ORIGINAL RESEARCH

Mortality, Health Status and Self-Perception of Health in Slovak Roma Communities

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Abstract

The impact of specific living conditions on the population of geographically and socially segregated Roma settlements in Eastern Slovakia is considerable. They are characterized by high unemployment, lower education, poor housing and sanitary conditions, a poor quality of life, which all affects significantly their higher mortality rates and worse health status. In this paper we try to approach the problem of adverse mortality conditions and health with a deeper demographic insight. The fundamental goal of the paper is to analyse mortality in the population from Roma settlements over the past two decades using complex demographic methods such as life tables, direct standardization with the objective of eliminating differences in the age structure, single and multi-dimensional decomposition of age, sex and causes of death. We also analyse mortality using the concept of avoidable mortality. The results obtained from Roma settlements confirmed significantly worse mortality rates for both sexes. In addition, it appears that the disparities between them and the majority population are growing over time. The primary reason is the higher mortality of the youngest children and persons at post-reproductive age. Basically, all main chapters of the causes of death shorten the life expectancy of persons from Roma settlements, but cardiovascular diseases have the greatest negative impact. Conclusions obtained from the avoidable mortality analysis point to problems related to the accessibility and quality of health care, as well as the lack of interest of population from Roma settlements in their own health, along with the need for more targeted prevention and screening campaigns in this environment. Although the answers of respondents from Roma settlements to their own health confirm the deteriorating quality of health, increasing morbidity and the degree of restriction of normal daily activities with increasing age, they also point to some problems associated with the use of this approach.

Keywords Mortality · Cause of death · Health status · Roma settlements · Slovakia

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1 Introduction

The number and share of Roma population are rising in Slovakia (Vaňo 2002; Šprocha 2014) together with stagnating or rising social inequalities, especially in connection with segregated Roma settlements (Džambazovič and Jurásková 2003; Vašečka and Radičová 2001; Radičová 2003). The environment of a segregated Roma settlement is very specific, not only in Slovakia, and in many ways it is an enclosure that represents a typical no-go area for the majority (Ringold 2000). The various dimensions of social exclusion (see e.g. Džambazovič and Jurásková 2003; Ringold et al. 2005) which we can identify in the communities living in this area also represent an influential complex of determinants of poor health and mortality rates (European Commission 2014; Kolarcik 2012; Kosa and Adany 2007; Kosa et al. 2007; Mihailov 2012; Popper et al. 2009). They include a very low level of education, a very high level of unemployment and long-term exclusion from the labour market, an associated very low standard of living, considerable dependence on social transfers, disastrous living conditions and a degraded environmental quality (Mušinka 2003; Filadelfiová et al. 2007; Filadelfiová and Škobla 2012; Filadelfiová 2013a, b). It is not in the power of these persons to escape this multiple exclusion (Vašečka and Radičová 2001; Radičová 2003). In fact, it is precisely the different socio-economic factors and inequality that are among the key mechanisms in explaining the differences in mortality, health status, and epidemiological situation (Kawachi et al. 1997; Marmot 2005; Materia et al. 2005; Mackenbach et al. 1997, 2008; Olson et al. 2010). People who live in worse living conditions have worse health, a higher incidence of various health problems and a shorter life span (Ansari et al. 2003; Mackenbach 2006; Shkolnikov et al. 2006). Moreover, the impact of ethnicity and race is often pointed out (Nazroo 2003; Nazroo et al. 2007; Voko et al. 2009; Rosicova et al. 2011). The significantly shorter life span and bad health status are linked in particular to Roma population and especially persons living in segregated Roma settlements (McKee 1997; Nesvadbova et al. 2000; Ginter et al. 2001; Koupilová et al. 2001; Šaško 2003; Bogdanović et al. 2007; Fundación Secretariado Gitano 2009; Madarasova Geckova et al. 2014; Masseria et al. 2010). As regards research on health and mortality, the population of Roma settlements represents an exceptionally interesting yet little-known subject (Cook et al. 2013; Hajioff and McKee 2000). The concept of avoidable mortality is used in the study. According to Newey et al. (2004), there are three major groups in terms of avoidable mortality: treatable diseases, preventable diseases and ischemic heart disease. Based on the 2019 OECD/Eurostat definitions, preventable mortality is defined as causes of death that can be mainly avoided through effective public health and primary prevention interventions (i.e. before the onset of diseases/injuries, to reduce incidence) (OECD 2019).

In the study, we try to answer following research questions: *What are the level, development and nature of the mortality process in Roma settlements compared to the population of communes without Roma communities in Slovakia? How do some internal factors (sex, age, causes of death) contribute to the worse mortality rates of people from Roma settlements? How does avoidable mortality and its three main groups of causes of death contribute to the shorter life expectancy of people from Roma settlements?* In addition, we will try to analyse the structure of answers of respondents from Roma settlements to questions concerning their own health status through two sample surveys. As the respondents answered the same or very similar wording of the questions as used in the EU-SILC surveys, we confronted the obtained results with data representing the entire population of Slovakia.

2 Roma Communities from the Viewpoint of Social Determinants of Health and Ethnicity Related Health Paradoxes

The social and economic factors are extremely powerful predictors of mortality condition and health status (Ansari et al. 2003). According to several researchers (Mackenbach et al. 2008; Materia et al. 2005; Olson et al. 2010 etc.), socio-economic factors and inequality play a crucial role in explaining differences in the mortality, health status and epidemiological situation. As Marmot et al. (2010) state, it is a well-established fact that persons living in poor living conditions are characterized by higher mortality and poorer health. A large number of theoretical models have been developed to explain the links between social determinants, health and mortality (e.g. Dahlgren and Whitehead 1991; Commission on Social Determinants of Health 2007; Valkonen 2001).

