

Geographical aspects of settlement structure consolidation in the context of local government reform in Slovakia. (example of the Prešov nodal region)

STELA LOVACKÁ
Ústav geografie
Jesenná 5
Košice
Slovak Republic
lovacka@centrum.sk

Abstract

In the European countries, local government reform was a legitimate part of the public administration reform in the second half of the 20th century. The general aim of local government reform is to reinforce the competitiveness of rural area and to fix local level of government so that communities can execute original as well as devolved competencies effectively. With the aim to achieve this goal many aspects must be taken into consideration. The question of settlement structure, the services distribution and the ways of intermunicipal cooperation are amidst the first. The paper presents geographical aspects of settlement structure consolidation as a part of local government reform considerations. The aim is to create regions on a micro-scale level - nets of communities with nodal centers providing services for their hinterland. The research area is the Prešov nodal region having 134 communities being elementary local units.

Key words: local government reform, functional region, settlement structure, service distribution, municipality, Prešov, Slovakia

1 INTRODUCTION

Municipalities in Europe vary enormously in size, both between and within individual countries. In 2005 in the Slovak Republic, there were 2891 communities / local administrative units [*obec*] 69 per cent of which had less than 1 000 inhabitants. Together with the Czech Republic and France it has a most fragmented settlement structure in Europe. The problem we are approaching comes from the inequality of size of communities having to execute the portfolio of original and devolved competencies. The state devolved more than 400 competencies from state bodies to self-governing bodies (communities and self-governing regions) over the years 2002 –2004. It was done *en bloc* – no matter the size of communities, their stuffing, technical, financial and information-communication facilities. So, the rural community in the periphery of Slovakia having 10 inhabitants executes the same functions as rural community with more than 4 000 inhabitants. Therefore, small communities logically fail to execute the competencies effectively because they lack financial, material and stuffing prerequisites. In order to perform competencies effectively, professionals present a strong voice to consolidate settlement structure in Slovakia. The considerations of settlement structure consolidation are, of course, very complex. They spread to a wider context in that

the question of services provision, their accessibility to inhabitants, spatial behaviour of inhabitants have to be taken into account.

The paper we present examines the issue mainly from geographical point of view which means that our aim is to delimit microregions (nets of communities) and their centres. When delimiting them, the strong emphasis is put to preserve natural and nodal ties existing among them. We are trying to explore how selected service providers with arbitrary delimited districts, spatial behaviour of inhabitants and mathematical method of the Voronoi tessellation contribute to delimitation of microregions. The study area is the Prešov functional nodal region consisting of two districts – district of Prešov and district of Sabinov. The term of functional nodal region is a purely geographical term introduced to Slovak geography by A. Bezák [1] and [2]. It is delimited predominantly by indicators of commuting to work and school.

The ideas of settlement structure consolidation within local government reform led to focus the academic attention on the problem of equity in the distribution of public services. The literature references dealing with the issue are f. ex. [3], [4], [5], [6] and [7].

2 LOCAL GOVERNMENT REFORM IN SLOVAKIA

The goal of local administration reform in Slovakia is to improve the conditions for powers execution at the local level, strengthen the competitiveness of rural areas and get the communities to become the key component of public administration.

The most critical reasons why local government reform should be realised in Slovakia are [8]:

1. fragmented settlement structure with prevalence of small communities,
2. competitiveness and reproduction capability of rural areas,
3. economy of provided services,
4. quality of provided services.

Generally, the two basic ways of settlement structure consolidation where small communities prevail are:

1. Municipalisation of communities (involuntary process) to larger units of optimal size. The number of communities decreases. It means their political-administrative autonomy was taken away and only symbolic autonomy preserves. Such process was carried out f. ex. in Denmark, Sweden and Belgium. There might be two forms of municipalisation:

- 1a) entire municipalisation - amalgamation – administrative consolidation, the creation of new municipalities with all self-governing competencies and functions,
- 1b) semi-amalgamation – communities are joined having common administration and service dispensation, but still, certain competencies preserve in each and every community

2. Establishing associations (voluntary process) adopting the principle of voluntary cooperation so the communities join without being discharged and their political autonomy preserves. This alternative is preferred in France.

Knowing the history and current social-political situation of our country, the second alternative is more plausible and feasible for the citizens whereas the first one is refused by wide public. People generally reject the first procedure of forced and involuntary municipalisation due to negative experience with the directive settlement changes during the communist regime. The attention to solve the problem is therefore focused on the various forms of voluntary cooperation which Slovak legislative offers.

