SOCIOECONOMIC CHARACTERISTICS OF THE POPULATION LIVING IN ROMA SETTLEMENTS AND THEIR ASSOCIATION WITH HEALTH AND HEALTH-RELATED BEHAVIOUR

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SUMMARY

Background: The aim of this study was to compare socioeconomic characteristics of the Roma population living in Roma settlements with the majority population. Moreover, it was aimed to assess socioeconomic differences in health and health-related behaviour within the population living in Roma settlements.

Methods: Data from the cross-sectional HepaMeta study conducted in Slovakia in 2011 were used. The sample consisted of 452 Roma (mean age = 34.7; 35.2% men) and 403 non-Roma (mean age = 33.5; 45.9% men) respondents. Roma in selected settlements were recruited by local Roma community workers. Respondents from the major population were randomly selected from a list of patients from general practitioners. Data were collected via questionnaire, anthropometric measures and analysed blood samples. Differences in socioeconomic characteristics between the population living in Roma settlements and the majority population were tested using the chi-square test. The contribution of selected socioeconomic characteristics on health and health-related behaviour of the population living in Roma settlements was assessed by logistic regression models adjusted for age and gender.

Results: The population living in Roma settlements is characterised by significantly lower socioeconomic standards, and the living conditions are significantly worse compared with the majority. With few exceptions, the study did not confirm any significant association between socioeconomic indicators and health and health-related behaviour within the population living in Roma settlements.

Conclusions: The deteriorating effect of living in Roma settlement on health and health-related behaviour seems to be immense regardless differences in socioeconomic characteristics or living condition within the settlement population.

Key words: Roma settlements, disadvantaged groups, health, health-related behaviour, socioeconomic indicators, living conditions

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INTRODUCTION

Roma people live all around the world, but they are concentrated mostly in the Central Europe and the Balkans. Estimates of the total number of Roma living worldwide range from 8 to 12 million, with approximately 5.2 million Roma living in Central and Eastern Europe (1–5). They are Europe's largest minority (1). According to historical records, Roma migrated in waves from North India into Europe between the ninth and fourteenth centuries (6), and many Roma still maintain their somewhat itinerant life and tribal organisation (5).

According to our knowledge the most realistic estimate of the Roma population in Slovakia is that of the Demographic Research Centre, which indicates that about 380,000 Roma live in the Slovak Republic, i.e. 7.2% of the total population (7, 8). Officially, only 105,738 citizens (2.0% of the total population of the Slovak Republic) declared themselves as ethnic Roma in the Census of the population, houses and flats in 2011. Another unofficial estimate claims that as many as 750,000 Roma live in Slovakia (9). However, the number is usually believed to be between 400,000 and 500,000 (i.e. 8.5% of the Slovak population). The Roma population in the Czech Republic ranges from 150,000 to 300,000 (10).

The health of Roma reflects differences in socioeconomic living conditions. The nature of these conditions affects an individual's health. Not only do constitutional factors and an individual's lifestyle matter, but social networks, living and working conditions and general cultural, environmental and socioeconomic conditions also have a direct or indirect effect on health (11).

A closer look at health of the Roma population shows that in general, Roma have poorer health than the national average (3,

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5, 12–15). Despite the fact that studies regarding the health of Roma are scarce, we can find several that report higher infant mortality rates than among the majority population (the rates are between 2 and 6 per 1,000 live births and differ among various countries) and a shorter life expectancy (4, 16). In general, life expectancy in Roma men and women is 10–15 years shorter than in their non-Roma counterparts from the same region, they have a higher prevalence of different diseases such as coronary artery disease, obesity, hyperlipidaemia, and diabetes mellitus compared with the majority population, and experience more frequent occurrence of health problems/complaints (4, 17–20). Published studies on the health of Roma are often fragmentary and burdened with methodological problems (3, 21, 22). According to the European Foundation for the Improvement of Living and Working Conditions, living in housing of poor quality has also a negative impact on Roma health: they have an increased risk of disability, chronic illness and being overweight. Overcrowding is associated with health problems, psychological problems, tuberculosis, respiratory infections, increased risk of fire, and domestic accidents (23).

Most of the available studies indicate that Roma in comparison with the majority population not only have worse health status but also unhealthier lifestyle, implying worse health-related behaviour (3, 5, 6, 12, 13). Roma are known as smoking a lot, drinking much alcohol and living in bad environmental conditions (24, 25).

The aim of this study was to describe the socioeconomic characteristics (education, employment status, poverty in terms of receiving social benefits and struggling with paying bills) and living conditions (standard household conditions, household heating, crowding in terms of having separate room for family) of the population living in Roma settlements in comparison with the majority population. However, the Roma population is very heterogeneous, and socioeconomic differences within this population might result in differences in health and health-related behaviour within the Roma population. Therefore, the study aimed to assess the contribution of selected socioeconomic characteristics and living conditions to health (self-reported health, obesity, metabolic syndrome) and health-related behaviour (nutrition habits, physical activity, smoking, binge drinking) within the population living in Roma settlements.

