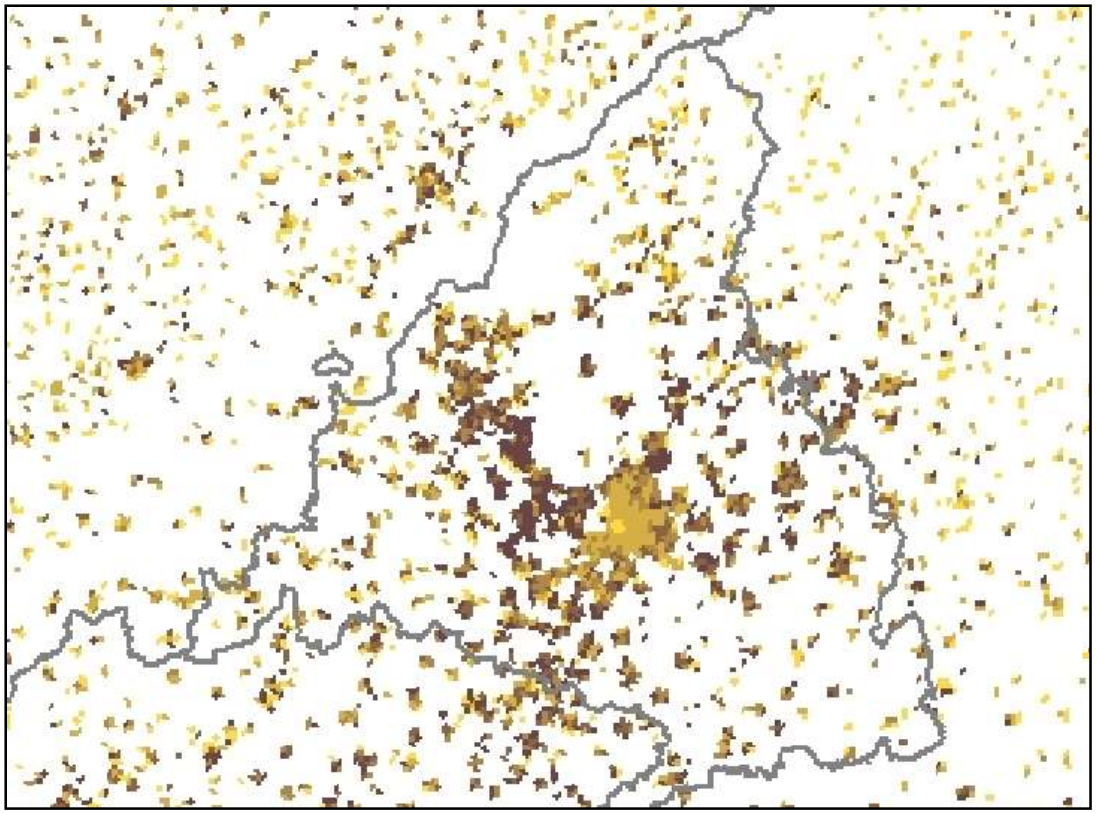

Thank you!

Questions, comments?