3 STUDY AREA

The model area the suggested procedure is going to be applied to is the Prešov functional nodal region [*funkčný mestský región*]. It consists of two districts (district as a statistical, former administrative unit) in eastern part of Slovakia.

Figure 3: Position of the Prešov functional nodal region in Slovakia



Altogether, there are 134 communities in the studied area, four of which are considered cities – the cities of Prešov, Sabinov, Lipany and Veľký Šariš. The city of Prešov is the third largest city in Slovakia, the others are small cities having less than 10 000 inhabitants. As to communities, their size varies but, from the European point of view, they are generally small. The smallest one is Ondrášovce with 64 inhabitants, the largest is Jarovnice with more than 4500 inhabitants. The communities by size groups are in table 1.

Table 1: Communities of the studied area by size categories (2005)

Size category	No of communities	Share in %	No of inhabitants	Share in %
Up to 99	1	0.75	64	0.03
100 - 199	12	8.95	1763	0.82
200 - 499	42	31.34	15383	6.99
500 - 999	38	28.36	27068	12.30
1000 - 1999	30	22.39	41648	18.93
2000 - 4999	8	5.97	23724	10.78
5000 - 9999	1	0.75	6340	2.88
10000 – more	2	1.49	103999	47.27
together	134	100	219989	100

Source: Statistical Office of the Slovak Republic (2005)

Most of them belong to category from 200 to 499 inhabitants (31,34%) and to category from 500 to 999 inhabitants.

4 METODOLOGY

Both qualitative and quantitative research methods were used in the research. When compiling information, we studied the literature references of indigenous and foreign origins. A great amount of data was provided by face-to-face interviews with the mayors of communities. They answered the questions about their community listed in questionnaire. The inhabitants were queried as well.

When processing data, mathematical-statistical and cartographical methods were used. We worked with MS Office, statistical programme SPSS, graphical programme Corel 12 and geographical information system Arc View 3.2. Method of the spatial tessellation (in other words the Voronoi tessellation) was used to create districts of „the closest neighbour“ - service provider for each community. We use special application software that has been created by information scientists.

In the field of Geography, the method of spatial tessellation has not been much used. Within the tools provided by GIS, D. Kusendová [9] uses the Voronoi diagram as an example of the interpolation method (a method of geometrical closeness) in demogeographical analyses. She mentions the Dirichlet polygon, TIN - triangular interpolation networks and Thiessen's polygons as distance operators.

The Voronoi tessellation

The word – tessellation - is derived from verb – to tessellate – which means to cover the plane with the pieces without any gaps and covers. Other words which are synonymously used with tessellation are the tiling, paving, parqueting or mosaic. We can distinguish between homogenous or heterogeneous tessellation. The figure 1 (the Escher tessellation) is an example of homogenous whereas the figure 2 (the Voronoi tessellation) is an example of heterogeneous tessellation.

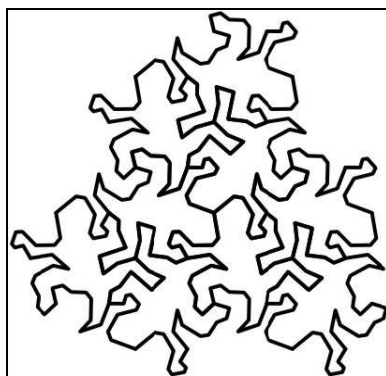


Figure 1: The Escher tessellation (the example of homogenous tessellation) (in [10])

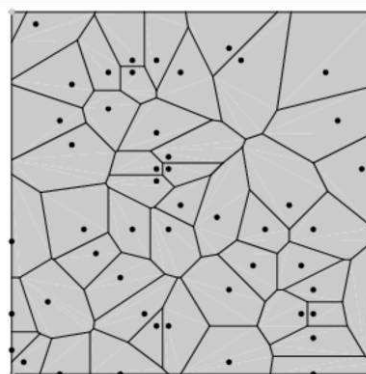


Figure 2: The Voronoi tessellation (the example of heterogeneous tessellation) (in [11])

The chief principle of the Voronoi tessellation is an area (space) being divided into districts (cells). The final shape of an area consists of a set of centres to which particular parts of an area (space) are affiliated. So, the area is fragmented into a system of districts – cells entirely filling the space and having joint borders. The inside of a cell includes the points which are closer to cell's centre than to any other centre in a plane. The borders of the cells are therefore made of points of equal distance from more centres.

For operational programme we work with the coordinates of n centres in a plane are input information parametres. To each point in the plane, the programme affiliates the closest centre. The points affiliating to one centre constitutes the cell.