The issues of classifying the determinants, their mutual overlap, action, intensity of influence and mechanisms of effect on human health are extremely complicated and broad. The WHO quite aptly defines the social determinants of health as follows: *The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at the global, national and local levels.* The WHO enumerates as many as 9 basic groups of factors that fall under the given term. In the conditions of segregated Roma communities in Slovakia, the essential role out of these nine groups is played notably by employment conditions, social exclusion, early child development, urbanization, and public health programmes. All these factors are interconnected and simultaneously overlapped to a certain degree.

Employment, income and the achieved level of education are some of the key social factors in health quality and mortality (Graham 2004). In general, persons with higher education, better positions in the labor market, and higher incomes have been shown to have better health and lower mortality (e.g. Gallo et al. 2012; Dowd et al. 2011; Roelsf et al. 2011). The study of the impact of material deprivation focuses mainly on household equipment, income and overall levels of poverty, mostly in the form of case studies, often for selected local communities (Santana 2002; Zimmerman and Bell 2006). Gatrell et al. (2001) argue that material conditions and deprivation are often more important than social capital.

In the case of the environment of Roma settlements we examined, the great significance of these predictors is underlined by high unemployment (more than 80%), considerable dependence on various types of social transfers and benefites from the state, as well as very low educational attainment (Filadelfiová and Škobla 2012; Filadelfiová 2013a, b). Moreover, Roma settlements are located in marginalized, primarily rural, regions of Slovakia with an underperforming economy and thus a weakened local labour market, which further worsens and complicates the situation.

The determinants that generally affect health do not only have a direct social background. Gatrell and Elliot (2009) also cite behavioral (lifestyle) factors, social and community influences, and local environments as very important. According to the research of Muennig et al. (2009), limited interventions of adults towards children and reduction of their risky behavior (e.g. smoking of tobacco products, alcohol consumption at a very young age, etc.) are very momentous in the context of health status as well.

From the point of view of local environments, several authors (Mušinka 2003; Rapant et al. 2015; Filčák et al. 2018) point to the fact that segregated Roma settlements in Slovakia are characterized by low quality housing, often without or—at most—with insufficient public utilities (toilets, sewerage, water supply, electricity, gas and so on). This is logically

connected with a problematic access to clean drinking water. In addition, Roma settlements are often situated in areas characterized by a deteriorating environmental quality (e.g. high dustiness, particulate emissions, etc.).

A specific issue discussed in relation to the health of ethnic minorities is their discrimination (e.g. Trivedi and Ayanian 2006; Schpero et al. 2017). Although some older reports from Slovakia (Šaško 2003; Zoon 2001) accent racially motivated discrimination in access to health care, it should be also noted that all citizens of the country have health insurance and the vast majority of examinations or medical interventions are covered by this insurance.

Ethnic-related studies can generally be divided into those dealing with health care (services) disparities and those dealing with health outcomes disparities. We have outlined some studies on health care above, but we pay more attention to health outcomes in this study. Of course, the two categories are interconnected and often worse health outcomes are the result of worse health services. The discussion on ethnicity-related issues has a wide background, it is also largely connected with community well-being and quality of life (Murgaš and Klobučník 2017). Some studies have addressed the impact of urban–rural dichotomy, with presented results suggesting that rural communities are worse off in their health (James et al. 2017; Henley et al. 2017). The investigated communities in Slovakia are unequivocally typical, literally model rural communities in terms of the degree of urbanization.

The recent study by Kahan et al. (2020) prove a lower rate of future care planning with African Americans, but decomposition shows that—for example—better educated African Americans do not differ from the majority. However, self-care planning and actual implementation, preparation for self-care are two different things. Research, particularly in the USA, suggests differences in, for instance, insurance coverage and quality of care (McBean and Gornick 1994; Rodolfo and Anderson 2004).

The subject of minority health is alive in Europe too, especially in West European literature, being probably the most frequent in the UK (Wohland et al. 2001). Some of works focus on the Roma (Parry et al. 2004). Roma also come from Eastern Europe; the analysed area of Eastern Slovakia is one of their source territories. It turns out that the group of chronic diseases plays an important role in ethnic differences (Egede 2006), which is one of the reasons why we pay attention to it in the empirical part. Some studies deal with a geographically broader area, covering most European countries as well as ethnic migrants (e.g. Bhopal 2009; Rafnsson and Bhopal 2009; Rechel et al. 2012). Single studies and comparatively oriented studies by authors directly from Eastern European countries focused on ethnic inequalities in these countries are scarcer. Most of them concentrate on the Roma ethnic group, which is understandable given the existing socio-economic and cultural disparities (Joubert 1991; Ostrihoňová and Bérešová 2010).

3 Data and Methods

As the fundamental objective of the study is an analysis of mortality and causes of worse mortality rates and health status in Roma settlements, the key step for its fulfilment was the identification of the target population. Detailed sociological mappings of Roma communities in Slovakia were carried out in 2003–2004, 2012–2013 and 2018, and obtained information on the number of persons living in settlements became the basis for its identification. Based on this, we selected 48 communes, mostly located in

Eastern and Central Slovakia, in which the persons living in Roma settlements represent a distinct majority (over 70%).

According to data from the end of 2018 (as of December 31), almost 59 thousand inhabitants lived in selected Roma communes. For the purposes of the study, we will refer to the population group defined in this way as Roma settlements. In order to compare the level, development, character and some internal differences in the mortality process, a benchmark population will be formed by a set of more than 2100 communes (on the whole, 2890 communes exist in Slovakia at present), in which no Roma communities were identified according to the above-mentioned sociological mappings. At the end of 2018 (December 31), more than 2.3 million persons lived in the latter. For the purposes of our contribution, the population group defined in this way will be referred to as communes without Roma communities.

The basic source of data for our analysis became the anonymized primary database on mortality data, marked OBYV 3–12 (Medical Report and Statistical Report on Death) and available for the 2000–2018 period. This is an exhaustive survey gathering selected information on all deceased persons in the territory of the country annually by the Statistical Office of the Slovak Republic. In total, more than 5.3 thousand records of deaths in Roma settlements and almost 500 thousand in communes without Roma communities were analyzed. From this database we used data concerning the year of death, permanent residence, age, gender and cause of death. Due to a relatively small number of events (deaths) in Roma settlements, we decided to work with 5-year moving averages.

