Some Data on the Health Status of the Roma and Non-Roma 10-11 Year Old Children and their Risk Factors according to the National Children's Respiratory Survey of 2005

PÉTER RUDNAI[1,2], MIHÁLY JÁNOS VARRÓ[2], ANNAMÁRIA MÁCSIK[1,2], RENÁTA SZENTMIHÁLYI[1,2], TAMÁS RUDNAI[2]

[1]National Public Health Institute, Budapest, Hungary,[2] National Institute of Environmental Health, Budapest, Hungary[1]•

Abstract

The country-wide National Children's Respiratory Survey of 2005 included a question on ethnicity which made possible for the authors to evaluate the health symptoms and their risk factors of Roma children as well. The objectives of presenting the up to now unpublished data was to back up and partly amplify the picture about the situation of this heavily disadvantaged ethnic group of Hungary. All children attending 3rd grade classes with at least 10 children in any elementary school of Hungary were invited. Out of the 2,726 schools invited 2,160 schools participated in the survey. Out of the 82,082 questionnaires sent out to these schools by post 62,711 were returned (76.4% response rate). The prevalence of respiratory symptoms was assessed by questionnaires sent to the parents through the schools. Parents were asked to answer, among others, the questions on the children's present and past health status including the perinatal conditions, the parents' respiratory health and smoking habits, the home environment and the socio-economic status of the family. Associations between various exposures and health outcomes were assessed by bivariate and multiple logistic regression. The reported prevalence of any chronic cough was twice as high among the Roma (31.7%) than the non-Roma (15.3%) children, asthmatic symptoms were reported in 29.7% of the Roma and 17.3% of the non-Roma children. The leading risk factor in both cases was serious lower respiratory tract (LRT) disease during the first two years of life. The two most important risk factors of serious LRT disease

Corresponding author: Péter Rudnai, M.D.

National Public Health Institute,

2-6 Albert Flórián út, Budapest, Hungary, H-1097

Phone: +361 476 1282

E-mail: rudnai.peter@oki.antsz.hu

[1]Workplace at the time of data collection and analysis

in the first 2 years of life were low birth weight and smoking during pregnancy. This latter one proved to be the most significant risk factor of low birth weight as well, besides the mother's age and low level of education. Among the significant risk factors there are some which we can't do much about (e.g. parents' chronic respiratory diseases), but the impact of most of them (e.g. the mothers' smoking during pregnancy, low level of education, improper living environment) could and should be diminished.

Key words: Roma children, respiratory survey, low birth weight, bronchitis, asthmatic symptoms, smoking during pregnancy, risk factors

INTRODUCTION

In the last decade several papers have dealt with the environmental and health situation of the Roma population in Hungary (Ungváry et al.,2005; 2014; 2015; 2016; 2018; Hegedűs et al., 2014a; 2014b; Szakmáry et al.,2012; 2017; 2018; Sándor et al., 2017; Törő et al., 2017). Some of them were partly related to the situation of the children population (Ungváry et al., 2005; 2014; 2018; Szakmáry et al., 2012; 2018; Hegedűs et al., 2014a) but neither of them gave a broader overview of the Roma children's actual health conditions. This inspired us to present unpublished data from the first National Children's Respiratory Survey of 2005 which may back up and partly amplify the picture about the situation of this heavily disadvantaged ethnic group of Hungary.

The National Institute of Environmental Health and its successor institutions, in co-operation with the National Public Health and Chief Medical Officer's Service, conducted three country-wide surveys among schoolchildren attending 3rd grade classes of elementary school. The first (2005) and the third (2017) surveys contained a question about the children's ethnicity. Evaluation of the last year's survey is still under way, so comparison between the two datasets will be the task of another analysis in the future.

METHODS

The survey was organised in autumn of 2005. All children attending 3rd grade classes with at least 10 children in any elementary school of Hungary were invited. Out of the 2,726 schools invited 2,160 schools participated in the survey. Out of the 82,082 questionnaires sent out to these schools by post 62,711 were returned (76.4% response rate).