MATERIALS AND METHODS

Data from the cross-sectional population-based HepaMeta study conducted in Slovakia in 2011 were used. This project aimed to map the prevalence of viral hepatitis B/C and metabolic syndrome in the population living in separated and segregated Roma settlements and to compare it with the occurrence of the same health indicators in the majority population considering selected risk and protective factors of these health indicators. Methods used in this study are described in details elsewhere (26).

The sample consisted of 452 Roma (mean age = 34.7; 35.2% men) and 403 non-Roma (mean age = 33.5; 45.9% men) respondents. Roma in selected settlements were recruited by local Roma community workers. Respondents from the major population were randomly selected from a list of patients from general practitioners. Data were collected via questionnaire, anthropometric measures and analysed blood and urine samples. The detailed demographic characteristic of the Roma and non-Roma samples are presented in Table 1. The methodology is described in detail elsewhere (26).

For the majority population trained assistants were present in the outpatient clinic to assist with questionnaires, if needed. In Roma respondents, questionnaires were administered in community centres by community workers or trained assistants who provided help in case of limited literacy. This approach seemed to have the smallest impact on the validity of data (27, 28). The questionnaire was developed by a group of experts made up of Roma health mediators and community workers as well as public health experts and academics, and it gathered information about socioeconomic characteristics, living conditions (highest education, employment status, receiving social benefits in last year, ability to pay bills, standard household equipment, source of heating, and household overcrowding), health (self-rated health), and health-related behaviour (eating habits, insufficient physical activity, smoking, alcohol consumption). Respondents smoking 6 or more cigarettes the day before were considered to be smokers, and respondents consuming 6 doses of alcohol at least once a month were considered to be binge drinkers. Those who reported being physically active less than 2 times a week were considered to be insufficiently physically active.

Trained medical personnel collected the blood and urine samples and performed anthropometric measurements in the outpatient clinic of the cooperating GPs. Body mass index (BMI) was calculated and BMI ≥ 30 was used as the criterion of obesity (29). The Standard International Diabetes Federation criteria were used for determination of metabolic syndrome (30).

The study was approved by the Ethics Committee of the Faculty of Medicine at Šafárik University in Košice. Participation in the study was fully voluntary and anonymous. Detailed information about this study and its procedures was given to all respondents.

Statistical Analysis

First, the frequencies of demographic characteristics, household equipment/facilities and payment issues of the samples were calculated. Differences between Roma and non-Roma sample were tested using the chi-square test. Results are presented in Tables 1–3.

As a second step, we examined the effect of selected sociodemographic and living conditions on the health outcomes, nutrition habits and health-related behaviours of respondents living in Roma settlements. We used a binary logistic regression analysis with adjustment of all effects for age and gender.

All analyses were performed using the statistical software SPSS 20.0 for Windows.

RESULTS

The final sample comprised 452 respondents living in Roma settlements (mean age = 34.47; SD = 9.16; 35.2% men) and 403 (mean age = 33.47; SD = 7.41; 45.9% men) non-Roma respondents. While 83.7% (n = 374) of respondents living in Roma settlements reported living with a partner and not alone (single, divorced or widowed), only 67.3% (n = 263) of non-Roma respondents reported that they do not live alone.

Respondents living in Roma settlements in comparison with non-Roma respondents significantly more frequently reported lower education, being unemployed, receiving social benefits, struggling with bills, and lacking at least one of standard household facilities (sewage system, water supply, flush toilet, bathroom or shower, electricity) (Table 1).

From those who are unemployed, 35.1% (n = 142) of Roma and 14.7% (n = 15) of non-Roma reported participation in community service; 37.3% (n = 151) of Roma and 25.5% (n = 26) of non-Roma reported being unemployed and not participating in community service; 0.7% (n = 3) of Roma and 28.4% (n = 29) of non-Roma reported being a student; 18.8% (n = 76) of Roma and 21.6% (n = 22) of non-Roma reported being on maternity or paternity leave; and 6.1% (n = 25) of Roma and 5.9% (n = 6) of non-Roma reported being retired or on a disability pension.

About one-fifth of non-Roma respondents could not pay a collection order and current expenditures, while only 4.0% to 5.5% of non-Roma reported this situation (Table 2).

The vast majority of non-Roma respondents reported having basic household facilities, while only 47.4% of respondents living in Roma settlements reported having a sewage system; 57.5% reported having a water supply; 51.3% reported having a flush toilet, 50.9% reported having a bathroom or shower, and 83.2% reported having an electricity supply in their household (Table 3).

