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ORIGINAL ARTICLE

Socioeconomic position, gender, and inequalities in self-rated health between Roma and non-Roma in Serbia

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Abstract
Objective Roma experience high levels of discrimination and social exclusion. Our objective was to examine differences in self-rated health (SRH) between Roma and non-Roma in Serbia.
Methods Using data from the 2007 Living Standards Measurement Survey in Serbia ($n = 14{,}313$), we used binomial regression to estimate the relative risk (RR) of poor (SRH) among Roma ($n = 267$) relative to non-Roma. We additionally conducted group comparisons of combinations of Romani ethnicity, poverty, and gender, relative to the baseline group of non-Roma males not in poverty.
Results Adjusting for age, Roma were more than twice as likely as non-Roma to report poor SRH (RR = 2.3, 95% Confidence Interval (CI) = 1.8, 2.8). After adjustment for household consumption, employment, and education, the RR was reduced to 1.6 (95% CI = 1.3, 2.0). Romani women, regardless of whether they were living in poverty or not, experienced the greatest risk of poor SRH, with risks relative to non-Roma males not in poverty of 3.2 (95% CI = 2.3, 4.2) and 3.1 (95% CI = 2.4, 4.0), respectively.
Conclusion Roma in Serbia are at increased risk of poor SRH; Romani women experience the greatest burden of poor SRH.

Keywords Health status · Inequalities · Socioeconomic factors · Romany · Serbia

Introduction

Roma are the largest minority group in Europe and experience widespread discrimination and social exclusion (Crowe 2007). Despite a growing awareness of the urgent public health needs of the Roma population, we lack data on inequalities in health between Roma and non-Roma, including self-rated health (SRH) (Open Society Foundations 2010, Sepkowitz 2006). Self-rated health is a robust indicator of overall health status and has a dose–response relationship with mortality (DeSalvo et al. 2006, Idler and Benyamini 1997). Although categorical self-reported assessment of health may be limited in its utility for clinical and policy decision-making, it is useful for measuring inequalities across many dimensions of health (Van Doorslaer and Jones 2003).

The self-rated health of Roma in Serbia has not previously been studied, although an analysis of inequalities in self-rated health between Roma and non-Roma was conducted in the neighboring country of Hungary (Kosa et al. 2007, Vokó et al. 2009). In this analysis, Roma had more than twice the risk of poor self-rated health as non-Roma, but in mediation analyses this increase in risk was accounted for entirely by socioeconomic measures. One other study in Slovakia found that Romani adolescents had

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a threefold greater risk of poor self-rated health than non-Roma adolescents, and that parents' level of education partially accounted for these differences (Kolarcik et al. 2009). Serbia presents a somewhat different context in which to examine the self-rated health of the Romani population. In Serbia, many Roma face the double burden of being both members of a marginalized ethnic group and internally displaced persons since large numbers, estimated at 80,000, of Roma fleeing the war in Kosovo were displaced to neighboring regions in Serbia (UNDP 2006). In addition, post-war Serbia has lagged behind in economic transition, and has not yet gained candidate status to the European Union, whereas both Hungary and Slovakia have been members since 2004.

One important aspect of health inequalities that the studies in Hungary and Slovakia did not examine is the role of gender. The theoretical perspective of "intersectionality" stresses the importance of examining together the position of gender, class and race in society (Janes and Corbett 2009, Mullings and Schulz 2005). Romani women in Serbia and throughout the Balkans are in a position of triple discrimination, due to racist societal attitudes toward Roma, negative societal attitudes toward persons living in poverty, and gender discrimination in their household due to patriarchal familial norms (Bond 2004; Ravnbol 2010). Thus, the social position of Romani women may make them particularly vulnerable to poor health.

The objective of the current study was to examine differences in self-rated health between Roma and non-Roma in Serbia. Using data from the 2007 World Bank Living Standards and Measurement Survey, we tested the following hypotheses among integrated Roma, i.e. Roma not living in illegal slum settlements, and non-Roma in Serbia: (1) Roma are at a greater risk of poor self-rated health; (2) Socioeconomic measures are mediating factors in the association between Romani ethnicity and poor self-rated health; (3) Romani women living in poverty will have the greatest risk of poor self-rated health.

