Transport operators servicing rural areas: Factors influencing accessibility values for education and health mobility in Castilla La Mancha (Spain)

Authors:

David Alejandro Ramirez Cajigas

Amparo Moyano

José María Coronado

Department of Civil Engineering

University of Castilla La Mancha

EUGEO 9è CONGRÉS BARCELONA 4-7 SETEMBRE 2023 eugeobcn23.eu

General index

1. Introduction

Rural environments as key issues in the international agendas

- Disperse and low-populated areas
- Limited access to basic services: health-related facilities (hospitals, health centres, pharmacies, etc.) or education facilities
    - Inefficient or even inexistent public transport services
    - Private vehicle as the only way to access in many cases.

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Increasing pressure to propose transport and land-use policies to offer solutions and improvements to mobility in rural territories

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New context for mobility strategies: **Digitalisation and 'smart' solutions**

- Emergence of new shared mobility services, mobile phone apps…

  → Mainly for urban environments!

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Only few initiatives trying to offer solutions to mobility in rural territories:

- "SMARTA" at European level and other national-scale experiences exploring the new possibilities offered by the digitalisation and 'Demand-Responsive Transport' (DRTs):
  - Germany, DRTs already implemented in several rural areas (König & Grippenkoven, 2020)
  - The Netherlands, pilot project to replace regular bus lines with DRTs (Coutinho et al., 2020)
  - Spain, where the first pilot project of "Demand Sensitive Transport in Castilla-La Mancha" has been recently approved and implemented (Ramírez-Cajigas et al., 2023).

1. Introduction

BUT before proposing transport solutions, it is key:

- To **analyse the current situation of public and private transport systems** in these rural areas
- To **detect deficiencies** on the services provided

2. Objective

This research proposes an analysis of the **factors influencing the accessibility levels by public and private transport for different purposes in rural territories,** to identify causes for spatial inequalities.

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→ Case study: the **Castilla La Mancha region**, as part of the so-called 'Empty Spain'

→ Accessibility and connectivity for education and health purposes

(some previous references, such as Martínez Sánchez-Mateos, & Ruiz Pulpón (2021).

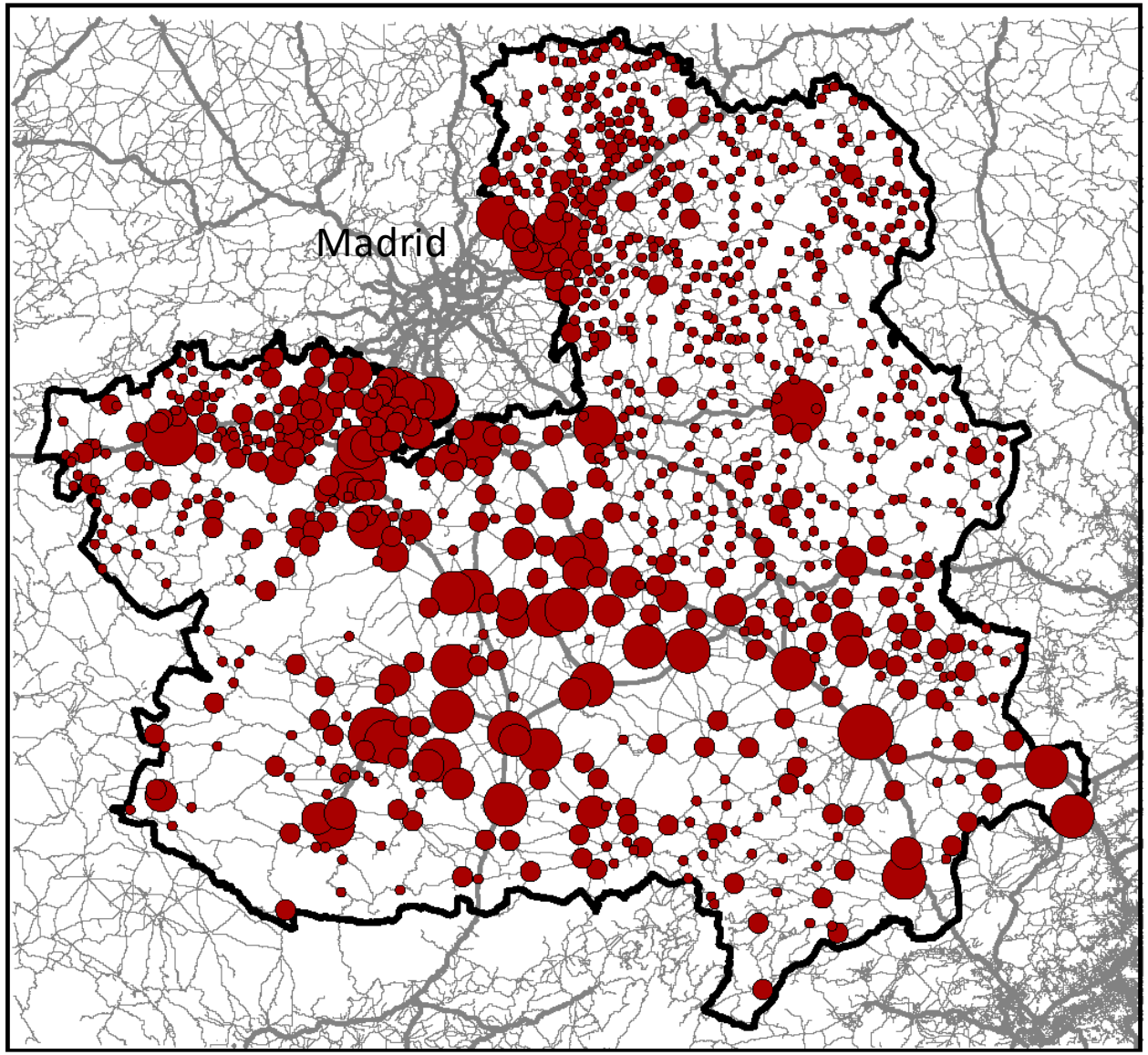
→ Our scope:

Focusing on both public and private transport systems

Factors identification

Case study: Castilla La Mancha region

- Classified areas as ‘extreme risk of depopulation’