Table 1. *Comparison of socioeconomic characteristics and living conditions between respondents living in Roma settlements (N = 452) and respondents from the majority population (N = 403)*

	Roma n (%)	Non-Roma n (%)	Chi-square test
Education			
Elementary	360 (81.3)	9 (2.3)	***
Apprenticeship	73 (16.5)	84 (21.4)	
Higher	10 (2.3)	300 (76.3)	
Unemployment	396 (89.6)	102 (26.4)	***
Receiving social benefits	290 (65.5)	28 (7.2)	***
Payment issues	218 (48.2)	49 (12.2)	***
Lack of basic household facilities[1]	281 (62.2)	78 (19.4)	***

***p<0.001, [1]lacking at least one item of the following: sewage system, water supply, flash toilet, bathroom or shower, electricity supply

Table 2. *The prevalence of problems in paying bills among respondents living in Roma settlements (N = 452) and respondents from the majority population (N = 403)*

Did your household have a problem paying some of the following items?	Roma n (%)	Non-Roma n (%)	Chi-square test
Rent	74 (16.4)	15 (3.7)	***
Collection order	97 (21.5)	22 (5.5)	***
Current expenditure, purchase	99 (21.9)	16 (4.0)	***
Purchase ante, credit ante, other loans	75 (16.6)	18 (4.5)	***
Health care costs	80 (17.7)	10 (2.5)	***

***p<0.001

Table 3. *Basic household facilities of respondents living in Roma settlements (N = 452) and respondents from the majority population (N = 403)*

	Roma n (%)	Non-Roma n (%)	Chi-square test
Sewage system	214 (47.3)	328 (81.4)	***
Water supply	260 (57.5)	382 (94.8)	***
Flush toilet	232 (51.3)	380 (94.3)	***
Bathroom or shower	230 (50.9)	385 (95.5)	***
Electricity supply	376 (83.2)	384 (95.3)	***

***p<0.001

While the vast majority of non-Roma use a central heating system, only 6.1% (n = 25) of respondents living in Roma settlements do so. From respondents living in Roma settlements 82.4% (n = 337) reported using a local stove or open fireplace, 82.3% (n = 372) reported using natural wood (trees) or black or brown coal, and 15.9% (n = 72) admitted using other items like old furniture parts, garbage, oil, gasoline, or petrol for heating.

The majority of respondents living in Roma settlements reported having a brick house with a house number (n = 325, 73.1%), but 21.3% (n = 95) reported a brick house without a house number, and 5.6% (n = 25) reported a house built from clay, metal plate or wood. Only 13.8% (n = 60) of respondents living in Roma settlements reported not having a separate room for their family. The average number of families per household was 1.8 (SD = 1.45), with 3.5 adults (SD = 2.03) and 3.7 children (SD = 3.71) on average sharing the household.

The older age group of respondents living in Roma settlements (40+ years) has more than a 2-times higher chance of reporting poor health or being obese and a 4.5-times higher chance for metabolic syndrome in comparison with younger respondents living in Roma settlements (Table 4). Respondents living in Roma settlements lacking at least one of standard household facilities (sewage system, water supply, flush toilet, bathroom or shower, electricity) have a 1.8-times higher chance for metabolic syndrome in comparison with respondents living in Roma settlements who did not report a lack of it. The study did not confirm any significant association between education, employment status, receiving social benefits, struggling with paying bills, lacking central heating, or lacking own room for the family with poor health, obesity or metabolic syndrome.

The younger age group of respondents living in Roma settlements (up to 40 years) has a 1.7-times higher chance of reporting consumption of farinaceous dishes, and more than a 2-times higher chance of reporting consumption of soft drinks in comparison with the older age group of respondents living in Roma settlements (Table 5). Women living in Roma settlements have a 1.6-times higher chance of consuming fruits in comparison with men living in Roma settlements. Lower educated respondents living in Roma settlements have more than a 2-times higher chance of reporting the consumption of farinaceous dishes in comparison with higher educated respondents living in Roma settlements. Respondents living in Roma settlements who reported having their own room for the family have a 2-times higher chance of consuming farinaceous dishes, a 2.4-times higher chance of consuming soft drinks, a 2.5-times higher chance of consuming dairy products, and a

Table 4. *Contribution of selected sociodemographic characteristics and living conditions to health of respondents living in Roma settlements (logistic regression model) (N=452)*

