PhD Thesis

HEALTH AND HEALTH DETERMINANTS AMONG VARIOUS NATIONAL MINORITIES IN SOUTH-EAST HUNGARY

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Publications Related to the Thesis

I. ***Kómár M,*** Paulik E. Data on the health and social status of some national minorities in the South-East region in Hungary. (Adatok a dél-kelet magyarországi régió egyes nemzeti kisebbségeinek egészségi és szociális állapotáról.) *Egészségnevelés* 2003;44:208-214.

II. ***Kómár M,*** Belec B, Paulik E, Nagymajtényi L. Environmental and social conditions and the health status in the national minorities of the Hungarian part of the DKMT Euroregion. Central European Occupational and Environmental Medicine. *Environmental and Social Conditions and Health* 2003;9(4):235-242.

III. ***Kómár M,*** Nagymajtényi L, Nyári T, Paulik E. The determinants of self-rated health among ethnic minorities in Hungary. *Ethn&Health* Accepted 14 November 2005. Impact factor:0.744

IV. Vincze H, Fazakas Z, ***Kómár M,*** Paulik E. The recognition of the health and social status of Romas living small-numbered, in closed communities. (Kis létszámú, zárt közösségben élő romák egészségi és szociális helyzetének felismerése.) *Egészségnevelés* 2003;44:161-166.

V. Belec B, Paulik E, ***Kómár M,*** Balogh S, Hajnal F, Nagymajtényi L. The characteristics of the health status from a settlement specific point of view. (Az egészségi állapot település specifikus jellemzői Csongrád megyében.) *Medicus Universalis* 2003;36(6):253-257.

VI. Paulik E, Lukács A, ***Kómár M,*** Nagymajtényi L. The health status of the Roma population living in closed communities in Csongrád County. (Csongrád megyei zárt közösségben élő roma populációk egészségügyi helyzete.) *Egészségfejlesztés* 2004;45:10-16.

VII. Balogh S, Hajnal F, Belec B, ***Kómár M,*** Papp R, Nagymajtényi L, Paulik E. Factors associated with the consumption of fruits and vegetables in South-East Hungary. *Acta Alimentaria.* 2005;34:145-152. Impact factor: 0.299

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2. *Kómár M,* Paulik E, Müller A. Data on the health and social status of some national minorities in the South-East region in Hungary. (Adatok a dél-kelet magyarországi régió egyes nemzeti kisebbségeinek egészségi és szociális állapotáról.) Népegészségügyi Tudományos Társaság (NETT) XII. Nagygyűlése, 24-26 April, 2003, Hévíz, p. 102.

3. Vincze H, Fazakas Z*, **Kómár M,*** Paulik E. The recognition of the health and social status of Romas living small-numbered, in closed communities. (Kis létszámú, zárt közösségben élő romák egészségi és szociális helyzetének felismerése.) Népegészségügyi Tudományos Társaság (NETT) XII. Nagygyűlése, 24-26 April, 2003, Hévíz, p. 89.

4. Belec B, ***Kómár M,*** Nagymajtényi L, Balogh S, Hajnal F. Data of the health status of the population living in small settlements in Csongrád County. (Adatok Csongrád megye kistelepülései lakosságának egészségi állapotáról.) Magyar Egészségügyi Társaság (MET) III. Nemzetközi Konferenciája, 20-21 June, 2003, Felsőszentiván, p. 13.

5. *Kómár M,* Nagymajtényi L, Paulik E. The subjective evaluation of the health status among some national minorities living in the south-east Hungarian region. (Az egészségi állapot szubjektív megítélése a dél kelet magyarországi régió egyes nemzeti kisebbségei körében.) Népegészségügyi Tudományos Társaság (NETT) XIII. Nagygyűlése, 6-8 May, 2004, Szekszárd, p. 19.

6. Lukács A, ***Kómár M,*** Nagymajtényi L, Paulik E. The health status and the use of health surveys among the Roma population in Csongrád County. (Az egészségi állapot és az egészségügyi ellátás igénybevétele Csongrád megyei roma populációk körében.) Népegészségügyi Tudományos Társaság (NETT) XIII. Nagygyűlése, 6-8 May, 2004, Szekszárd, p. 39.

Motto

A miniature from the Illustrated Chronicle: Saint Stephen, the first king of Hungary, in full military adornment.

"Nam unius lingue uniusque moris regnum inbecille et fragile est. Propterea iubeo te fili mi, ut bona voluntate illos nutrias et honeste teneas, ut tecum libentius degant quam alicubi habitant."

"A country with but one tongue and one custom is weak and frail. Therefore I command thee, my son, to act benevolently towards settlers, to hold them in esteem that live more willingly with thee than elsewhere."

(Saint Stephen's Admonitions to Prince Imre - early 11th century, English translation)[1,2]

Contents

Abbreviations

BMI	body mass index
95% CI	95% confidence intervals
DKMT Euroregion	Danube-Kris-Mures-Tisa Euroregion
ICD	International Classification of Diseases
IHD	ischaemic heart diseases
ISEqH	International Society for Equity in Health
OR	odds ratio
SES	socio-economic status
SRH	self-rated health
WHR	waist-hip ratio

Summary

The health status of a population is largely determined by the mutually interrelated factors of social and financial conditions and by lifestyle, including health-related behaviour.

A number of previous surveys have provided information about the health status, lifestyle, employment and occupations of the Hungarian population, but until recently there have been no reliable data about national minorities.

Various national communities have lived in the territory of Hungary since the foundation of the Hungarian state. A common feature of the majority of Hungary's national and ethnic minorities is that, having lived within the framework of the Hungarian state for centuries, they profess a dual identity: their consciousness of being Hungarian is as strong as their nationality ties. Most left their original homeland and communities before the formation of a structured literary language.

The aim of the study was to investigate health and health determinant factors, demographic characteristics (age, gender, marital status, education level and minority status), environmental and social conditions (employment ratio, living environment, housing conditions, etc.), health behaviour (e.g. smoking, alcohol consumption, physical activity, nutrition, and participation in screening programmes), health status (self-reported chronic diseases, self-rated health, and medicine taking) among various national minorities living in closed communities in the South-East Hungarian region.

The cross-sectional survey was based on interviewer–administered questionnaires on socio-demographic and socio-economic variables (e.g. age, gender, and ethnicity), lifestyle factors (e.g. smoking) and health status indicators (e.g. self-rated health, body mass index). In the study, 100-120 persons (aged between 15 and 75) were recruited from the Serbian, Croatian, Romanian, German minorities and the Hungarian population. Chi-square test, one-way ANOVA, univariate and multivariate logistic regression models were used. The associations in both univariate and multivariate analyses were examined on the basis of odds ratios, 95% confidence intervals and p values. The limit of significance was set at $p < 0.05$ for all tests. Data analysis was carried out with the SPSS 9.0 for Windows statistical software.

Significant differences were found in the socio-economic (e.g. employment ratio, and structure of the dwellings), lifestyle (e.g. alcohol consumption, cooking habits, daily consumption of fruit and vegetables, and participation in screening programmes) and health status characteristics (e.g. chronic diseases, self-rated health, medicine taking) among the different minorities. In the multivariate logistic regression model, significant differences were

observed between cholesterol level screening, blood pressure screening and age, and ethnicity. Poor health was found to be significantly associated with age, educational level, nationality, employment ratio, self-evaluation of material circumstances, self-evaluation of dwelling, body mass index, and chronic diseases. The strong association between ethnicity and poor self-rated health or screenings seems to be mediated by traditional differences in cultural background, and socio-economic status.

Our results demonstrated that demographic parameters, and especially membership of a minority, are highly important determinants of health status, lifestyle characteristics, participation in screening and self-rated health in South-East Hungary.

Several of the parameters studied in our survey indicated no special health risks of the population of the Danube-Kris-Mures-Tisa Euroregion (DKMT Euroregion), which means that the control of these risk factors should be aimed at the whole population without taking nationality into account. Some other factors, however, represent special health risks of certain minorities (e.g. alcohol consumption, and cooking habits), justifying the launching of target group- oriented health programmes.

Eliminating ethnic disparities in health will also require new knowledge about the determinants of disease, the causes of health disparities and effective interventions for prevention and treatment. It will also require improved access to the benefits of society, including qualitative preventive and treatment services, as well as innovative ways of working in partnership with health care systems, state and local governments, tribal governments, national and community-based organisations, and communities.

1. Introduction

The words of the state-founding Saint Stephen have been timely for more than one thousand years, because the cultural diversity, multiculturalism, and culture autonomy accepted by the Council of Europe and the European Union (EU) are obviously parts of our political culture.[2,3]

History shows that the European continent has always been a plurilingual one – although languages such as Latin were hegemonious for centuries – but it also shows that cultures have developed separately, even in regions speaking the same language (e.g. in France), despite the fact that these cultures have more or less been shaped by common factors like the antique ones or the Christian ones.[4] Even nowadays, Europe enjoys a rich diversity of languages. According to *Vogel* 750 million citizens live in Europe, 100 million of whom belong in minority groups. This means that every seventh person belongs in a minority.[3,5]

On 1 May 2004, the EU welcomed 75 million new EU citizens. In consequence, the number of people belonging in minorities living on the EU territory will be more than doubled. The new EU will not be larger in the sense of "more of the same", but rather considerably more diverse in terms of its cultures, ethnicities and languages. This greater diversity, with its particular histories, constitutes a significant challenge for the whole EU. In this knowledge, the EU was, during the accession process, very much engaged in enhancing the situation of the minorities living in the candidate states and ensuring their political stability.[6]

At the beginning of the 21st century, the problems of nation and nationality are once again at the centre of attention among social scientists and humanists. Empirical and theoretical studies of national phenomena are multiplying rapidly. The interests of theoreticians reflect the practical importance of national problems in the life of societies all over the world. There is a certain paradox connected with this practical side of the subject: on the one hand, the world today is striving for unity and as a matter of fact it is already linked together by a network of political, economic and information relations. On the other hand, individuals and minorities tend to form an identity, and the regionalism of ethnocultural basis can establish autonomous identities whereby a region manifests itself.[7,8]

Equity in health has been conceptualized and defined in several ways and its principles derive from the fields of philosophy, ethics, economics, medicine, public health, and others. Common to most definitions of health equity is the idea that certain health differences (most often called inequalities in health) are unfair or unjust. Equity, as defined by the International

Society for Equity in Health (ISEqH), is: "the absence of potentially remediable, systematic differences in one or more aspects of health across socially, economically, demographically, or geographically defined population groups or subgroups."[9]

Processes of marginalisation, exclusion and vulnerability of population groups are, directly or indirectly, strongly linked to inequalities in health. Poverty is probably the most commonly found and strong discriminator in time and space. Race as a biological/genetic concept has, scientifically and for ethical reasons, been abandoned as a social mode of classification in most societies. By its devastating historical misuse in social contexts and its legacies, it still has an impact on factual social exclusion or inclusion in today's world. Ethnicity is a softer term in the modern discourse. Ethnical groups however, have also been defined, categorised and treated according to the perception of outsiders, with far-reaching consequences for those who are categorised, also influencing their share of communal goods, health services, etc. As a matter of fact, even material inequalities have been used in order to distinguish cultures of poverty, which may lead to patronising and discriminating effects.[10]

Consciousness of the stigmatising processes is an argument for the abandonment of such categories in the public discourse, especially when used in official registrations of populations. Still, the fact that these concepts have been used and have made their impact on the conditions on those who have been members of these groups is the impetus for an observation of its consequences for the welfare and health of those affected in order to concentrate attention on inequalities and inequities in social services.[10]

Governments and minorities in Central and Eastern European countries, do for instance, not accept race or ethnicity, whilst discrimination based on connotations of race has a long history with a surviving negative legacy. The most evident example is the situation for the Roma populations. Other countries have met similar situations with different policies, e.g. in South Africa or in the USA. Another example can be found in Western Europe, where there is a tendency to abandon even ethnicity and similar terms and instead to discuss the situation of immigrants versus non-immigrants.[10]

The international literature covers a wide range of researches in connection with minorities, which provide statistical data on ethnic and national minorities, their history, identity, rights, education and literature. Some studies from the USA[11-13] and Europe (e.g. the UK[14,15] and Scandinavian states[16,17]) deal with inequalities in health among minorities, immigrant ethnic groups and historical or national minorities.

Various national communities have lived in the territory of Hungary since the foundation of the Hungarian state. The modern ethnic and linguistic composition of the

country was basically established following the decimation and the movement of the population during the Ottoman occupation, with mass spontaneous migration or the organised resettlement of people in the 17th-18th centuries. With the exception of the Slovene population on the western border, it was during these centuries that the minorities living in Hungary moved into the territory of today's country. Towards the end of the 19th century, non-Hungarian nationalities living within the borders of the country constituted more than 50% of the total population. Following the revision of the borders after World War I this proportion changed significantly. Some 33% of the Hungarians living in the Carpathian Basin (3.3 million people) actually reside outside the country's borders, while the number of minorities living within the borders has declined. Today, the minorities make up some 10% of the population.[2,18-21]

A common feature of the majority of Hungary's national and ethnic minorities is that, having lived within the framework of the Hungarian state for centuries, they profess a dual identity: their consciousness of being Hungarian is as strong as their nationality ties. Most left their original homeland and communities before the formation of a structured literary language, and as a consequence the languages and dialects they use to this day are in general archaic linguistic variations.

This lengthy historical coexistence is an important criterion in the definition formulated in the minority act. "All groups of people who have lived in the territory of the Republic of Hungary for at least one century, who represent a numerical minority in the country's population, whose members are Hungarian citizens, who are distinguished from the rest of the population by their own languages, cultures, and traditions, who demonstrate a sense of belonging together that is aimed at preserving all of these and at expressing and protecting the interests of their historical communities" *(Act LXXVII of 1993 on the Rights of National and Ethnic Minorities, Chapter 1, Section 1, Subsection (2))*. There are national and ethnic minorities recognised as constituent components of the state. This act defines the Bulgarian, Roma, Greek, Croatian, Polish, German, Armenian, Romanian, Ruthenian, Serbian, Slovak, Slovenian and Ukrainian ethnic groups as national or ethnic minorities native to Hungary. A characteristic feature of the situation in Hungary is that the minorities live scattered geographically throughout the country in some 1,500 settlements, and generally they also constitute a minority within these settlements.[22,23]

Researches dealing with minorities have many precedents,[21,23-27] and they can be traced continuously from the end of the 18th century until the present. First separated disciplines can be found and by the middle of the 20th century it was already an

interdisciplinary topic. In this latter sense, minority research can be regarded as a separate discipline and it means the complex usage of the knowledge and methods of various branches. Researches in this topic can be classified in two directions: some specialized fields such as ethnography, historical science, statistics, sociology, political science and education, and interdisciplinary analyses of minority problems.[28] Many health surveys examining the health status and health behaviour habits of Roma ethnic groups have been made.[29-33]

In Hungary, there has been so far no complex health survey involving several nationalities. In the Danube-Kris-Mures-Tisa Euroregion, people of the same nationality live on both sides of frontiers, in South-East Hungary, for example, Croatian, German, Romanian and Serbian populations are found. People belonging in one of these minorities have a traditionally different cultural background, which potentially influences their attitude to health and health-related factors such as lifestyle, career and environment. People forming the majority in one country and a minority in the other, and living under largely similar natural conditions, can have a dissimilar state of health, which is of interest.

1.1. Aim of the Study

The aim of the study was to investigate the health status and health-influencing factors of different national minorities living in closed communities in the South-East Hungarian region.

The minority-related inequalities in health and health behaviour in the South-East Hungarian region among Croatian, German, Romanian and Serbian minorities were studied in comparison with the data on the Hungarian population.