Life tables provide the most complete statistical description of mortality (Pressat 1972). In our paper we construct an abridged period life table with data on age-specific death rates based on a method suggested by Fergany (1971). The age-specific death rate (m_x) can be expressed by the following relationship:

$$m_x^{p,sex} = \frac{D_x^{p,sex}}{P_x^{p,sex}} \tag{1}$$

where, $m_x^{p,sex}$ is age-specific death rate for population (p)—in our case Roma settlements or communes without Roma communities, selected sex (males or females) in completed age interval (x),

$D_x^{p,sex}$ is the number of deaths in population (p), selected sex aged (x),

$P_x^{p,sex}$ is the number of persons in population (p), selected sex aged (x).

In the following step, the age-specific death rate was converted into the probability of dying (q_x) using a simple formula:

$$q_x^{p,sex} = 1 - e^{-n \bullet m_x^{p,sex}} \tag{2}$$

where, (e) is the symbol for the base number of a natural log and (n) is the length of the age interval.

Let the radix of the life table (l_0) be 100,000 individuals. This function represents number of newborns in the life table. The remaining functions were easily calculated using the following relationships:

The number of persons in population (p) who die in the age interval *(x, x+n):*

$$d_x^{p,sex} = q_x^{p,sex} \bullet l_x^{p,sex} \tag{3}$$

The number surviving to the beginning of the age interval (x):

$$l_x^{p,sex} = l_{x-n}^{p,sex} - d_{x-n}^{p,sex} \tag{4}$$

Person-years of life in the age interval (x):

$$L_x^{p,sex} = \frac{d_x^{p,sex}}{m_x^{p,sex}} \tag{5}$$

Total person-years of life contributed after attaining age (x)—the last age interval was chosen as an open age category 85+ years:

$$T_x^{p,sex} = \sum_{x}^{85+} L_x^{p,sex} \tag{6}$$

Life expectancy or average number of years of life remaining for a person alive at the beginning of the age interval (x):

$$e_x^{p,sex} = \frac{T_x^{p,sex}}{l_x^{p,sex}} \tag{7}$$

We analysed the age-structural character of probabilities of death and tried to explain the resulting differences in life expectancy at birth first through one-dimensional decomposition (methodology by Pollard 1988).

In terms of the above-mentioned functions of life tables, the difference between life expectancy at birth between Roma settlements ("Roma") and the group of communes without Roma communities ("Without") is expressed as follows:

$$\Delta e_0 = e_0^{Roma} - e_0^{Without} = \sum_{x=0}^{85+} \left(m_x^{Roma} - m_x^{Without} \right) . w_x^p \tag{8}$$

where w_x^p represents the weight constructed by the following relations:

$$w_x^p = \frac{n}{2}(w_x + w_{x+n}) \tag{9}$$

$$w_x = \frac{1}{2}(l_x^{Roma} e_x^{Without} + l_x^{Without} e_x^{Roma}) \tag{10}$$

For the open age interval 85+, the weight is calculated as follows:

$$w_{85+} = \frac{l_{85+}^{Roma}}{l_0^{Roma}} \left(\frac{T_{85+}^{Roma}}{l_{85+}^{Without}} - \frac{T_{85+}^{Without}}{l_{85+}^{Roma}} \right) \tag{11}$$

As is generally known, the numbers of deaths per 100,000 inhabitants are influenced by the age distribution of population. As there are large differences in the age structure between the Roma settlements and the group of communes without Roma communities, this aspect had to be taken into account in further work. In order to compare levels of mortality by the major causes of death, age-standardized death rates had also been compiled. Whereas we had data on age-specific death rates by cause of death and sex, it was possible to use the method of direct standardization. New European standard 2013 was chosen as the standard population. Age-standardized mortality rates eliminate differences in the age distribution of population by applying the observed age-specific mortality rates for each

population to a standard population. The basis of this construction is the multiplication of known age-specific mortality rates by sex and cause of death by the standard population. In this way, we get the number of deaths, assuming the real mortality rate of population and the same (standard) age structure. The calculation of standardized mortality rate $smr_c^{p,sex}$ in population (p), for the cause of death (c) was performed by the following equation:

$$smr_c^{p,sex} = \sum m_x^{p,sex,c} \bullet \frac{P_x^{st}}{P^{st}} \tag{12}$$

where, P_x^{st} is the number of persons of the standard population aged (x),

$m_x^{p,sex,c}$ is the age-specific mortality rate in population (p) by sex and cause of death (c).

Further, we focused on the impact of individual main causes of death and decomposed their effect together with information on age and sex using a multi-dimensional decomposition technique (methodology from the study Arriaga 1984). The effects of individual causes of death on the difference in life expectancy between the Roma settlements and the group of communes without Roma communities could be expressed for age (x) and cause of death (c) by the following equation:

$$\Delta e_x^c = \left[\frac{l_x^{Roma}}{l_0^{Roma}} \cdot \left(\frac{L_x^{Without}}{l_x^{Without}} - \frac{L_x^{Roma}}{l_x^{Roma}} \right) + \frac{T_{x+n}^{Without}}{l_0^{Roma}} \cdot \left(\frac{l_x^{Roma}}{l_x^{Without}} - \frac{l_{x+n}^{Roma}}{l_{x+n}^{Without}} \right) \right] \bullet \left(\frac{m_x^{c,Roma} - m_x^{c,Without}}{\sum_c m_x^{c,Roma} - m_x^{c,Without}} \right) \tag{13}$$

The selection of causes of death for the lists of preventable and treatable causes of mortality was made by the revision of avoidable mortality by Nolte and McKee (2004).