Methods

Data source

Data were obtained from the 2007 Living Standards Measurement Survey, a household survey conducted by the Statistical Office of Serbia and the World Bank (Statistical Office of the Republic of Serbia 2008). The sampling frame for the LSMS was based on the enumeration districts delineated for the 2002 Serbia Census, excluding those with less than 20 households. A stratified three-stage sample was used. First stage units were enumeration districts, second stage units were inhabited dwellings, and third stage units were households. Enumeration districts were stratified according to six geographical regions of Serbia (Vojvodina, Belgrade, West Serbia, Sumadija and Pomoravlje, East Serbia, and South-East Serbia) and the type of settlement (urban and rural).

In-person interviews were conducted with a response rate of 78%. The total number of respondents was $n = 17{,}375$. We excluded respondents under age 18, leaving a total of $n = 14{,}313$ respondents. There were 267 (1.9%) who self-reported their ethnicity as Roma. Roma from settlements, i.e. illegal slum housing, were not covered by this survey.

Measures

Self-rated health was determined by the question, "How is your health in general?" The response categories (very good, good, fair, poor, and very poor) were collapsed into a dichotomous variable with poor or very poor representing "poor self-rated health". Romani ethnicity, education, and employment status were self-reported and were categorized as follows: Romani ethnicity (yes/no), education (less than primary, primary, secondary or more), employment status (employed, unemployed, inactive). Household consumption is a measure of household living standards commonly used by the World Bank, and is considered to be more accurately reported and less sensitive to short-term fluctuations than income, in particular in countries in transition such as Serbia (Statistical Office of the Republic of Serbia 2008). Household consumption was measured as part of the LSMS by a self-report diary and includes the following expenditure categories: food and non-alcoholic beverages; alcoholic beverages and tobacco; clothing and footwear; housing; furnishings, household equipment and maintenance; health; transport; communication; recreation and culture; education; restaurants and hotels and miscellaneous goods and services. Households with difficulties filling out the consumption diary were assisted by interviewers. Household consumption was aggregated and divided into quintiles by the World Bank team. A dichotomous variable for "poverty" was also created by the World Bank using the lowest quintile of consumption (<8,883 RSD or 89 Euro/month) to represent poverty status. More details on the consumption measure can be found in the LSMS Serbia 2007 report (Statistical Office of the Republic of Serbia 2008).

Statistical analysis

Covariates were compared between Roma and non-Roma in bivariate analyses. The age distribution of Roma was much younger than that of non-Roma, and because age is

such a strong predictor of poor self-rated health, in subsequent analyses we age-adjusted all estimates by including a linear variable for age.

Next, we used binomial regression with a log link to estimate the relative risk of poor self-rated health among Roma relative to non-Roma (Spiegelman and Hertzmark 2005). This approach was chosen over logistic regression since the outcome of poor self-rated health was common (24%), and therefore the odds ratio would overestimate the risk ratio. We then sequentially added socioeconomic variables to examine the extent to which they mediated the relationship between Romani ethnicity and self-rated health (Hafeman and Schwartz 2009). We assessed the model including all socioeconomic variables simultaneously for multicollinearity by examining the variance inflation factor, and no evidence was found.

The intersectionality analysis was conducted as follows. We created dummy variables for three-way combinations of ethnicity, poverty, and gender, with white males not in poverty as the reference group. We chose to use the dichotomous measure of poverty rather than other socioeconomic measures for simplicity in the analysis and interpretation of the results. We then used applied same binomial regression with a log link as described above to estimate relative risks for each group, adjusting for age. The binomial model did not converge, so we instead used a Poisson distribution with a robust variance estimator (Spiegelman and Hertzmark 2005). In the intersectionality model, we purposely did not adjust for the other socioeconomic variables, since we wanted to estimate the total effects of gender, ethnicity, and poverty on poor self-rated health. We then tested pair-wise differences between each group. This approach allowed us to explore coexisting inequalities simultaneously, as well as to explore the risk across the spectrum of social groups (Sen et al. 2009). All models were estimated using PROC GENMOD, SAS Version 9.2.

Results

Roma differed significantly from non-Roma for every covariate, with Roma having lower levels of education, higher levels of poverty, and greater unemployment (Table 1). Roma also had a higher risk of poor self-rated health in every age group ($p < 0.01$) (Fig. 1). Adjusting for age, Roma were 2.3 times more likely to report poor self-rated health than non-Roma (95% CI = 1.8, 2.9) (Table 2). Each socioeconomic variable entered independently into the model slightly attenuated the relative risk for poor self-rated health among Roma compared with non-Roma. Together, all socioeconomic variables attenuated the relative risk to 1.6 (95% CI = 1.3, 2.0).