The main aim of the study was achieved by investigating the following factors on the basis of a questionnaire:

- demographic characteristics (age, gender, marital status, education level, and minority status)
- environmental and social conditions (employment ratio, living environment, housing conditions, etc.)
- health behaviour (smoking, alcohol consumption, physical activity, nutrition, participation in screening programmes, etc.)
- health status (self-reported chronic diseases, self-rated health (SRH), and medicine taking)

The purpose of this study was to furnish examples of evidence concerning the socio-demographic and socio-economic determinants of health to illustrate minority differences and general and specific national differences in health status (chronic diseases, medicine taking, SRH, etc.), health behaviour including health-damaging (smoking, alcohol consumption, etc.) and health-protecting (e.g. screening) activities. The SRH and financial situation, and the SRH, health status, and health behaviour were compared. Another analysis showed the relationship between cholesterol level - blood pressure screening and the SRH and other factors (e.g. socio-demographic and socio-economic characteristics, health behaviour and health status).

2. Literature Review

2.1. Minorities Research

2.1.1. Historical Precedents, Chronology

Numerous peoples have inhabited the Carpathian Basin in the heart of Europe since the age of the great migrations. The Hungarian tribes that arrived in the region 1,100 years ago found Avar, Slavic and Celtic populations settled here. Saint Stephen, the founder of the Hungarian state, invited German knights and Italian and French monks into the country in order to help spread Christianity and Western European social and agricultural norms. After the Kiev Russia was conquered, the Kuns living on the Russian Steppe, asked for admission to Hungary. As they had many conflicts with the Hungarian population before 1242, Béla IV forced them to leave the country. After the Tatar invasion of Hungary in 1241-1242, they were called back and were settled with the Jász (Jazygian people) of Iranian origin, because 50% of the Danube-Tisa population had been killed.[2,18-20] The Ottoman wars began in the 15th century, and in the 16th-17th centuries the population decreased drastically in the central part of the country during the 150 years of Turkish occupation. Meanwhile, massive immigration of Romanians and Serbians began along the eastern and southern borders. After the Turks had been driven out of the country, the rulers of Hungary, which had become one of the member countries in the Habsburg Monarchy, populated the previously Hungarian-occupied areas primarily with German and Slovakian settlers. As a result of this, the total number of national and ethnic minorities living in Hungary at the end of the 18th century was higher than the number of Hungarians. In the middle of the 19th century, only 41-48% of the population was Hungarian.[18,21,26]

The second phase of creating national states occurred at the end of World War I. The Habsburg Monarchy collapsed and the Russian Empire also changed, in consequence of which seven new states were born in the Northern and Central European region. However, the Treaty of Trianon in 1920, which concluded World War I, radically altered the political and ethnic map of the Carpathian Basin. Hungary lost two-thirds of its territories, and the number of national and ethnic minorities in the 93,000 square kilometre country decreased to a small fraction because of the new national borders.[21,24,27]

For well over a century, and even today, the "national question" has played an important part in politics.[25,34]

2.1.2. Minority Policy in the 20th and 21st Centuries

"Equal treatment of minorities is a cornerstone of the new United Europe."

Romano Prodi, Commission ex-President of the EU[35]

The concept of national minorities in international law has a history of only 100 years. It was during the last century that, under the specific influence of Romanticism, the concept of a nation became the unifying principle for identifying a people. The 19th century, however, was already characterised by bourgeois and national development, which strengthened the desire of the various nationalities for freedom and self-determination.[36]

The protection of minorities under international law was not realised in the second part of the 20th century because of the lack of actual undertakings and an effective enforcement system. However, the traditional conception of the law expects the power not only to accept legal norms, but also to enforce its will on citizens.[37,38]

The present Europe inherited the "national question" from the 19th century and this question was not solved after the World War I and II measures. The problem came into the centre of attention after the political and social reorganisation in 1989-90, when the three officially multinational states of the continent (the Soviet Union, Yugoslavia and Czechoslovakia) collapsed and 22 new states were created in their place. These events have fundamentally changed the map of Europe and Central Asia. These transformations were followed by occasionally bloody ethnic conflicts, and from these it was clear that the safety and stability of the continent could not be achieved without solving "national questions".[39]

Nowadays in Europe, only Portugal and Iceland are one-language states. Every other European countries has minorities. From the point of view of international law, there are only some places where ethnic groups with special status live: South-Tyrol Germans, Slovene groups living in the area of Trieste, Croatians and Slovenes living in Austria, and the Swedish population on the Aland islands belonging to Finland. In most European states the minorities situation is controlled by legal norms or bilateral agreements or declarations.[40]

During the last 12 years, many European states have stated their intention to make it possible for their minorities living outside the country's border to integrate into the nation

without changing the borders. The most important element of this reintegrational process is the preservation and reinforcement of the linguistic and cultural identity-community.[3]

2.1.3. Legal Frameworks in Hungary

Hungary is trying to develop a social atmosphere in which none of the minorities have to suffer any discrimination. In the course of implementing its minorities policy, Hungary relies on the active cooperation of the national and ethnic minorities and the activities of their legitimate and elected bodies.[39,41,42,44]

The programmes of the governments that have followed one another since the change in regime in 1990 have clearly undertaken to fully ensure the rights of minorities in accordance with European norms.[3,42,43]

Act XX of 1949, the *Constitution of the People's Republic of Hungary*, stipulates the position of national and ethnic minorities in Hungarian society. *Paragraph (1) of Article 68 of the Constitution* states that the minorities living in Hungary are constituent components of the state. The Constitution guarantees the minorities the right to collective participation in public life, the nurturing of their own cultures, education in their native languages, the widespread use of their mother tongue, and the right to use their names in their own languages. *Subsection (2) of Section 32/B of the Constitution* and *Act LIX of 1993* provides for the institution of a parliamentary commissioner to protect the rights of national and ethnic minorities. The minorities ombudsman is responsible for investigating any kind of abuse of the rights of national or ethnic minorities that comes to his/her attention and initiating general and individual measures in order to remedy it.[43-45] In 1993, Parliament passed *Act LXXVII on the Rights of National and Ethnic Minorities*, which established individual and collective minority rights in the areas of self-government, the use of language, public education and culture. Among the collective rights, the act states that the minorities have the right to form local and national self-governments.[23,43,46]

Hungary was admitted as a member of the Council of Europe on 6 November 1990; this date also marks Hungary's signature of the *Convention for the Protection of Human Rights and Fundamental Freedoms*. It was ratified on 5 November 1992. In 1995, Hungary ratified the two most important documents of the Council of Europe regarding minority protection: the *Framework Convention on the Protection of National Minorities* and the *European Charter for Regional or Minority Languages*. Legal regulations in Hungary concerning the minorities are in accord with these two international conventions, and indeed

in certain areas they actually provide broader rights to the minorities resident in the country. Hungary has undertaken to implement the optional regulations contained in *Chapter III of the European Charter for Regional or Minority Languages* in respect of the Croatian, Slovakian, German, Serbian, Romanian and Slovene languages.[3,41,42,44]

The 1997 country report prepared by the European Commission concerning Hungary's application to the EU determines, among other things, that minority rights are secured and protected in Hungary.[40,43,44]

The Hungarian minority policy of the past decade has attracted international attention. Our immediate neighbours pay close attention to any developments in the situation of the minorities in Hungary. Western European democracies and international organisations are continuously evaluating our measures in connection with minorities and their impact.[3,42,44]

Key laws that guarantee the rights of national and ethnic minorities in Hungary and are continuously being harmonized serve as the background for the findings of the EU, the Council of Europe and other international organisations concerning Hungarian minority policy. After becoming a member of the EU, Hungary continues to guarantee these rights.[3,41,42]

2.1.4. Demographic Characteristics of the National and Ethnic Minorities in Europe and Hungary

Nowadays, about 750 million European citizens live in 36 states (except for mini states), of which 31 were created as those of an ethnic majority. The Europeans can be divided into two groups: 650 million of the 750 million citizens live in their own states, constituting the national majority, the remaining 100 million being national minority-state creating groups (apart from Belgium, Finland and Switzerland where national minorities are real state-creating groups). On the average, at least five languages have official language status and many of these (except for English, Spanish and Norwegian) are in a multiplied minority condition.[39]

In the seven Central European countries (Austria, the Czech Republic, Poland, Slovakia, Hungary, Slovenia and Croatia) and in three historical regions associated with this area on historical-religious and cultural grounds (Sub-Carpathia, Transylvania and Voivodina), there are a total of 107 national and ethnic minorities with a population exceeding 1 000 each, according to the latest official census. The total population of the 107 minorities

slightly exceed 7 million, which amounts to 8.6 per cent of the region's overall population of 81 million.[47]

As concerns the Hungarian situation, *Act LXXVII of 1993 on the Rights of National and Ethnic Minorities* states: "It is the individual's exclusive and inalienable right to take on and declare their affiliation to a national or ethnic group or a minority. Nobody is obliged to proclaim that they belong to a minority group."[23]

Since 1880, during the Hungarian censuses the population have been asked about their mother tongue and other languages spoken.[28] According to the latest census, in 2001, in a population of 10 198 315 a total of 442 739 persons indicated minority affiliation – 71% of them stating that they belonged to a minority (314 344 persons) and 30% of them (132 821 persons) stating that their native language was one of the national or ethnic minority languages. Estimates from researchers and minority organisations suggest that the true number of national and ethnic minorities is greater: individual groups are reckoned to comprise from a few thousand persons up to nearly half a million.[48,49]

The difference between the estimated and declared figures can be explained on the one hand by historical, social and psychological reasons relating to minority questions in Central-Eastern Europe. On the other hand, the figures reflect the minorities' emotional and cultural duality dilemma: many feel themselves to be equally Hungarian and a minority. To a certain extent, it is possible to track minority affiliation on the basis of four questions posed in the 2001 census: nationality, native language, ties to cultural values and traditions, and spoken language in the family and friendly community. Answers given by the minorities to these four criteria allow us to draw conclusions as to ethnic affiliation. *Table 1* below shows the numbers of national and ethnic minorities and their percentages of the population and of the overall minorities, based on data from the 2001 population census.[48,49]

Table 1 *Numbers of the 13 national and ethnic minorities and their percentages in the population in Hungary, 2001*

Minority	Number	Percentage of the population	Percentage of the minorities
Armenian	1 165	0.01	0.26
Bulgarian	2 316	0.02	0.52
Croatian	**25 730**	**0.25**	**5.81**
German	**120 344**	**1.18**	**27.18**
Greek	6 619	0.06	1.50
Polish	5 144	0.05	1.16
Roma	205 720	2.02	46.47
Romanian	**14 781**	**0.14**	**3.34**
Ruthenian	2 079	0.02	0.47
Serbian	**7 350**	**0.07**	**1.66**

Slovakian	39 266	0.39	8.87
Slovenian	4 832	0.05	1.09
Ukrainian	7 393	0.07	1.67
Total	**442 739**	**4.34**	**100.00**

It can be seen from *Table 1* that only two minorities exceed 1 per cent within the country's population, the German and the Roma minorities. This should not be accepted without reservation as the figures given by ethnologists are higher than the official statistical data. This phenomenon can be traced back to the earlier-mentioned historical, social and psychological reasons.[49]
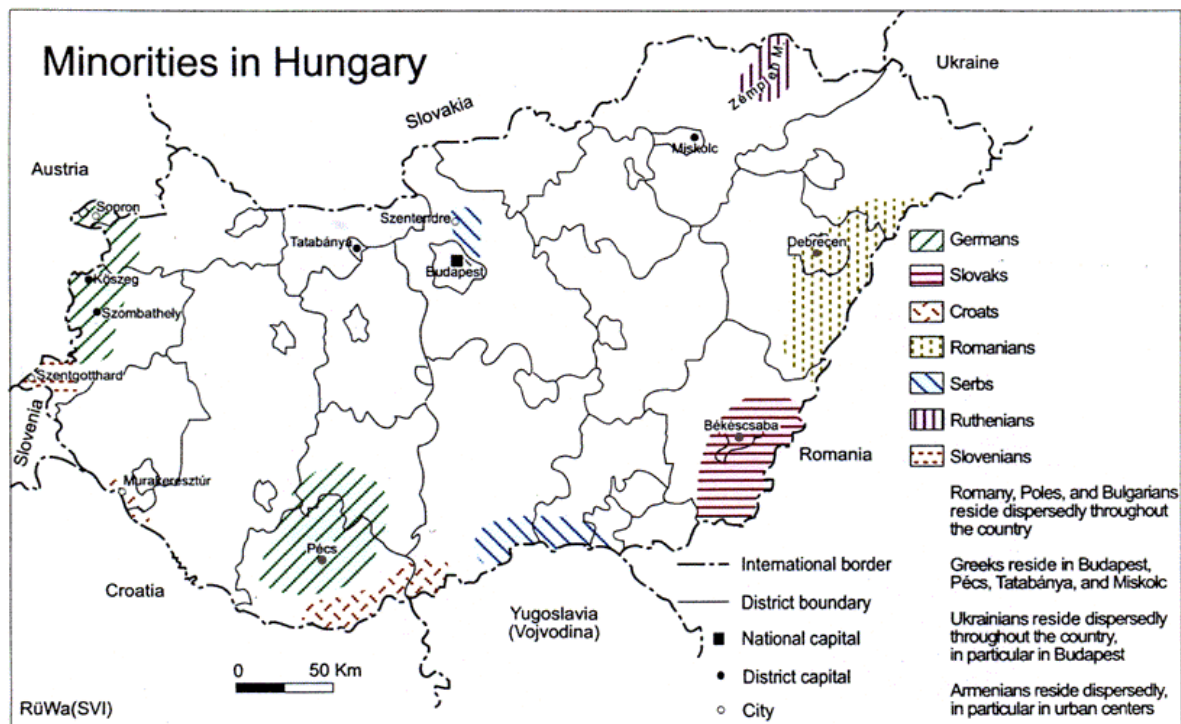
Figure 1 The 13 native national and ethnic minorities in Hungary[50]

Figure 1 shows the geographical situation of the 13 native national and ethnic minorities. The Germans live mostly along the western border, in the Central Hills, around the Mecsek Hills and in the environs of Budapest. Most of the South Slavs are resident in districts on the southern and south-western fringes of the country. Some of them are of Serbian, others of Croatian and Slovenian origin. The Romanians and the Slovaks live mainly along the south-eastern border.[51]

2.1.5. A Brief History of the Examined Minorities

In the following, a brief summary will be given of the history of four examined minorities living in the current territory of Hungary as they pertain to the history of the Hungarians: in Bácsalmás (Bács-Kiskun County) Croatian and German minorities; in Méhkerék (Békés County) the Romanian minority; and in Deszk (Csongrád County) the Serbian minority.