	Poor health		Obesity		Metabolic syndrome	
	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)
Age						
18−39 years	106 (35.5)	1	63 (21.5)	1	52 (17.2)	1
40−55 years	74 (51.4)	2.15 (1.35–3.43)**	53 (39.3)	2.20 (1.32–3.67)**	76 (52.8)	4.52 (2.71–7.53)***
Gender						
Woman	119 (41.3)	1	74 (26.7)	1	84 (28.7)	1
Man	62 (39.5)	1.09 (0.70–1.71)	45 (28.8)	1.23 (0.75–2.02)	47 (29.6)	1.21 (0.67–1.88)
Education[1]						
Lower	148 (41.3)	1.24 (0.70–2.18)	96 (27.6)	0.92 (0.49–1.75)	103 (28.6)	1.94 (0.49–1.82)
Higher	31 (37.3)	1	20 (25.6)	1	24 (28.9)	1
Employment						
Unemployed	164 (41.5)	1	103 (27.1)	1	110 (27.8)	1
Employed	15 (33.3)	0.88 (0.43–1.81)	11 (24.4)	0.89 (0.40–2.02)	16 (34.8)	1.24 (0.56–2.75)
Social benefit						
Receiving	114 (39.4)	1	79 (28.3)	1	98 (33.8)	1
Not receiving	66 (43.4)	1.52 (0.96–2.41)	37 (25.0)	0.88 (0.51–1.50)	30 (19.6)	0.59 (0.33–1.03)
Payment issues						
At least one	99 (45.4)	1	63 (29.7)	1	73 (33.5)	1
None	82 (36.1)	0.70 (0.45–1.07)	56 (25.3)	0.82 (0.50–1.33)	58 (24.8)	0.74 (0.45–1.22)
Equipment						
Lacking	115 (41.7)	1	74 (27.8)	1	71 (25.3)	1
Not lacking	66 (39.1)	0.79 (0.50–1.25)	45 (26.9)	1.05 (0.63–1.75)	60 (35.1)	1.84 (1.10–3.08) *
Heating						
Radiator	10 (40.0)	1.29 (0.53–3.17)	6 (24.0)	0.78 (0.27–2.27)	6 (24.0)	0.60 (0.20–1.81)
Other	154 (40.2)	1	99 (26.9)	1	109 (28.4)	1
Own room						
Yes	151 (40.4)	0.95 (0.52−1.75)	99 (27.3)	0.88 (0.44–1.78)	116 (30.9)	1.65 (0.75–3.64)
No	26 (43.3)	1	14 (25.0)	1	11 (18.3)	1

[1]lower education: elementary, apprenticeship; higher education: secondary, university
*p<0.05, **p<0.01, ***p<0.001

2.8-times higher chance of consuming vegetables in comparison with respondents living in Roma settlements and not having their own room available for their nuclear family. The study did not confirm any significant association between employment status, receiving social benefits, struggling with paying bills, standard household facilities, lacking central heating and nutrition habits.

The older age group of respondents living in Roma settlements (40+ years) has nearly 2-times higher chance of reporting smoking in comparison with younger respondents living in Roma settlements (Table 6). On the other hand, the younger age group of respondents living in Roma settlements (up to 40 years) has a 1.5-times higher chance of reporting sufficient physical activity and binge drinking. Men living in Roma settlements have approximately a 10-times higher chance for binge drinking in comparison with women living in Roma settlements. The study did not confirm any significant association between education, employment status, struggling with paying bills, lacking standard household facilities, lacking central heating, or lacking own room for family with sufficient physical activity, smoking or binge drinking.

DISCUSSION

The presented study aimed to describe the sociodemographic characteristics and living conditions of the population living in Roma settlements in comparison with the majority population; and to assess the contribution of selected sociodemographic characteristics and living conditions to health outcomes (self-reported health, obesity, metabolic syndrome), nutrition habits and health-related behaviour (physical activity, smoking, binge drinking) in the population living in Roma settlements. The study found that respondents living in Roma settlements are more likely to live with partner compared with non-Roma respondents. The vast majority of respondents from the non-Roma population reported having standard basic household facilities, while only half of respondents living in Roma settlements reported having such facilities. The deteriorating effect of living in a Roma settlement on health and health-related behaviour seems to be immense regardless differences in socioeconomic characteristics or living conditions within the settlement population. The study did not

Table 5. *Contribution of selected sociodemographic characteristics and living conditions to nutrition habits of respondents living in Roma settlements (logistic regression model) (N=452)*

