Distance to Education and Health Services by Pupils from Marginalized Roma Communities

TOMÁŠ ŽELINSKÝ, MATÚŠ KUBÁK
Faculty of Economics, Technical University of Košice
Němcovej 32, 040 01 Košice
Slovakia
tomas.zelinsky@tuke.sk, matus.kubak@tuke.sk

Abstract

Roma in Slovakia are characterised by high unemployment rate and low education level. The paper preliminary results of spatial analysis of accessibility of different types of schools (nursery and elementary) and health services (pediatricians) by the pupils from municipalities with Roma population. The paper first presents analysis of spatial polarization of the selected variables, which is followed by estimation of mean and median distances in the Slovak regions, and the distances are visualised by kriged thematic maps.

Key words: Marginalized Roma Communities, distance, education, health, kriging, Slovakia.

JEL Classification: R12, J15, J24

1 Introduction

Marginalized Roma communities in Slovakia are characterized by intergenerationally reproduced culture of poverty. There are considerable differences between the Roma and Non-Roma population from the viewpoint of several characteristics, such as age structure (a significantly higher share of 0-14 age group and lower share of 50+ age group), life expectancy at birth (63.9 years for Roma men and 69.4 for Roma women, in comparison to 70.1 years for Non-Roma men and 78.2 years for Non-Roma women), fertility rate (on average 2 children per a Non-Roma woman in comparison to 3.5 children per a Roma woman), around 78 % of Roma population achieved at most primary education, employment rate of Roma reaches 10 % and more than 54 % are unemployed.

Figure 1 presents spatial distribution of percentage share of the Roma in Slovak municipalities. The map comes from the publication "Atlas of Roma Communities" (Mušinka et al., 2014). According to the Atlas, it is estimated that there are almost 403,000 Roma in Slovakia what is approximately 7.4% of overall population in Slovakia. The highest shares of the Roma on total regional populations are linked to the eastern and south-eastern regions that are the weakest in terms of their economic performance (Klimovský, 2010).

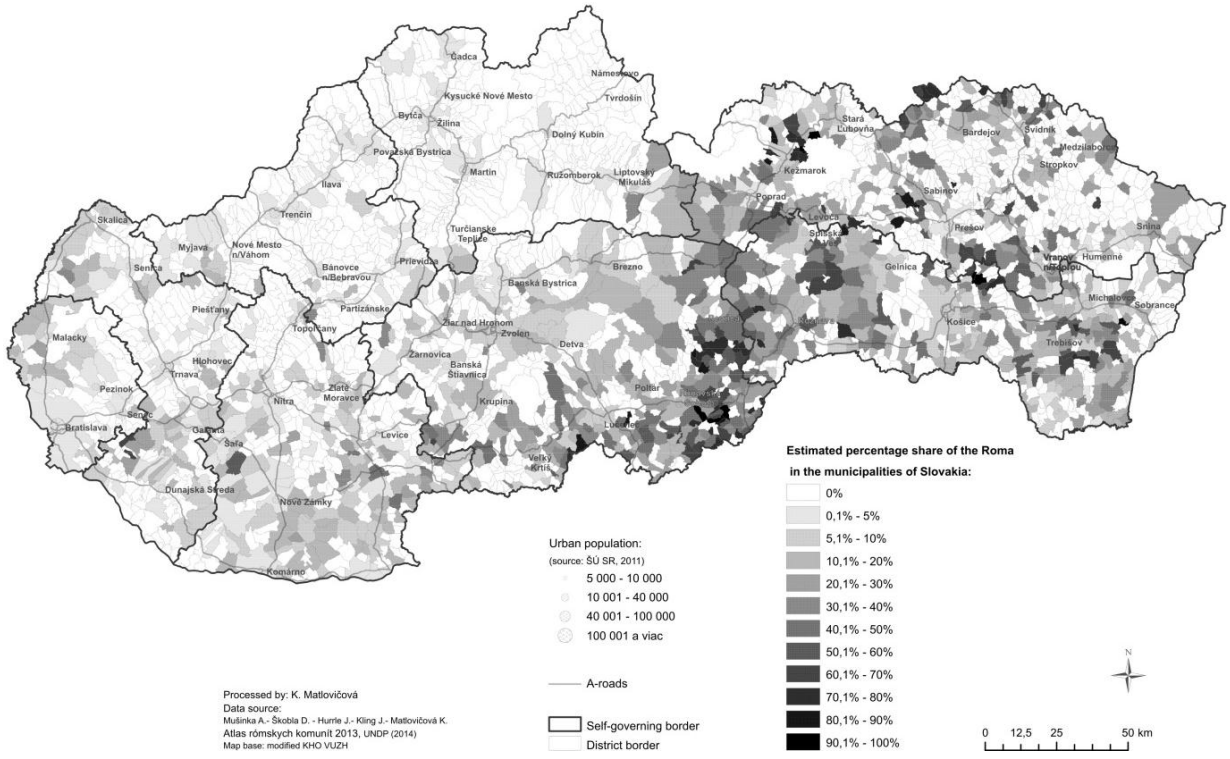

Fig. 1 Estimated percentage share of the Roma in Slovak municipalities
Source: Mušinka et al. (2014)