5 PROCEDURE

There are three pillars – groups of determinants which help us delimit the relations and ties among communities in the studied area. It will be possible to see different hierarchy of the communities – those providing services for the others and those exploiting the services because there are no services in the communities of their permanent residence. The determinants reveal the power (gravitation) of the communities to gravitate to nodes.

1. **Institutional** (objective) determinants: the affiliation of each community of the studied area to institutions with law-based districts.

- a) postal district
- b) registry office
- c) police district
- d) fire brigade districts

2. **Behavioural** (subjective) determinants: spatial behaviour of the respondents to the following questions:

- a) preference of primary school
- b) preference of the general practitioner
- c) preference of the community with the closest relation
- d) preference of the community providing most of the services to respondents

3. **Mathematical** (formal) determinants: the affiliation of each community of the studied area to institutions (service provider) with no legally delimited districts. The method of the Voronoi tessellation is used to:

- a) second degree of the primary school
- b) paediatrician

- c) general practitioner
- d) dentist
- e) pharmacy

Firstly, based on the data we create maps depicting the distribution of posts, registry offices, police centers and fire centers and their districts in the studied area. Secondly, we assess the respondents' answers to find out their preferences for primary schools, general practitioners, the closest neighbouring community, and the closest service provider, all form the respondents' points of view. Following that, we create maps using the pointers to display the intensity and pointer direction. The third step is to construct the maps based on the Voronoi tessellation. Considering all the determinants, we can see the individual communities affiliating to a particular community. There is the assumption that communities usually affiliate to those communities which are larger (by number of inhabitants), equipped with services and infrastructure, demographically growing (except from the Roma people).

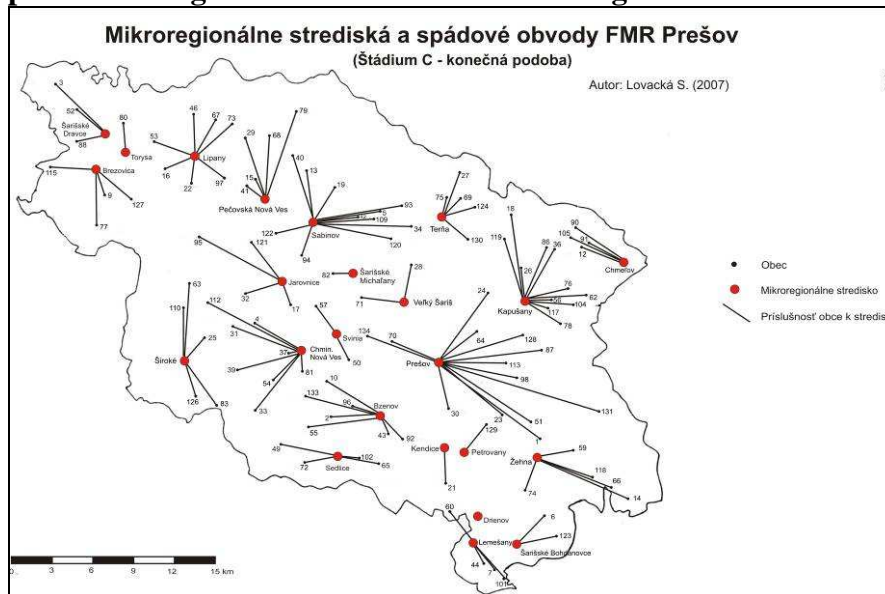
6 REGIONALISATION - RESULTS

Regionalisation is based on the above mentioned groups of determinants. To each community of the studied area regional relations (ties) to 13 above mentioned determinants were identified. The intent is to find which communities are the service centres and which communities exploit their services. Each community demonstrates 13 regional ties and the most frequent one is taken into account in the final regionalisation. The one of the highest frequency becomes a micro-regional centre for a community. Such procedure suggests there might arise vague situations which lead to necessity to reassess the results. We identified 24 micro-regional centres (17,9%), communities having clear and univocal relation (65,7%), communities with unclear relation (9,7%) and communities with unsuitable relation (6,7%).