	Fruits		Vegetables		Dairy products		Farinaceous dishes		Soft drinks		Meat products		Meat	
	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)
Age														
18–39 years	152 (51.7)	1	144 (49.3)	1	161 (55.7)	1	205 (70.9)	1	223 (74.8)	1	233 (78.7)	1	195 (66.8)	1
40–55 years	79 (57.2)	1.18 (0.74–1.87)	80 (58.4)	1.30 (0.81–2.07)	87 (62.6)	1.46 (0.90–2.37)	93 (66.9)	0.59 (0.36–0.98)*	88 (63.3)	0.46 (0.28–0.76)**	110 (79.7)	1.03 (0.59–1.82)	97 (71.3)	1.22 (0.73–2.03)
Gender														
Woman	162 (57.2)	1	152 (53.7)	1	169 (59.7)	1	195 (69.1)	1	198 (69.7)	1	222 (78.4)	1	181 (65.1)	1
Man	70 (46.4)	0.63 (0.40–0.97)*	73 (49.3)	0.84 (0.54–1.32)	81 (55.1)	0.76 (0.48–1.21)	104 (70.3)	0.88 (0.54–1.42)	115 (74.2)	1.14 (0.70–1.86)	123 (80.4)	1.20 (0.69–2.08)	111 (73.0)	1.51 (0.93–2.45)
Education[1]														
Lower	185 (52.6)	0.93 (0.53–1.63)	182 (52.1)	1.11 (0.63–1.95)	204 (59.0)	1.38 (0.77–2.45)	237 (67.9)	0.47 (0.24–0.93)*	246 (69.5)	0.63 (0.33–1.22)	276 (78.6)	0.90 (0.45–1.79)	244 (70.1)	1.77 (0.99–3.16)
Higher	44 (56.4)	1	40 (51.3)	1	45 (56.3)	1	59 (76.6)	1	64 (79.0)	1	65 (80.2)	1	44 (56.4)	1
Employment														
Unemployed	206 (53.5)	1	196 (51.0)	1	216 (56.5)	1	267 (69.7)	1	278 (71.3)	1	305 (78.6)	1	257 (67.1)	1
Employed	24 (54.5)	0.86 (0.43–1.76)	26 (61.9)	1.36 (0.65–2.85)	32 (74.4)	2.48 (1.08–5.66)*	28 (66.7)	0.91 (0.41–2.01)	33 (75.0)	0.96 (0.43–2.13)	36 (83.7)	0.94 (0.38–2.29)	31 (73.8)	1.37 (0.60–3.11)
Social benefit														
Receiving	154 (55.0)	1	153 (54.4)	1	167 (59.2)	1	201 (71.8)	1	204 (71.6)	1	227 (79.6)	1	196 (70.5)	1
Not receiving	77 (50.7)	1.01 (0.65–1.59)	71 (48.3)	0.84 (0.53–1.33)	81 (55.5)	1.07 (0.67–1.71)	94 (64.4)	0.66 (0.40–1.09)	106 (70.2)	0.92 (0.55–1.52)	117 (78.5)	0.86 (0.50–1.49)	94 (63.1)	0.69 (0.43–1.11)
Payment issues														
At least one	107 (50.7)	1	107 (51.4)	1	118 (57.0)	1	145 (69.4)	1	157 (73.7)	1	162 (76.4)	1	136 (66.0)	1
None	125 (56.1)	1.19 (0.78–1.82)	118 (52.9)	1.04 (0.68–1.59)	132 (59.2)	1.09 (0.70–1.69)	154 (69.7)	0.94 (0.59–1.50)	156 (69.0)	0.65 (0.41–1.05)	183 (81.7)	1.48 (0.88–2.49)	156 (69.6)	1.51 (0.96–2.39)
Equipment														
Lacking	141 (52.8)	1	130 (49.2)	1	139 (53.3)	1	188 (71.8)	1	192 (71.1)	1	205 (76.8)	1	178 (67.7)	1
Not lacking	91 (54.5)	1.08 (0.69–1.68)	95 (56.9)	1.21 (0.78–1.89)	111 (65.7)	1.66 (1.05–2.65)*	111 (66.1)	0.77 (0.47–1.24)	121 (71.6)	1.12 (0.68–1.84)	140 (82.8)	1.50 (0.85–2.64)	114 (68.3)	1.13 (0.70–1.83)
Heating														
Radiator	12 (50.0)	0.94 (0.39–2.28)	12 (50.0)	1.04 (0.43–2.53)	17 (68.0)	1.54 (0.59–4.02)	14 (58.3)	0.51 (0.20–1.27)	17 (68.0)	0.61 (0.24–1.59)	21 (84.0)	1.12 (0.35–3.57)	15 (62.5)	1.02 (0.40–2.65)
Other	193 (51.9)	1	184 (49.7)	1	209 (56.6)	1	259 (70.2)	1	269 (71.5)	1	294 (78.8)	1	250 (67.6)	1
Own room														
Yes	204 (56.0)	1.78 (0.96–3.29)	202 (55.6)	2.75 (1.40–5.38)**	224 (61.9)	2.52 (1.32–4.78)**	259 (71.3)	1.94 (1.02–3.69)*	268 (72.6)	2.38 (1.25–4.54)**	294 (80.1)	1.28 (0.64–2.58)	249 (68.8)	0.91 (0.47–1.77)
No	25 (42.4)	1	18 (32.1)	1	22 (38.6)	1	33 (58.9)	1	36 (62.1)	1	44 (75.9)	1	37 (66.1)	1