In the last part we focused on the issue of how respondents of Roma settlements in Slovakia reflect on the quality of their health in field surveys through a block of questions generally used for this purpose. First survey was entitled Health and the Roma Community, Analysis of the Situation in Europe (further referred to as Health… 2009), and funded by the European Union and promoted by the Fundación Secretariado Gitano. The reference population, as well as the sample are constructed on the basis of data from the sociographic mapping of Roma communities made in 2004 (see above). The main stratification criteria were: the place of residence (NUTS-III) and the share of Roma in a given municipality. Subsequently, communes meeting the selected stratification criteria and the proportional number of dwellings that were examined in the survey were selected by random selection. A personal door-to-door survey obtained responses from 657 Roma households and 3760 individuals.

The Report on the Living Conditions of Roma Households in Slovakia (further referred to as UNDP 2011), was conducted under the management of the United Nations Development Programme (UNDP). Like the previous survey, this was also based on the results of the sociographic mapping of Roma communities in the country in 2004. The method of data collection in it made it possible to identify specific Roma communities that became the reference population for the survey. The essential stratification criterion was the degree of segregation of a community by the majority (non-Roma) population. For each of the three groups (segregated, separated, and diffused one), 240 Roma households were selected by a random proportionate selection. In this way, a total of 723 households with 3511 persons were examined.

The wording of the questions used for our purposes was very similar to the one used in the Minimum European Health Module (MEHM) in the EU-SILC survey. Respondents were asked to evaluate their own health, the presence of chronic or long-term diseases and the level of limitation of their daily activities.

In the Health… (2009) survey, the following three questions were used:

(1)　How would you assess your health status for the last 12 months? (very good, good, average, bad, very bad),
(2)　Do you suffer from a disability (e.g. sight, hearing or other physical disability) or chronic illness (e.g. high blood pressure, diabetes, cancer or other)? If yes, please specify.
(3)　Can you tell whether you have recently suffered from a medical problem causing you difficulties in daily activities (walking outside, dressing, personal hygiene, feeding, etc.).

(no difficulty, moderate difficulty, serious difficulty, very serious difficulty or inability). The UNDP (2011) survey asked the respondents these three questions:

(1)　How is his/her health in general? (very bad, bad, fair, good, very good),
(2)　(2) Does s/he have any longstanding illness or health problem? (yes, no),
(3)　(3) For the last 6 months, has [name] been limited in daily activities people usually do because of a health problem? (yes strongly limited, yes limited, not limited).

4 Mortality in Roma Settlements and Some Aspects of Residents' Shorter Life

The Roma population in Slovakia has long been characterized by significant unfavourable mortality rates. According to estimates from the 1970s (Kalibová 1993), life expectancy at birth for Roma men was slightly more than 55 years and for Roma women it was 59.5 years. Compared to the overall population of Slovakia it was 11 years shorter for men and 14 years shorter for women. A deeper analysis of the mortality process also confirmed a lagging behind in all age groups, while the largest differences existed in the youngest age group and in the first half of the reproductive period. It also showed that male excess mortality in the Roma population was not so significant. The risk of death among Roma children was approximately 2–3 times higher and in the 1960s the infant mortality rate was still more than 60‰. In the second half of the 1980s, it was reduced to about 30‰ (Finková 1988).

In the past 20 years, life expectancy at birth has definitively shown markedly worse mortality rates in selected Roma settlements. Moreover, as obvious from Fig. 1, the difference between Roma settlements and the group of communes without Roma communities in Slovakia has deepened over time. In the early twenty-first century, the value of male life expectancy at birth in Roma settlements was lower by approximately 3 years, and in the most recent period it was already approximately 4 years. With women, this situation is even worse; moreover, a more dynamic deepening of these disparities has occurred. From the initial 3.5 years, female life expectancy at birth in Roma settlements is currently shorter by almost 6 years.

However, from the development aspect, certain improvements in mortality rates have occurred among the population living in Roma settlements. With men this trend took place slightly faster (growth by 3 years in comparison to less than a year in the case of women). As a result, we witnessed a decrease in male over-mortality (from 7.5 to 5 years).
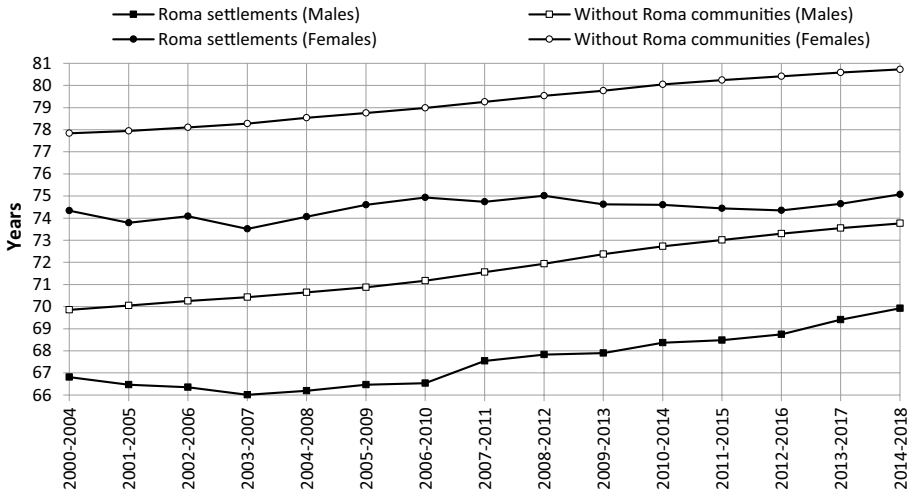
Fig. 1 Life expectancy at birth for males and females in Roma settlements and communes without Roma communities in Slovakia. *Source* SO SR, authors' calculations

Contributions of age groups to the differences in life expectancy (Fig. 2) at birth for males and females living in Roma settlements and in the communes without Roma communities in Slovakia show two principal facts. The first is still the considerable influence of infant mortality in generally worse mortality conditions in Roma settlements. With men, the higher mortality of the youngest children cuts the life expectancy by over 0.4 year (11% of the difference) and with women it is by almost 0.9 year (over 15%). The infant mortality in Roma settlements in the observed period was at the level of 13–18‰ (with a slightly decreasing trend), while in the group of communes without Roma communities it dropped