Table 2: Categories of communities after regionalisation

Type	abs	%
micro-regional centres	24	17,9
communities having clear relation	88	65,7
communities with unclear relation	13	9,7
communities with unsuitable relation	9	6,7
total	134	100

Map 1: Micro-regional centres and the nodal regions of the studied area



7 CONCLUSION

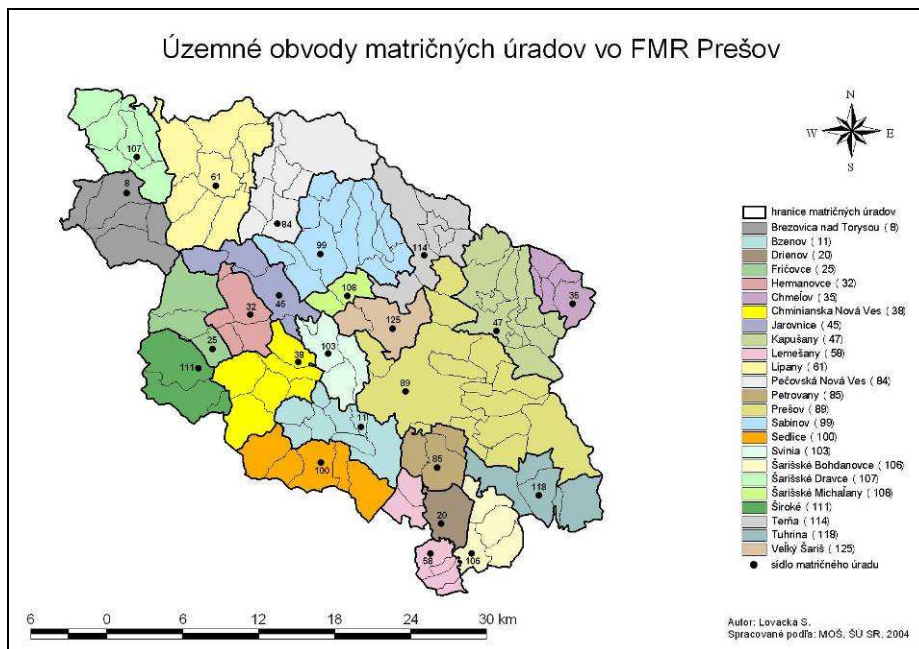
In European countries, local government reform was a legitimate part of the public administration reform in the second half of the 20th century. The general aim of local government reform is to fix local level of government so that communities can execute original as well as devolved competencies effectively and to reinforce the competitiveness of rural area. With the aim to achieve the goal a lot of aspects must be taken into consideration. The question of settlement structure, the services distribution and the ways of intermunicipal cooperation are amidst the first.

In the paper, we managed to construct the districts and their centres for the purposes of the local government reform. Topic we presented in the paper is not nowadays a hot issue for our government, though certain steps towards reform have been taken out recently. There have been first discussions about reduction of registry offices which is an obvious part of local government reform. We will see in the near future whether this idea will be supported or rejected.