The predecessors of the **Croatians** living in modern Hungary arrived at their current locations as a result of a "continuous" immigration, due mostly to flight from the Turks. The Hungarians came into contact with Croatia throught the conquests of Saint Ladislas and King Charles. The first immigration of the Croatians was recorded at the beginning of the 13th century and this process lasted until the beginning of the 18th century. The joint Hungarian-Croatian state, which existed for eight centuries and ceased after World War I, greatly influenced their special position. The Croatian minority lives scattered throughout the country and is a collection of groups (e.g. bunyevác and sokác) with no significant differences between each other in terms of their dialects and folk traditions. All of the Croatian ethnic groups are Roman Catholics.[20,44,52,53]

The first Hungarian connections with the **Serbians** started after 1389, when Serbia was defeated by the Turks in the battle of Kosovo Polje (Rigómező). Serbians settled in Hungary on a massive scale in the 15th to 17th centuries as a result of the Ottoman occupation of the Balkan peninsula and their later penetration into the Danube Basin. On the basis of the privileges that were granted by the Habsburg emperor, the Serbians acquired personal, religious and related national autonomy in the 18th and 19th centuries. In addition to its own autonomous operation, the national (Serbian Orthodox) church had its own national assembly with jurisdiction in matters of autonomy. After the Treaty of Trianon, which concluded World War I, most of the Serbians who lived scattered throughout the country's current territory moved to Yugoslavia in the 1920s.[20,44,52,53]

The **Germans** began immigrating into Hungary during the Middle Ages, coming mostly from the northern and central regions of the German-Roman Empire. The first planned settlements of Germans can be linked to the name of Géza II (12th century). During the 18th century, the Habsburg Monarchy of Austria, which ruled Hungary at that time, encouraged Germans to emigrate to the unsettled lands of Southern Hungary, which had been devastated by over 150 years of Turkish occupation. At this time they tended to come from southern and western Germany. By the end of the 19th century, there were more than two million people of German origin living in Hungary. The position of the German minority in modern Hungary

was fundamentally changed by the events that followed World War II. As German defeat became imminent, German military leaders initiated plans to evacuate the Germans from many Eastern European countries in which they lived. In Hungary, many refused to leave the only homeland they had ever known, but some 50 000, primarily those most closely associated with Nazi Germany, did leave. The German communities in Hungary have recently become more active.[20,54,55]

During their known history, the **Romanians** who live in the present territory of Hungary have always lived within the Hungarian state outside the frontiers of the Romanian state. The sources first mention the Romanians in the territory of Hungary after the Tatar invasion of Hungary in 1241-1242. According to historians, the Romanian population appeared on a massive scale after the Turks were driven out of the country. Over the centuries, these communities have created institutions, schools, and societies and associations to represent their interests and carry out cultural programmes, primarily within the scope of the native-speaking Romanian Orthodox Church. As a consequence of the Treaty of Trianon (1920), these communities became isolated from the millions of Transylvanian Romanians and left on their own as a small ethnic group.[20,56,57]

2.2. Health Research

2.2.1. Inequalities in Health Status among Ethnic and National Minorities

"The future health of the nation will be determined to a large extent by how effectively we work with communities to reduce and eliminate health disparities between non-minority and minority populations experiencing disproportionate burdens of disease, disability, and premature death."

Guiding Principle for Improving Minority Health[58]

The World Health Organisation (WHO) defines health as "a state of complete physical, mental and social well-being [...] not merely the absence of disease or infirmity [...] the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."[59]

In the European region, inequalities appear in two dimensions, both of which require a strong programmatic response. One dimension is the large and growing inequity between

Member States, and the other is the wide – and now often widening – gap in health among groups within each country.[60]

According to WHO documents (called *Health 21 – Health for all in the 21st century*), the most important interpretation of equity is in health status. *Kunst* and *Machenbach* specify that "socio-economic inequalities in health can be defined as differences in the prevalence and incidence of health problems among individual people of higher and lower socio-economic status".[61]

Since the early 1970s ethnic inequalities in health have become an increasing focus of research. The data in the Black Report made in the UK made it clear that inequalities in health do exist in the British society and are growing in almost every population group, independently of gender. This report suggested four types of explanation of social class differences in health: artefact, social selection, behavioural/cultural and materialist.[62,63]

More recently there have been national surveys of variations in morbidity rates by ethnic group, and the tradition of analysing differences in morbidity rates by country of birth has continued. The issues of inequalities in the health status of the population have been important both in the evaluation of different health care systems and for health policy-making in individual countries.[61]

The programme called *Healthy People 2010* is designed to achieve two overarching goals: the first is to increase the quality and the duration of healthy life, and the second goal is to eliminate health disparities, including differences that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation.[58]

Compelling evidence indicates that race and ethnicity correlate with persistent, and often increasing, health disparities among USA populations in all these categories and it demands national attention because racial and ethnic minority groups are expected to comprise an increasingly larger proportion of the USA population in the coming years.[64]

Table 2 shows the aspects of health where ethnicity and health inequality may be linked.[65] In our study we deal with the following topics: determinants of health, prevalence of ill health/health behaviour, and service use - screening.

Table 2 *Aspects of health where ethnicity and health inequality may be linked*[65]

Determinants of health	Prevalence of ill health/ Health behaviour	Service use	Health /Service outcomes
Age Sex Genetics	Prevalence of specific diseases (e.g. diabetes, renal failure, cardiovascular	Health services: Hospital Primary care	Mortality Health status

Income	disease)	Community services	Satisfaction
Employment			
Education	Limiting long-term illness	Social services	
Housing			
Social networks		Voluntary sector	
Mobility and migration	Health behaviour and lifestyle	Private sector	

2.2.1.1. Socio-demographic and Socio-economic Inequalities in Health

In light of the current awareness that the individual health status is strongly associated with social and personal resources, determinants of health are of considerable interest in health research today. The common outcome is that the health status of a population is largely determined by the mutually interrelated factors of living conditions, socio-economic status (SES), and lifestyle.[66-72] Less well known, however, is how these determinants are associated with health and influence health status in different nationalities and ethnic groups.[15,73,74]

It has often been shown that people of lower socio-economic groups have higher mortality and more frequent health problems than those in higher socio-economic strata.[75-77,] There was a strong correlation between education and employment, but studies from the UK[78] and Norway[79] show that occupational social class is a stronger predictor of health outcomes than education.[80-82] From all constituents of the world surrounding human individuals, the working environment is the most hazardous, imposing a 1-3 times greater health risk than any other part of the environment. Evaluating occupational risk factors and making the working environment safe is thus of crucial importance in shaping the health state of individuals and populations.[71,83]

The issue of housing and health has received growing attention in recent years. *Evans* and *Kantrowitz*[84] found that there is evidence of inverse relations between income and other indices of SES with environmental risk factors, including hazardous wastes and other toxins, ambient and indoor air pollutants, water quality, ambient noise, residential crowding, housing quality, educational facilities, working environments and neighbourhood conditions. Poor housing conditions are associated with a wide range of health conditions, including respiratory infections, asthma, injuries, and mental diseases.[85-89]

These inequalities have been observed among national and ethnic minorities around the world.[15,90,91] In Hungary, there have been many studies concerning the health problems arising from the socio-economic inequalities in health in the Roma population,[29-33] while similar studies have not been made among the national minorities.

2.2.1.2. Health Behaviour Differences

Socio-economic differences in health behaviour such as smoking, leisure time physical activity and dietary choice have been consistently described in population surveys. The determinants of the physical environment (e.g. places to walk, and the availability of healthy food), social norms (e.g. smoking levels in the community, and eating habits), and the costs of health protective behaviour are included in health behaviour.[92-96]

Alcohol dependence, cigarette smoking, and illicit drug use are all closely associated with markers of social and economic disadvantages. In some of the transition economies of central and eastern Europe, for example, the past decade has been a time of great social upheaval. Consequently, the numbers of deaths linked to alcohol use – such as accidents, violence, poisoning, injury and suicide – have risen sharply. According to the WHO, people turn to alcohol to numb the pain of harsh economic and social conditions, and an alcohol dependence leads to downward social mobility.[97]

Smoking and alcohol consumption are important risk factors for cardiovascular and cancer morbidity and mortality, and some studies have examined differences in smoking and alcohol consumption among ethnic and national minorities. It is well known that economic factors such as unemployment seem to be associated with a higher smoking and drinking prevalence.[98-101] *Sundquist* and *Winkleby*[102,103] found that female Mexican Americans born in the USA had a smoking prevalence that was twice as high as that of Mexican Americans born in Mexico, but a lower smoking prevalence than that of non-Hispanic White women. Other studies showed that smoking is more common among African Caribbean and Bangladeshi men and less frequent among Indian, African and Asian men than among White men. By contrast, in women rates of smoking are low in all these ethnic groups, with the exception of African Caribbean women, where the rates are similar to those in White women. Alcohol consumption tends to be lower in all minority ethnic groups for both men and women as

compared with that in the White population. Total abstinence is common amongst Muslim groups, predominantly within the Pakistani and Bangladeshi communities.[104]

Obesity, a major risk factor for cardiovascular disease, diabetes, hypertension and premature death[105,106] is increasing in the industrialised countries[107] and is rapidly increasing worldwide.[108] Poor diets, together with sedentary lifestyles, have been shown to be the main causes of the development of obesity.[109] The body mass index (BMI), is a useful index of relative weight that can be applied to define obesity and chronic energy deficiency and to assess the individual and community nutritional status. Another study shows that the link between generalised obesity (as measured by BMI) and central obesity (as assessed by the waist-hip ratio (WHR)) may be stronger in some minority ethnic groups than others (e.g. in Whites and Black Caribbeans than in South Asians).[110]

Eating and cooking habits, which are influenced by the individual taste, age and culture, are major causative – or preventive – factors of cardiovascular diseases and different types of cancer.[111-114] Many studies have reported social inequalities in food consumption patterns: diets in the higher social classes are more often in line with dietary recommendations than those in the lower classes.[115-118] *Becker et al.*[119] observed that ethnic minority subjects with self-acknowledged eating and weight concerns were also significantly less likely than non–minority participants to have been asked by a doctor about eating disorder symptoms.

2.2.1.3. Inequalities in Mortality, Morbidity and Screening

Over the past twenty years, socio-economic inequalities in mortality have widened.[120,121] *Harding et al.*[122] found that in the UK there were socio-economic differences in mortality between South Asian and West Indian migrants.

The rapidly rising occurrence of cardiovascular and other non-communicable diseases is one of the major challenges to global development. The WHO estimates that 17 million people die of cardiovascular diseases around the globe each year.[121,123,124] *Hayles et al.*[125] reported that mortality from coronary heart diseases is 1.4 times higher in Indians in the UK than in Whites. *Bardsley et al.*[65] found that this mortality was 20-40% higher than average in people born in Pakistan and India, and about 30% lower than average amongst those born in the Caribbean and West Indies.

The prevalence of chronic conditions is one of the main characteristics of a population's health status. High blood pressure increases the risk of heart disease and stroke. Good scientific evidence exists in support of a link between the blood cholesterol level and the development and progression of artherosclerosis and subsequent coronary heart disease.[121,123,124] In the USA, about 30% of hypertensive people are unaware of their condition and only 34% have their high blood pressure controlled. Likewise, high blood pressure affects approximately 16 million adults in the UK, at least a third of whom are likewise unaware that they have the condition.[123,126]

Ethnicity has increasingly been recognised as an important concept in epidemiological studies of disease risks. *Bartys et al.*[127] found that recording the risk in the (cardiovascular disease) screened population was significantly less complete for women and South Asian participants over the duration of the screening programme as compared with men and Caucasian participants.

In the past few years, cardiovascular diseases overtook tumours as the leading cause of death in Hungary. In our country, hypertension displays a prevalence of 29%, which is 70% higher than the EU average (17%), and altogether 39% of women and 32% of men suffer from diseases of the cardiovascular system. The data from 2003 demonstrated that the risk of early death due to ischaemic heart disease and cerebrovascular diseases had increased in Hungary.[128-130]

There have been a number of studies on the health status (morbidity and mortality data) and screening of the Roma population in Humgary [29-33] but only a few have been made among national minorities.[131-133]

2.2.1.4. Inequalities in Self-rated Health

Self-rated health (SRH) is a major determinant of a person's expectations concerning health care, because it governs the decision as to when, how often, and with what requirements the individual will seek medical advice when certain complaints arise. The quality of life is easily assessed on the basis of SRH as it relates not only to diseases, but also to aspects of general well-being. It additionally plays an important role in forecasting needs and demands in health care because SRH may be used to follow patient behaviour.[134,135] *Idler et al.*[136] found a relation between SRH and mortality even after adjusting for prevalent diseases and some health behaviour factors.

Ethnic differences in SRH have proved to be a strong prognostic indicator for subsequent mortality differences between ethnic groups in the USA.[137] Several Swedish studies have demonstrated poor health among foreign-born immigrants, but only a few have managed to demonstrate the association between migration and health. The finding that psychosocial and economic conditions had the strongest influence on the increased risk of having poor SRH among those who had immigrated to Sweden from countries that were geographically most distant and culturally most dissimilar to the Swedish society, i. e. the groups born in Arabic-speaking countries, Yugoslavia and all other countries, agreed with the results of another Swedish study.[138] However, men born in other countries, and particularly refugees from non-European countries, still had an increased risk of poor SRH after adjustment for socio-economic, psychosocial and economic conditions in the new country.[139]

Several studies have analysed SRH among Hungarians,[134,135] but only a few have described the association between an ethnic and national minority population and health.[31,32,33,140]

3. Materials and Methods

3.1. Subjects and Data Collection

A cross-sectional survey was carried out on minorities living in relatively closed communities – in families where both parents belong to a minority – in the South-East Hungarian region: the Romanians in Méhkerék (Micherichi), the Serbians in Deszk (Деска), the Germans and Croatians in Bácsalmás (Almasch/Aljmaš), and a Hungarian control group from the same places. The number of participants – similar age and sex distribution – totalled 567, 100-120 per nationality, aged between 15 and 75.

Data were collected by a simple random sampling. The data obtained were representative in terms of age and sex structure of the economically active population. Local family practitioners' assistants and staff from the Minorities' Self-Administrations were employed as interviewers for data collection by means of a questionnaire. Answering the questions was voluntary and anonymous. The examination was from December 2002 to March 2004. The questionnaire of 132 entries related to socio-demographic characteristics, employment, work environment, housing conditions, health-related behaviour, and health status; participation in blood pressure and cholesterol level screening; health status and SRH.

The questionnaire was approved by the Human Investigation Review Board of Albert Szent-Györgyi Medical and Pharmaceutical Centre, University of Szeged. Informed written consent was obtained from each of the study participants.

3.2. Most Important Variables and Categorised Participants

The questions in our survey were divided into two major groups. On the basis of the questionnaire, the variables analysed in the study were classified into two groups, one about the main demographic and social characteristics, and the other about the health status and health behaviour factors. The discussion will follow this classification.

3.2.1. Socio-demographic and Socio-economic Characteristics

➢ *Minority.* Romanian, Serbian, German and Croatian minorities and a Hungarian control group from the same place.

➢ *Age.* Participants were categorised into five age-groups, from 15 to 19, 20 to 39, 40 to 59, 60 to 69, and 70 to 75 years or, it was continuous.

➢ *Marital status.* Marital status was categorised into six groups: "married", "cohabiting", "single", "divorced", "widowed" or was dichotomised according to whether the respondent was married/cohabiting or single. The latter means living alone (including divorced, widowed and never-married).

➢ *Education.* The level of education was measured in terms of the total number of years spent at school, and categorised into the following three groups: a "low level" of education (8 years of schooling or less), a "medium level" (9-12 years) and a "high level" (more than 12 years).

➢ *Employment ratio.* "Are you an economically active person?" The possible answers: "yes" or "no".

➢ *Work environment. The character of the job.* "What kind of job do you have?" The expected responses were categorised as mainly physical jobs, mental jobs or mixed.

➢ *Self-evaluation of material circumstance.* "How do you regard your material circumstances?" The responses were graded on a three-point scale: "good", "acceptable", "bad".

➢ *Holiday.* "Does your family go on holiday?". Answers:"yes" or "no".

➢ *Subjective evaluation of the dwelling.* "How do you regard the condition of your flat or your house?" The responses were graded on a three-point scale: "good", "acceptable", "bad".

➢ *Structure of dwellings. "*Is there a separate kitchen, a bathroom, a flush toilet, or piped water in your flat/house?" Answers: "yes" or "no".

➢ *Sewer system.* "Is your home connected to a septic tank or public sewer?" The responses: "yes" or "no".

➢ *Living environment. "*Is there organised waste management?" Responses: "yes" or "no".

3.2.2. Health Behaviour and Health Status Characteristics

❖ *Smoking.* "Do you smoke?" The subjects were subdivided into three groups: "ex-smokers", "smokers", and "never smokers". Only subjects who smoked daily, regardless of quantity, were considered smokers.