[1]lower education: elementary, apprenticeship; higher education: secondary, university
*p<0.05, **p<0.01, ***p<0.001

Table 6. *Contribution of selected sociodemographic characteristics and living conditions to health-related behaviour of respondents living in Roma settlements (logistic regression model) (N=452)*

	Physical inactivity		Smoking		Alcohol	
	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)
Age						
18–39 years	94 (31.5)	1	103 (34.8)	1	57 (19.3)	1
40–55 years	38 (26.8)	0.69 (0.41–1.14)	68 (48.9)	1.98 (1.25–3.15)**	18 (12.5)	0.73 (0.36–1.47)
Gender						
Woman	88 (30.7)	1	102 (36.4)	1	19 (6.7)	1
Man	45 (29.0)	0.91 (0.57–1.47)	70 (44.6)	1.54 (0.99–2.40)	56 (35.7)	9.70 (5.13–18.32)***
Education[1]						
Lower	109 (30.6)	0.70 (0.39–1.25)	139 (39.6)	1.11 (0.63–1.96)	61 (17.2)	1.78 (0.82–3.89)
Higher	24 (29.3)	1	32 (39.0)	1	13 (15.7)	1
Employment						
Unemployed	123 (31.4)	1	151 (38.9)	1	65 (16.6)	1
Employed	9 (20.0)	0.58 (0.25–1.33)	19 (41.3)	1.10 (0.55–2.21)	10 (22.2)	1.06 (0.43–2.60)
Social benefit						
Receiving	83 (29.0)	1	118 (41.7)	1	45 (15.7)	1
Not receiving	49 (32.2)	1.13 (0.70–1.83)	52 (34.7)	0.91 (0.57–1.44)	29 (19.2)	1.03 (0.55–1.93)
Payment issues						
At least one	62 (28.8)	1	86 (40.2)	1	32 (15.0)	1
None	71 (31.3)	0.98 (0.62–1.56)	86 (38.6)	1.07 (1.70–1.63)	43 (18.9)	1.29 (0.71–2.33)
Equipment						
Lacking	89 (32.7)	1	106 (39.3)	1	48 (17.6)	1
Not lacking	44 (25.9)	0.77 (0.47–1.25)	66 (39.5)	0.95 (0.61–1.49)	27 (16.0)	0.77 (0.41–1.42)
Heating						
Radiator	4 (16.0)	0.44 (0.14–1.38)	11 (45.8)	1.41 (0.58–3.39)	4 (16.0)	1.19 (0.34–4.16)
Other	119 (31.3)	1	155 (41.2)	1	69 (18.2)	1
Own room						
Yes	110 (29.6)	0.93 (0.47–1.77)	145 (39.2)	0.73 (0.39–1.37)	60 (16.3)	0.68 (0.30–1.55)
No	18 (30.5)	1	25 (43.9)	1	13 (21.7)	1

[1]lower education: elementary, apprenticeship; higher education: secondary, university
*p<0.05, **p<0.01, ***p<0.001

confirm any significant association between socioeconomic indicators (education, employment status, receiving social benefits, struggling with paying bills, lacking central heating, or lacking own room for family) and poor health, obesity or metabolic syndrome. Older respondents living in Roma settlements (40+ years) are more likely to report poor health, being obese, having metabolic syndrome, and smoking in comparison with younger respondents living in Roma settlements. On the other hand, the younger age groups of respondents living in Roma settlements (up to 40 years old) are more likely to report sufficient physical activity and binge drinking. Men living in Roma settlement have approximately a 10-times higher chance for binge drinking in comparison with women living in these settlements.

Naturally, respondents living in Roma settlements displayed substantially worse socioeconomic characteristics, and their living circumstances are significantly worse in comparison with the majority population. This is consistent with general observations and with the report of the European Foundation for the Improvement of Living and Working Conditions (23).

Surprisingly, socioeconomic characteristics as well as living conditions do not contribute to differences in health or health-related behaviour within a Roma settlement. Only a few exceptions were found, mostly in nutritional habits. This might be explained by the situation when multiple families share one flat/house, ad it might also imply that they are rather poor and unable to buy such foods as vegetables, dairy products and sweet soft drinks and due to the lack of space they are also less able to prevent such foods from being shared with/consumed by others.