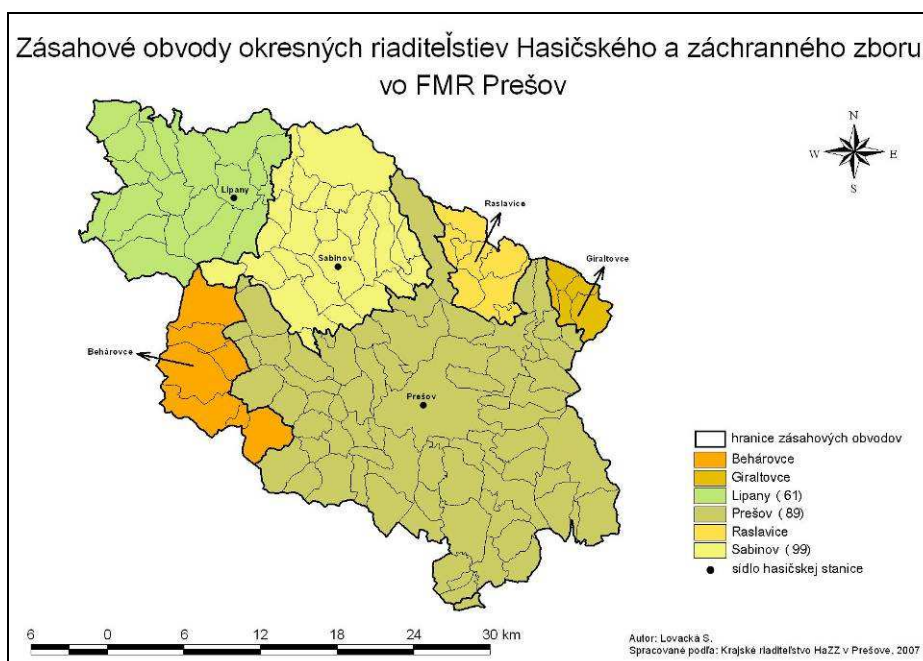
REFERENCES

- [1] BEZÁK, A. 1990. Funkčné mestské regióny v sídelnom systéme Slovenska. In *Geografický časopis*, 1990, 42, 1, Bratislava: SAV, s. 57 - 73.
- [2] BEZÁK, A., 2000. Funkčné mestské regióny na Slovensku. In *Geographia Slovaca* 15. Bratislava: Geografický ústav SAV.
- [3] McLAFFERTY, S. 1982. Urban Structure and Geographical Access to Public Services. In *Annals of the American Geographers*, 1982, 72, 3, s. 347 – 354. [online] www.blackwell-synergy.com/doi/pdf/10.1111/j.1467-8306.1982.tb01830.x (Accessed June 2006)
- [4] BRABYN, L. – SKELLY, C. 2001. *Geographical Access to Services, Health (GASH): Modelling Population Access to New Zealand Public Hospitals*. <<http://www.geocomputation.org/2001/papers/brabyn.pdf>> (Accessed June 2006)
- [5] SLOBODA, D. 2005. *Charakter sídelnej štruktúry Slovenska ako predpoklad pre komunálnu reformu*.

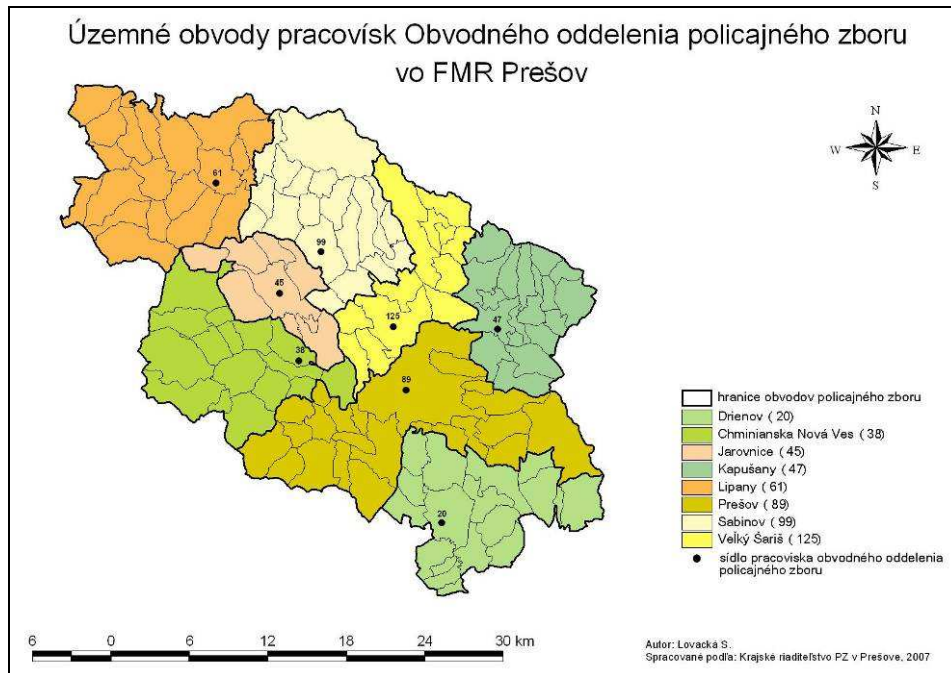
Map 3: Registry districts in the studied area



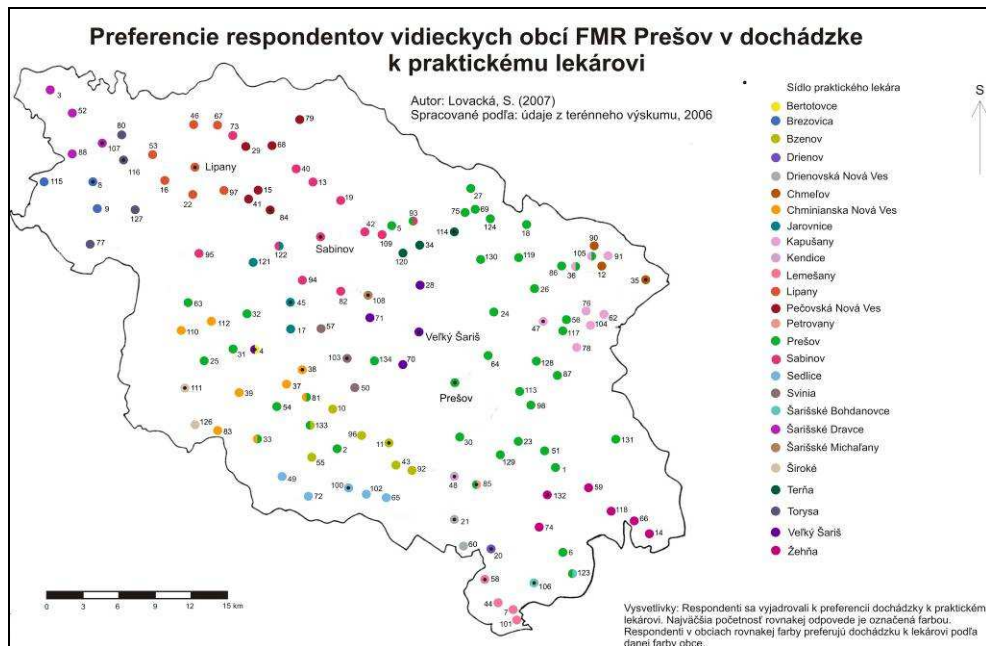
Map 4 Fire districts in the studied area