❖ *Alcohol consumption.* A single structured question measured the overall frequency of drinking: "How often do you drink alcohol?" Respondents were dichotomised as "drinkers" if the answer was "daily" or "2-3 times a week", and "non-drinkers" when the response was "2-3 times a month", "a few times a year" or "never".

❖ *Coffee consumption. "*Do you drink black coffee?" Answers: "yes", "no".

❖ *Cooking habits. "*Do you usually use oil, margarine, butter, lard or fat for cooking?" The answers were categorised on the basis of the origin of the fat (vegetable or animal).

❖ *Daily consumption of fruit and vegetables.* Respondents were asked how often they ate fruit or vegetables, with the following alternatives in the answer: "never", "less than once a week", "once a week", "2 to 3 times a week", "once a day" or "2 or more times daily". In the data processing, these responses were converted into dichotomous variables, the consumption being recorded as "daily" if the answer was "2 or more times daily" or "once a day", while all other answers were classified as a "less than daily" consumption.

❖ *Physical activity.* The answer alternatives to the question "Do you regularly participate in any sport?" were "yes" or "no".

❖ *Body mass index.* Body mass index (BMI) was calculated as the weight in kilograms divided by the square of the height in metres, and was grouped into four categories:

underweight (BMI<18.5 kg/m^2), normal weight (BMI=18.5-24.9 kg/m^2), overweight (BMI=25.0-29.9 kg/m^2) and obesity (BMI≥30.0 kg/m^2) (categorised by WHO).

❖ *Cholesterol level screening*. The answer alternatives to the question "Do you regularly have your cholesterol level checked?" were "yes" or "no".

❖ *Blood pressure screening.* "Do you have your blood pressure measured, regularly?" answered by "yes" or "no".

❖ *Chronic diseases.* The question "Are you suffering from any chronic disease diagnosed by a doctor?", answered by "yes" or "no", and if "yes" the disease was specified.

❖ *Regular use of pharmaceuticals. "*Do you take any medicaments regularly?" The answers were as following: "yes" or "no" and if "yes" the type was specified.

❖ *Self-rated health.* The subjects were questioned about their present state of health, and their responses were graded on a five-point scale: very good (5), good (4), average (3), poor (2), and very poor (1). A grading of "very good" or "good" SRH was considered to reflect a good status of health, whereas an "average", "poor" or "very poor" grading reflected a poor status of health.

3.3. Statistical Analyses

Data analysis was carried out with the SPSS 9.0 for Windows statistical software. The limit of significance was set at $p<0.05$ for all tests. The percentage figures refer to actual respondents.

1. Socio-demographic factors, health and health-related factors, social situation, working and living conditions, and lifestyle characteristics of individual nationalities were compared by One-way ANOVA and the chi-square test. Univariate logistic regression was also used (where significant differences were observed in the chi-square test) to allow comparisons with the control group.

2. Multifactorial statistical evaluation was performed by binary logistic regression.

    In the following two analyses the univariate and the multivariate logistic regression model, were used. Only those variables from the univariate analyses were included in the multivariate model in which significant associations could be observed or the variables were of great importance. The associations in both univariate and

multivariate analyses were examined on the basis of odds ratios (OR), 95% confidence intervals (CI) and p values.

⊕ The dependent variables were blood pressure measurements in the physician's office, and blood cholesterol level testing, while the independent variables were: socio-economic and socio-demographic characters (e.g. age, gender, marital status, nationality, and educational level), health status (e.g. chronic diseases, and SRH) and health behaviour characteristics (e.g. smoking, and participation in screening).

⊕ The associations between poor SRH as a dependent variable and in the first analyses the material situation (e.g. employment, housing conditions, and owning a computer) and socio-demographic features (age, gender, education, nationality, etc.), as independent explanatory variables and in the second analyses socio-demographic features (age, marital status, nationality, etc.), lifestyle characteristics (smoking, alcohol consumption, nutritional habits, physical activity, etc.) and health status indicators (BMI, chronic diseases etc.), as independent variables were evaluated by means of univariate and multivariate logistic regression.

4. Results

4.1. Demographic Characteristics

In our study 567 persons were questioned: 121 persons of the Romanian, 120 persons of the Serbian, 97 persons of the German, 108 persons of the Croatian minority and 121 persons of the Hungarian population, as a control group.

Demographic characteristics are presented in *Table 3*. It is clear that no significant differences were found among the five groups as conerns mean age, sex and marital status. Thus, the five groups could be considered similar in the basic demographic characteristics. In education, however, the differences were significant (p<0.001). From this aspect, therefore, belonging to one of the minorities or the majority was an important issue.

Table 3 *Demographic characteristics*

	Romanian		Serbian		German		Croatian		Hungarian		p value
Mean age	years	n	years	n	years	n	years	n	years	n	**0.290**[1]
	43.9	121	47.2	120	42.4	97	43.5	108	46.1	121	
Gender	%	n	%	n	%	n	%	n	%	n	**0.313**[2]
Males	49.6	60	56.7	68	42.3	41	49.1	53	47.1	57	
Marital status	%	n	%	n	%	n	%	n	%	n	**0.366**[2]
Married	56.2	68	58.5	69	48.5	47	53.7	58	55.0	68	
Cohabiting	1.7	2	1.7	2	5.2	5	6.5	7	3.3	4	
Single	28.1	34	30.5	36	27.8	27	25.9	28	22.5	27	
Divorced	2.5	3	2.5	3	6.2	6	1.9	2	2.5	3	
Widowed	11.6	14	6.8	8	12.4	12	12.0	13	16.7	20	
Education	%	n	%	n	%	n	%	n	%	n	**<0.001**[2]
Low	51.2	62	20.0	24	23.7	23	40.7	44	36.4	44	
Medium	36.4	44	48.3	58	53.6	52	46.3	50	53.7	65	
High	12.4	15	31.7	38	22.7	22	13.0	14	9.9	12	

One-way ANOVA test[1], Chi-square test for the categorical variables[2]

There was no significant difference in marital status, but the proportion of those living in cohabitation was above the average (3.5%) in the Croatian (6.5%) and German (5.2%) groups. The proportion of divorces was highest in the Germans (6.2%) and lowest in the Croatians (1.9%). There were more widowed persons in the Hungarian population (16.7%) and less among the Serbians (6.8%).

Analysis of the educational level showed that those with college or university degree were about three times more frequent in the Serbians (31.7%) and about twice more in the Germans (22.7%) than in the Hungarians (9.9%), Romanians (12.4%), or Croatians (13.0%). Examining this with univariate logistic regression revealed that the chance of having a high-level education was 4.2 times greater in the Serbian population (OR=4.21, 95%CI, 2.07-8.55, p<0.001), 2.6 times greater in the German population (OR=2.67, 95%CI, 1.24-5.71, p=0.012), and about 1.3 times greater among Croatians (OR=1.35, 95%CI, 0.59-3.07, p=0.469) and Romanians (OR=1.28, 95%CI, 0.57-2.87, p=0.541) than in the Hungarian control group (OR=1.00, reference category).

4.2. Employment and Work Environment

Figure 2 shows the employment ratio of national minorities (significant differences were found, p=0.003). The employment ratio was high in the Serbian and German minorities (over 50%) and low among the Romanians (ca. 30%). From among those having no employment, 60% were pensioners in the Serbian minority, as compared with only about 40% in all other groups, but there was no significant difference.
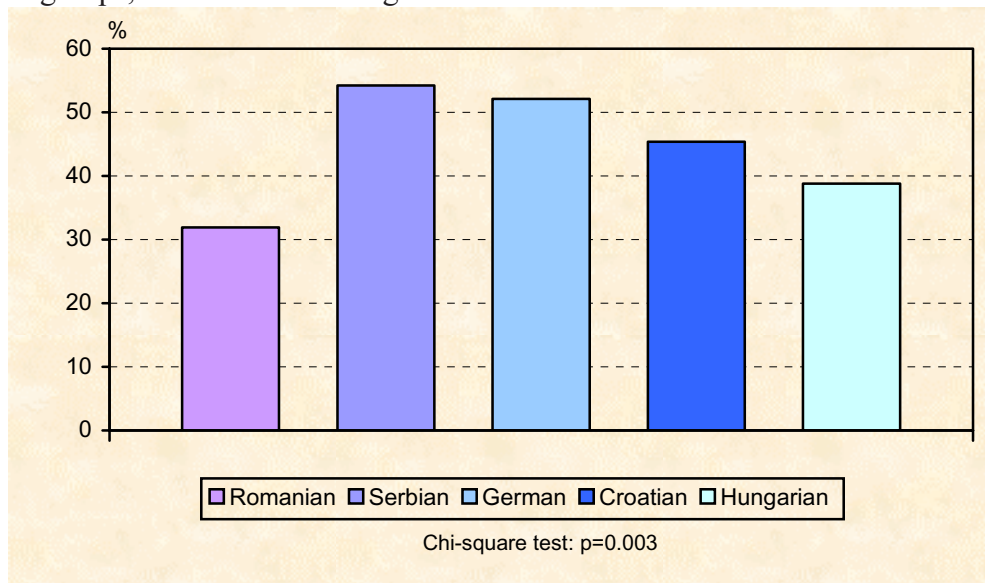

Figure 2 Employment ratio

The univariate logistic regression revealed the following figures: the chance of economically active persons among the Serbians (OR=1.86, 95%CI, 1.11-3.10, p=0.017), in Germans (OR=1.71, 95%CI, 0.99-2.96, p=0.053), and the Croatian minority (OR=1.30, 95%CI, 0.77-2.21, p=0.318) was higher than in the Hungarian control group (OR=1.00,

reference category). The only population where this chance was smaller was the Romanian one (OR=0.74, 95%CI, 0.43-1.25, p=0.264).

As regards the material circumstances, significant differences (p<0.001) can be seen. The number of those who considered their material circumstances "good" was highest in the Romanian (39.6%) and Serbian (38.7%) groups. The Hungarians tended to regard them as "acceptable" (62.8%) and the worst classification was given by the Croatians (22.7%) and Germans (19.8%). In the Romanian (OR=2.52, 95%CI, 1.42-4.47, p=0.002) and the Serbian nationality (OR=2.42, 95%CI, 1.36-4.29, p=0.003) groups, the grading of their material circumstances as "good" was 2.2-2.5 times more chance than among the Hungarians (OR=1.00, reference category) and Germans (OR=1.14, 95%CI, 0.59-2.18, p=0.689), but among Croatians (OR=0.68, 95%CI, 0.34-1.36, p=0.279) the chance was smaller.

The holiday habits also revealed significant differences (p<0.001). Our study showed that Serbians went on holiday very often (66.9%), but the Hungarians (52.1%) and Germans (51.6%) did this less often. The Romanians had a holiday more rarely (48.8%), though they lived in quite good material circumstances, but the figure was the smallest in the case of the Croatians (38.1%). In the Serbian population, the chance of going on holiday was 1.8 times higher (OR=1.86, 95%CI, 1.10-3.15, p=0.020) than among the Hungarians (OR=1.00, reference category). The figure for the German minority (OR=0.98, 95%CI, 0.57-1.69, p=0.944) was very close to that for the control group and the chance was smaller in the Romanian (OR=0.87, 95%CI, 0.53-1.45, p=0.605) and Croatian (OR=0.56, 95%CI, 0.33-0.96, p=0.036) populations.

Figure 3 shows the nature of the job (it was not declared by 16.2% of the persons asked).
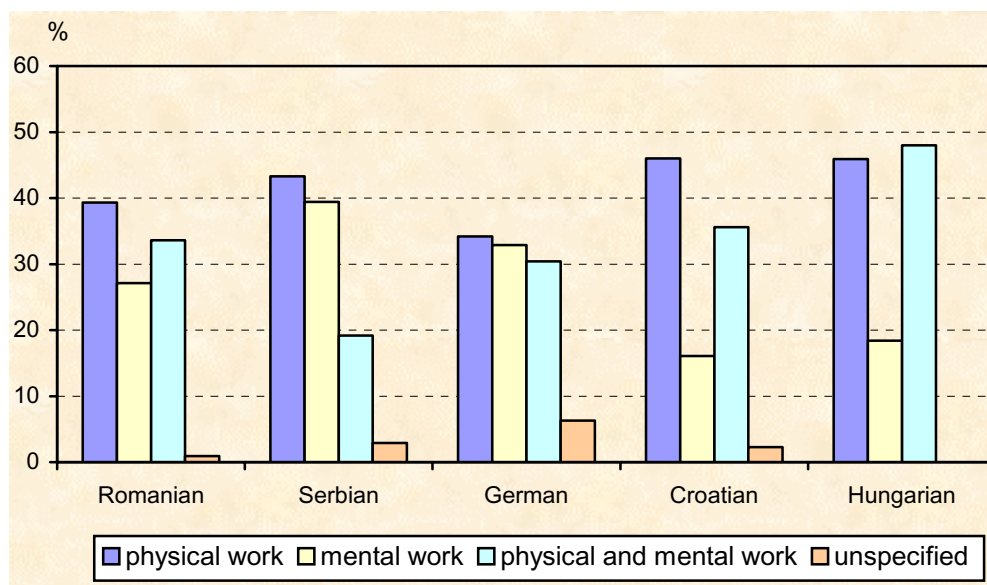
Figure 3 *The character of the job*

40.1% of those giving an answer do physical work, over 25% (26.9%) do mental work, and ca. 30% (33.3%) have a mixed-type job. Physical work was the most typical in the Croatian (46.0%) and Hungarian (45.9%) groups, in comparison with mental work in the Serbian (39.4%), and a mixed job in the Hungarian group (48.0%).

4.3. Living Environment, Housing Conditions

In our study, the living environment was characterised by the presence of public utilities and the structure of the dwelling units. In the area of the present study, the conditions with access to piped water were available for almost everyone. However, there were significant differences between the settlements in the disposal of sewage *(Table 4)*.

Table 4 *Characteristics of living environment of the participants*

Access to public utilities	Romanian (n=121)		Serbian (n=120)		German (n=97)		Croatian (n=108)		Hungarian (n=121)		p value[1]
	%	n	%	n	%	n	%	n	%	n	
Piped water	99.2	120	98.3	118	97.9	94	100.0	107	98.3	117	**0.657**
Sewer system											**<0.001**
Septic tank	99.2	120	88.2	105	89.6	86	88.0	95	81.0	98	
Public sewer	0.0	0	9.2	11	5.2	5	5.6	6	5.8	7	

Chi-square test for the categorical variables[1]

Another settlement-specific service is household waste management. Of all the settlements studied, Méhkerék has no organised waste collection service. In the other places, this service is provided and nearly 100% of the population make use of it.

Figure 4 shows that the only significant difference in the structure of the dwellings (separate kitchen, bathroom and toilet) was in the presence of flush toilets (p<0.001), which were mostly missing among the Romanians (83.5%).