The prevalence of respiratory symptoms was assessed by questionnaires sent to the parents through the schools. Parents were asked to answer, among others, the questions on the children's present and past health status including the perinatal conditions. The presence of *chronic bronchitis symptoms (chronic cough)* was based on at least one positive answer to the questions whether the child usually coughed in the morning or during the day or at night in the autumn-winter season; whether the child coughed on most days for at least 3 months consecutively

in the last autumn-winter season and whether the child usually coughed up phlegm when he/she did not have a cold. The assessment of *asthmatic symptoms* used the information given to four questions all related to the last 12 months (Whether the child's chest sounded wheezy or whistling; the child's chest sounded wheezy during or after exercise; the child was woken up by wheeze, or the child suffered from dry cough at night) and was considered positive if a positive answer was given at least to one of the composing questions. Further questions related to the children's perinatal conditions, the parents' respiratory health and smoking habits, the home environment and the socio-economic status of the family.

Associations between various exposures and health outcomes were assessed by bivariate and multiple logistic regression, using STATA/SE 10.0 software (Stata Corp., 2008). Besides crude odds ratios, adjusted ones were also calculated using four factors *a priori* selected on the basis of previous experience: age, gender, chronic respiratory disease of the parents and serious lower respiratory tract (LRT) disease during the first two years of life.

The survey and its questions were approved by the Data Protection Authority on 28th February 2005 (261/K/2005-3).

RESULTS

According to the answers given by the parents 9.1% of the participating children were of Roma ethnicity. The prevalence of children with various symptoms of chronic bronchitis is presented in *Figure 1*. All symptoms occurred significantly more frequent among the Roma than the non-Roma children. The reported prevalence of any chronic cough was twice as high among the Roma (31.7%) than the non-Roma (15.3%) children.
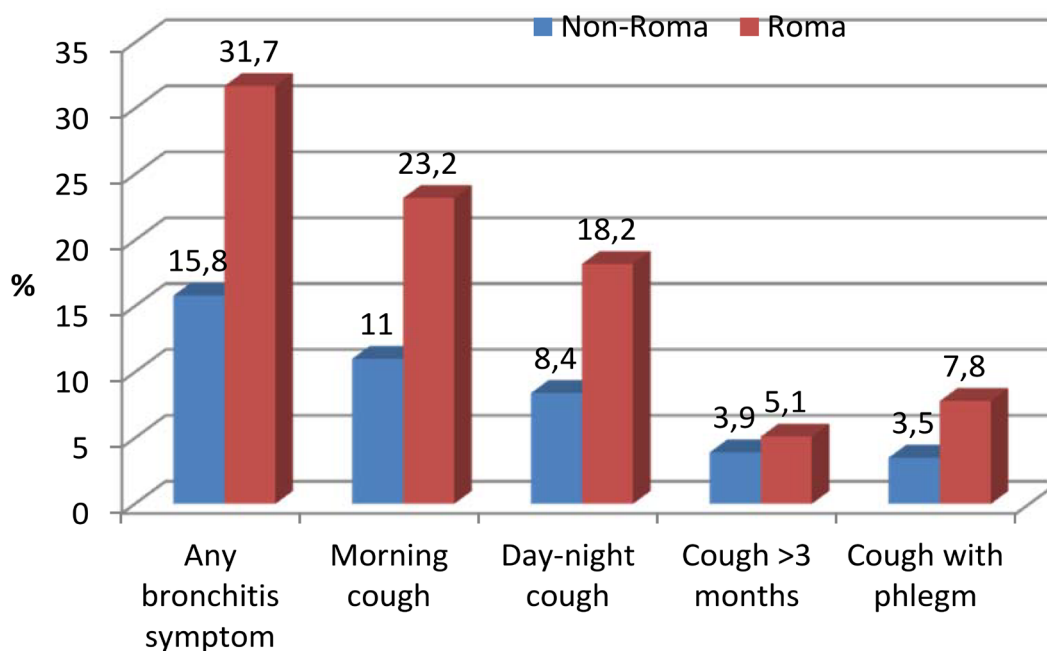

Figure 1. Prevalence of Roma and non-Roma children with symptoms of chronic bronchitis

Significant risk factors of chronic bronchitis symptoms are listed in *Table I*. Besides typical problems of the Roma people's living environment (dump site in the neighbourhood, frequent occurrence of pests, crowded and noisy home) late consequences of early life exposures or genetic effects (mother's smoking during pregnancy, serious lower respiratory tract (LRT) disease in the first two years of life, chronic respiratory disease of the parents) were all significant independent variables.

TABLE I.