Being healthy and educated can be considered as important factors of people's well-being. In this paper we focus on the Roma's access to education and health care[1]. Analyses are performed at local level and access to education is proxied by the distance to: nursery school, elementary school (first four grades only), elementary school (all grades), and elementary school for pupils with special needs. Access to health services is proxied by the distance to a pediatrician.

Firstly, spatial autocorrelation coefficients describing the spatial polarization of the selected variables are estimated, which is followed by estimation of median and mean distances according to the Slovak regions (at NUTS-2 level), and the distances are visualised by kriged thematic maps (ordinary kriging is applied).

2 Methodology

Analyses in the paper are based on the data from the publication "Atlas of Roma Communities" (Mušinka et al., 2014). The survey of Romani population within Atlas 2013 did not examine the number of people declaring themselves as Romani, but so-called attributed ethnicity was surveyed (i.e. occurrence, location and nature of communities perceived as the Romani by the majority) using a qualified estimate methodology (Matlovičová et al., 2012). The following variables were used: distance to the closest nursery school; distance to the closest elementary

[1] For a discussion on health status of people from Roma settlements see e.g. Gavurova, Soltes and Soltes (2014) or Soltes, Soltes and Gavurova (2014).

school (first four grades only); distance to the closest elementary school (all grades); distance to the closest elementary school for pupils with special needs; distance to the closest pediatrician; and the percentage of Roma on municipality's total population.

Spatial polarization of variables is assessed by Moran's spatial autocorrelation coefficient and the accessibility of the closest school/pediatrician is visualised by the kriged thematic maps. All estimations and graphical outputs were performed in R software (R Core Team, 2012) using libraries spdep (Bivand et al., 2013), sp (Pebesma and Bivand, 2005), rgdal (Keitt et al., 2013), maptools (Lewin-Koh, 2013) and gstat (Pebesma, 2004).

3 Results and Discussion

The values of Moran's spatial autocorrelation coefficient (Table 1) indicate that all investigated variables are statistically significantly spatially autocorrelated (polarized).

Tab. 4 Moran's I spatial autocorrelation coefficients

Variable	Moran's I	p-value
%_Roma	0.44	<0.0001
ESSN	0.37	<0.0001
NS	0.23	<0.0001
PED	0.17	<0.0001
ES	0.13	<0.0001
ES_1-4	0.05	0.0019

* ESSN – elementary school for pupils with special needs; NS – nursery school; PED – pediatrician; ES – elementary school; ES_1-4 – elementary school with first four grades only;
Source: own table

A value of 0.44 in case of percentage of Roma population indicates relatively strong positive spatial autocorrelation, and hence similar percentages of Roma population are clustered together. The situation is very similar from the viewpoint of distance to the closest elementary school for pupils with special needs.

The percentage of municipalities with limited access to the selected services (Table 2) significantly differs among the Slovak regions (NUTS-2 level). Most of the municipalities have limited access to elementary schools for pupils with special needs is the most often, which is followed by access to pediatrician and access to elementary schools. Municipalities have the best access to elementary school with first grades only.

Tab. 2 Percentage of municipalities with non-zero distances to the selected services

Region	PED	ESSN	ES	ES_1-4	NS
BB	79.70	90.60	66.54	9.77	32.71
PO	74.90	86.42	57.61	8.23	19.34
NR	56.72	85.07	37.31	12.69	5.22
KE	73.44	89.45	61.72	12.11	17.58
TN	46.34	70.73	21.95	4.88	7.32
BA	44.44	74.07	18.52	3.70	0.00
TT	48.68	75.00	27.63	1.32	1.32
ZA	40.74	55.56	22.22	0.00	7.41

* PED – pediatrician; ESSN – elementary school for pupils with special needs; ES – elementary school; ES_1-4 – elementary school with first four grades only; NS – nursery school
Source: own table

As the distribution of distance to the closest school/physician is skewed, mean and median distances are reported in tables 3 and 4. Table 3 reports means and medians of all municipalities, while table 4 reports means and medians of municipalities with non-zero distance to the selected services. In case of Zilina, Trnava, Trencin and Bratislava Regions zero median values for all services except of elementary schools for pupils with special needs are reported.