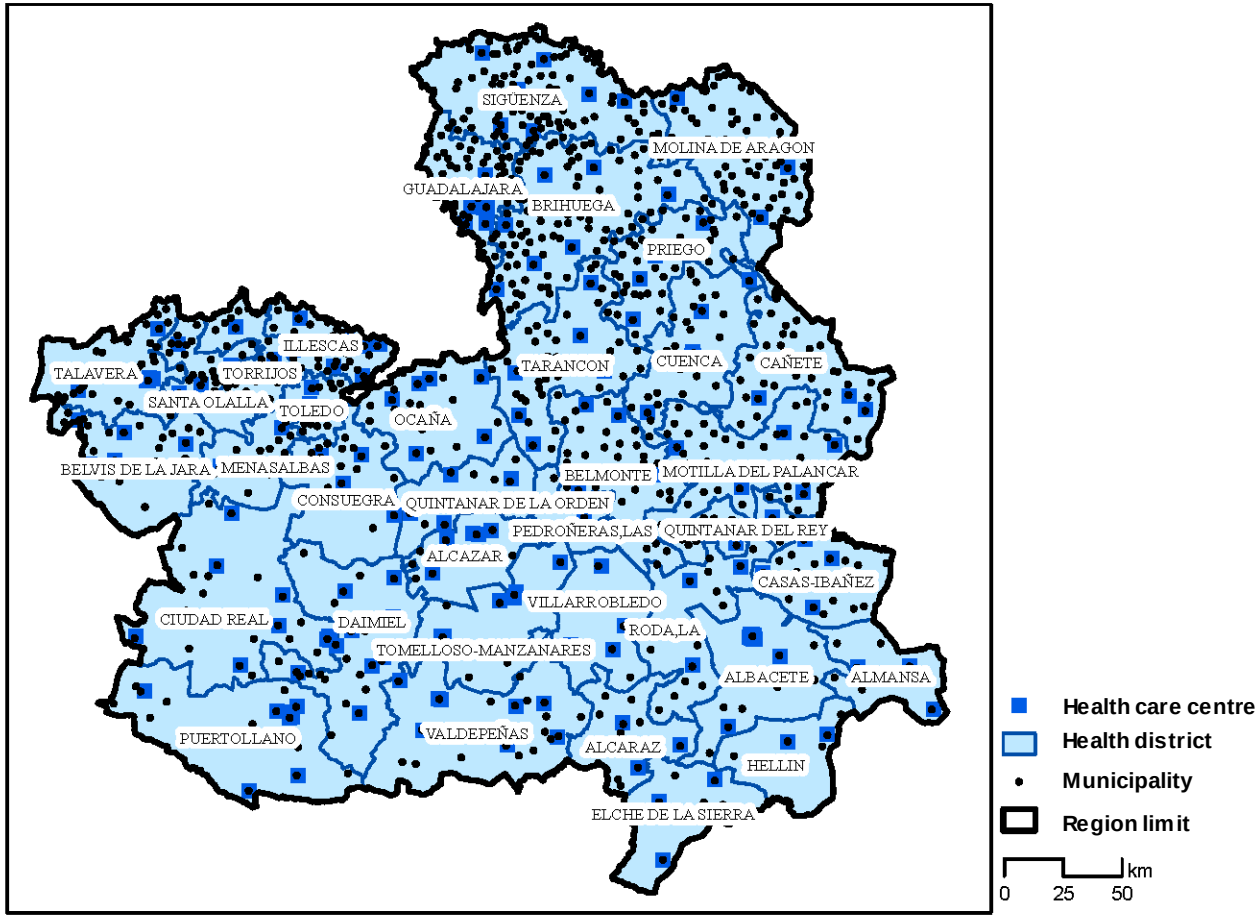


3. Methodology

Characterisation of health/education areas

- **Identification of sectorial areas**
  - For <u>health services</u>

Municipalities are grouped in **'health districts'** where several **primary health care centres** are located.



Characterisation of health/education areas

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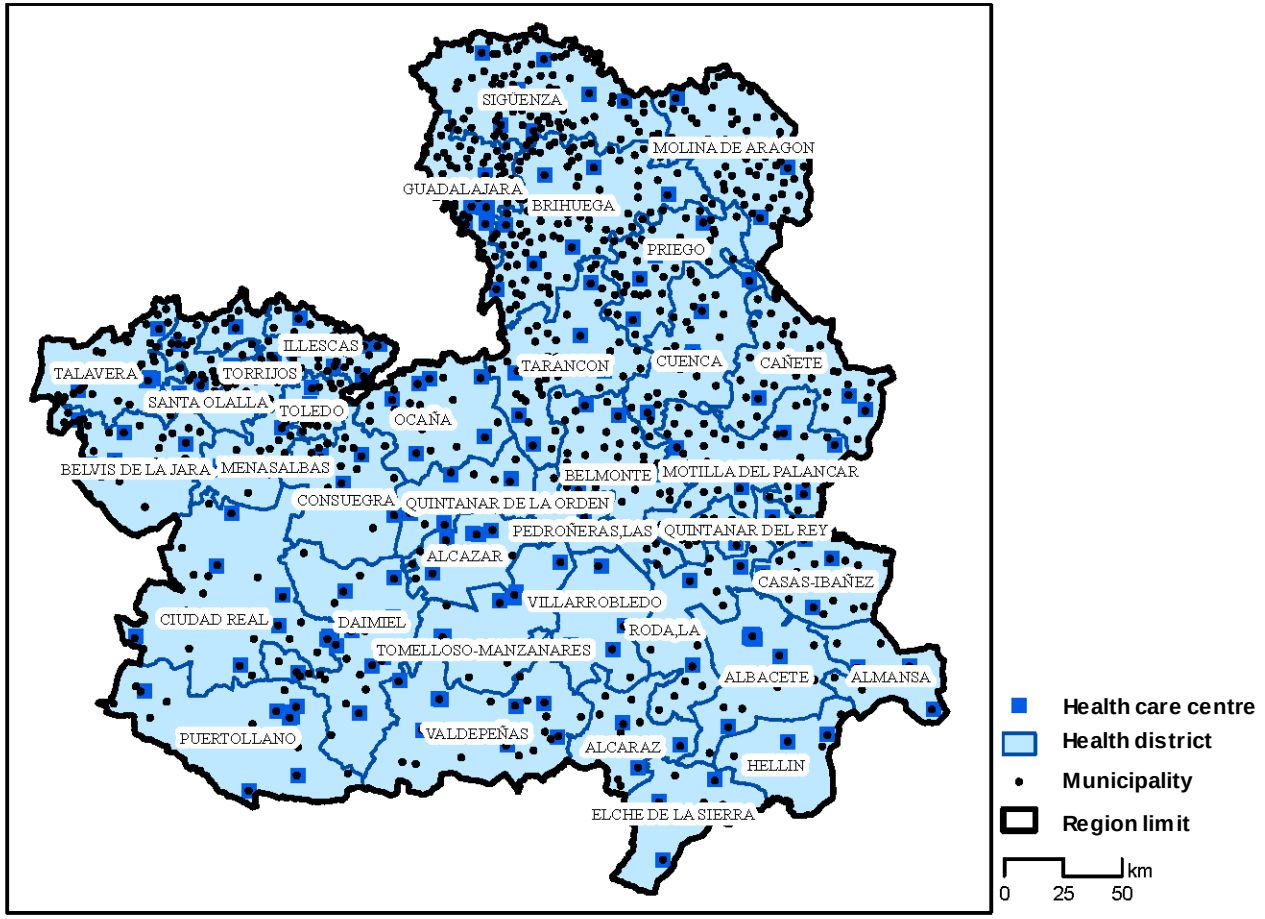
Municipalities are grouped in **'health districts'** where several **primary health care centres** are located.