Significant risk factors of chronic bronchitis symptoms of Roma schoolchildren

Risk factors	OR	95% C.I.	P value
Serious LRT disease during 0-2 years of age	2.50	2.12 – 2.94	< 0.001
Gas-cooker used for heating	2.35	1.49 – 3.71	< 0.001
Parents' chronic respiratory diseases	2.00	1.68 – 2.39	< 0.001
Frequent occurrence of pests	1.93	1.28 – 2.91	< 0.01
Dump site in the close neighbourhood	1.72	1.30 – 2.27	< 0.001
Noise disturbing sleep	1.50	1.01 – 2.23	< 0.05
Mother smoking during pregnancy	1.35	1.15 – 1.60	< 0.001
Crowded home	1.35	1.10 – 1.65	< 0.01
Mother's low education (≤ 8 classes)	1.24	1.02 – 1.49	< 0.05

Figure 2 shows the significant differences between the prevalence of asthmatic symptoms experienced during the previous 12 months by the Roma and the non-Roma children. Any of the asthmatic symptoms was reported in 29.7% of the Roma and 17.3% of the non-Roma children. Woken up by wheeze, the most frightening asthmatic symptom was reported by almost twice as many Roma than non-Roma children.
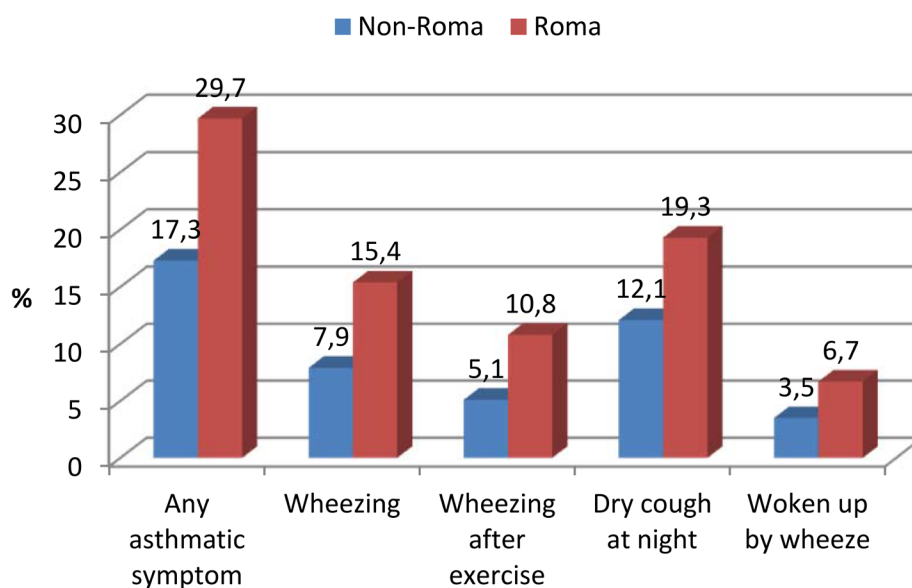
Figure 2. Prevalence of Roma and non-Roma children experiencing asthmatic symptoms during the previous 12 months
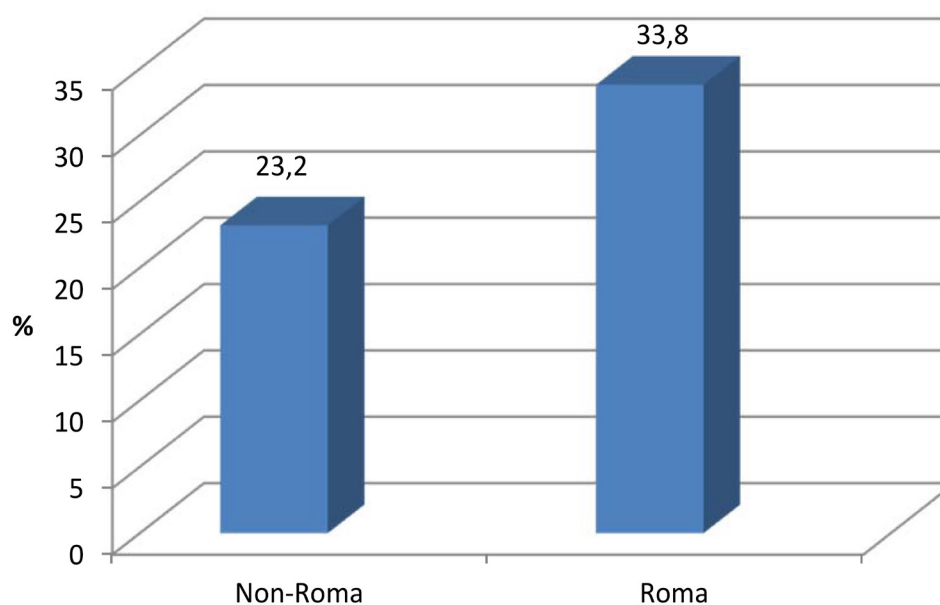
Significant risk factors of recent asthmatic symptoms among the Roma children are present-ed in *Table II*. Roma children with serious lower respiratory tract disease during the first two years of life were more than three times more likely to develop asthmatic symptoms at age 9-11. In addition to the unpleasant environmental situations (disturbing noise and dump site in the close neighbourhood) family factors (the mothers' low level education and smoking during pregnancy, chronic respiratory disease of at least one of the parents) were also found to be sig-nificant risk factors.