In analyses comparing the risk of poor self-rated health for ethnic/gender/poverty subgroups relative to non-Romani men not-living in poverty (reference group), Romani women regardless of poverty were 3.1 times more likely to report poor self-rated health (for subgroup in poverty: RR = 3.1, 95% CI = 2.0, 4.8, for subgroup not in poverty: RR = 3.1, 95% CI = 2.1, 4.5) (Fig. 2). Romani men in poverty were 2.2 times more likely to report poor self-rated health than the reference group (RR = 2.2, 95% CI = 1.4, 3.3), as were Romani men not in poverty (RR = 2.2, 95% CI = 1.4, 2.2). Risk ratios for Romani women in poverty were significantly different from risk ratios for all non-Roma groups (p values all <0.001), and were of borderline significance with Romani men in poverty and not in poverty ($p = 0.06$, $p = 0.12$, respectively). The results were similar for Romani women not in poverty.

Discussion

We found that Roma in Serbia were more than two times more likely to have poor self-rated health than non-Roma. As hypothesized, socioeconomic factors partially accounted for the difference, suggesting that low socioeconomic position due to historical social exclusion partially mediates the relationship between Romani ethnicity and poor self-rated health. However, the fact that socioeconomic measures did not fully account for the differences in self-rated health between Roma and non-Roma in Serbia suggests that Romani ethnicity additionally impacts health status by pathways other than socioeconomic position.

Our findings are consistent with a large body of literature based in the United States showing that racial inequalities in health persist even after adjustment for socioeconomic position, suggesting that there are additional mechanisms by which race is a fundamental cause of health inequalities (Williams and Mohammed 2009). Mechanisms other than socioeconomic position by which race or ethnicity may impact health include access to care, psychosocial factors arising from discrimination such as stress, and neighborhood characteristics such as segregation and housing quality (Bambra et al. 2010; Smedley and Stith 2003; White and Borrell 2010; Williams and Mohammed 2009). There is some evidence that such mechanisms also are implicated in health disparities in Serbia. One previous study in Serbia demonstrated that persons of lower socioeconomic position had lower access to health care (Janković et al. 2010). Another study demonstrated barriers to access health care among Romani women including discrimination (Janevic et al. 2011). Neighborhood environment and psychosocial factors arising from discrimination have

Table 1 Descriptive characteristics of the study population by Romani ethnicity, Serbia, 2007 ($n = 14{,}313$)

Characteristic[a]	Roma ($N = 267$)	Non-Roma ($N = 14{,}046$)	p value[b]
Sex			
Male	50.9	48.0	0.35
Female	49.1	52.0	
Age			
18–29	28.8	19.0	<0.001
30–44	30.3	23.1	
45–59	32.2	28.9	
60+	8.6	29.0	
Place of living			
Urban	47.6	52.2	0.07
Rural	52.4	47.8	
Education			
No school/incomplete primary	58.4	15.2	<0.001
Primary school	30.3	22.8	
Secondary school	11.2	55.1	
University	0	6.9	
Working status			
Employed	37.5	49.5	<0.001
Unemployed	13.5	7.3	
Inactive[c]	49.1	43.2	
Consumption below poverty <8,883 RSD or 89 Euro/month (%)	41.1	6.4	<0.001
Consumption quintile			
Lowest	61.8	21.5	<0.001
2nd	23.6	21.1	
3rd	10.4	20.7	
4th	4.1	19.9	
Highest	0	17.7	

[a] Some percentages do not add to 100% due to rounding

[b] χ^2 test

[c] "Inactive" refers to persons who are not seeking employment due to retirement, family reasons, education, or other reasons

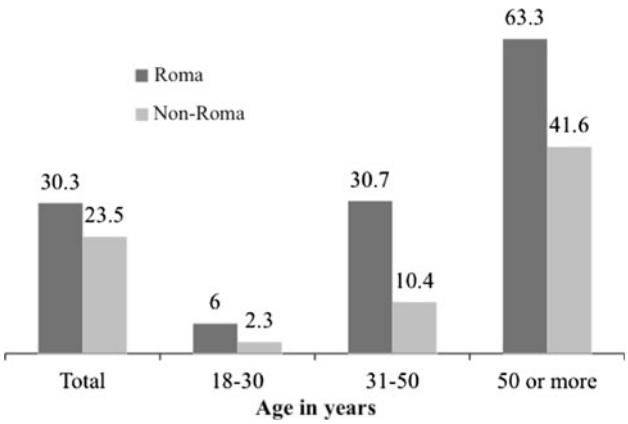

Fig. 1 Risk of poor self-rated health by Romani ethnicity and age, Serbia, 2007

not been studied in association with Romani health in Serbia or elsewhere but are important avenues for future research.