  - For <u>education services</u>

Municipalities with no primary/**secondary schools** are assigned to other municipalities.

In many cases, regional government provides **scholar bus services** for free.



3. Methodology

- **Characterisation of these areas**
  - Number of services and facilities
  - Population densities
  - Ratios per population

  (…)

3. Methodology

Characterisation of health/education areas → Allocation analysis to the closest facility →

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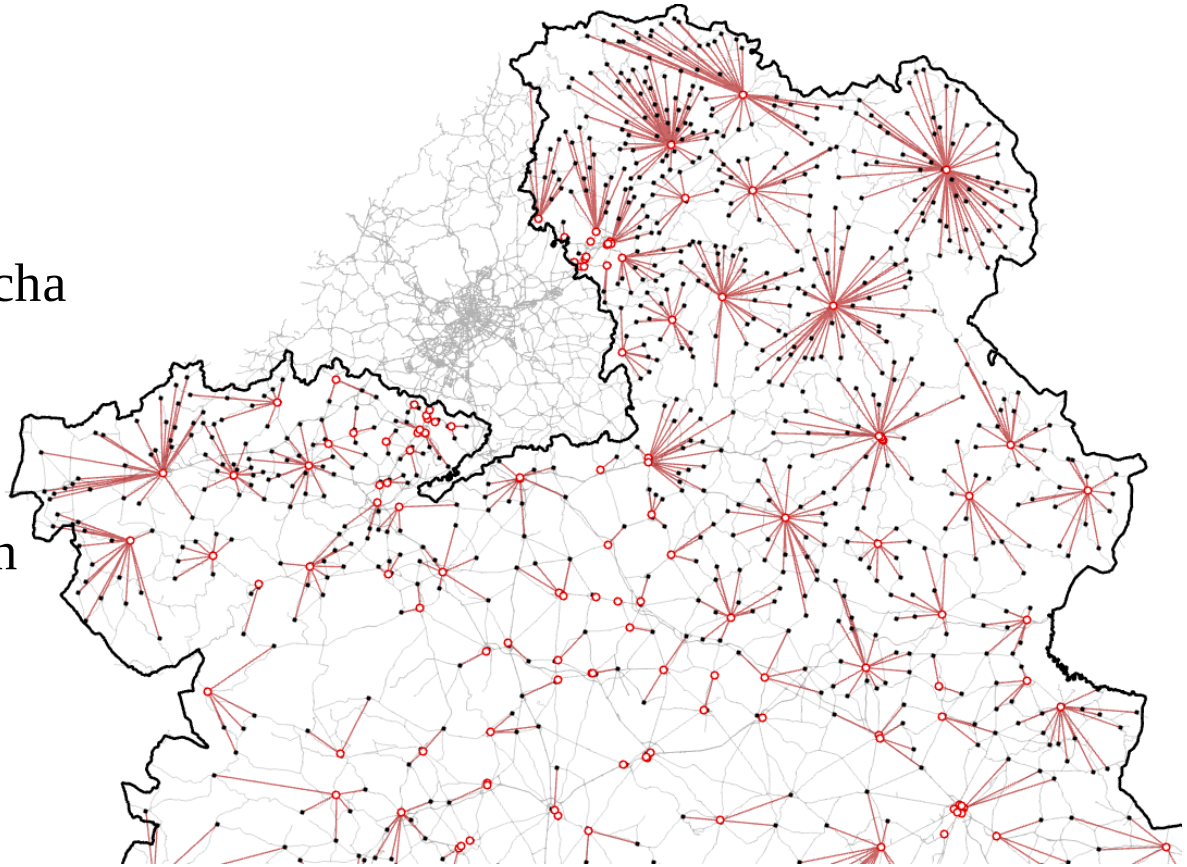
- Location of health and education facilities
- Definition of road network in Castilla La Mancha
  - Open Transport Map in a GIS environment
- Allocate each municipality to the closest health and education service
  - ‘Closest facility’ tool of the ‘Network Analyst’ extension in ArcGIS Pro



3. Methodology

Characterisation of health/education areas → Allocation analysis to the closest facility → Critical assessment of transport constraints

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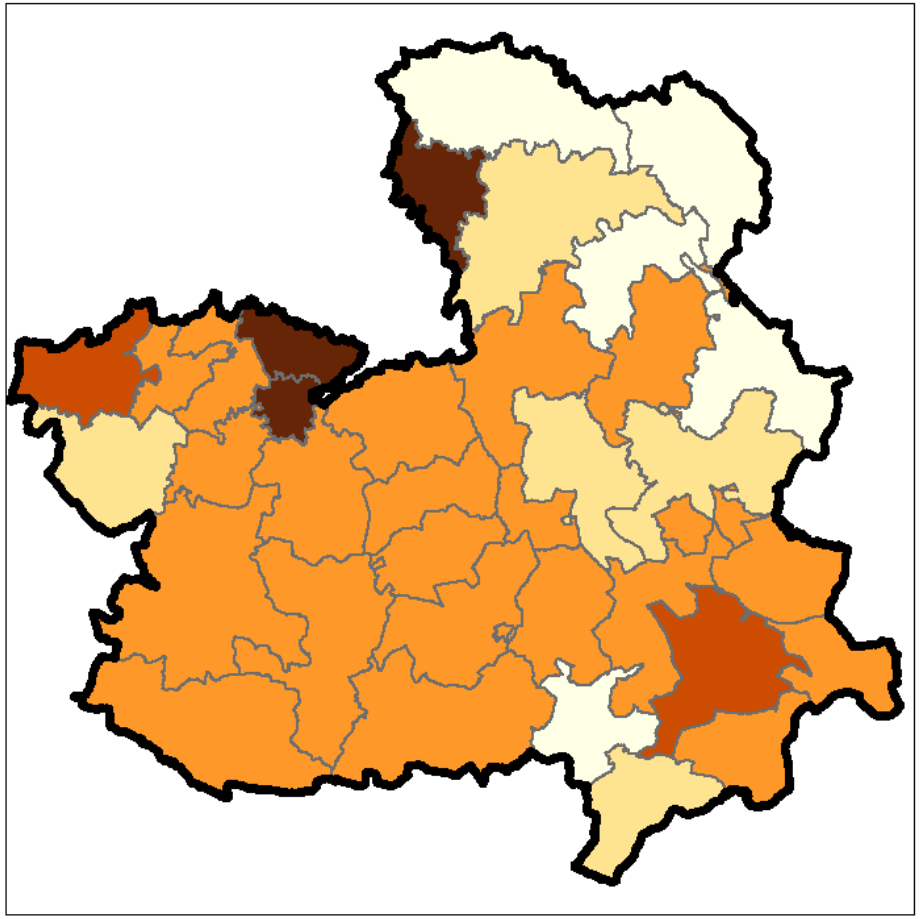
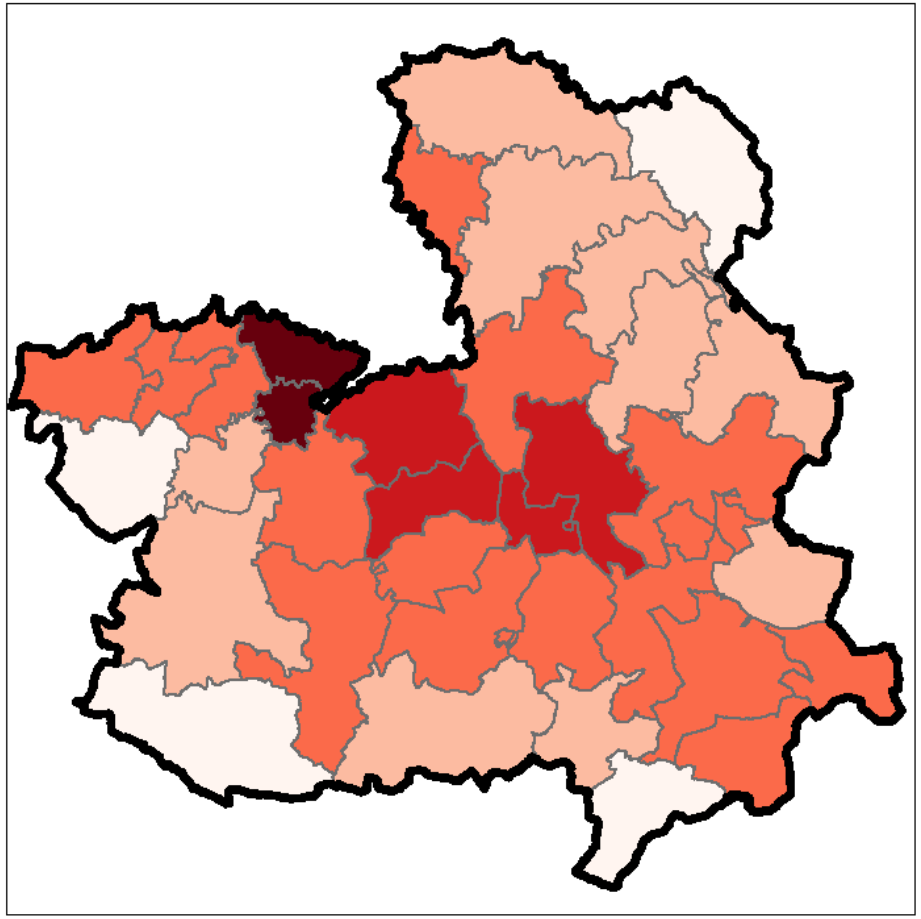
- Comparison of sectorial assignations with the ‘closest facility’ analysis

- Detecting differences and assessing factors influencing these political/sectorial decisions

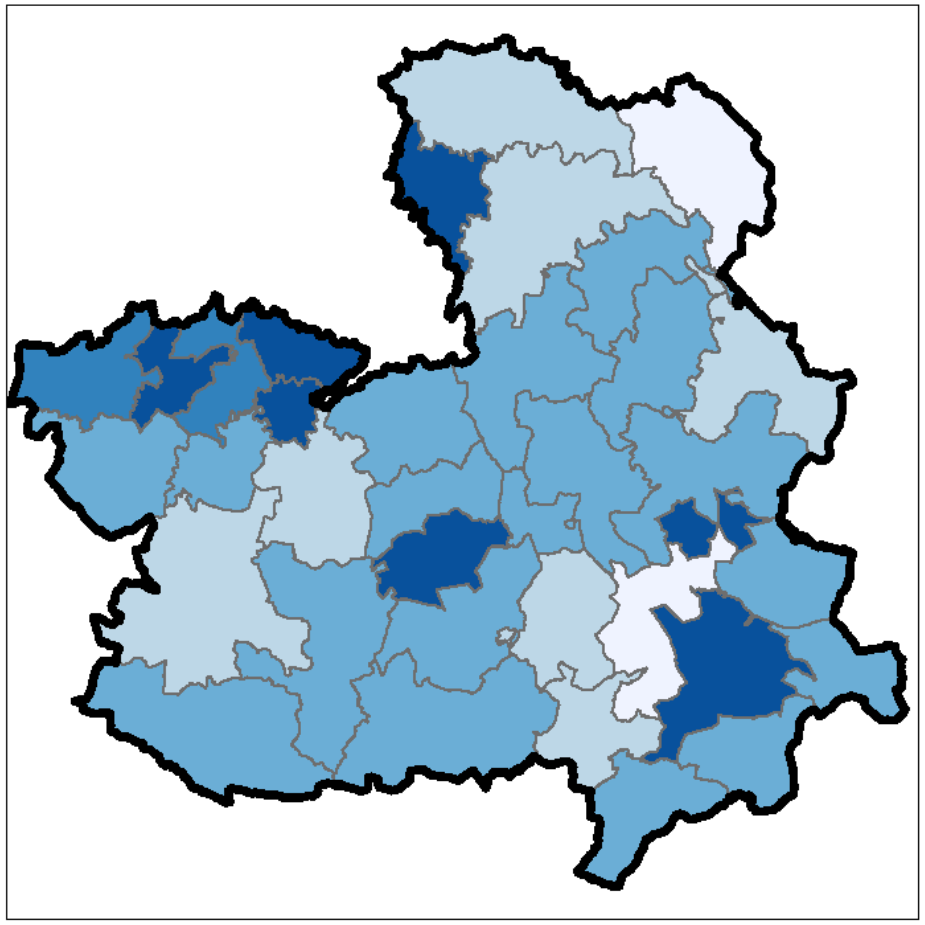
Health districts characteristics

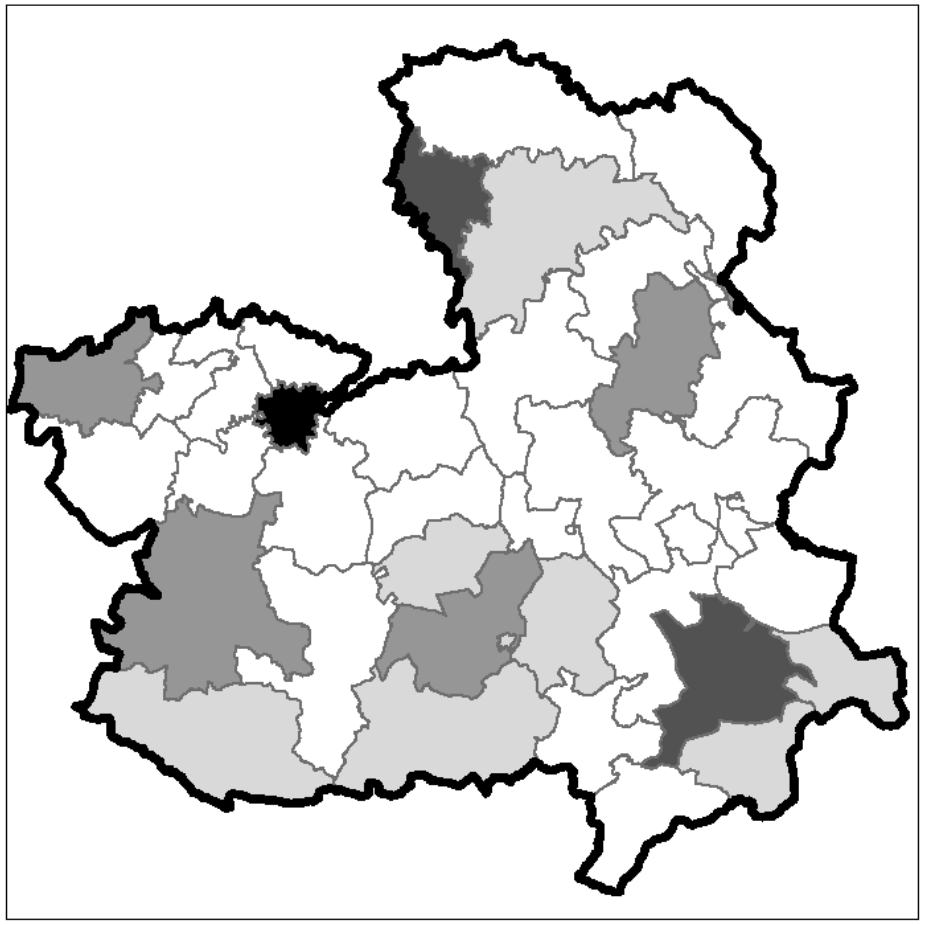
Health districts characteristics





Health districts characteristics





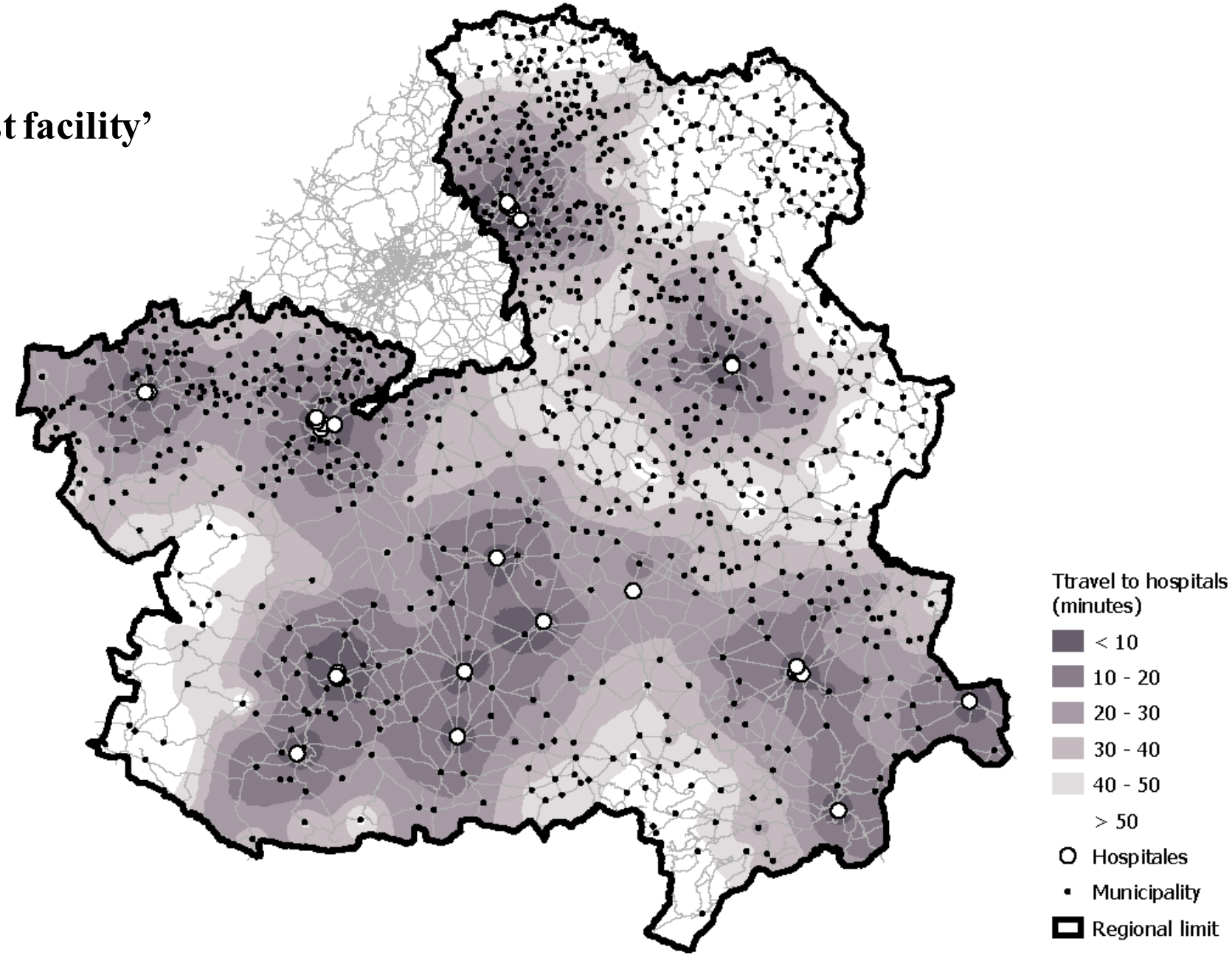