TABLE II.

Significant risk factors of asthmatic symptoms of Roma schoolchildren

Risk factors	OR	95% C.I.	P value
Serious LRT disease during 0-2 years of age	3.16	2.74 – 3.65	< 0.001
Parents' chronic respiratory diseases	2.07	1.77 – 2.43	< 0.001
Sleep disturbed by noise	1.91	1.36 – 2.69	< 0.001
Dump site in the close neighbourhood	1.64	1.28 – 2.09	< 0.001
Mother smoking during pregnancy	1.35	1.16 – 1.56	< 0.001
Mother's low education (≤ 8 classes)	1.26	1.07 – 1.49	< 0.01

Prevalence of Roma and non-Roma children with serious lower respiratory tract (LRT) dis-ease is illustrated in *Figure 3*. The difference (more than 10%) is statistically highly significant.

Figure 3. Prevalence of Roma and non-Roma children with serious lower
respiratory tract disease during the first two years of life

The most important risk factors of the children's LRT diseases are shown in *Table III*. Lack of breastfeeding and low education level of the mother were significant risk factors among all children but not among the Roma ones, while smoking of the mother during pregnancy, low birth weight and the mother's young age were significant risk factors among both the Roma and the non-Roma children.
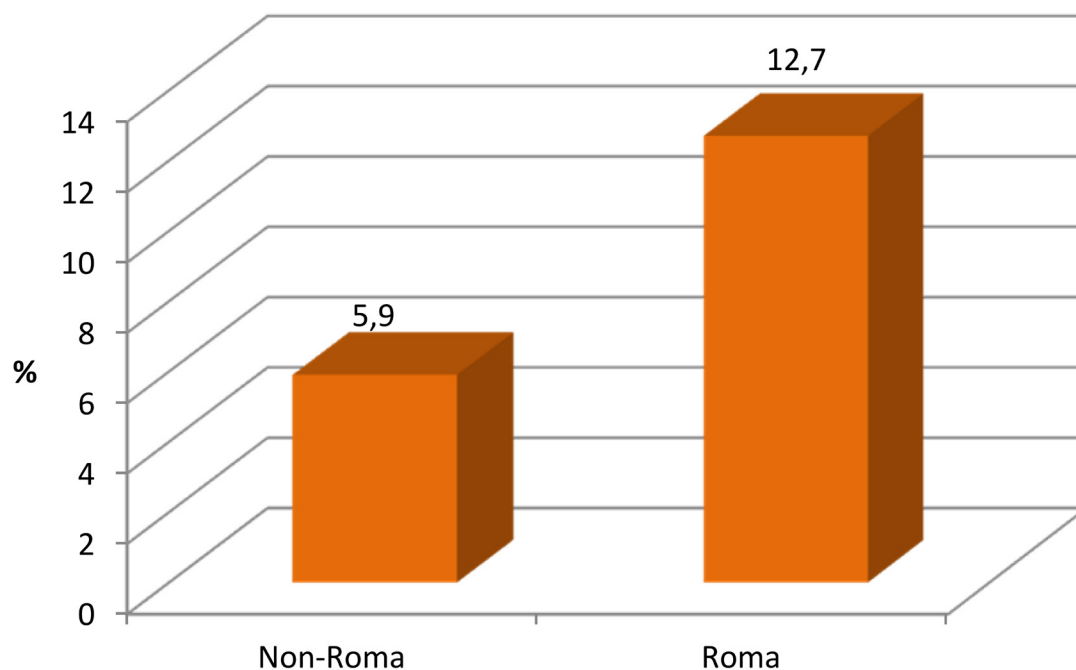
**Significant risk factors of serious lower respiratory tract diseases
in the first two years of life of Roma and non-Roma children**