Chi-square test: p=0.232; p=0.515; p<0.001
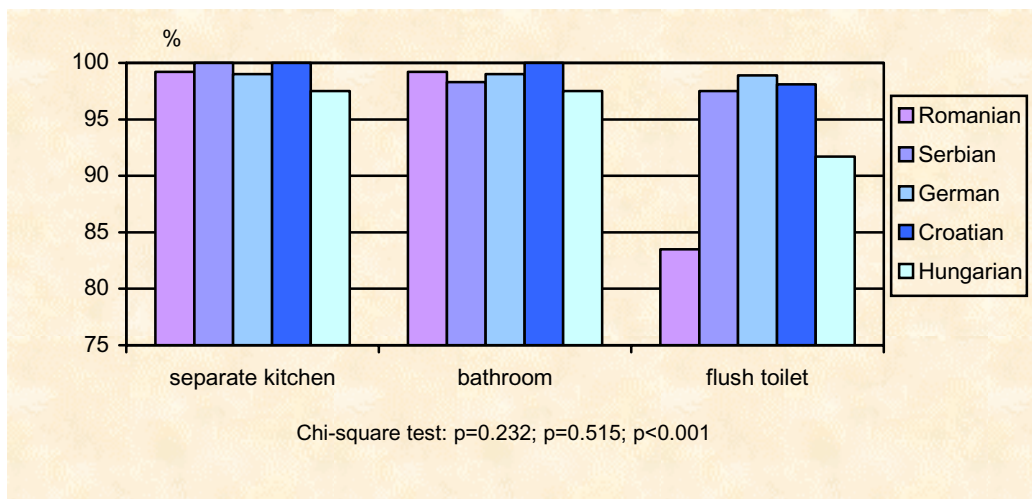
The chance   *Figure 4 The structure of the dwellings*   he German minority (OR=8.47 95%CI, 1.06-67.35, p=0.043), 4.7 times higher among the Croatians (OR=4.73, 95%CI, 1.01-22.09, p=0.048), and 3.5 times higher among the Serbians (OR=3.51, 95%CI, 0.94-13.10, p=0.061) than in the Hungarian group (OR=1.00, reference category), but the chance was smaller in the Romanians (OR=0.45, 95%CI, 0.20-1.02, p=0.055).

Only 5% of the interviewees rated the condition of their dwellings as "bad"; mainly the Hungarians (7.4%) and Germans (6.3%) did so; while the Romanians (53.7%) considered it "acceptable". The Serbians (62.5%) and the Croatians (51.9%) tended to answer with "good" (*Figure 5*).

Chi-square test: p=0.036

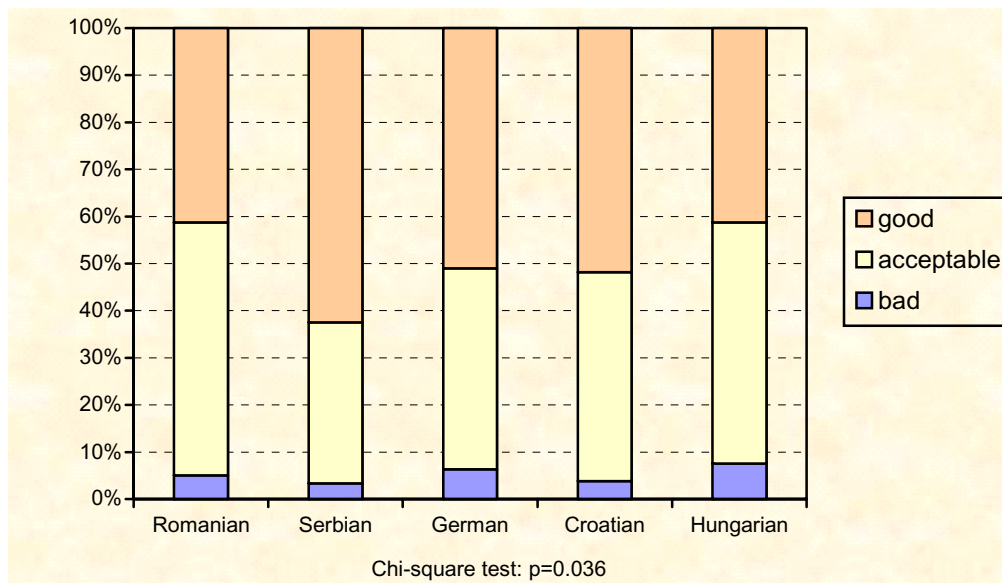*Figure 5 Subjective evaluation of the dwelling*

The chance of regarding their dwellings as "good" was 2.3 times greater among the Serbians (OR=2.36, 95%CI, 1.41-3.97, p<0.001) and 1.5 times greater among the Croatians (OR=1.53, 95%CI, 0.90-2.58, p=0.111) and the Germans (OR=1.48, 95%CI, 0.86-2.54, p=0.154) than among the Romanians (OR=1.00, 95%CI, 0.59-1.67) and the Hungarians (OR=1.00, reference category).

4.4. Health-related Behaviour

There were no major differences in the smoking habits. Current smokers were found in the highest proportion in the Romanian group (29.0%), whereas never-smokers were most abundant among the Croatians (67.6%) (*Figure 6).*
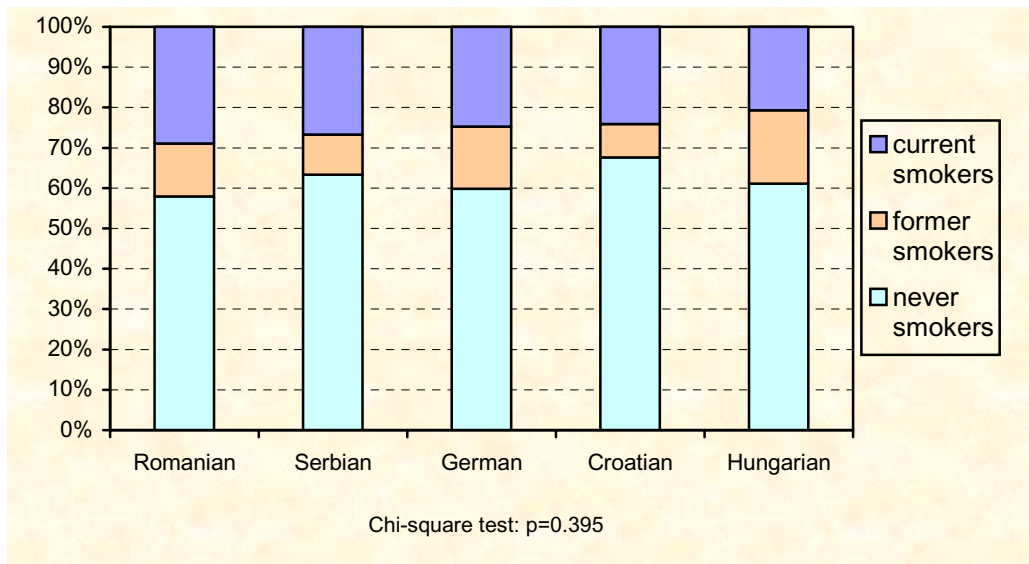

Chi-square test: p=0.395

Figure 6 Smoking habits

There were differences in the alcohol consumption habits of the nationalities. The proportion of regular drinkers was about the same in all groups, but the percentage of those declaring total abstinence was higher (ca. 60%) in the Romanian and Croatian minorities (*Figure 7*). The chance of not drinking alcohol was 3 times higher in the Romanian population (OR=3.06, 95%CI, 1.81-5.18, p<0.001), and 2.4 times higher among the Croatians (OR=2.39, 95%CI, 1.40-4.07, p<0.001) than among the Hungarians. In the German (OR=0.92, 95%CI, 0.53-1.60, p=0.769) and Serbian populations (OR=0.59, 95%CI, 0.34-1.02, p=0.061), the chance was worse.
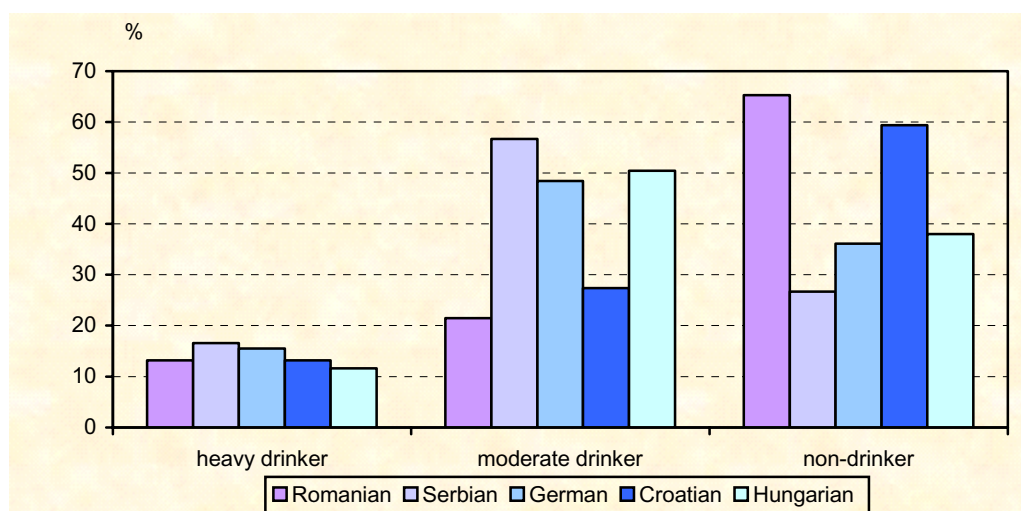
Figure 7 Alcohol consumption

Figure 8 illustrates the cooking habits. The use of vegetable oil, for example, was most frequent among the Romanians (ca. 90%), whereas among the Serbians 41.2% used exclusively animal fat. The chance of cooking with vegetable oil was 4.1 times greater in the Romanian minority (OR=4.15, 95%CI, 2.04-8.45, p<0.001), and 1.5 times greater among the Germans (OR=1.54, 95%CI, 0.83-2.84, p=0.166), but the Croatians (OR=1.14, 95%CI, 0.64-2.00, p=0.657) used vegetable oil with almost the same chance as the Hungarian control group (OR=1.00, reference category). Among the Serbians (OR=0.51, 95%CI, 0.30-0.87, p=0.013) the chance was only half.
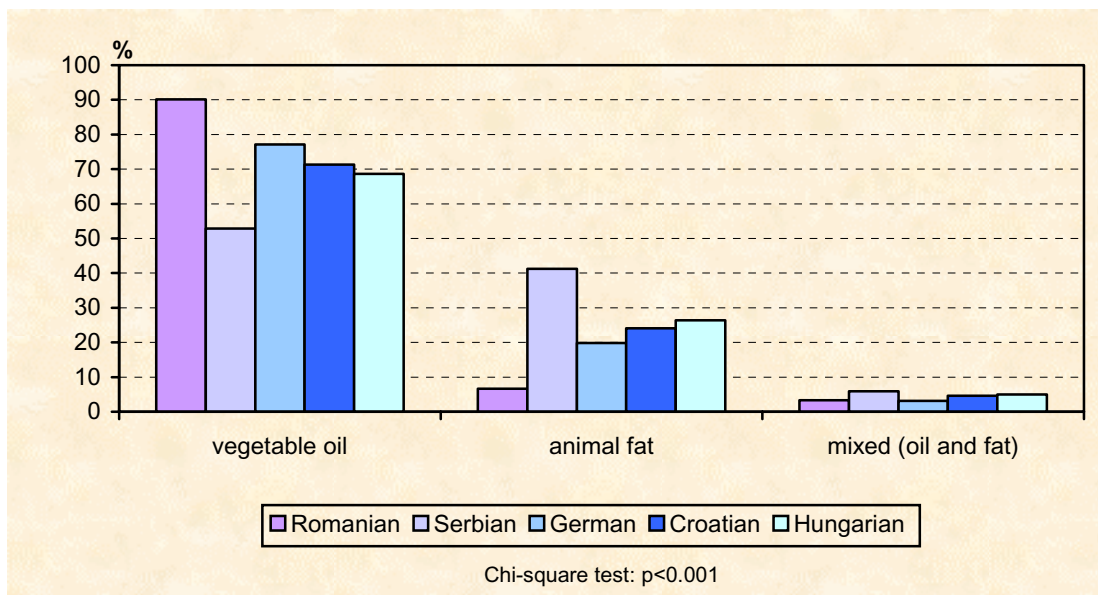
Figure 8 Cooking habits

The answers on the fruit and vegetable consumption demonstrated significant differences. The average daily fruit consumption data for the Serbian, German and Croatian minorities and the Hungarian group were similar (41-50%). About half of the Croatian and German population, 40% of the Hungarian group and one-third of the Serbian minority eat some vegetables on a regular basis. In the Romanian minority, the consumption of fruit (10.7%) and vegetables (0.5%) was markedly poorer *(Figure 9)*. It may be seen that in the

Romanian population (OR=7.39, 95%CI, 3.76-14.56, p<0.001) the chance of eating fruit daily was 7.4 times smaller than among the Hungarians (OR=1.00, reference category). In the other groups, this chance was the same as in the reference category (among the Croatians OR=1.15, 95%CI, 0.68-1.95, p=0.586 among the Germans OR=1.09, 95%CI, 0.64-1.88, p=0.734, and among the Serbians OR=1.03, 95%CI, 0.62-1.72, p=0.890).
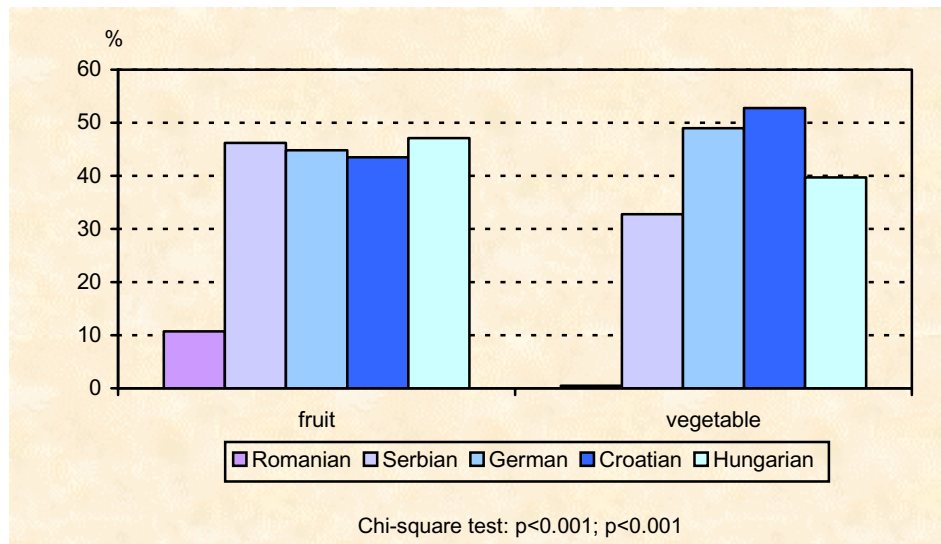

Figure 9 *Daily consumption of fruit and vegetables*

As concerns the consumption of black coffee on a regular basis, significant differences were observed (p<0.001). The highest percentage was found in the Serbian minority (77.5%), while this habit was not so important in the Romanian population (45.5%) as in the others. The chance of drinking more coffee than the Hungarians (OR=1.00, reference category) was 2.6 times greater among the Serbians (OR=2.59, 95%CI, 1.48-4.54, p<0.001), and 1.7 times greater among the Croatians (OR=1.77, 95%CI, 1.02-3.08, p=0.042). In the case of the German (OR=0.84, 95%CI, 0.48-1.43, p=0.519) and Romanian populations (OR=0.63, 95%CI, 0.38-1.04, p=0.072) this chance was smaller.

The Romanians (12.7%) and Serbians (7.7%) were more active in regular sport, while the Hungarians (5.1%), Croatians (4.7%) and Germans (4.3%) did less physical exercise, but there was no significant difference (p=0.090).

Table 5 shows the participation in health screenings, where significant differences can be observed (p<0.001).

Table 5 *Cholesterol level and blood pressure level screening*

	Romanian		Serbian		German		Croatian		Hungarian		p value[1]
	%	n	%	n	%	n	%	n	%	n	
Cholesterol level screening Yes	5.0	6	57.5	69	35.2	32	45.3	48	28.3	34	**<0.001**
Blood pressure screening Yes	20.7	25	56.3	67	46.7	43	57.4	58	47.9	58	**<0.001**

Chi-square test for the categorical variables[1]

It is clear, that the percentage participation in the cholesterol level screening and the blood pressure screening was lowest among the Romanian minority (5.0%; 20.7%). The highest percentages in both screenings were those of the Serbian (57.5%; 56.3%) and Croatian minorities (45.3%; 57.4%).