Our finding of a twofold increase in unadjusted risk of poor self-rated health is similar to the findings of Vokó et al. (2009) in Hungary. However, in our study after taking into consideration poverty, education, and employment, Roma were still at a 1.6 times greater risk of poor self-rated health, where as in Hungary socioeconomic factors accounted entirely for the difference in self-rated health. There are several potential explanations for this difference. Hungary has been an EU member since 2004, and there is evidence that the status of Roma has improved in EU member countries more rapidly than those not in the EU (Spirova and Budd 2008). Additionally, the study in Hungary focused on Roma living in settlements whereas our study focused on integrated Roma. It is possible that the more desperate socioeconomic circumstances of Roma living in settlements may more fully account for poor self-rated health.

Our study contributes to a small but growing body of literature on the health of the Romani population in Eastern Europe that has identified inequalities in health in many

Table 2 Relative risk of poor self-rated health among Roma compared to non-Roma, adjusted for socioeconomic characteristics, Serbia, 2007 ($n = 14{,}313$)

	RR	95% Confidence interval
Roma + age	2.3	1.8, 2.8
Roma + age + gender	2.3	1.8, 2.9
Roma + age + gender + poverty status	2.2	1.7, 2.7
Roma + age + gender + consumption quintile	2.0	1.6, 2.5
Roma + age + gender + employment status	2.1	1.7, 2.6
Roma + age + gender + education level	1.8	1.4, 2.2
Roma + age + gender + poverty + employment + education	1.6	1.3, 2.0

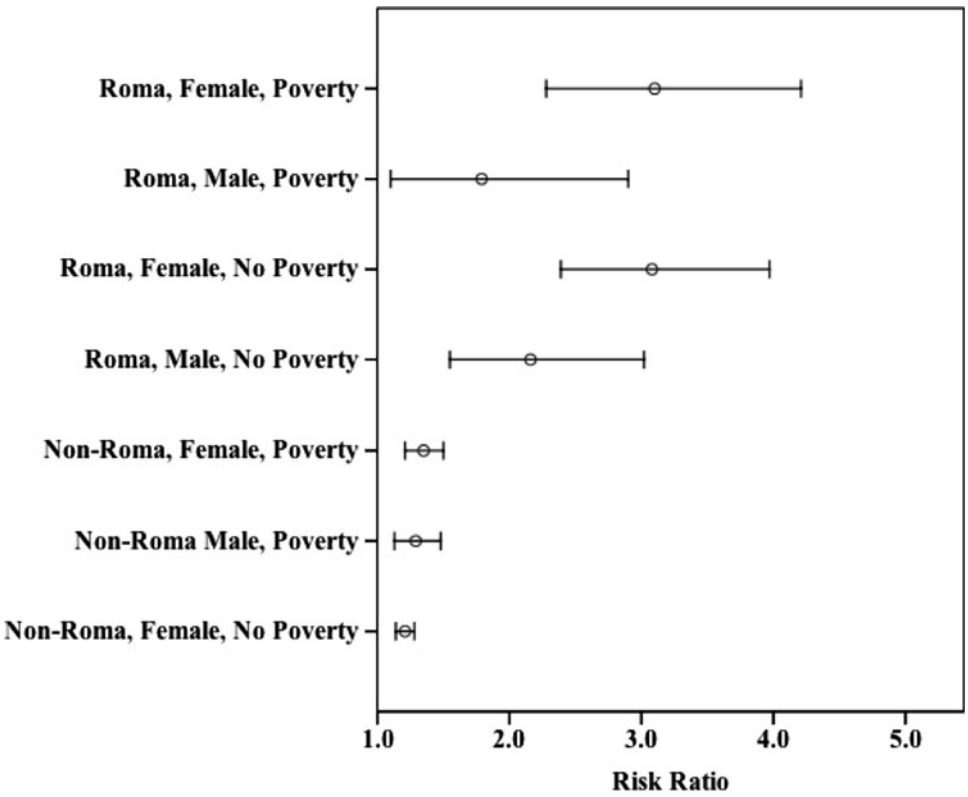

Fig. 2 Risk ratios (Reference group is non-Roma, male, no poverty; risk ratios are adjusted for age) for the intersection of Romani ethnicity, gender, and poverty in association with poor self-rated health, Serbia, 2007 ($n = 14{,}313$)