There are several possible explanations for the absence of socioeconomic differences in health and health-related behaviour within the population living in Roma settlements. The sharing of amenities is deeply embedded in Roma culture as the possessing of material belongings, which might indicate higher socioeconomic status in the majority population, does not reflect the real situation of individual's socioeconomic status within the Roma community. In the Roma population social stratification is not derived from economic situation but from the respect gained by the individual within the community. Thus, differences in socio-

economic status indicators might not reflect variation in health and health related-behaviour of the Roma sample observed in this study. Furthermore, the findings might also reflect the situation of Roma, which is so poor and under the lowest cut-off point that simply any variation in socioeconomic status indicators cannot compensate for the disadvantage faced by Roma every day (31). According to observations by the anthropologist Belák (32), higher socioeconomic status among Roma living in settlements is rarely transferred into their daily lives. Possible benefits which accompany improvement in socioeconomic status are not reflected in Roma life style and culture. These are potential background factors that might explain the absence of a socioeconomic gradient in health among Roma respondents.

Strengths and Limitations

We were successful in recruiting a considerable number of Roma respondents and a comparable sample of non-Roma respondents in the catchment areas, even though the Roma population is considered to be a hard-to-reach population. This was achieved by following principles of community-based participatory research through engaging Roma community workers. Compared with other studies concerning Roma, which collected self-reported data by asking respondents questions, we collected more reliable data by making use of blood samples and anthropometric measures.

However, this study has also some limitations. First, we were not able to compute response rates among Roma since recruitment of the Roma sample took place directly in settlements under difficult circumstances. On the other hand, we were able to collect some information on reasons for non-response among Roma. These were mostly unrelated to the outcomes as assessed, being a fear of blood-taking and reluctance or fear to visit a general practitioner. Another limitation may be the relatively low response rate (56%) of the majority population. Reasons for non-response seem to be unrelated to the outcomes, though, the main reasons for non-response were that respondents were not able to take time off from work during the week of data collection, were busy at the moment, were not interested or, in the case of a postal invitation, that we did not reach the recipient. Third, data on behaviour were collected differently among Roma and non-Roma, by interview and by questionnaire, respectively. However, findings on biological and behavioural outcomes fully pointed in the same direction.

Furthermore, this sample was representative for Roma adults who live in settlements. This comprises the most substantial part of the Roma living in eastern Slovakia. The findings should be generalize with caution to other groups of Roma, such as integrated Roma living in cities, because Roma communities vary in terms of regional settlement patterns, integration levels, economic and social development, and health (7).

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Conflict of Interests

None declared

APPENDIX

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REFERENCES

1. Brearley M. The Persecution of Gypsies in Europe. Am Behav Sci. 2001 Dec;45(4):588-99.
2. EURoma report: Roma and the structural funds. Madrid: Fundación Secretariado Gitano; 2010.
3. Hajioff S, McKee M. The health of the Roma people: a review of the published literature. J Epidemiol Community Health. 2000 Nov;54(11):864-9.
4. Sepkowitz KA. Health of the world's Roma population. Lancet. 2006 May 27;367(9524):1707-8.
5. Zeman CL, Depken DE, Senchina DS. Roma health issues: a review of the literature and discussion. Ethn Health. 2003 Aug;8(3):223-49.
6. Ringold D, Orenstein MA, Wilkens E. Roma in expanding Europe: breaking the poverty cycle. Washington, DC: World Bank; 2005.
7. Filadelfiová J, Gerbery D, Škobla D. Report on the living conditions of Roma in Slovakia. Bratislava: UNDP, Regional Bureau for Europe; 2007.
8. Reynolds M. Myths debunked. Transitions Online [Internet]. 2005 Jan 17 [cited 2013 Nov 29]. Available from: http://www.ceeol.com/aspx/issuedetails.aspx?issueid=8631ee01-dc65-4b4b-8504-ddc3bc4cdcbd&articleId=e0760951-fe90-4981-8f3f-28e1b1655af6
9. Ginter E, Krajcovicova-Kudlackova M, Kacala O, Kovacic V, Valachovicova M. Health status of Romanies (Gypsies) in the Slovak Republic and in the neighbouring countries. Bratisl Lek Listy. 2001;102(10):479-84.
10. Koupilová I, Epstein H, Holčík J, Hajioff S, McKee M. Health needs of the Roma population in the Czech and Slovak Republics. Soc Sci Med. 2001 Nov;53(9):1191-204.
11. Dahlgren G, Whitehead M. Policies and strategies to promote equity in health. Copenhagen: WHO Regional Office for Europe; 1992.
12. Parry G, Van Cleemput P, Peters J, Walters S, Thomas K, Cooper C. Health status of Gypsies and Travellers in England. J Epidemiol Community Health. 2007 Mar;61(3):198-204. Erratum in: J Epidemiol Community Health. 2007 Jun;61(6):559.
13. Van Cleemput P, Parry G, Thomas K, Peters J, Cooper C. Health-related beliefs and experiences of Gypsies and Travellers: a qualitative study. J Epidemiol Community Health. 2007 Mar;61(3):205-10.
14. Janevic T, Jankovic J, Bradley E. Socioeconomic position, gender, and inequalities in self-rated health between Roma and non-Roma in Serbia. Int J Public Health. 2012 Feb;57(1):49-55.
15. Jarcuska P, Bobakova D, Uhrin J, Bobak L, Babinska I, Kolarcik P, et al.; HEPA-META team. Are barriers in accessing health services in the Roma population associated with worse health status among Roma? Int J Public Health. 2013 Jun;58(3):427-34.
16. Rosicova K, Madarasova Geckova A, van Dijk JP, Kollarova J, Rosic M, Groothoff JW. Regional socioeconomic indicators and ethnicity as predictors of regional infant mortality rate in Slovakia. Int J Public Health. 2011 Oct;56(5):523-31.
17. Vozarova de Courten B, de Courten M, Hanson RL, Zahorakova A, Egyenes HP, Tataranni PA, et al. Higher prevalence of type 2 diabetes, metabolic syndrome and cardiovascular diseases in gypsies than in non-gypsies in Slovakia. Diabetes Res Clin Pract. 2003 Nov;62(2):95-103.
18. Ostrihoňová T, Bérešová J. Occurrence of metabolic syndrome and its risk factors amongst selected group of Roma inhabitants. Hygiena. 2010;55(1):7-14. (In Slovak.)