Tab. 3 Mean and median distances to the closest services

	Mean					Median				
Region	PED	ESSN	ES	ES_1-4	NS	PED	ESSN	ES	ES_1-4	NS
BB	7.1	11.8	4.2	0.4	1.7	6	12	3.5	0	0
PO	6.6	10.7	2.9	0.4	0.9	5	10	2	0	0
NR	5.1	11.4	2.3	0.6	0.1	3	10	0	0	0
KE	5.8	11.0	3.3	0.7	0.8	5	10	3	0	0
TN	3.2	7.1	1.3	0.3	0.2	0	7	0	0	0
BA	4.4	8.1	1.5	0.1	0.0	0	8	0	0	0
TT	3.7	6.5	1.6	0.1	0.0	0	6	0	0	0
ZA	3.1	4.4	1.0	0.0	0.1	0	2	0	0	0

* PED – pediatrician; ESSN – elementary school for pupils with special needs; ES – elementary school; ES_1-4 – elementary school with first four grades only; NS – nursery school
Source: own table

If municipalities with zero distances are not considered in the calculations (see Table 4), the lowest changes are reported in case of mean and median distances to elementary school for pupils with special needs. The highest increase is reported in case of distance to the closest nursery school and elementary school.

Tab. 4 Mean and median distances to the closest services (for municipalities with non-zero distances)

	Mean					Median				
Region	PED	ESSN	ES	ES_1-4	NS	PED	ESSN	ES	ES_1-4	NS
BB	8.9	13.1	6.4	3.5	5.0	7	13	6	3	4
PO	8.8	12.4	5.1	4.6	4.6	7	11	4	4	4
NR	9.0	13.4	6.2	4.9	2.6	7	12	5	4	3
KE	7.9	12.3	5.4	5.4	4.3	6	11	5	4	4
TN	7.0	10.0	5.8	5.5	2.7	7	9	4	5.5	2
BA	10.0	11.0	8.2	3.0	NA	10	10.5	5	3	NA
TT	7.5	8.7	5.8	5.0	2.0	6	7	4	5	2
ZA	7.6	7.9	4.3	NA	1.5	8	7	2	NA	1.5

* PED – pediatrician; ESSN – elementary school for pupils with special needs; ES – elementary school; ES_1-4 – elementary school with first four grades only; NS – nursery school
Source: own table

Distances to the closest nursery/elementary school and pediatrician are visualized on kriged thematic maps (see Figures 2 – 6). In order to see differences among the variables, the same continuous scale is used (0 – 45 km).

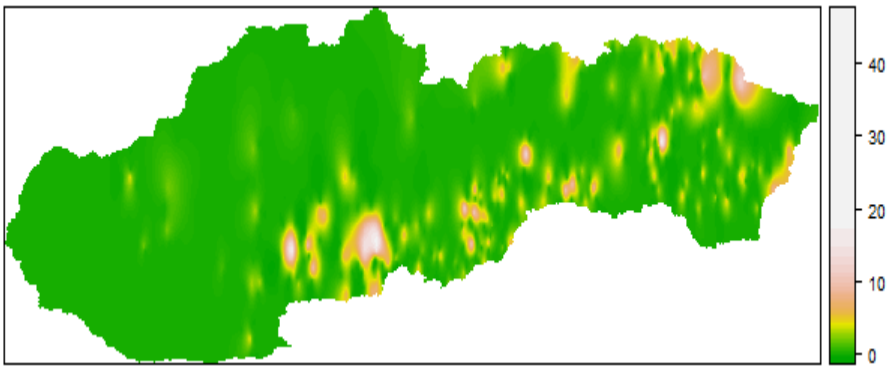

Fig. 2 Distance to the closest nursery school
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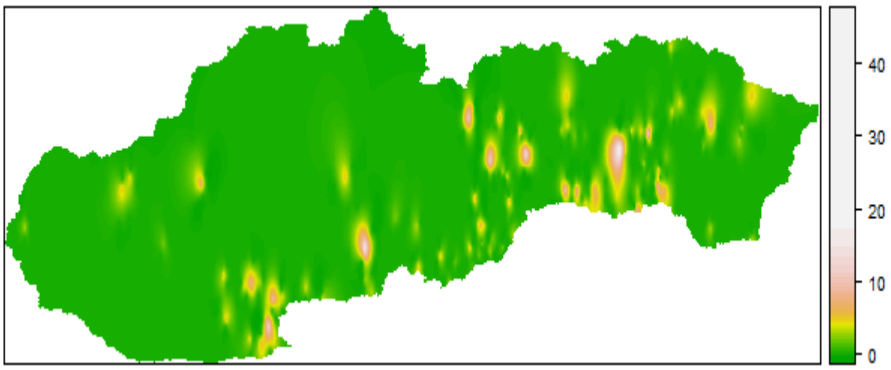