Fig. 2 Contribution to the difference in life expectancy at birth between Roma settlements and communes without Roma communities in Slovakia, 2014–2018. *Source* SO SR, authors' calculations
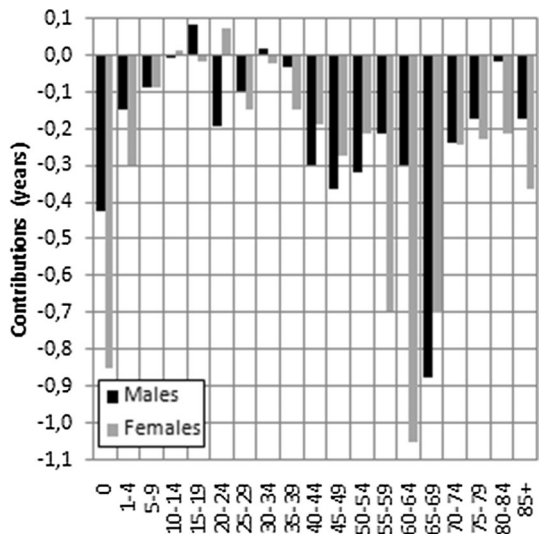
from over 7‰ under 5‰. It is evident that infant mortality in Roma settlements is still 2–3 times higher.

In the case of older children and particularly younger persons in the productive age, the differences between the population in Roma settlements and the group of communes without Roma communities are minimal. In certain age groups, the decomposition even showed better mortality conditions for selected Roma settlements. However, these results may be affected by a low number of deceased persons in this age and are thus distorted by the small data sample. The unfavourable level of mortality at the end of and shortly after the reproduction age (40–54), as well as at the end of the productive and younger senior ages (60–74) is definitely the key factor of worse mortality rates of men in Roma settlements. In the first above-mentioned group, higher mortality shortens the life of men in Roma settlements by almost 1 year (approximately a quarter of the difference) and, in the second group, it is by over 1.4 years (37%). With women, the main cause of shorter life expectancy at birth is hidden particularly in worse mortality rates between the ages of 55 and 69. They shorten it by over 2.4 years (43%).

The analysis of causes of death is highly relevant in connection with the process of mortality and health status. The level of standardised mortality rates due to cardiovascular diseases (Figs. 3, 4, 5, 6) confirms the high relevance to the generally higher mortality of males and females in Roma settlements. Although certain improvements have occurred in the case of both sexes, differences in comparison with the group of communes without Roma communities in Slovakia remain relatively distinctive and, in the case of women, they have even been deepening over recent years. We can also observe this phenomenon in the case of cancer and respiratory system diseases.

As indicated by the standardized mortality rates, the main causes of the overall shorter life of individuals from Roma settlements in Slovakia are the unfavourable mortality conditions due to cardiovascular diseases. This group of causes of death accounts for the shortening of the life expectancy at birth for men by approximately 35% (− 1.3 years) and for women by 37% (− 37%). Another one-fifth of men (− 0.8 years) and women (− 1.3 years) can be explained by worse mortality rates due to cancer. In both cases, the main cause of worse mortality rates of Roma settlements is concentrated in the older productive and

Fig. 3 Age-standardised mortality rates by cause of death for men from Roma settlements (New European Standard 2013). *Source* SO SR, authors' calculations
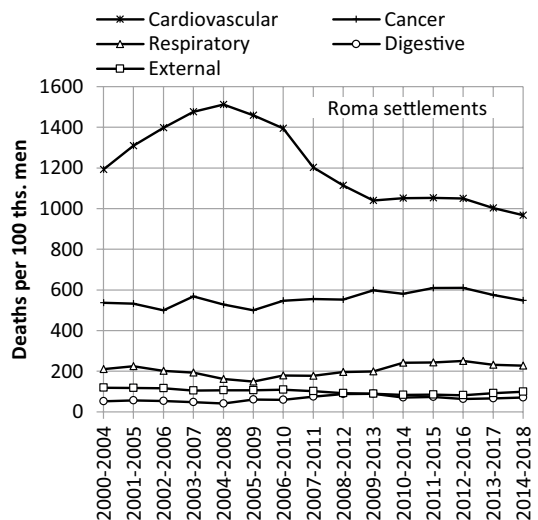
Fig. 4 Age-standardised mortality rates by cause of death for men from communes without Roma communities (New European Standard 2013). *Source* SO SR, authors' calculations
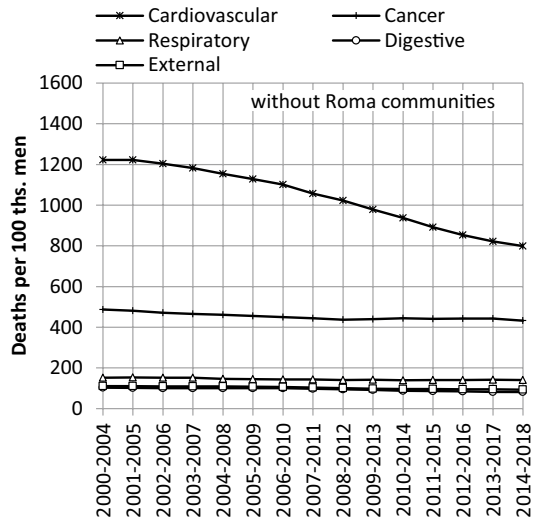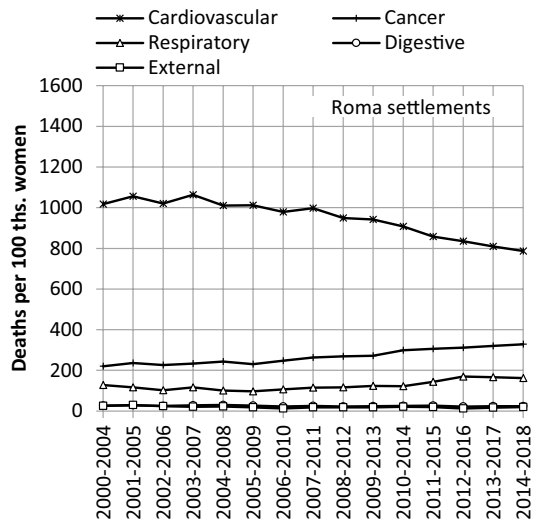

Fig. 5 Age-standardised mortality rates by cause of death for women from Roma settlements (New European Standard 2013). *Source* SO SR, authors' calculations

younger senior ages. The rest group of "other" causes of death is also of great importance, with men approximately 25% (− 1 year) and 22% with women (− 1.2 years) of the overall difference in life expectancy.