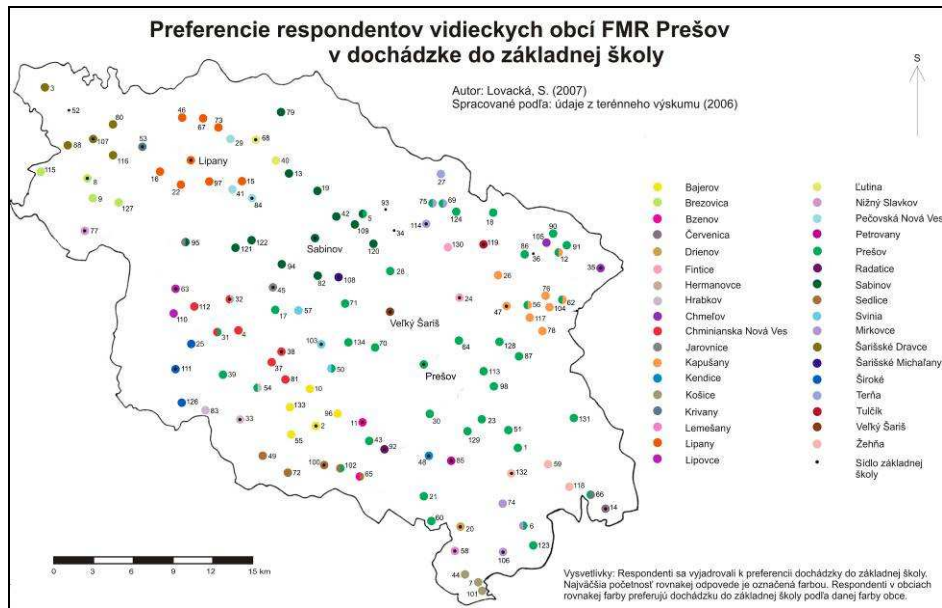
Map 5 Police districts in the studied area



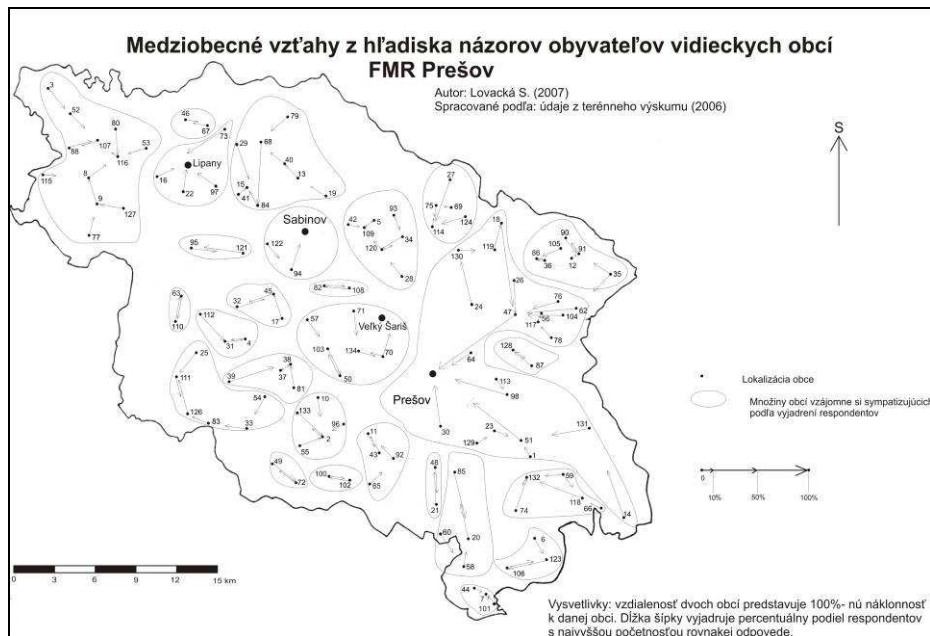
Map 6 Preference of the seat of general practitioner from the respondents' views