realms, including, childhood malnutrition (Janevic et al. 2010) and infectious disease (Dostal et al. 2010), infant mortality (UNICEF 2007; Rosicova et al. 2009), pregnancy outcomes (Bobak et al. 2005; Rambouskova et al. 2009), and cervical cancer screening rates (Todorova et al. 2009). In Serbia, one study found that mortality rates among Romani men and women were approximately one and a half and two times higher, respectively, than that of non-Roma (Bogdanovic et al. 2007). Given that self-reported health is a good predictor of mortality, trends in inequalities in self-rated health by Romani ethnicity may be a useful way to monitor health inequalities between and within countries in Eastern Europe.

Romani women in Serbia had the highest risk of poor self-rated health (Fig. 2). However, contrary to our hypothesis, Romani women were at the highest risk regardless of their poverty status. This finding does not negate the importance of alleviating poverty to improve the health of Romani women, but rather calls attention to the fact that as Romani women in Serbian society, Romani women experience health disadvantage regardless of their poverty status, and that in addition to anti-poverty measures, measures addressing ethnic and gender discrimination are called for.

This population-based study is the first to our knowledge to identify the increased burden of poor self-rated health faced by Romani women. In addition, this was the first study to examine the self-rated health of Roma in a non-European Union country in a post-conflict setting. We also used more detailed measures of socioeconomic position than some previous studies, such as household consumption. However, there are several limitations to consider. One concern is that different social groups may interpret the meaning of health differently, either due to cultural

differences or different expectations on what one's health should be (Agyemang et al. 2006; Burström and Fredlund 2001; Delpierre et al. 2009; Finch et al. 2002; McGee et al. 1999; Thomas et al. 2010). Any differences on the validity of self-rated health by Romani ethnicity, gender, or poverty status could have either lessened or increased our reported associations, but are not likely to have accounted entirely for these measures of inequalities. Additionally, differences in validity should not affect the measurement of trends in inequalities; the relative measures presented here can serve as benchmarks for monitoring inequalities moving forward.

In addition, since the LSMS survey did not include informal slum settlements, in which it is estimated live approximately half of Roma in Serbia, the results of this analysis are not generalizible to the entire population of Roma in Serbia. It is probable that the inequality in self-rated health would be even greater between Roma and non-Roma if the sample included the most endangered Roma living in settlements, the majority of which are slums with extremely poor living conditions (Jakšić and Bašić 2005). However, this sample had the analytic advantage that there was sufficient overlap in socioeconomic measures between Roma and non-Roma to examine their contribution to health inequalities.

Finally, it is thought that Roma sometimes do not report their ethnicity in surveys and censuses due to fear of discriminatory treatment and therefore, our study may have some misclassification bias (Kosa and Adany 2007; Rughiniş 2010). In this survey, the percent of persons who reported their ethnicity as Romani was only 1.9%, which is similar to the estimated population percentage of Roma in Serbia in the 2002 Census, but about half of the population percentage estimated by international organizations (UNDP 2004). The underestimate of the population percentage in the LSMS survey used here, and in the census data, is likely due to the under sampling of Romani settlements as well as underreporting of Romani ethnicity. Misclassification of Romani ethnicity could bias the reported associations in either direction, depending on the self-rated health of misclassified Roma. If healthier Roma with a higher level of education are more likely to be assimilated and therefore not report their ethnicity as Roma, the true percentage of Roma with poor health could be lower than we found in our analysis. On the other hand, if less healthy Roma with a lower level of education are more frightened to report their ethnicity as Roma, or less likely to be present in the sampling frame due to unstable residence, then the true percentage of Roma with poor health could be higher then reported here. Future research on the validity of self-reported Romani ethnicity is merited in order to better understand its use in public health research and planning.

In Serbia, Roma have more than twice the risk of poor self-rated health than non-Roma. This inequality is only partially explained by socioeconomic indicators. These findings call attention to the need for multi-sectoral interventions to improve the health of the Romani population, while at the same time investigating pathways that might influence Romani health independent of socioeconomic status, such as discrimination, access to health care, and neighborhood environment. We additionally found that Romani women are at the highest risk of poor self-rated health, regardless of their poverty status, in support of the hypothesis that structural gender and ethnic inequalities work together as a fundamental cause of ill health. Thus interventions to improve the health status of Romani women should address gender and ethnic inequalities simultaneously.

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