Higher mortality due to respiratory system diseases, which cut the value of life expectancy at birth with men by 15% (-0.6 year) and almost by 21% (− 1.2 years) with women, is also a significant cause of the shorter life of persons from Roma settlements. A more detailed distribution of contributions to the differences in life expectancy at birth according to the five major groups of causes of death, sex and age is presented in Figs. 7 and 8.

The analyzed main groups of causes of death provide only indirect information on the state of health and, in addition, give only a rough idea. The analysis of avoidable mortality points to unfavourable mortality rates in Roma settlements (Figs. 9, 10). It is evident in all three categories that standardised mortality rates were higher among men and women living in Roma

Fig. 6 Age-standardised mortality rates by cause of death for women from communes without Roma communities (New European Standard 2013). *Source* SO SR, authors' calculations
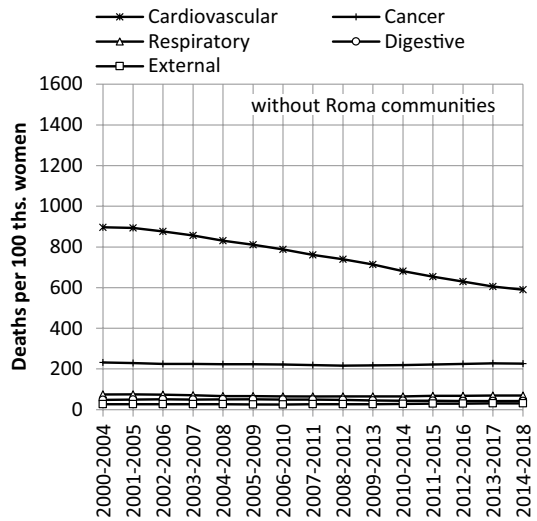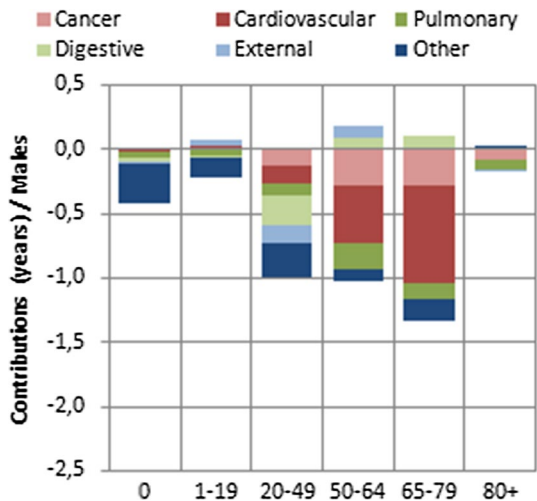

Fig. 7 Contributions to the differences in male life expectancy at birth between Roma settlements and communes without Roma communities in Slovakia by age and the five major groups of death, period 2014–2018 *Source* SO SR, authors' calculations

settlements during the entire observed period. From the development aspect, only a slight decrease was recorded in avoidable mortality. It was more intensive among men, because we noted a certain deterioration of the situation among women in the group of treatable diseases and ischemic heart diseases, particularly in recent years. These results indirectly indicate the problems related to the accessibility and quality of healthcare in regions inhabited by populations from Roma settlements, as well as a certain lack of interest of these persons in their own health status.

Fig. 8 Contributions to the differences in female life expectancy at birth between Roma settlements and communes without Roma communities in Slovakia by age and the five major groups of death, period 2014–2018. *Source* SO SR, authors' calculations
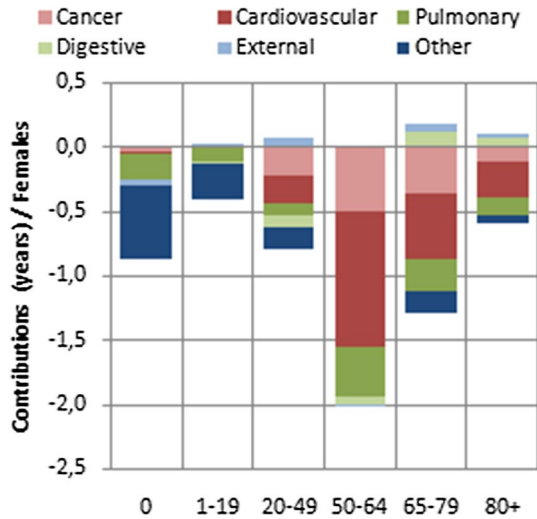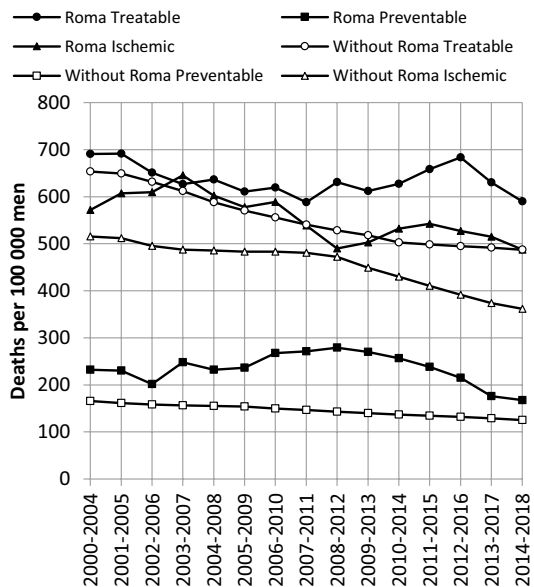
Fig. 9 Age-standardised mortality rates for treatable, preventable and ischemic heart diseases for men from Roma settlements and communes without Roma communities (persons aged less than 75 years, New European Standard 2013). *Source* SO SR, authors' calculations