Risk factors	Only Roma children		Roma and non-Roma children together	
	OR (95% C.I.)	P-value	OR (95% C.I.)	P-value
Low birth weight	1.32 (1.10 – 1.59)	< 0.01	1.35 (1.25 – 1.46)	< 0.001
Smoking in pregnancy	1.25 (1.10 – 1.42)	0.001	1.25 (1.18 – 1.33)	< 0.001
Mother's low education level	1.03 (0.89 – 1.18)	0.679	1.19 (1.13 – 1.25)	< 0.001
Lack of breastfeeding	1.01 (0.82 – 1.25)	0.940	1.15 (1.07 – 1.24)	< 0.001
Mother's age*	0.981 (0.97 – 0.99)	0.001	0.979 (0.975 – 0.983)	< 0.001

continuous variable

Prevalence of Roma and non-Roma children with low birth weight (< 2500 g) is presented in *Figure 4*. The difference was highly significant (P < 0.001). However, not only the prevalence of low birth weight was twice as high among the Roma than the non-Roma children but the mean birth weight also differed significantly between the Roma (2852 g) and the non-Roma (3225 g) children.

Figure 4. Prevalence of Roma and non-Roma children with low birth weight (< 2500 g)

Significant risk factors of low birth weight were female gender, the mother's smoking during pregnancy and her low level of education as well as the mother's age *(Table IV)*. The extremely high differences in the prevalence of these latter two risk factors between the Roma and the non-Roma children are illustrated in *Figure 5*.

Significant risk factors of low birth weight (<2500g) among Roma and non-Roma children

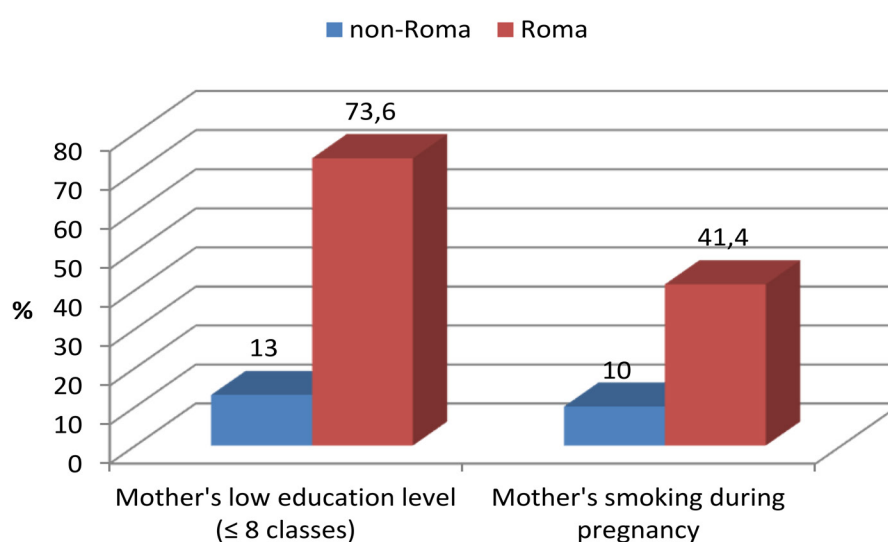| Risk factors	Only Roma children		Roma and non-Roma children together	
	OR (95% C.I.)	P-value	OR (95% C.I.)	P-value
Smoking in pregnancy	1.88 (1.58 – 2.25)	< 0.001	2.45 (2.25 – 2.67)	< 0.001
Mother's low edu level	1.26 (1.02 – 1.56)	< 0.05	1.68 (1.54 – 1.82)	< 0.001
Mother's age*	1.04 (1.03 – 1.06)	< 0.001	1.03 (1.03 – 1.04)	< 0.001
Gender (being boys)	0.82 (0.69 – 0.98)	< 0.05	0.78 (0.72 – 0.83)	< 0.001

continuous variable

Figure 5. Prevalence of Roma and non-Roma children of mothers
with low level of education and having smoked during pregnancy

DISCUSSION

The prevalence of both chronic bronchitis and asthmatic symptoms was significantly higher among the Roma than the non-Roma children. The leading risk factor in both cases was serious lower respiratory tract (LRT) disease during the first two years of life which also occurred more frequently among the Roma than the non-Roma children. The two most important risk factors of serious LRT disease in the first 2 years of life were low birth weight and smoking during pregnancy. This latter one proved to be the most significant risk factor of low birth weight as well, besides the mother's age and low level of education. All these risk factors occurred more significantly among the Roma than the non-Roma children.