19. Krajcovicova-Kudlackova M, Blazicek P, Spustova V, Valachovicova M, Ginter E. Cardiovascular risk factors in young Gypsy population. Bratisl Lek Listy. 2004;105(7-8):256-9.
20. Babinska I, Dankulincova Veselska Z, Bobakova D, Pella D, Panico S, Reijneveld SA, et al.; HEPA-META team. Is the cardiovascular risk profile of people living in Roma settlements worse in comparison with the majority population in Slovakia? Int J Public Health. 2013 Jun;58(3):417-25.
21. Kelly JA, Amirkhanian YA, Kabakchieva E, Csepe P, Seal DW, Antonova R, et al. Gender roles and HIV sexual risk vulnerability of Roma (Gypsies) men and women in Bulgaria and Hungary: an ethnographic study. AIDS Care. 2004 Feb;16(2):231-45.
22. Vokó Z, Csépe P, Németh R, Kósa K, Kósa Z, Széles G, et al. Does socioeconomic status fully mediate the effect of ethnicity on the health of Roma people in Hungary? J Epidemiol Community Health. 2009 Jun;63(6):455-60.
23. Molinuevo D, Koomen M, Fóty K. Living conditions of the Roma: substandard housing and health. Dublin: European Foundation for the Improvement of Living and Working Conditions; 2012.
24. Gourgoulianis KI, Tsoutsou P, Fotiadou N, Samaras K, Dakis D, Molyvdas PA. Lung function in Gypsies in Greece. Arch Environ Health. 2000 Nov-Dec;55(6):453-4.
25. Petek D, Rotar Pavlič D, Švab I, Lolić D. Attitudes of Roma toward smoking: qualitative study in Slovenia. Croat Med J. 2006 Apr;47(2):344-7.
26. Madarasová Gecková A, Jarčuška P, Mareková M, Pella D, Siegfried L, Jarčuška P, et al.; HepaMeta Team. HepaMeta – Prevalence of hepatitis B/C and metabolic syndrome in population living in separated and segregated Roma settlements: a methodology for a cross-sectional population-based study using community-based approach. Cent Eur J Public Health. 2014 Mar;22 Suppl:S6-11.
27. Tourangeau R, Smith TW. Asking sensitive questions: the impact of data collection mode, question format, and question context. Public Opin Q. 1996;60(2):275-304.
28. Tourangeau R, Yan T. Sensitive questions in surveys. Psychol Bull. 2007 Sep;133(5):859-83.
29. Catapano AL, Reiner Ž, De Backer G, Graham I, Taskinen MR, Wiklund O, et al.; European Society of Cardiology (ESC); European Atherosclerosis Society (EAS). ESC/EAS Guidelines for the management of dyslipidaemias The Task Force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and the European Atherosclerosis Society (EAS). Atherosclerosis. 2011 Jul;217(1):3-46.
30. Alberti KG, Zimmet P, Shaw J. Metabolic syndrome - a new world-wide definition. A Consensus Statement from the International Diabetes Federation. Diabet Med. 2006 May;23(5):469-80.
31. World Health Organization, Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. Geneva: WHO; 2008.
32. Belák A. Health through eyes of those excluded. A Medical-anthropological survey of Romani rural settlement in Central Slovakia [dissertation]. Prague: Charles University; 2005. (In Slovak.)