5 Perception of Health Status Among Inhabitants of Roma Settlements

The health of Roma is generally assessed very negatively (e.g. McKee 1997; Nesvadbová et al. 2000; Popper et al. 2009; Mihailov 2012). Most studies focus on partial issues (e.g. infectious, congenital, cardiovascular diseases, metabolic syndrome), and there are often various medical, anthropological, or biological studies conducted on small samples of respondents or patients from the Roma population. As regards certain differences in the construction of sample surveys in this environment, we will only indicate some differences in comparison with the entire population of Slovakia. As a

Fig. 10 Age-standardised mortality rates for treatable, preventable and ischemic heart diseases for women from Roma settlements and communes without Roma communities (persons aged less than 75 years, New European Standard 2013). *Source* SO SR, authors' calculations
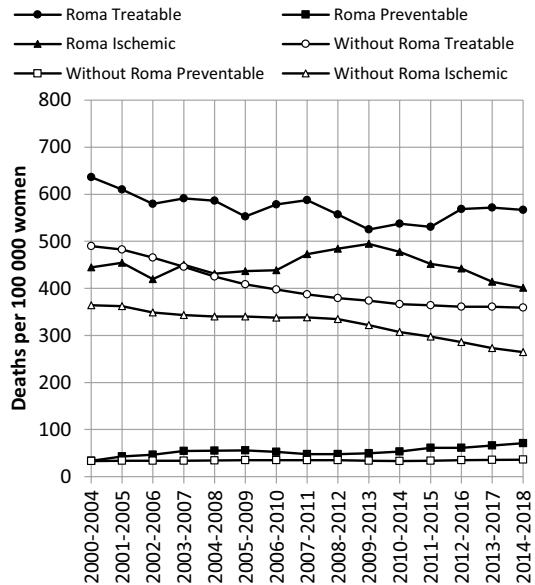
result, it should be noted that these findings cannot be overestimated or generalized for the entire Roma population in Slovakia. They rather serve as a case study of the problematic use of this methodological concept in finding information on health in a specific environment of Roma settlements.

The first sample survey (Health… 2009) generally pointed out the fact that Roma individuals evaluated their health quite favourably compared to the whole population of Slovakia. However, in the UNDP (2011) survey we can find an inclination to answers which suggest a worse quality of health (Table 1). This conclusion can be applied only to younger persons in the reproductive age, while with older persons we again identified a better perception of their own health status.

To a certain extent, controversial results also arose from the survey of the presence of long-term diseases (Table 2). In the Health… (2009) survey, the respondents from Roma settlements reflected the presence more frequently than in the case of the total population of Slovakia. However, according to the UDNP (2011) survey, persons from selected Roma settlements responded to the above-mentioned question negatively to a greater extent. We can find some explanation for these distortions in the wording of the question. While in the second survey the respondents were confronted with questions of essentially the same wording as in the EU-SILC 2011, in the Health… (2009) survey examples of chronic diseases were conclusively presented. We believe that the realization and thus also correct understanding of the subject of this question in a specific environment of Roma settlements could contribute to the detected differences.

6 Discussion

Analysis of the intensity and nature of mortality in Roma settlements clearly confirms the significantly worse mortality rates in virtually all age groups. The most serious impact on shorter life expectancy at birth is the higher probability of infant mortality and mortality

Table 1 The subjective perception of the quality of own health. *Source* Health… (2009), UNDP (2011), SO SR EU-SILC (2009 and 2011)

Age group	Very good and good	Average/fair	Bad and very bad	Very good and good	Average/fair	Bad and very bad
Males						
Health…2009				*EU-SILC 2009*		
16–29	93.4	5.9	0.7	92.9	4.9	2.2
30–49	82.1	16.3	1.6	77.0	17.6	5.4
50+	50.9	32.2	16.8	33.5	37.7	28.8
All 16+	80.1	15.5	4.4	66.9	20.6	12.5
UNDP 2011				*EU-SILC 2011*		
16–29	83.5	12.2	4.3	94.0	4.4	1.6
30–49	65.2	25.5	9.3	79.5	15.9	4.6
50+	47.7	32.7	19.6	37.5	38.9	23.6
All 16+	70.2	21.0	8.8	68.1	21.1	10.8
Females						
Health…2009				*EU-SILC 2009*		
16–29	91.8	6.1	2.0	92.8	5.6	1.6
30–49	74.5	21.9	3.6	74.6	20.7	4.7
50+	34.9	47	18.1	25.9	40.6	33.5
All 16+	73.7	20.5	5.8	57.8	25.7	16.5
UNDP 2011				*EU-SILC 2011*		
16–29	80.5	17.5	2.0	93.2	5.2	1.5
30–49	57.7	30.6	11.6	77.5	17.7	4.7
50+	42.4	31.1	26.5	30.1	395	30.3
All 16+	65.4	25.0	9.6	59.0	25.2	15.8

Table 2 The share of persons without chronic disease or disability. *Source* Health… (2009), UNDP (2011), SO SR EU-SILC (2009 and 2011)

Age group	Health…2009	UNDP 2011	EU-SILC 2009	EU-SILC 2011
Males				
16–29	92.5	94.3	91.7	90.5
30–49	79.3	85.4	81.3	81.6
50+	42.3	68.0	52.0	51.0
All 16+	76.9	86.5	74.5	72.9
Females				
16–29	91.4	95.0	90.1	89.6
30–49	73.8	80.8	80.8	79.7
50+	27.8	58.7	44.3	42.1
All 16+	71.9	83.7	67.3	64.5

after the age of 50. In the case of the youngest children, if we look away from some signals leading to genetic predispositions (Hajiof and McKee 2000; Šaško 2003), higher severity of congenital diseases and some specificities of Roma newborns (a lower birth weight, a

shorter birth length, more often premature (Šaško 2003; Rambouskova et al. 2009), our results also showed an important role of higher post-neonatal mortality.