If we examine the mentioned risk factors of the two types of respiratory symptoms one by one, there are some which we can't do much about (e.g. parents' chronic respiratory diseases), but the impact of most of them could and should be diminished. First we would like to mention

the mothers' smoking during pregnancy which was shown to be a risk factor of all the mentioned adverse health outcomes (low birth weight, serious LRT diseases during the first two years of life, both types of chronic respiratory symptoms). Pregnancy care counselling should put more emphasis on discouraging the Roma mothers-to-be from smoking. This in itself has also relevance to the next important risk factor where a change should be made: the low level of mother's education. In this analysis we used this variable as a proxy to assess the socio-economic status of the family. Mothers' and fathers' education levels often go together and they have determinant effect on the socio-economic status of the family. There have been various initiations to help Roma youth to stay on longer in the education system but this would require ensuring home environment which provides proper circumstances for studying (Szakmáry et al., 2018) Further risk factors are parts of the living environment of Roma families (noisy, crowded homes, dump site in the close neighbourhood, frequent occurrence of pests and improper way of heating) which also needs to be changed (Ungváry et al., 2018).

ACKNOWLEDGEMENT

REFERENCES

HEGEDŰS, I., MORVAI, V., RUDNAI, P., et al. (2014a). Public health issues of the Roma and non-Roma unemployed in the Ózd microregion of Hungary. (in Hungarian) Orv. Hetil., 155 (15): 582-589.

HEGEDŰS, I., MORVAI, V., RUDNAI, P., et al. (2014b). Life-style, personal hygienic habits, health status and fitness for work of Hungarian and Roma unemployed in the Ózd Micro Region. Centr. Eur. J. Occup. Environm. Med., 20(3-4): 155-189

SÁNDOR, J., KÓSA, ZS., BORUZS, K., et al. (2017). The decade of Roma inclusion: did it make a difference to health and use of health care? Int J Public Health 62(7): 803-815

SZAKMÁRY, É., HEGEDŰS, I., and PAKSY, A., (2012). Level of education and unemployment in Roma communities living in Roma colonies and colony-like conditions in the years preceding the financial - economic world crisis. Centr. Eur. J. Occup. Environm. Med., 18(1-4), 3-13

SZAKMÁRY, É., HEGEDŰS, I., RUDNAI, P., et al. (2017). Quality of life of second generation Roma and non-Roma unemployed I. – Environmental health situation. Centr. Eur. J. Occup. Environm. Med. 23(3-4): 176-190

SZAKMÁRY, É., PAKSY, A., and UNGVÁRY, GY., (2018). The role of education in the quality of life of Roma women and their families living in colonies and colony-like living environments with alarming public health-epidemiological safety, and the effect of the two settlement

types on the learning conditions of Roma children in Hungary at the time of joining the EU. Centr. Eur. J. Occup. Environm. Med. 24(1-2): 8-57

TÖRŐ, V., SÁRVÁRY, A., TAKÁCS, P., et al. (2017). Assessment of quality care of chronic illness patients living in Roma colonies and in the general population: a comparative study. Centr. Eur. J. Occup. Environm. Med., 23(1-2), 58-70

UNGVÁRY, GY., ODOR, A., BÉNYI, M., et al. (2005). Roma colonies in Hungary – health care provision of children, hygienic conditions. (in Hungarian) Orv. Hetil., 2005, 146(15), 691-699.

UNGVÁRY, GY., SZAKMÁRY, É., HEGEDŰS, I., et al. (2014). Public health situation of colonies or colony-like conditions and the significant differences determining quality of life of these two types of living environments in Hungary. Centr. Eur. J. Occup. Environm. Med. 20(1-2); 119-150.

UNGVÁRY, GY., HEGEDŰS, I., PLETTE, R., et al. (2015). On the aetiology of the adverse health effects of unemployment and mental hygienic status of the Roma and Hungarian unemployed in Ózd micro region. Centr. