

Mortality of Roma Population in Serbia, 2002-2005

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Aim To describe and compare mortality and population changes in the Roma and non-Roma population in Serbia in 2002 and 2005.

Methods The number of cases of death were obtained from the 2002 and 2005 Mortality Database and population data from the Population Census 2002. Standardized sex specific rates of non-traumatic and traumatic mortality in 2002 and 2005 were calculated in relation to the European standard population. We presented population pyramid and aging index for both populations in 2002 and compared sex specific standardized traumatic and non-traumatic mortality rates and the average age of death for 2002 and 2005. The causes of death were coded according to the 10th revision of the International Classification of Diseases (ICD-10) groups, and the proportional mortalities in the year 2002 and 2005 were compared between the Roma and non-Roma population using χ^2 test.

Results Standardized mortality rates were higher in the Roma than in the general population. Non-traumatic mortality rate in Roma men in 2002 was 18.2 per 1000 and in slightly decreased to 18.0 per 1000 in 2005; it was significantly higher than in non-Roma men in both years (11.9 per 1000 in 2002 and 12.5 per 1000 in 2005; $P < 0.001$). Standardized non-traumatic mortality rate in Roma women decreased significantly from 16.78 per 1000 in 2002 to 14.89 per 1000 in 2005 ($P = 0.014$), but it was still significantly higher than in non-Roma women (8.46 per 1000 in 2002 and 8.84 per 1000 in 2005; $P < 0.001$). Morbidity structure indicated that the most common causes of death in the Roma population were cardiovascular diseases, neoplasms, and respiratory system diseases. In relation to the general population respiratory system diseases were denoted as main causes of deaths in significantly higher percent (6% vs 3% in 2002 and 7% vs 4% in 2005; $P < 0.001$) and cardiovascular diseases in significantly lower percent (44%:55% in 2002 and 46%:57%; $P < 0.001$).

Conclusions Our data show that mortality rates in the Roma population are significantly higher than in the general population, and morbidity structure of the most common causes of death significantly different from that of general population.

According to the most recent population census in the Serbia from 2002, 108 193 or 1.44% residents declared themselves as Romani. The Roma population is among the most imperiled and potentially most vulnerable groups. Living Standards Measurement Survey (LSMS) conducted in Serbia in 2002-2003 indicated significant differences in living conditions between the Roma and non-Roma population (1). The prevalence of poverty, defined as an average total consumption below the poverty line of 57 euros per month/consumption unit, in the Roma population was as high as 64.4%, which is 6.1 times more frequent than in the general population (10.5%) (1). Extremely low level of education and very high level of unemployment characterize the social status of the Romani people. Almost two thirds (62%) of the Roma older than 15 years did not finish primary school, as opposed to 19% of the general population (1). The unemployment rate is also high, reaching 45%, while in the rest of the Serbian population it amounts to 9% (1). Such findings are not unexpected since these characteristics are highly associated with poverty (1).

Although the range of vaccination coverage in Serbian general population is 98%-100%, many Roma children are not included in vaccination programs (2). Twenty nine percent of Roma children aged 18-29 months do not even have vaccination cards. Data regarding the education of Roma children are also discouraging: 62% of them attended pre-school programs one year prior to the first grade, as opposed to 89% children in the general population. Also, the vast majority (98%) of children of primary school age in general population attends school, while the attendance rate among Roma children is significantly lower (74%). The difference between the proportions of Roma children and children in general population who attend secondary schools is even more drastic (only 10% vs 85%).

During the last decade, several studies dealing with diverse problems of the Roma population have been conducted in South-Eastern Europe (3-10). Compared with the general populations in Eastern and Central Europe, life expectancy of the Roma population is 10-year shorter because of poor living conditions and poverty (11). A study conducted in the Czechoslovakia in 1989 compared census data and pointed out that life expectancy of the Roma men and women were 12.1 and 14.4 years, respectively, shorter than in the general population (12).

The aim of this study was to describe and compare mortality and population changes in the Roma and non-Roma population in Serbia in 2002 and 2005. We present population pyramid and aging index for both populations for the year 2002 and compared sex specific standardized traumatic and non-traumatic mortality rates and the average age of death for 2002 and 2005.

Methods

Population census data from 2002 and data from mortality database from 2002 and 2005 were received from the Serbian Office of Statistics. Causes of death were analyzed according to the 10th revision of the International Classification of Diseases (ICD-10) groups (13).

Descriptive statistics was used to present population pyramid of the Roma and non-Roma population in 5-year age categories (0 to 75+). The aging index was calculated as the number of persons of 60 years or over per hundred persons of 15 years.

We combined the mortality data for 2002 and 2005 with age-stratified counts of men and women in the Roma and general population from 2002 census, to calculate sex specific non-traumatic and traumatic standardized

death rates per 1000 residents, in relation to the European standard population.

Statistical analysis

To compare proportional mortalities and standardized mortality rates, χ^2 test was performed using Statcalc software from EpiInfo, version 6.0 (CDC, Washington DC, USA).

Mann-Whitney U test was used to compare average age of death values, using Statistical Package for the Social Sciences, version 10.0 (SPSS Inc, Chicago, IL, USA).

Results

Population pyramid of the general population in Serbia (Figure 1) indicated negative population growth in 2002, characterized by a low proportion of under-five children and a high proportion of the elderly. The age distribution of the Roma population was completely different. The proportion of children under-five in the Roma population was 11%, after which the percentage progressively decreased in subsequent age groups (Figure 1). The aging index was 18.86 for the Roma and 112.22 for non-Roma population (data not shown).

In 2002, sex specific standardized non-traumatic mortality rate in Roma men was significantly higher than in non-Roma men (18.22 vs 11.93 per 1000; $\chi^2 = 178.88$; $P < 0.001$). In

Table 1. Sex specific standardized non-traumatic mortality rates in Roma and non-Roma in 2002 and 2005 by sex

Year	No. of deaths	Age standardized death rate per 1000	<i>P</i> *
2002:			
male:			
Roma	402	18.22	<0.001
non-Roma	49436	11.93	
female:			
Roma	432	16.78	<0.001
non-Roma	48584	8.46	
2005:			
male:			
Roma	395	17.97	<0.001
non-Roma	51146	12.49	
female:			
Roma	377	14.89	<0.001
non-Roma	51044	8.84	

* χ^2 test.

2005, the rate in Roma men slightly decreased to 17.97 per 1000 and in non-Roma men it increased to 12.49 per 1000, but the difference remained significant ($\chi^2 = 129.31$; $P < 0.001$). Sex specific standardized non-traumatic mortality rate in Roma women decreased significantly from 16.78 per 1000 in 2002 to 14.89 per 1000 in 2005 ($\chi^2 = 6.10$; $P = 0.014$). In non-Roma women it was significantly lower: 8.46 per 1000 in 2002 ($\chi^2 = 431.63$; $P < 0.001$) and 8.84 per 1000 in 2005 ($\chi^2 = 218.54$, $P < 0.001$) (Table 1).

Sex specific standardized traumatic mortality rate was higher in Roma men than in non-Roma men in both analyzed years (Table 2), but not significantly (0.90 vs 0.72 per 1000 in 2002 and 0.84 vs 0.71 per 1000 in 2005). The

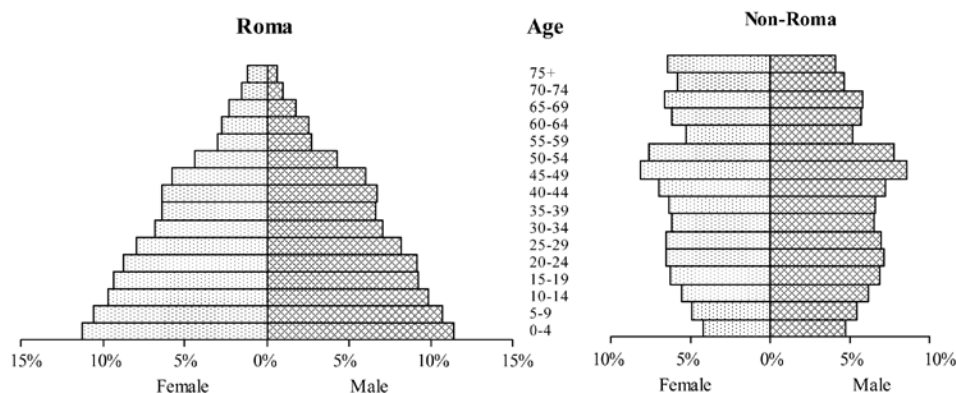


Figure 1. Age structure of Roma and non-Roma population in Serbia.

rate was also higher in Roma women in 2002 but not significantly (0.30 vs 0.22 per 1000). In 2005, the rate increased to 0.39 per 1000 and the difference in comparison with non-

Roma women (0.21 per 1000) became significant ($\chi^2 = 7.38$; $P < 0.01$) (Table 2).