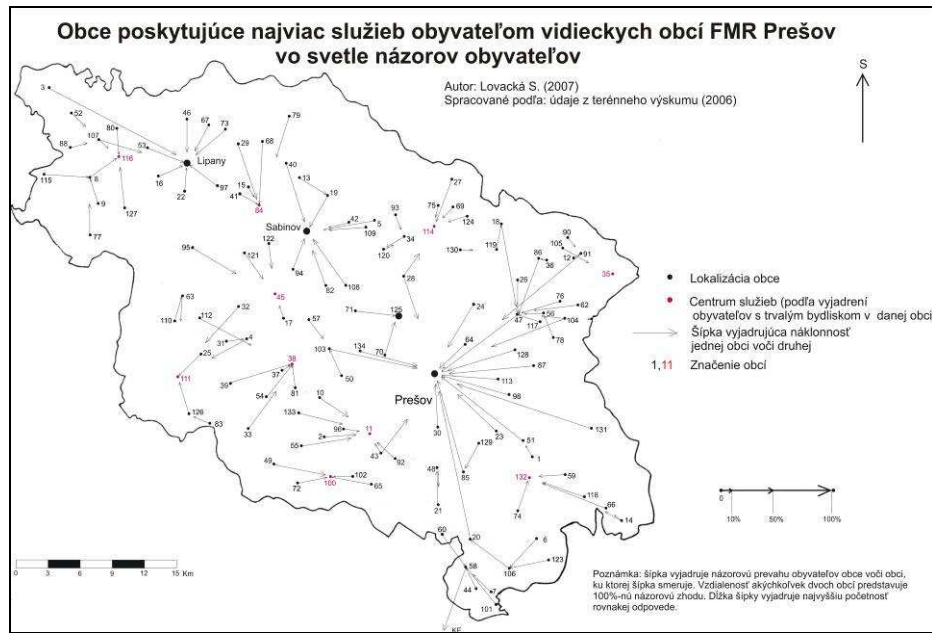
Map 7 Preference of the seat of primary school from the respondents' views