Educational areas characteristics

There is no ‘educational division’, only assigments to head municipalities

Allocation to ‘closest facility’

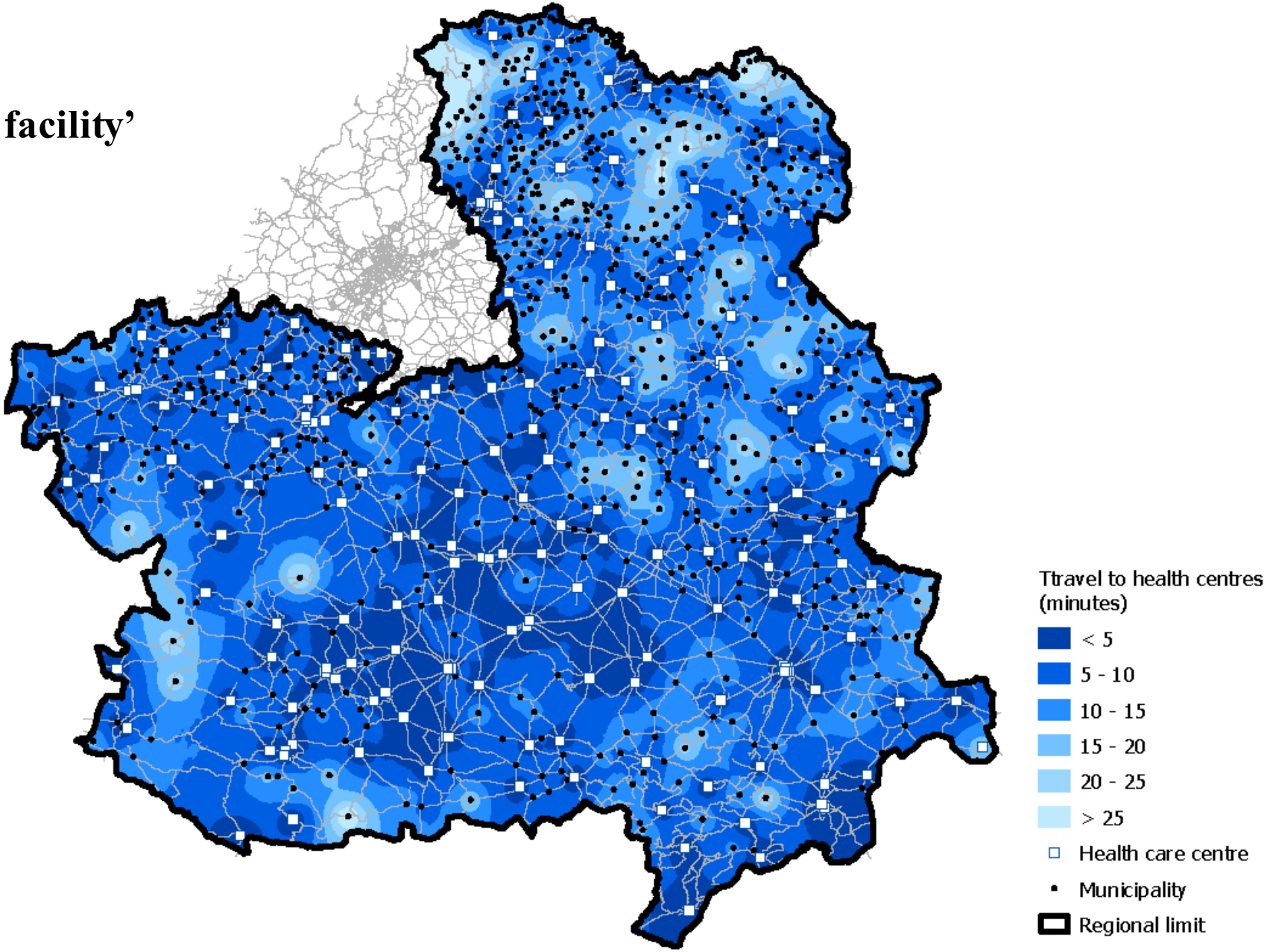
Allocation to ‘closest facility’