Fig. 3 Distance to the closest elementary school, 1st-4th grades
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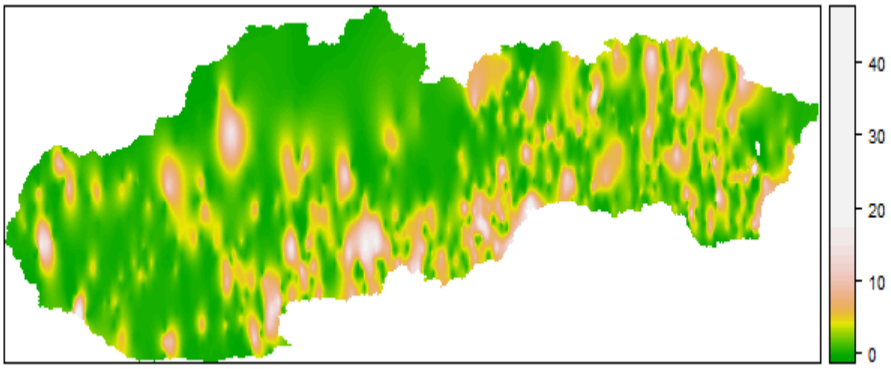

Fig. 4 Distance to the closest elementary school
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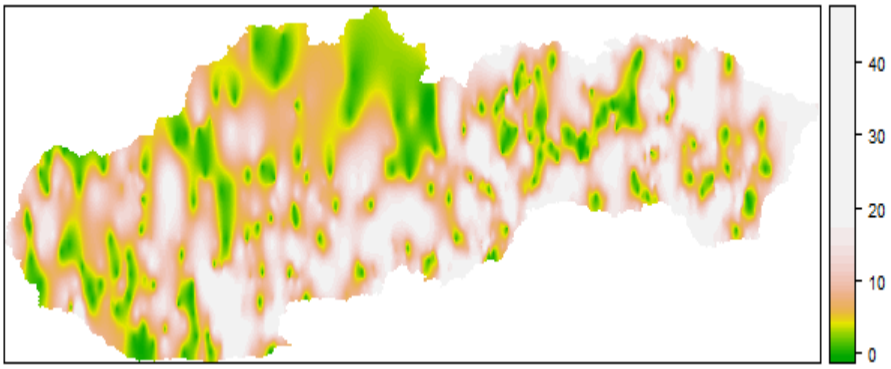

Fig. 5 Distance to the closest elementary school for pupils with special needs
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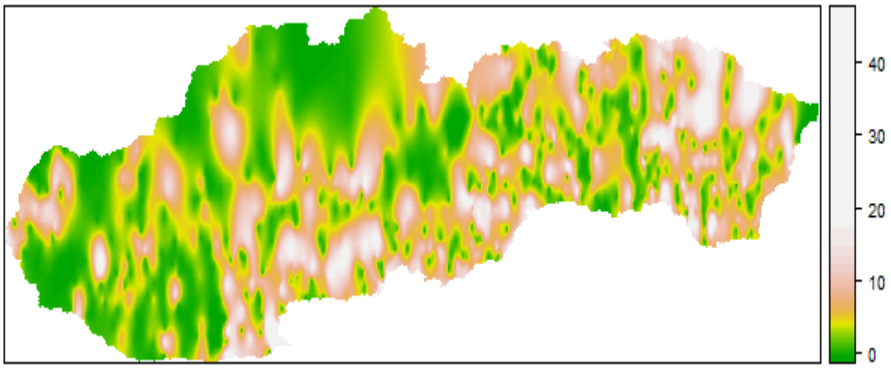

Fig. 6 Distance to the closest pediatrician
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From Figures 2 – 6 it is clear that the situation is the least favourable from the viewpoint of distance to the closest elementary school for pupils with special needs and to the closest pediatrician. On the other hand, from the viewpoint of distance to the closest nursery school or elementary school with the first four grades, the situation is the least favourable in eastern and south-eastern part of Slovakia.

4 Conclusions

The paper presents the first preliminary results of a more complex analysis aimed at investigating economic behaviour of children from marginalized Roma communities. Considering space in such analyses might be of high importance, as commuting to school might influence pupils' educational outcomes. Further partial analyses will focus on differences in educational achievements, school attendance, commendations and misdemeanours.

According to the results the share of Roma population on total population indicates relatively strong positive spatial autocorrelation, and hence similar percentages of Roma population are clustered together. Similarly, there is a strong positive spatial autocorrelation in case of distance to the closest elementary school for pupils with special needs.

As for the distances of children from Roma communities to the selected service, the situation is the least favourable from the viewpoint of distance to the closest elementary school for pupils with special needs (mean distance around 11 km, median distance 10 km) and to the closest paediatrician (mean distance 8 km, median distance 7 km).

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