Map 8: Intercommunal relationships from the respondents' views

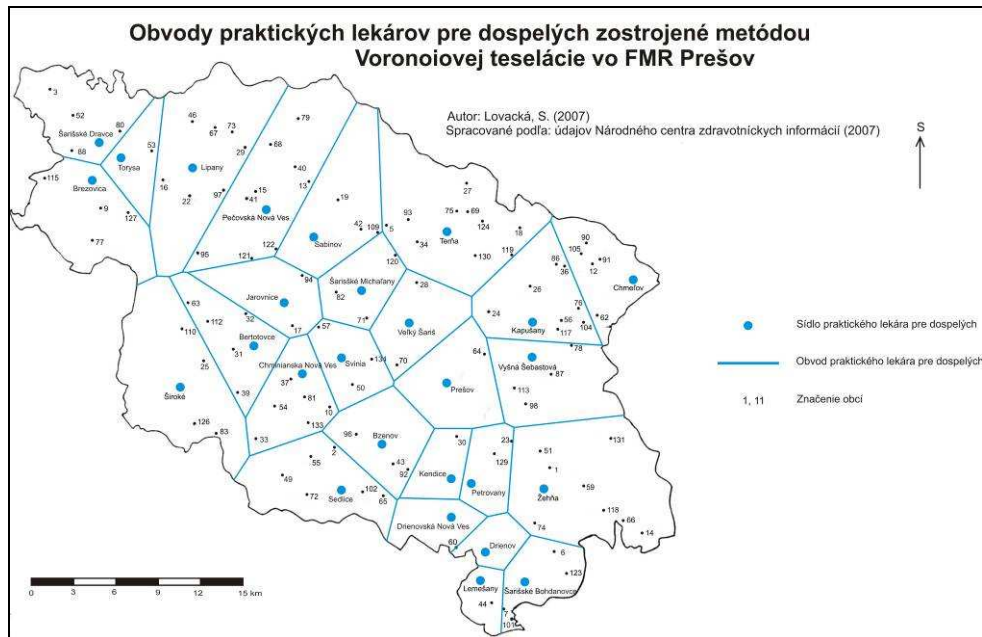


Map 9: Communities providing most services from the respondents' views

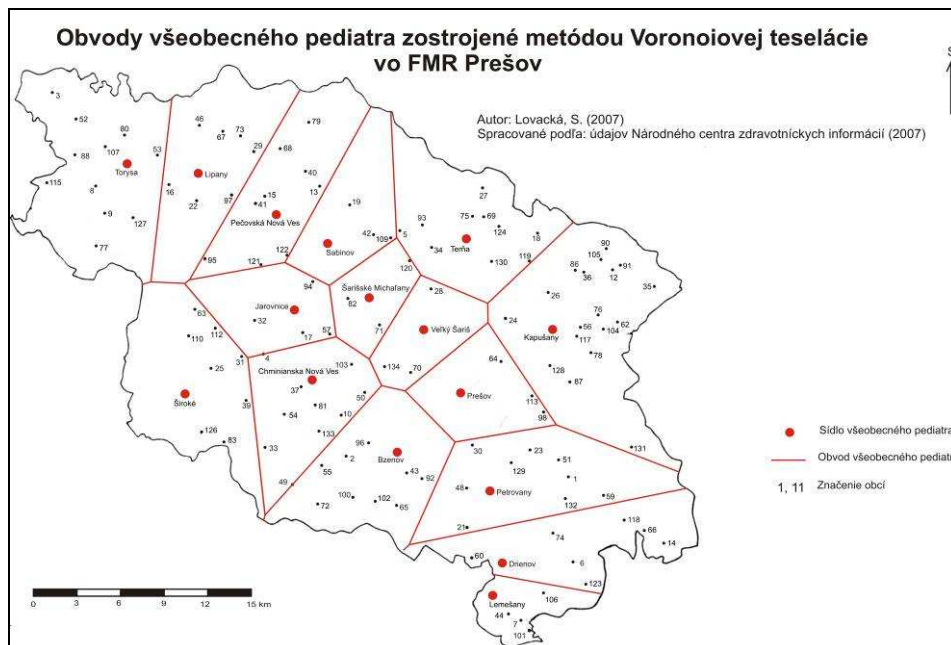


Map 10: Districts of primary schools using the method of the Voronoi diagram

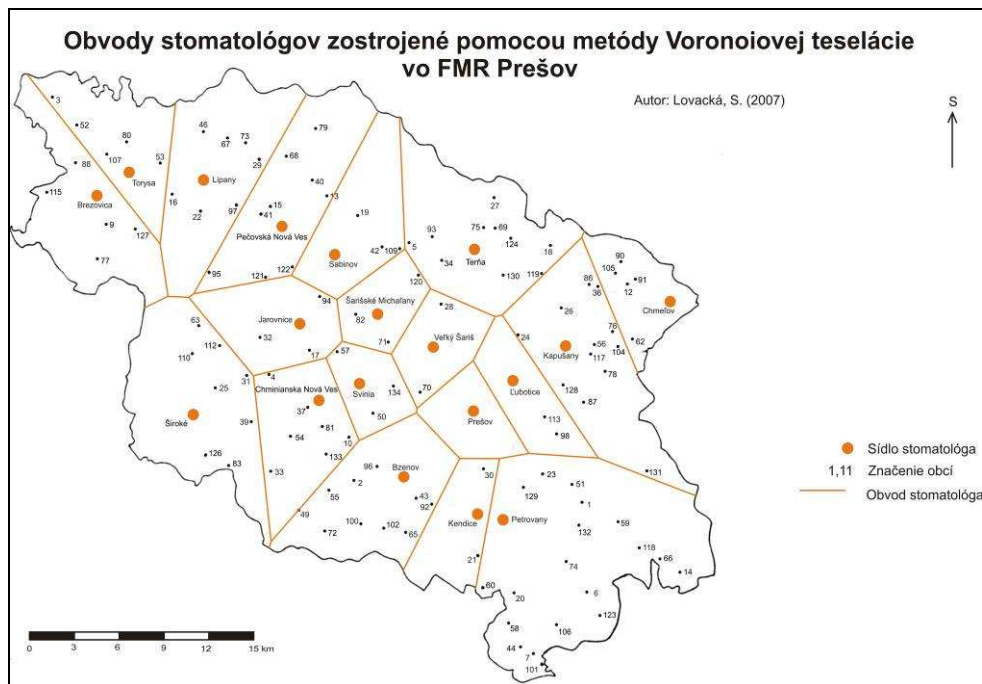
Map 11: Districts of general practitioners using the method of the Voronoi diagram



Map 12: Districts of pediatricists using the method of the Voronoi diagram



Map 13: Districts of dentists using the method of the Voronoi diagram



Map 14: Districts of pharmacies using the method of the Voronoi diagram