4.5. Health Status

The health status was self-assessed on a five-grade scale (*Figure 10*). The health was judged to be "very good" in the highest proportion (33.1%) in the Romanian group, "good" was chosen by around 40-50% (highest by the Germans, with 54.6%), while 42.1% of the Hungarians and 40.7% of the Croatians regarded their health as "average". These latter two groups also evaluated their health status as poor in the highest proportions: Hungarians: 16.6%; and Croatians: 16.7%.

Chi-square test: p<0.001
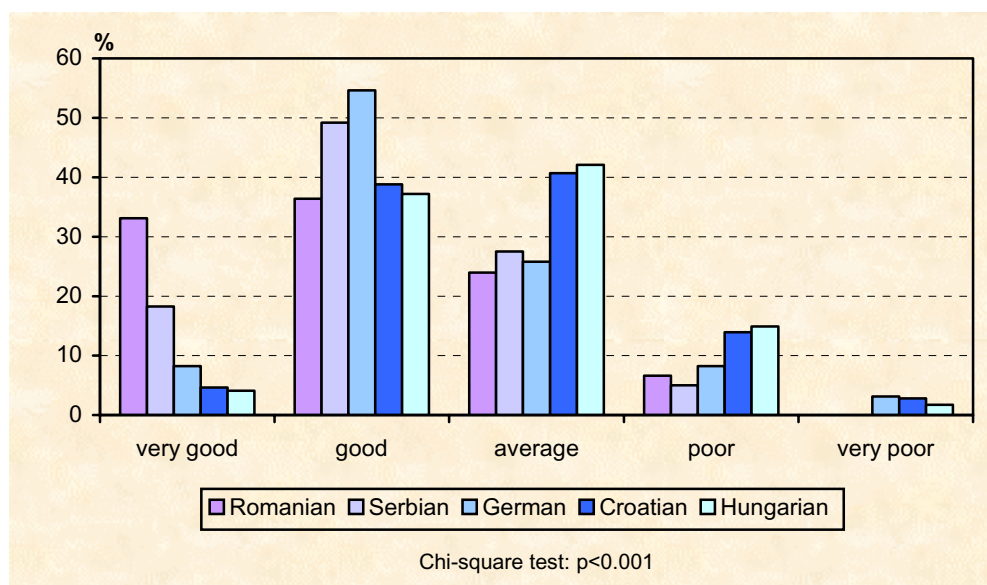
Figure 10 *Self-rated health*

The calculations relating to the presence of chronic diseases were based on self-reported data, using the groups of ICD-10 *(Figure 11)*. 41.2% of all the participants reported some chronic disease, most frequently among the Hungarians (53.1%) and least frequently among the Serbians (27.3%).
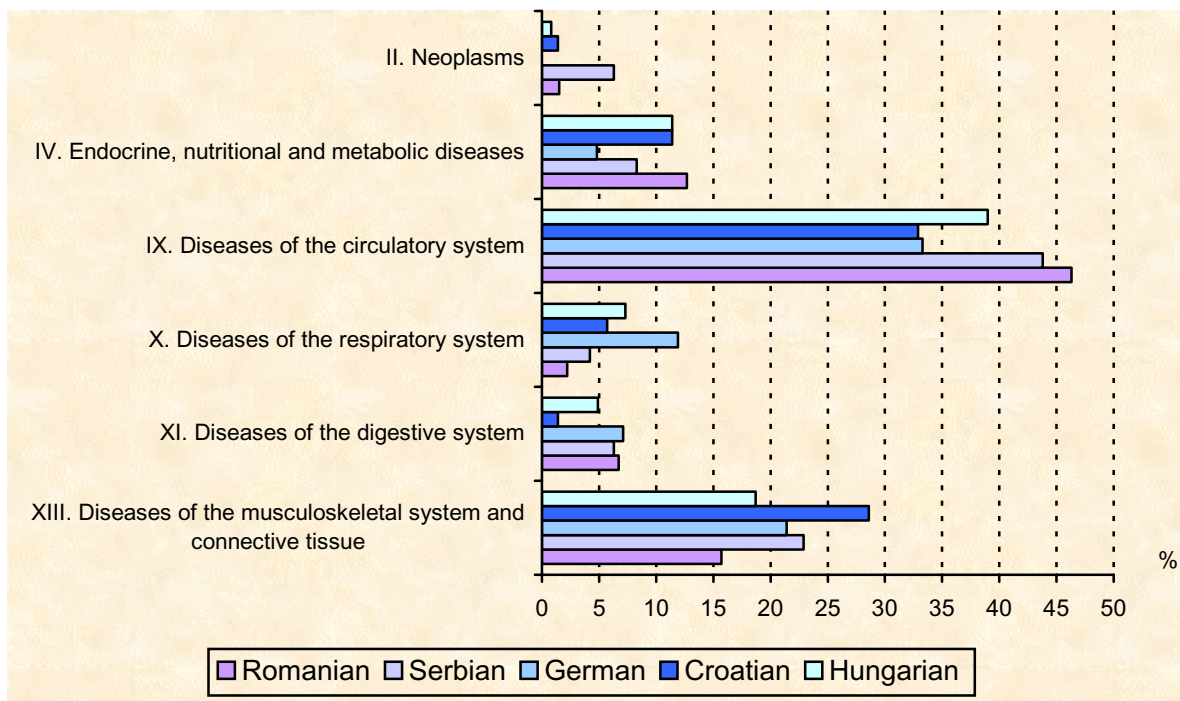
Figure 11 *The most frequent chronic diseases (ICD-10)*

In all nationalities, circulatory diseases were the most abundant (32.9% to 46.3%), and musculoskeletal diseases were in second place (15.7% to 28.6%). Endocrine diseases were reported in more than 10% of the respondents among the Romanians, the Croatians and the Hungarians. In the German minority, a high percentage of respiratory diseases (11.9%) was noticed, while neoplasms appeared in the highest proportion among the Serbians (6.3%). The Croatian nationality was least likely to suffer from diseases of the digestive system (1.4%).
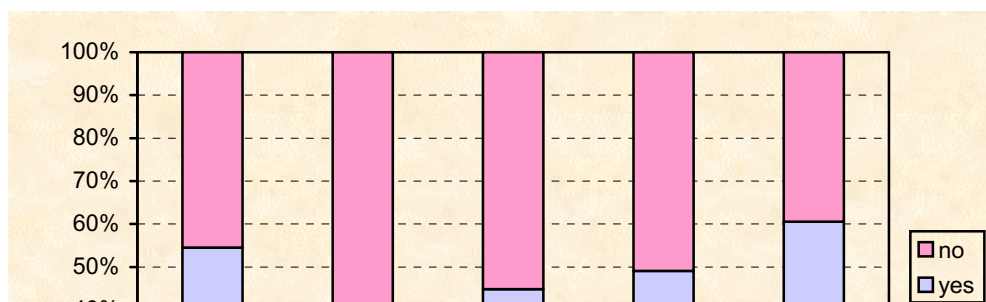
Figure 12 Regular use of pharmaceuticals

The regular use of pharmaceuticals was highest among the Hungarians (60.5%) and lowest in the Serbian group (37.8%) (*Figure 12*). The chance of not taking any medicine was 2.5 times higher among the Serbians (OR=2.52, 95%CI, 1.49-4.24, p<0.001), 1.8 times higher in the German group (OR=1.88, 95%CI, 1.09-3.25, p=0.022), 1.5 times higher among the Croatian group (OR=1.59, 95%CI, 0.94-2.69, p=0.084) and 1.3 times higher in the Romanians (OR=1.27, 95%CI, 0.76-2.13, p=0.351) than among the Hungarians (OR=1.00, reference category). In all groups, antihypertensives, pain killers, antiphlogistics, vitamins, cardiac drugs and tranquillisers were taken most often.

The BMI furnished the following results: underweight was most common among the Germans (6.0%), normal weight was most common among the Romanian population (57.0%), overweight was most frequent among Serbians (34.4%), and obesity was highest in the

Hungarian (24.8%) and Croatian (22.4%) groups. There was no significant difference (p=0.285).

4.6. Multifactorial Statistical Evaluations (Logistic Regression Models)

4.6.1. Regular Blood Pressure and Cholesterol Level Screening

In the univariate analyses the distribution of the cholesterol level screening participants was 275 men and 283 women, i.e. 558 altogether, while in the blood pressure screening it was 274 men, 280 women, i.e. 554 altogether. In the multivariate logistic regression model, after the exclusion of the subjects for whom only incomplete data were available (because of unanswered questions), the study population comprised 271 men and 276 women, i.e. 547 altogether for both blood pressure and cholesterol level screening.

The associations between cholesterol level and blood pressure screening as dependent variables, and socio-demographic features (e.g. age, gender and minority), lifestyle factors (e.g. smoking and eating habits) and health status indicators (e.g. BMI and SRH) as independent, explanatory variables were evaluated by means of univariate and multivariate logistic regression.

4.6.1.1. Univariate Logistic Regression

Table 6 presents the factors associated with participation in the two types of screening among the national minorities in South-East Hungary. The following socio-demographic variables (age, marital status, nationality and education), and health behaviour variables (smoking status, daily consumption of fruit and vegetables, regular sport and blood pressure measurement) and health status characteristics (BMI, self-reported chronic diseases and SRH) were significantly associated with cholesterol level screening in the univariate logistic regression model.

The chance of participation in cholesterol level screening was higher among older persons (OR=1.04, 95% CI, 1.03-1.06), among those who were married/cohabiting (OR=2.28, 95%CI, 1.56-3.31) and those with a high level of education (OR=1.00, reference category). Serbians were the most likely to participate in cholesterol level screening (OR=3.42, 95%CI, 1.99-5.85), while the least likely were the Romanians (OR=0.12, 95%CI, 0.05-0.33).

High ratios were observed among ex-smokers (OR=1.19, 95%CI, 0.71-2.01), persons who consume fruit (OR=1.64, 95%CI, 1.15-2.35) and vegetables (OR=2.28, 95%CI, 1.58-3.29) every day, those who do not take part in sport regularly (OR=10.46, 95%CI, 2.49-43.86), the obese persons (OR=3.88, 95%CI, 2.35-6.34), those who suffer from cardiovascular diseases (OR=2.07, 95%CI, 1.36-3.16) and those who regarded their SRH as poor (OR=2.44, 95%CI, 1.71-3.50). There was also a strong association between blood pressure and cholesterol level screening (OR=35.74, 95%CI, 20.47-62.42).

As concerns blood pressure testing, the following socio-demographic variables (age, marital status and nationality), and health behaviour variables (smoking status, alcohol consumption, daily consumption of fruit and vegetables, regular sport and participation in cholesterol level screening), and health status characteristics (BMI, SRH and self-reported chronic diseases) proved to be significantly associated in the univariate logistic regression model; the likelihood of participation increased with age (OR=1.06, 95%CI, 1.05-1.07). The highest odds were found for those who live with a partner (OR=1.64, 95%CI, 1.16-.32), among the Croatian minority (OR=1.46, 95%CI, 0.86-2.49), and the lowest among the Romanians (OR=0.28, 95%CI, 0.16-0.49).

High ratios of participation were observed among ex-smokers (OR=1.54, 95%CI, 0.92-2.58) and non-drinkers (OR=1.00, reference category), persons who consume fruit (OR=1.59, 95%CI, 1.13-2.25) and vegetables (OR=1.74, 95%CI, 1.22-2.48) every day, those who do not take part in sport regularly (OR=5.79, 95%CI, 2.22-15.10), and obese persons (OR=4.34, 95%CI, 2.59-7.25). Those with cardiovascular diseases (OR=6.64, 95%CI, 4.19-10.50), those who regarded their SRH as poor (OR=5.07, 97%CI, 3.52-7.29) and those who had their cholesterol level checked (OR=35.77, 95%CI, 20.48-62.48) were also more likely to attend for blood pressure screening.

Table 6 Results of the univariate logistic regression model assessing the factors associated with the likelihood of participating in health screening among the nationalities investigated

	Cholesterol level screening				Blood pressure screening			
	N	OR	95% CI	p value	N	OR	95% CI	p value
Age	558	1.04	1.03-1.06	**<0.001**	554	1.06	1.05-1.07	**<0.001**
Gender				**0.609**				**0.592**
Female	283	0.91	0.64-1.29		280	1.09	0.78-1.53	
Male	275	1.00			274	1.00		
Marital status				**<0.001**				**0.004**
Married/cohabiting	322	2.28	1.56-3.31		321	1.64	1.16-2.32	
Single	233	1.00			230	1.00		

Nationality				**<0.001**				**<0.001**
Romanian	121	0.12	0.05-0.33	<0.001	121	0.28	0.16-0.49	<0.001
Serbian	120	3.42	1.99-5.85	<0.001	119	1.39	0.84-2.32	0.195
German	91	1.37	0.76-2.46	0.289	92	0.95	0.55-1.64	0.863
Croatian	106	2.09	1.20-3.63	0.008	101	1.46	0.86-2.49	0.159
Hungarian	120	1.00			121	1.00		
Education				**0.002**				**0.271**
Low	192	0.41	0.24-0.68	<0.001	188	1.04	0.64-1.69	0.875
Medium	267	0.66	0.41-1.06	0.085	268	0.78	0.49-1.24	0.292
High	99	1.00			98	1.00		
Smoking status				**0.010**				**<0.001**
Ex-smokers	71	1.19	0.71-2.01	0.501	73	1.54	0.92-2.58	0.098
Current smokers	140	0.53	0.34-0.83	0.006	140	0.38	0.25-0.58	<0.001
Never smokers	347	1.00			341	1.00		
Alcohol consumption				**0.528**				**0.011**
Drinkers	305	1.12	0.78-1.59		306	0.64	0.46-0.90	
Non-drinkers	252	1.00			247	1.00		
Daily consumption of fruit				**0.006**				**0.008**
Yes	211	1.64	1.15-2.35		212	1.59	1.13-2.25	
No	346	1.00			341	1.00		
Daily consumption of vegetables				**<0.001**				**0.002**
Yes	188	2.28	1.58-3.29		188	1.74	1.22-2.48	
No	369	1.00			365	1.00		
Regular sport				**0.001**				**<0.001**
No	509	10.46	2.49-43.86		507	5.79	2.22-15.10	
Yes	39	1.00			37	1.00		
Cholesterol level screening	-	-	-	-				**<0.001**
Yes					185	35.77	20.48-62.48	
No					365	1.00		
Blood pressure screening				**<0.001**	-	-	-	-
Yes	247	35.74	20.47-62.42					
No	303	1.00						
Body mass index (kg/m²)				**<0.001**				**<0.001**
<18.5	20	0.82	0.26-2.55	0.732	19	0.48	0.15-1.50	0.209
25-29.99	151	2.10	1.35-3.27	0.001	151	1.84	1.21-2.78	0.004
>30	96	3.88	2.35-6.34	<0.001	95	4.34	2.59-7.25	<0.001
18.5-24.99	244	1.00			242	1.00		
Chronic diseases				**<0.001**				**<0.001**
Cardiovascular diseases	133	2.07	1.36-3.16	<0.001	133	6.64	4.19-10.50	<0.001
Other diseases	105	1.93	1.22-3.06	0.005	102	2.19	1.39-3.45	<0.001
None	320	1.00			319	1.00		
Self-rated health				**<0.001**				**<0.001**
Poor	241	2.44	1.71-3.50		238	5.07	3.52-7.27	
Good	317	1.00			316	1.00		

OR, odds ratio; CI, confidence interval

4.6.1.2. Multivariate Logistic Regression

The questions on screening were answered by 547 persons (the non-response rate was 3.5%). Among those answering, 44.9% participated in regular professional blood pressure screening (once a year) and 33.6% in regular cholesterol level screening (every two years).