Hospitals



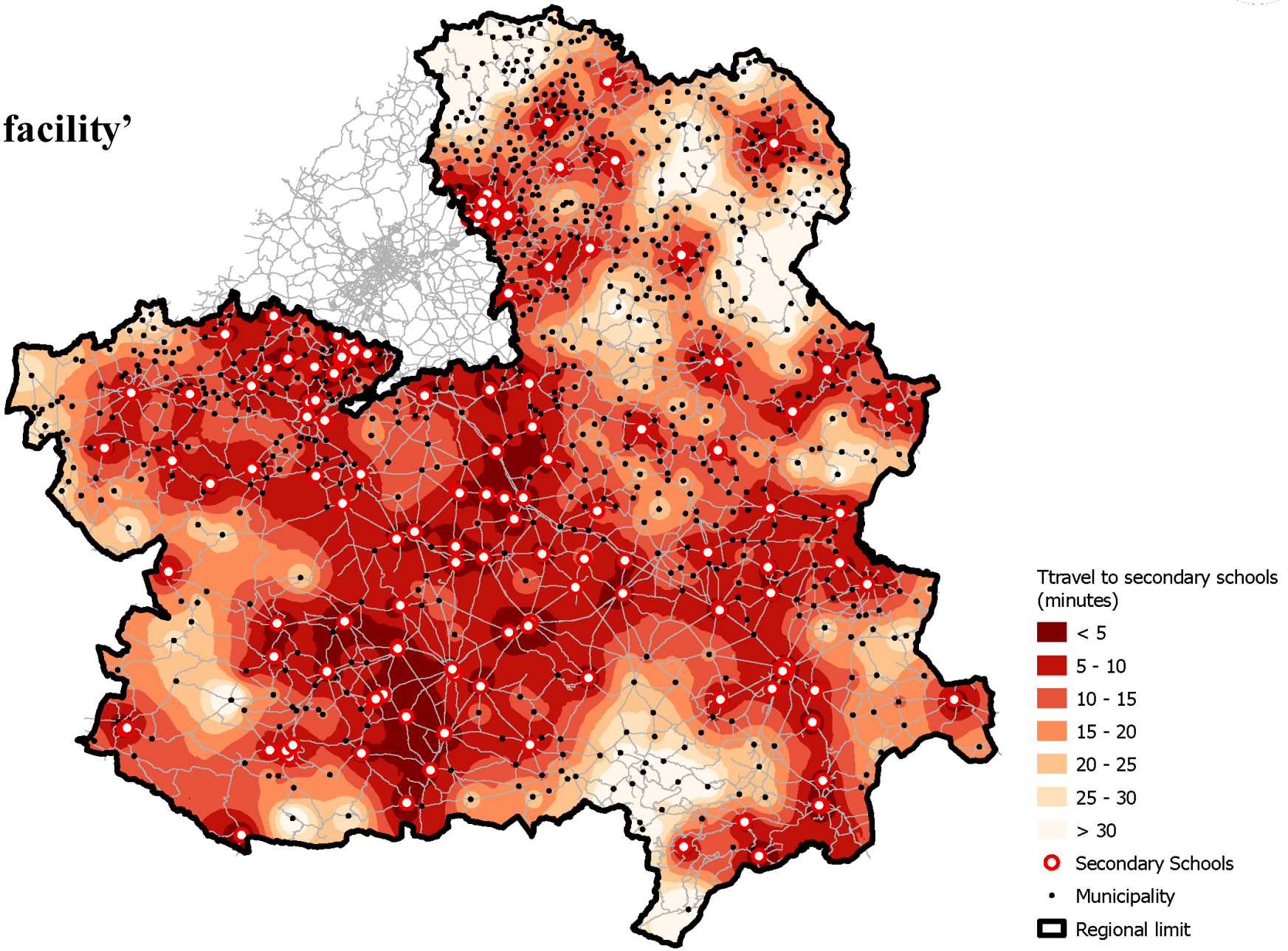
Allocation to ‘closest facility’

Health care centres



Allocation to ‘closest facility’