Table 2. Sex specific standardized traumatic mortality rates in Roma and non-Roma in 2002 and 2005 by sex

Year	No. of deaths	Age standardized death rate per 1000	P*
2002:			
male:			
Roma	26	0.90	0.157
non-Roma	2842	0.72	
female:			
Roma	16	0.30	0.265
non-Roma	1047	0.22	
2005:			
male:			
Roma	26	0.84	0.270
non-Roma	2769	0.71	
female:			
Roma	12	0.39	0.006
non-Roma	1002	0.21	

* χ^2 test.

Table 3. Average age of death in Roma and non-Roma in 2002 and 2005 by sex

Year	Average age of death (mean \pm SD)	P*
2002:		
male:		
Roma	57.79 \pm 17.92	<0.001
non-Roma	67.89 \pm 14.83	
female:		
Roma	61.00 \pm 18.61	<0.001
non-Roma	72.99 \pm 13.44	
2005:		
male:		
Roma	56.83 \pm 18.66	<0.001
non-Roma	68.88 \pm 14.42	
female:		
Roma	61.97 \pm 19.48	<0.001
non-Roma	73.96 \pm 12.57	

*Mann-Whitney U test.

Mean age of death in Roma men decreased from 57.79 \pm 17.92 years to 56.83 \pm 18.66 years in 2005 and it was significantly lower than in non-Roma men; 10 years for 2002 and 12 years for 2005 (Table 3). Mean age of death of Roma women in 2002 was 61.00 \pm 18.61 years, and it increased to 61.97 \pm 19.48 years in 2005, but it remained 12 years lower than in non-Roma women (Table 3).

In 2002, the three most common causes of death in the Roma population were blood circulatory system diseases (44%), malignant diseases (20%), and respiratory system diseases (6%) (Table 4). In the general population, blood circulatory system diseases were present in a significantly higher proportion than in the Roma population (55%, $\chi^2 = 40.87$; $P < 0.001$). The respiratory system diseases, on the other hand, were present in 3% of the cases, which is significantly lower ($\chi^2 = 23.34$; $P < 0.001$) than in the Roma population. Differences between all other proportional mortalities were not significant. In 2005, frequencies of death causes and their relations between Roma and general population did not change decisively (Table 4).

In both analyzed years, symptoms, signs, and abnormal findings, rather than the con-

Table 4. Number of people who died and proportional mortality in 2002 and 2005 by the 10th Revision of the International Classification of Diseases (ICD-10) group

ICD-10 group*	No (%) of people who died in			
	2002		2005	
	Roma	non-Roma	Roma	non-Roma
I Infectious and parasitic diseases	3 (0.3)	537 (0.55)	14 (1.7)	532 (0.5)
II Neoplasms	177 (20.2)	18 628 (18.3)	175 (21.6)	19 941 (18.8)
IX Blood circulatory system diseases ($P < 0.001$)	390 (44.5)	56 364 (55.3) [†]	373 (46.1)	60 311 (56.9) [†]
X Respiratory system diseases ($P < 0.001$)	56 (6.4)	3473 (3.4) [†]	57 (7.0)	4199 (4.0) [†]
XI Digestive system diseases	23 (2.6)	2953 (2.9)	24 (3.0)	3556 (3.4)
XV Pregnancy, childbirth, and puerperium	–	1 (0.0)	–	10 (0.0)
XVI Conditions originating in perinatal period	12 (1.4)	484 (0.5)	7 (0.9)	346 (0.3)
XVII Congenital malformations	2 (0.2)	200 (0.2)	5 (0.6)	160 (0.2)
XVIII Symptoms, signs and abnormal findings ($P < 0.001$)	119 (13.6)	9636 (9.5) [†]	74 (9.1)	6479 (6.1) [†]
XIX Injuries and poisonings	42 (4.8)	3889 (3.8)	38 (4.7)	3771 (3.6)
Other	52 (5.9)	5744 (5.6)	43 (5.3)	6656 (6.3)
Total	876 (100.0)	101 909 (100.0)	810 (100.0)	105 961 (100.0)

*Roman numerals indicate ICD-10 group of diseases (13).

[†] $P < 0.001$ between Roma and non-Roma in the same year (χ^2 test).

ditions that caused them, were nominated as causes of deaths in significantly higher percentage of the Roma than non-Roma population: 14% vs 10% in 2002 ($\chi^2 = 17.24$; $P < 0.001$) and 9% vs 6% in 2005 ($\chi^2 = 12.74$; $P < 0.001$), but there was a positive tendency of a decrease in their frequency.