Table 7 presents the factors associated with participation in the two types of screening among the national minorities in South-East Hungary. Four of the eight variables (age, nationality, education and blood pressure measurement) were significantly associated with cholesterol level screening in the logistic regression model. The chance of participation in cholesterol level screening was higher among older persons (OR=1.04, 95% CI, 1.02-1.06) and those with a high level of education (OR=1.00, reference category). Serbians were the most likely to participate in cholesterol level screening (OR=5.65, 95%CI, 2.39-13.35), while the least likely were the Romanians (OR=0.21, 95%CI, 0.07-0.62). There was also an association between blood pressure and cholesterol level screening (OR=36.04, 95%CI, 17.69-73.40).

As concerns blood pressure screening, five of the nine variables (age, nationality, cholesterol level screening, chronic diseases, and SRH) proved to be significantly associated in the logistic regression model; the likelihood of participation increased with age (OR=1.02, 95%CI, 1.00-1.04). High odds were found among the Croatians (OR=1.48, 95%CI, 0.65-3.40) and the German minority (OR=1.46, 95%CI, 0.62-3.43) and the lowest among the Romanians (OR=0.31, 95%CI, 0.13-0.75). Those with cardiovascular diseases (OR=6.07, 95%CI, 2.56-14.38), those who had their cholesterol level checked (OR=37.34, 95%CI, 18.11-76.96) and those with a poor SRH (OR=2.15, 95%CI, 1.08-4.28) were also more likely to attend for blood pressure screening.

Table 7 *Results of the multivariate logistic regression model assessing the factors associated with the likelihood of participating in health screening among the nationalities investigated. (Data missing in up to 20 cases.)*

	N	Cholesterol level screening			Blood pressure screening		
		OR	95% CI	p value	OR	95% CI	p value
Age	547	1.04	1.02 - 1.06	**<0.001**	1.02	1.00 - 1.04	**0.034**
Gender				**0.728**			**0.714**
Female	276	1.11	0.61 - 2.01		1.11	0.64 - 1.92	
Male	271	1.00			1.00		
Marital status				**0.078**			**0.774**
Married/cohabiting	318	1.70	0.94 - 3.09		0.92	0.52 - 1.62	
Single	229	1.00			1.00		
Nationality				**<0.001**			**0.016**
Romanian	121	0.21	0.07 - 0.62	0.005	0.31	0.13 - 0.75	0.009
Serbian	117	5.65	2.39 - 13.35	<0.001	0.90	0.37 - 2.19	0.825
German	90	1.86	0.79 - 4.36	0.150	1.46	0.62 - 3.43	0.382
Croatian	100	2.86	1.27 - 6.44	0.011	1.48	0.65 - 3.40	0.349
Hungarian	119	1.00			1.00		
Education				**<0.001**			**0.477**
Low	185	0.20	0.08 - 0.51	<0.001	1.31	0.57 - 3.02	0.521
Medium	266	0.71	0.33 - 1.55	0.394	0.86	0.41 - 1.81	0.694
High	96	1.00			1.00		
Smoking status				**0.889**			**0.131**
Ex-smokers	70	0.99	0.43 - 2.31	0.997	1.23	0.56 - 2.72	0.606
Current smokers	139	0.83	0.39 - 1.76	0.638	0.53	0.26 - 1.07	0.075
Never smokers	338	1.00			1.00		
Cholesterol level screening							**<0.001**
Yes	184	-	-	-	37.34	18.11 - 76.96	
No	363				1.00		
Blood pressure screening				**<0.001**			
Yes	246	36.04	17.69 - 73.40		-	-	-
No	301	1.00					
Chronic diseases				**0.438**			**<0.001**
Cardiovascular diseases	132	0.90	0.37 - 2.23	0.833	6.07	2.56 - 14.38	<0.001
Other diseases	100	1.52	0.63 - 3.70	0.351	1.22	0.55 - 2.70	0.615
None	315	1.00			1.00		
Self-rated health				**0.415**			**0.023**
Poor	237	0.71	0.32 - 1.59		2.15	1.08 - 4.28	
Good	310	1.00			1.00		

OR, odds ratio; CI, confidence interval

4.6.2. Self-rated Health

The distribution of the participants in the univariate analyses was 288 men and 279 women, i.e. 567 altogether. In the multivariate logistic regression model, after the exclusion of the subjects for whom only incomplete data were available, the study population comprised 274 men and 270 women in the material circumstances model, and 252 men and 250 women in the health behaviour model.

The associations between poor SRH as a dependent variable, and socio-demographic features (age, gender, marital status, education and ethnicity), socio-economic characteristics (employment ratio, living environment, housing conditions, etc.), lifestyle factors (smoking, alcohol consumption, nutritional habits, and physical activity, etc.) and health status indicators (BMI, chronic diseases, etc.) as independent, explanatory variables were evaluated by means of univariate and multivariate logistic regression. The associations in both univariate and multivariate analyses were examined on the basis of the odds ratios, 95% confidence intervals and p values.

4.6.2.1. Univariate Logistic Regression

Table 8 presents the results of the univariate logistic regression model of socio-demographic and socio-economic variables, lifestyle and health status indicators with SRH. The following socio-demographic (age, sex, marital status, education and nationality) and socio-economic variables (economically active, self-evaluation of material circumstances, summer holiday, self-evaluation of the dwelling and having another property, a computer, and a new car) and health behaviour variables (smoking and drinking habits and physical activity) and health status characteristics (BMI and chronic diseases) were significantly associated with poor SRH in the univariate logistic regression analyses.

The risk of poor health was higher at ages over 40 years, the highest risk being observed among those 60 to 69 years old (OR=12.61, 95% CI, 5.78-27.53), women (OR=1.43, 95% CI, 1.03-2.01), married/cohabiting subjects (OR=1.41, 95% CI, 1.01-1.98), and those with a low level of education (OR=5.81, 95% CI, 3.32-10.16). Hungarians had the highest risk of poor health (OR=1.00, reference category), the risk being significantly lower among the ethnic Romanians (OR=0.31, 95% CI, 0.18-0.53), Serbians (OR=0.34, 95% CI, 0.20-0.57) and Germans (OR=0.41, 95% CI, 0.24-0.71).

Poor SRH was observed among economically inactive persons (OR=3.22, 95% CI, 2.26-4.60), whose material circumstances was "bad" (OR=10.19, 95% CI, 5.49-18.94), persons who did not go on holiday (OR=4.70, 95% CI, 3.28-6.75), those whose self-evaluation of their dwelling was "acceptable" (OR=4.75, 95% CI, 2.12-10.66), and those who did not have another property (OR=1.92, 95% CI, 1.21-3.05), a computer (OR=3.58, 95% CI, 2.46-5.19), or a new car (OR=2.82, 95% CI, 1.79-4.44).

The worst health status was reported by the ex-smokers (OR=1.77, 95% CI, 1.06-2.95). As concerns the effect of alcohol consumption, the worst health status was reported by the non-drinkers (OR=1.00, reference category). Physical activity had a strong positive effect on SRH, the difference between physically active and inactive persons proving significant (OR=7.11, 95% CI, 2.49-20.29). Obesity (OR=4.27, 95% CI, 2.57-7.08), an overweight condition (OR=1.68, 95% CI, 1.12-2.54) and reported chronic diseases (OR=17.52, 95% CI, 11.50-26.69) were also significantly associated with poor SRH. There was no significant correlation between the SRH and the daily consumption of fruit and vegetables.[140]

Table 8 *Factors associated with poor SRH using univariate logistic regression*

Variables	N	Poor health (n)	OR	95% CI	p value
Age group (years)					**<0.001**
15-19	69	14	1.00		
20-39	154	23	0.69	0.33- 1.44	0.323
40-59	199	98	3.81	1.99- 7.29	<0.001
60-69	80	61	12.61	5.78-27.53	<0.001
70-75	65	49	12.03	5.33-27.15	<0.001
Sex					**0.034**
Female	288	137	1.43	1.03- 2.01	
Male	279	108	1.00		
Marital status					**0.048**
Married /Cohabiting	328	154	1.41	1.01- 1.98	
Single	236	91	1.00		
Education					**<0.001**
Low	197	119	5.81	3.32-10.16	<0.001
Medium	269	105	2.44	1.42- 4.18	0.001
High	101	21	1.00		
Nationality					**<0.001**
Romanian	121	37	0.31	0.18- 0.53	<0.001
Serbian	120	39	0.34	0.20- 0.57	<0.001
German	97	36	0.41	0.24- 0.71	0.002
Croatian	108	62	0.95	0.56- 1.61	0.846
Hungarian	121	71	1.00		
Economically active					**<0.001**
No	314	174	3.22	2.26- 4.60	
Yes	248	69	1.00		
Self-evaluation of material circumstances					**<0.001**
Bad	85	56	10.19	5.49-18.94	<0.001
Acceptable	321	162	5.38	3.33- 8.69	<0.001
Good	157	25	1.00		

OR, odds ratio; 95% CI, 95% confidence interval

Table 8 *(continued)*

Variables	N	Poor health (n)	OR	95% CI	p value
Summer holiday					**<0.001**
No	268	166	4.70	3.28- 6.75	
Yes	288	74	1.0		
Self-evaluation of the dwelling					**<0.001**
Bad	29	19	3.29	2.30- 4.70	<0.001
Acceptable	257	146	4.75	2.12-10.66	<0.001
Good	280	80	1.00		
Another property					**0.005**
No	460	210	1.92	1.21- 3.05	
Yes	102	31	1.00		
Computer					**<0.001**
No	342	186	3.58	2.46- 5.19	
Yes	220	55	1.00		
New car					**<0.001**
No	440	211	2.82	1.79- 4.44	
Yes	122	30	1.00		
Smoking					**<0.001**
Ex-smokers	74	44	1.77	1.06- 2.95	0.028
Current smokers	142	42	0.51	0.33- 0.77	0.001
Never smokers	351	159	1.00		
Alcohol consumption					**<0.001**
Drinkers	310	109	0.47	0.34- 0.67	
Non-drinkers	255	136	1.00		
Daily consumption of fruit					**0.841**
No	350	150	0.96	0.68- 1.36	
Yes	215	94	1.00		
Daily consumption of vegetables					**0.088**
No	374	152	0.73	0.52- 1.05	
Yes	191	92	1.00		
Regular sport					**<0.001**
No	516	232	7.11	2.49-20.29	
Yes	39	4	1.00		
Body mass index (kg/m^2)					**<0.001**
<18.5	20	3	0.34	0.09- 1.20	0.094
25-29.99	155	72	1.68	1.12- 2.54	0.013
>30	96	66	4.27	2.57- 7.08	<0.001
18.5-24.99	247	84	1.00		
Chronic diseases					**<0.001**
Yes	241	189	17.52	11.50-26.69	
No	326	56	1.00		

OR, odds ratio; 95% CI, 95% confidence interval

4.6.2.2. Multivariate Logistic Regression – Material Circumstances Model

Table 9 shows the results of the multivariate logistic regression model concerning material circumstances. In this multivariate logistic regression analysis, the associations

between poor SRH and sex, marital status, material circumstances, another property, a computer and a new car proved non-significant.

Table 9 Factors associated with poor SRH using multivariate logistic regression. Material circumstances model. (Data missing in up to 23 cases.)

Variable	N	Poor health (n)	OR	95% CI	p value
Age group (years)					**<0.001**
15-19	65	13	1.00		
20-39	151	22	1.42	0.50 - 4.03	0.504
40-59	189	94	12.67	4.15-38.63	<0.001
60-69	77	60	21.38	6.89-66.27	<0.001
70-75	62	47	15.37	5.10-46.29	<0.001
Sex					**0.062**
Female	270	132	1.57	0.98- 2.53	
Male	274	104	1.00		
Marital status					**0.778**
Married /Cohabiting	315	148	1.08	0.61- 1.93	
Single	229	88	1.00		
Education					**0.019**
Low	188	114	3.28	1.39- 7.72	0.006
Medium	261	101	1.62	0.80- 3.27	0.177
High	95	21	1.00		
Nationality					**<0.001**
Romanian	119	36	0.14	0.06- 0.31	<0.001
Serbian	116	39	0.38	0.18- 0.81	0.012
German	89	34	0.51	0.24- 1.08	0.081
Croatian	103	59	1.04	0.49- 2.16	0.924
Hungarian	117	68	1.00		
Economically active/ earning					**0.011**
No	308	172	2.26	1.20- 4.25	
Yes	236	64	1.00		
Self-evaluation of material circumstances					**0.021**
Bad	83	56	3.75	1.42- 9.87	0.007
Acceptable	309	155	2.23	1.12- 4.42	0.022
Good	152	25	1.00		
Summer holiday					**0.163**
No	263	163	1.46	0.85- 2.49	
Yes	281	73	1.00		
Self-evaluation of dwelling					**0.001**
Bad	25	17	3.37	0.94-12.02	0.061
Acceptable	247	142	2.52	1.51- 4.21	<0.001
Good	272	77	1.00		
Another property					**0.568**
No	448	207	0.81	0.40- 1.67	
Yes	96	29	1.00		
Computer					**0.481**
No	333	181	1.21	0.70- 2.09	
Yes	211	55	1.00		
New car					**0.715**
No	427	207	1.13	0.58- 2.19	
Yes	117	29	1.00		

OR, odds ratio; 95% CI, 95% confidence interval

In the multivariate analysis, the following variables were significant: age, education level, nationality, economically active, self-evaluation of material circumstances, and self-evaluation of dwelling. Poor SRH was related to an older age; the risk was higher as the person became older, and the highest risk (OR=21.38, 95% CI, 6.89-66.27) was observed for those aged from 60 to 69 years. Persons with a lower level of education assessed their health as poor to a significantly important extent (OR=3.28, 95% CI, 1.39-7.72). High risk of poor SRH was found among the Hungarians (OR=1.00, reference category) and among the Croatian minority (OR=1.04, 95% CI, 0.49-2.16, but the association was not significant); the risk of poor health among the Romanian minorities (OR=0.14, 95% CI, 0.06-0.31) was significantly lower.

Study of the material circumstances led to the following findings: poor SRH was given by persons who were economically inactive (OR=2.26, 95% CI, 1.20-4.25), those who regarded their material circumstances as "bad" (OR=3.75, 95% CI, 1.42-9.87), and those whose self-evaluation of their dwelling was "bad" (OR=3.37, 95% CI, 0.94-12.02).

4.6.2.3. Multivariate Logistic Regression – Health Behaviour Model

Table 10 reports the results of the multivariate logistic regression model concerning health behaviour. In the multivariate logistic regression analyses, the associations between poor SRH and sex, marital status, smoking, alcohol consumption and physical activity proved to be non-significant.

In the multivariate analysis, the following variables were significant: age, education level, nationality, BMI and chronic diseases. Poor SRH was related to an older age, the highest risk (OR=14.68, 95% CI, 4.06-53.03) being observed for those aged from 60 to 69 years. Persons with a lower level of education assessed their health as poor to a significantly important extent (OR=4.43, 95% CI, 1.84-10.69). There were also significant differences between the different ethnic groups. High risk of poor SRH was found among the Hungarians (OR=1.00, reference category) and among the Croatian minority (OR=1.18, 95% CI, 0.53-2.64, but the association was not significant); the risk of poor health among the Romanian (OR=0.07, 95% CI, 0.03-0.19) and Serbian (OR=0.27, 95% CI, 0.11-0.68) minorities was significantly lower.