Secondary schools

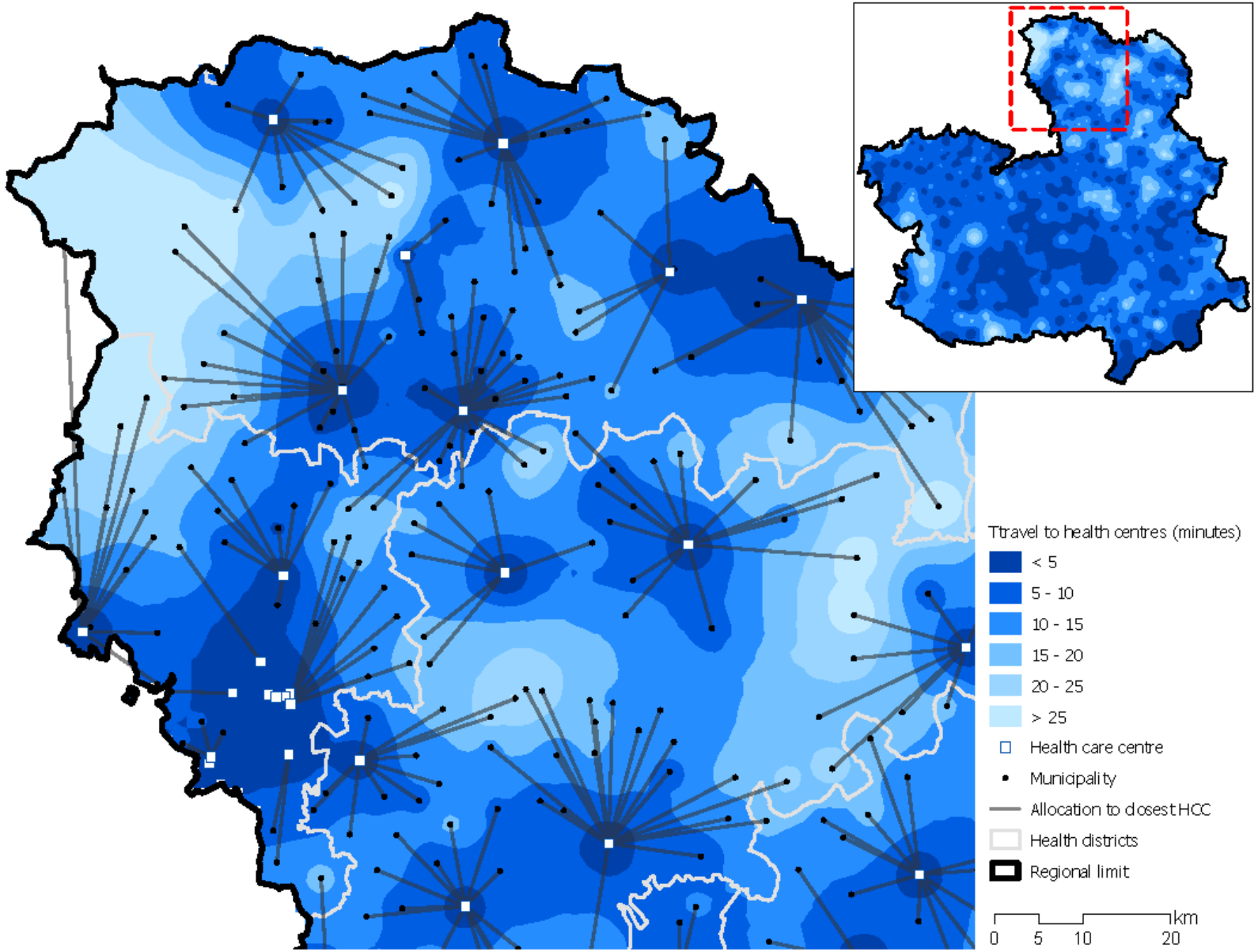


Critical assessment:

4. Results

Critical assessment:

Health centres' accessibility



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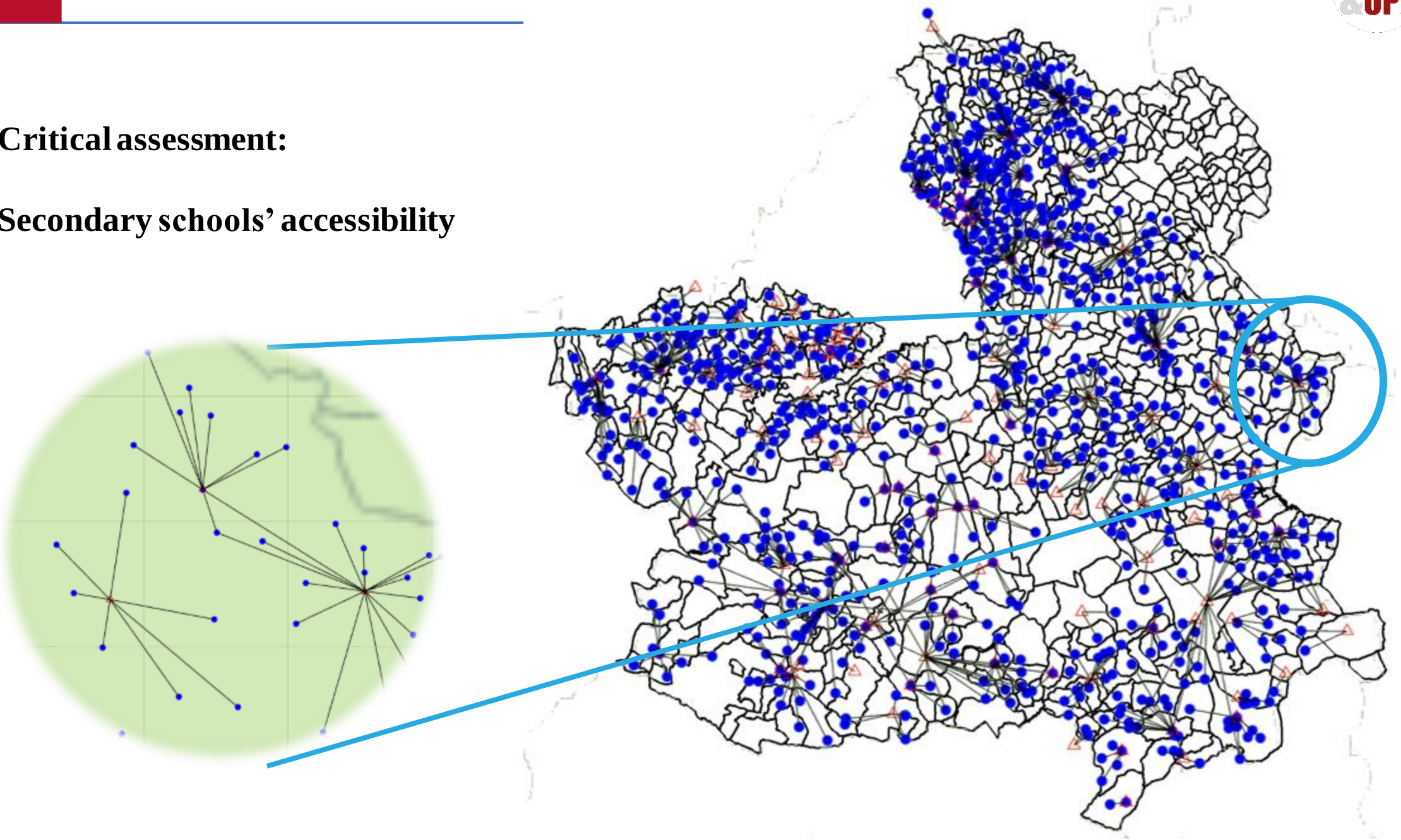

5. Discussion and conclusions

- High differences in accessibility among different areas/counties/districts, regarding:
  - Spatial distribution of services
  - Availability of high-capacity road infrastructures

→ Different territorial schemes: typologies of urban systems

- Political/sectorial decisions based on superior criteria than ‘accessibility’ or ‘travel times’
  - Capacities of the facilities
  - Administrative divisions playing a bigger role than expected

→ Need for a regional and multisector planning and policies

Further steps

- Deeping on the analysis of accessibility by public transport services, including education transportation, and other alternatives
- Identification of territorial schemes including both territorial, topological and accessibility variables, among others.
- Reassessing the regional divisions as a strategic element in transportation system planning.

Thank you for your attention.

Questions?

My personal website:
https://www.davidalejandroramirezcajigas.com/

Email: DavidA.Ramirez@uclm.es