In terms of nutrition and diet with Roma, many irregularities, energy overconsumption and nutrient imbalances have been detected. Animal fats, sweets, alcoholic beverages at a low volume of protective factors prevail (Krajcovicova-Kudlackova et al. 2004; Siváková et al. 2007). The nutritional-knowledge level of persons in Roma settlements is particularly unfavourable. Several studies also indicate the high, regular and long-term use of tobacco products (Popper et al. 2009; Hujova et al. 2011). The considerable tolerance to the smoking of adolescents and the high level of passive smoking in children is unfavourable as well. We can also negatively evaluate the very low level of physical activity (e.g. Health… 2009). Analogically, a higher incidence of overweight, obesity, unfavourable HDL cholesterol, and triglycerides was detected among people in Roma settlements (Krajcovicova-Kudlackova et al. 2002; Vozarova et al. 2003; Dolinska et al. 2007). Several studies point to the general and higher risk of developing cardiovascular diseases in the Roma population (Nozdrovický 1991; Krajcovicova-Kudlackova et al. 2004; Babinska et al. 2013). A significant factor in the development of cardiovascular disease is the high incidence of metabolic syndrome. Several biochemical-epidemiological studies aimed directly at this issue (Dolinská et al. 2007; Danková et al. 2009; Ostrihoňová and Bérešová, 2010; Simko and Ginter 2010; Kósa et al. 2015) confirm that there are relatively unfavourable circumstances in Roma communities in relation to all five defined criteria.

In contrast to an individual's responsibility for own health, a high degree of fatalism exists within Roma communities. The perception of good health is often associated with personal happiness, as something that is predetermined for a person (Kurnienková 2007). Belief in predestined fate erases the need for and importance of preventive medical examinations. Doctor visits for preventive examinations are therefore often unthinkable because they are perceived by Roma as an unnecessary risk, either from fear of being infected or of receiving bad news after examination (Kurnienková 2007). Hence, many Roma regard medical staff and medical examinations with suspicion and concern. To some extent, this is influenced by discrimination that Roma encounter in some cases when visiting a doctor (Zoon 2001; Šaško 2003). To date, the result is only a limited effect of healthcare and prevention programmes on the health status and mortality characteristics of Roma communities and thus they considerably lag behind the whole population in Slovakia in terms of avoidable mortality.

The issue of health contradictions and its subjective perception is not new, and the presented empirical results corroborate findings from older studies. In the first place, it is necessary to mention one of the basic pillars for the explanation of contradictions between actual and self-reported health. It is the social representation theory–developed for several decades by Moscovici (1988), also in relation to ethnic minorities—applied in a 2011 study concerning the Roma (Moscovici 2011). It acknowledges social exclusion as one of the significant determinants, but emphasizes that persecutions, exclusion, racism, intolerance or prejudices cannot be studied in isolation. The Roma in Slovakia are undoubtedly confronted with social exclusion. Likewise, certain stereotypes in their perception have been confirmed (SAS 2020). As many as 80% of respondents agreed with the statements that Roma in the country have undeserved benefits and misuse the social system.

Social representation is also used in explanations of health perception (Murray and Flick 2002). Borowiec and Lignowska (2015) defined three dimensions of the social representation of health: the 'ability to function independently', which involves mental well-being and the ability to fill social roles; the 'absence of disease'—the lack of an ailment, the feeling of zest and the lack of a diagnosed illness; and the 'biological

reserves of the organism'—the resources for resisting diseases. The results presented above confirm that the 'absence of disease', which is completely unrealistic according to hard data, is manifested in Roma communities in Slovakia too. Monteiro et al. (2013) focused on the mental health of Roma and they conclude that mental health interventions with Roma community members must meet (among others) their social representations relating to mental health. When explaining the contradictions between self-reported health and mortality, there exist several research risks and a certain type of ecological error. Godley et al. (2010) point to variations in self-reported health even within small cohesive communities, for which the studied Roma settlements can be considered as well.

7 Conclusion

Inconsistent results of the assessment of health status through the sample surveys can be explained by several factors. On the one hand, the nature of responses could be influenced by demographic and socio-economic variables: the level of education, economic status, living standard, and others. On the other hand, the access to and level of health services, their utilization rate and thus the rate of real knowledge of own health status may play an important role too. According to the experience of several field workers, persons from Roma communities often seek medical advice in a situation where symptoms are observable in the long-term or in the case of an emergency. In this way, this can be reflected in a large number of undiagnosed diseases. In this specific environment it is also necessary to allow for a different character of the reference framework, meaning what the respondent understands under the various categories of health status and also with which group of people he/she compares his/her health status (Popper et al. 2009).

We can therefore assume that people from Roma settlements assess their health status positively as long as they do not have health problems requiring medical treatment or they have not been diagnosed by a doctor. In addition, it should be noted that the collection of data and the value of gathered information is influenced by the sample methodology and the formulation of questions. This was clearly manifested in the responses to the presence of chronic diseases and the rate of limitation of daily activities in the UNDP (2011) and the Health … (2009) surveys. While the UNDP survey questions mirrored the module from the EU-SILC, in the Health… (2009) survey, examples of chronic diseases and health problems were directly specified in the question, or examples of daily activities with which the respondents could have problems were there mentioned. Probably due to this fact, it was determined that the older respondents from Roma settlements often reported the presence of a chronic disease or declared a higher rate of limitation in daily activities.

In any case, the appropriateness of applying this method of obtaining information to the health status of Roma communities living in settlements should be discussed. It seems that the most correct approach to data acquisition might comprise a combination or replacement of subjective responses with an analysis of medical records, or the implementation of large and well targeted biochemical investigations and surveys by doctors directly in the field.

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