The BMI was significantly associated with poor SRH, obese persons reporting the worst health (OR=2.15, 95% CI, 1.03-4.49). The presence or absence of a chronic disease had a major influence on SRH. Persons with a chronic medical state judged their own health status

as much worse than those who did not suffer from chronic diseases (OR=14.32, 95% CI, 7.82-26.22).[140]

Table 10 *Factors associated with poor SRH using multivariate logistic regression. Health behaviour model. (Data missing in up to 65 cases.)*

Variable	N	Poor health (n)	OR	95% CI	p value
Age group (years)					**<0.001**
15-19	62	13	1.00		
20-39	132	20	1.54	0.47-4.98	0.472
40-59	181	91	8.68	2.56-29.44	<0.001
60-69	66	48	14.68	4.06-53.03	<0.001
70-75	61	46	8.39	2.51-28.02	<0.001
Sex					**0.327**
Female	250	122	1.33	0.75-2.36	
Male	252	96	1.00		
Marital status					**0.217**
Married/Cohabiting	293	136	0.66	0.34-1.28	
Single	209	82	1.00		
Education					**0.001**
Low	175	106	4.43	1.84-10.69	<0.001
Medium	237	92	1.38	0.66-2.88	0.391
High	90	20	1.00		
Nationality					**<0.001**
Romanian	121	37	0.07	0.03-0.19	<0.001
Serbian	85	21	0.27	0.11-0.68	0.006
German	81	33	0.56	0.24-1.30	0.178
Croatian	103	62	1.18	0.53-2.64	0.691
Hungarian	112	65	1.00		
Smoking					**0.981**
Ex-smokers	65	39	0.93	0.40-2.15	0.863
Current smokers	126	38	1.01	0.48-2.10	0.973
Never smokers	311	141	1.00		
Alcohol consumption					**0.259**
Drinkers	271	95	0.69	0.36-1.31	
Non-drinkers	231	123	1.00		
Regularly sport					**0.374**
No	465	213	1.91	0.46-8.01	
Yes	37	4	1.00		
Body mass index (kg/m^2)					**0.038**
<18.5	20	3	0.26	0.05-1.35	0.108
25-29.99	151	71	0.88	0.47-1.65	0.695
>30	92	62	2.15	1.03-4.49	0.042
18.5-24.99	239	81	1.00		
Chronic diseases					**<0.001**
Yes	217	167	14.32	7.82-26.22	
No	285	51	1.00		

OR, odds ratio; 95% CI, 95% confidence interval

5. Discussion

According to the literature, there is an inverse relation between the socio-economic level and health, meaning that persons in lower socio-economic strata have higher mortality and more frequent health problems than those in higher socio-economic strata. This association has been found for all indicators of socio-economic level, whether based on occupation, education, or income.[70,80] *Saxena et al.*[141] observed large socio-economic differences between ethnic subgroups; a higher proportion of Afro-Caribbean, Indian, Pakistani, and Bangladeshi children belonged in lower social classes than the general population. In our survey, the analysis of the educational level showed that those with a college or university degree were three times more numerous among the Serbians and twice more numerous among the Germans than in the other groups.

Of all the constituents of the world surrounding human individuals, the working environment is the most hazardous, imposing a 1-3 times greater health risk than any other part of the environment. The evaluation of occupational risk factors and the creation of a safe working environment are therefore of crucial importance in shaping the health status of individuals and populations.[71,83] *Berthould*[142] found that Chinese and Indian working families averaged slightly higher earnings than White people, but Caribbean and African earnings were significantly lower than those of Whites, though this was not true for Black women. The earnings of Pakistani and Bangladeshi families were much lower than those of any other group. The employment ratio was high (over 50%) in the Serbian and German minorities and lowest among the Romanians (ca. 30%).

There are many housing characteristics, e.g., indoor air quality, temperature and warmth, house type and design, etc., that have been strongly associated with health.[143] Poor housing conditions are associated with a wide range of adverse health conditions, including respiratory infections, asthma, injuries, and mental diseases. Addressing housing issues offers public health practitioners an opportunity to address an important social determinant of health.[144] The living environment, characterised here by the presence of public utilities and the structure of dwelling units, is another important determinant of the health status. In Hungary in 2003, 90.8% of the dwelling units had a piped water supply, but only 55.8% were connected to the sewer system.[48] In the area of the present study, the conditions were similar to the national average, with access to piped water for almost everyone. The disposal of sewage, however, was (with significant differences between the settlements) well below the national average. Another settlement-specific service is household waste management. Of all

the settlements studied, Méhkerék had no organised waste collection service. In the other places, this service was provided and nearly 100% of the population made use it. The only difference in the structure of the dwellings (separate kitchen, bathroom and toilet) was in the presence of flush toilets, which were mostly missing among the Romanians. Only 5% of the interviewees rated their dwellings as "bad"; the majority considered them "acceptable" or "good".

In Hungary, 54.2% of the adult population consume alcohol, 9.6% of them being drinkers and 5% (of the adult population) have alcohol-related diseases. (According to the literature, alcohol consumption tends to be lower in African Caribbean, Bangladeshi, Indian and Asian ethnic groups for both men and women as compared with that in the White population.[104]) There was a major difference in the alcohol consumption of the nationalities; the proportion of regular drinkers was about the same in all groups, but those declaring total abstinence was higher in the Romanian and Croatian minority.

In our country, the per capita consumption of cigarettes, roughly 2700 per person per year, is about 50% higher than the EU average. Among those 15 years of age or more, almost every third person (30.8 %) is a smoker thereby, having an extra risk of lung cancer, cardiac diseases, and chronic obstructive pulmonary diseases.[128,129] Besides the use of tobacco, air pollution (primarily in the case of respiratory diseases) is an important risk factor. There were no major differences in the smoking habits. Current smokers were found in the highest proportion in the Romanian group, whereas never-smokers were most abundant among the Croatians.

Murray et al. [145] observed that, although no association was found between coffee consumption and mortality from IHD (ischaemic heart diseases), there was a negative association between coffee consumption and mortality from diseases other than IHD. As regards the consumption of black coffee on a regular basis, the highest percentage was found in the Serbian minority.

Nutrition-related diseases are an extremely serious problem for both the individual and society. Among these, cardiovascular diseases and malignant tumours are the most important. Eating and cooking habits are major causative – or preventive – factors of these diseases.[112,128,129,146] The use of vegetable oil was most frequent among the Romanians, whereas the Serbians used exclusively animal fat. The majority of the population in Hungary does not consume sufficient amounts of milk and dairy products, fruits and vegetables, and wholemeal cereals. The situation relating to fruit and vegetable consumption in the Romanian minority was particularly poor.

Worldwide, between 60% and 85% of adults are simply not active enough to benefit their health. Despite the proven benefits of physical activity, 54% of American adults do not engage in sufficient physical activity, and 24% of adults are not active at all in their leisure time. In Europe, more than 30% of adults are not sufficiently active in their daily life. Some Eastern European countries are estimated to have the highest prevalence of physical inactivity throughout the world (24% among those over 15 years) and an attributable fraction of mortality from physical inactivity in the range 8-10%.[147] This rate in Hungary is 12%.[128,129]

In general, the level of physical activity was inversely correlated with the BMI and blood pressure. The BMI is a useful index of relative weight that can be applied to define obesity and chronic energy deficiency and to assess the individual and community nutritional status. The proportion of persons considered obese in the USA in 1980 was 14.5%, which rose to 22.5% in 1994, and was 20.4% in 2001. There were similar rises outside the USA, e.g. the frequency of obesity increased from 6 to 15% during the same period in the United Kingdom. The current rate of obesity in the developed industrial countries is between 15 and 25%. The situation is similar in Hungary, where the proportion of obese people is 20%, while the rate of those who are overweight is over 50%.[111,128,148] (*Hayes et al.*[149] found that Europeans were more active physically than Indians, Pakistanis or Bangladeshis. In another study BMI levels were significantly higher for Black and Mexican American girls than for White girls.[103]) In our study the physical activity was highest in the Romanian group, where the persons were more often of normal weight, while overweight was observed among the Serbian minority and obesity among the Hungarian and Croatian populations.

In Hungary, more than half of the deaths are due to diseases of the circulatory system, with coronary heart disease being the number one cause of death.[128,129] In our study, 41% of all the participants, reported some chronic diseases, most frequently among the Hungarians and least frequently among the Serbians. In all nationalities, circulatory diseases were the most abundant, and musculoskeletal diseases were in second place. The regular use of pharmaceuticals was highest in the Hungarians and lowest in the Serbian group.

In efforts to prevent these diseases, the early detection and elimination of the major risk factors such as hyperlipidaemia, hypertension and tobacco use are important aims to be achieved through regular screening of the blood pressure and the cholesterol level, and the avoidance of smoking.[128,129,149] Only a few studies have examined the relationship between ethnicity and preventive use. According to a North Carolina survey, Hispanic women are less likely to receive blood pressure and cholesterol screening than White women are.[150]

In our study, age and nationality proved to be common determinants of participation in the blood pressure and cholesterol screening. Among the minorities, the extremely low participation of the Romanians in these screenings was noteworthy. High odds ratios can be observed in the participation in cholesterol level screening among the Serbians, and in the high blood pressure screening among the Croatians.

Ex-smokers and never-smokers were more likely to have their blood pressure and cholesterol level checked than current smokers. The latter exhibited the lowest odds of participation, possibly resulting in the presence of cumulated risk factors, but the difference was significant only in the univariate logistic regression.

Those who had already had a known cardiovascular disease were more likely to have their blood pressure checked than healthy persons, and those who had a higher education level or poor SRH went to have their cholesterol level checked more often. Comparison of the levels of participation in the blood pressure and cholesterol level screenings revealed that interviewees attending one type of testing were more likely to attend the other one, too.

In a number of earlier publications, females consistently rated their health status lower than did males.[68,151] This "gender paradox" was also seen in our investigated population, as shown by the univariate analyses. An increase in age was significantly associated with a decrease in SRH.

The socio-economic status is associated with health, with SRH, and with mortality, as shown in the Scandinavian countries,[152] Britain,[153] Ireland,[154] Germany,[155] the Netherlands[156] and the USA.[157] Findings in the literature indicate an inverse relation between the socio-economic level and health: persons in lower socio-economic strata have a higher mortality and more frequent health problems than those at higher levels. This association has been found to hold true for all indicators of socio-economic level, whether based on occupation, education or income.[80] A high level of education is strongly associated with good SRH.[158] Our results proved similar: those with merely a basic level of education generally rated their own health status as lower than did those with a higher education level. In the multivariate logistic regression, poor SRH was observed among those whose self-evaluation of material circumstances was considered "bad", and those who didn't go on holiday; an "acceptable" or "bad" self-evaluation of the dwelling can be recognised among the people who didn't have another property or a computer or a new car.

Ethnic differences in SRH emerged as a strong prognostic indicator for subsequent mortality differences between ethnic groups in the USA.[137] A few previous studies have

examined differences in SRH between ethnic groups in Sweden. It was demonstrated that the influence of psychosocial and economic conditions on an increased risk of poor SRH was strongest among those who had immigrated to Sweden from countries that were geographically most distant and culturally most dissimilar to the Swedish society, such as the Arabic-speaking countries or former Yugoslavia.[138] However, after adjustment for socio-economic, psychosocial and economic conditions in the new country, men born in other countries (particularly refugees from non-European countries) still had an increased risk of poor SRH.[139] *Angel et al.*[159] looked at SRH among English and Spanish-speaking Hispanics and found that those who were interviewed in English were more likely to rate their health more favourably than those who responded in Spanish. The authors presumed that this may be due to a linguistic variation in the meaning of "good health". Our study revealed that ethnicity is also a factor influencing of SRH. The SRH data on the ethnic minorities in Hungary were significantly different from those for the Hungarian majority, but the direction was opposite to that generally reported in the literature. That is, SRH was better among the ethnic minorities than among the Hungarian controls (except for the Croatians).

The literature data demonstrated that people living a healthier life have a better SRH. *Wannamethee et al.*[160] found that men and women with a poor-rated health status were more likely to be obese, to smoke and to have an unhealthy diet. This was also the conclusion of other studies.[161,162] In persons reporting a limiting illness, the relationship between SRH and smoking and diet was less pronounced, suggesting that these people focus less on the broader range of mortality risk factors.[163] SRH has been found to correlate strongly with other direct or indirect measures of health. In *Mackenbach*'s cross-sectional study[164] good SRH turned out to be positively associated with a moderate alcohol intake. The results on our study populations were in disagreement with the international experience: SRH was not significantly associated with fruit and vegetable consumption as nutritional habits in the univariate analyses, nor with the smoking habits and alcohol intake in the multivariate model. Regular physical exercise is important for mental and physical well-being.[147] Our results confirmed that regular exercise positively influenced on SRH in the univariate logistic regression. Other studies revealed that poorer SRH was significantly associated with chronic diseases such as hypertension, cardiovascular diseases or diabetes.[165] Via objective indicators of the health status, e.g. the BMI, existing chronic diseases proved to be closely correlated with the SRH in our study. Those with a chronic disease or a higher BMI gave a worse SRH.

6. Conclusions

"In varietate concordia"

"United in diversity"

The motto of the European Union

The cultural diversity, multiculturalism and culture autonomy accepted by the Council of Europe and the EU countries are obviously parts of our political culture. In Hungary, laws have been passed to protect the minorities, to create their local and national self-governments and the office of Ombudsman for National Minorities.

"Diversity and disadvantage", however, can be read in the literature: compelling evidence indicates that ethnicity correlates with persistent, and often increasing, health disparities among EU and US populations and this demands national attention. A national focus on disparities in health status is particularly important as major changes unfold in the way in which health care is delivered and financed.

The programme called *Healthy People 2010* is designed to achieve two overarching goals: the first is to increase the quality and the duration of healthy life, while the second goal is to eliminate health disparities, including differences that occur by gender, ethnicity, education or income.

In recent decades, there have been negative trends in the health of the population in Hungary, which initiated the launch of the *National Public Health Programme*, with improvement of the health status and well-being of the population as a main goal. A healthy population, to be achieved by reducing inequalities, and by elaborating international, national and regional strategies, is a prerequisite of socio-economic development. The goals of the programme can only be realised with an adequate knowledge of the environmental and lifestyle risk factors, which should be reduced and eliminated in order to establish a healthy way of life. Lifestyle is partly determined, as in case of eating habits, by deep-rooted traditions which need to be investigated (one of the aims of the present study), and changed, if necessary, to improve health.

In the literature, a wide range of researches in connection with minorities have been reported in which statistical data on ethnic and national minorities, their identity, rights (human and minority), history, education and literature are provided. In Hungary, there has as yet been no complex survey involving several nationalities, so this study provides the first data.

Our results showed that, among those belonging in certain national minorities, there were detectable differences in education, employment, access to the workplace, the kind of job, certain parameters of the home environment, health behaviour (e.g. alcohol consumption, cooking habits, and fruit and vegetable consumption), health status (chronic diseases and the use of pharmaceuticals), the SRH, and participation in blood pressure and cholesterol level screening.

Age, education, ethnicity, the BMI and the presence of chronic disease proved to be significant determinants of SRH in this study.

In contrast with literature data, however, gender, and lifestyle factors such as smoking, the alcohol intake, and the consumption of fruit and vegetables did not have a significant effect on SRH.

Our results demonstrated that demographic features, especially ethnicity and the subjective health status, are highly important as determinants of self-rated health in South-East Hungary.

Several of the parameters studied in our survey indicated no special health risks for the population of the region (e.g. smoking habits), which means that the control of these risk factors should be aimed at the whole population without taking nationality into account.

Some other factors, however, represent special health risks of certain minorities (e.g. alcohol consumption and cooking habits), justifying the launch of target group-oriented health programmes.

In order to achieve a better efficiency of health promotion and preventive programmes, factors influencing the participation (e.g. the difference in readiness to attend screening among different nationalities) must be taken into account during the planning and implementation.

Eliminating ethnic disparities in health will also require new knowledge about the determinants of disease, the causes of health disparities and effective interventions for prevention and treatment. It will also require improved access to the benefits of society, including qualitative preventive and treatment services, as well as innovative ways of working

in partnership with health care systems, state and local governments, tribal governments, national and community-based organisations, and communities.

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Acknowledgements

Appendix

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