Discussion

Our study showed that the Roma population in Serbia was a vulnerable and imperiled minority. The age distribution of Roma population was visibly different from general Serbian population. In this "young" population, the proportion of children under-five was as much as 11%, the percentage which progressively decreased in each subsequent age group. This shape of population pyramid can partly be explained by high population growth of Roma population, but the influence of higher morbidity than in the rest of the Serbian population needs to be emphasized. The values of standardized mortality rates of non-traumatic causes among Roma women were twice higher than in non-Roma women, and in men these differences were only slightly lower. Especially concerning is that the Roma population had more than 10 years lower mean age of death than the general population. Such results are not unexpected since similar results have been obtained by other European studies in countries more economically developed than Serbia (11,12,14). Even a study in the USA obtained similar data on the influence of poverty on excessive mortality (15).

When we compared the proportional mortalities, significant differences were observed in the blood circulatory system diseases and respiratory system diseases group. Since the Roma population is a "young" population, having a lower proportion of circulatory system diseases caused death cases (46.1% vs 56.9%). On the other hand, they had twice as

high proportion of the respiratory system diseases caused deaths as non-Roma population (7.0% vs 4.0%).

The large percent of the Roma lives in overcrowded homes with more than 3 persons per room or less than 6 m² per person. Such living conditions are 13 times more frequent than in the general population (40% vs 3%). The basic infrastructure such as electricity, sewage, or water supply is not available for the large percent of the Roma. As much as 11% of households in the Roma settlements are unfit for living, in comparison to 1% of the general population. Only 87% of Roma households have electrical supply, as opposed to 99.9% of the general population; 61% have water supply, as opposed to 90% of the general population; and 32% have sewage, as opposed to 62% of the general population (1).

Such living conditions represent a substantial risk for the occurrence of infectious and respiratory system diseases.

A low percent of Roma children attended pre-school programs, primary, and secondary school (2), and therefore were not included in the compulsory medical examinations of pre-school and school children, which should determine growth and development disorders and the existence of illnesses.

Available data show that 40.2% of the Roma population had an accessible health care institution up to 1 km away from the settlement they live in, but they rarely used this convenience for different reasons (16). The study "United Nations Development Programme Vulnerable Groups Dataset" conducted in 10 countries in 2005 revealed that only 52% of Roma households had a family doctor, as opposed to 63% of households in the general population (17).

Traditional way of life is very important for the Roma people. Attitudes toward health are also a part of such a life-style. Among such attitudes is that only a bed-ridden person is a

sick person (18-20). Roma women start their biological reproduction very young, they do not use contraceptives, visit doctors in pregnancy, or visit the counseling offices for children. Due to poor living conditions, lack of health insurance, and low education, they usually turn to doctors in the later phases of illnesses, which is the reason why so many curable illnesses are not diagnosed and cured, but cause permanent consequences to health. The existing illnesses usually become chronic, which mostly brings premature death. Similar findings were described for Roma populations in other settings (21-25).

In the recent years, the problems of the Roma population have been given a place within the European integrations programs, since handling the needs of imperiled communities is considered very important for maintaining cohesion of the society. Social involvement of Roma is incorporated into the Millennium Development Goals (16).

We faced several limitations and biases in our research. Many members of the Roma population do not have legal documents and it is likely that they are not registered by population censuses. Also, it is possible that some of them, to avoid stigmatization, did not declare themselves or their deceased family members as Romani to census takers or death certificate issuing officials. All of this could bias the research and underestimate the size of the Roma population in the Serbia. Despite limitations, this research gives valuable insight into the main morbidity and health problems of the Roma population in Serbia and the foundation for future research.

Among many initiatives, we should point out "A Decade of Roma Inclusion 2005-2015." It represents an unprecedented political commitment by governments in Central and Southeastern Europe to improve the socio-economic status and foster social inclusion of Roma within a regional framework.

The 9 countries taking part in the Decade are Bulgaria, Croatia, The Czech Republic, Hungary, Macedonia, Montenegro, Romania, Serbia, and Slovakia. Each country participating in the Decade has developed a national Decade Action Plan that specifies the goals and indicators in the priority areas. The Decade is an international initiative that brings together governments, intergovernmental, and non-governmental organizations, as well as the Romani civil society, to accelerate progress toward improving life conditions of the Roma and to review such progress in a transparent and quantifiable way. The Decade focuses on the priority areas of education, employment, health, and housing, and commits governments to take into account the other core issues of poverty, discrimination, and gender mainstreaming. Our results could contribute to defining relevant measures and activities for Roma health status improvement. Also, further analysis of Roma mortality could be a useful way of measuring the progress made in the Decade implementation.

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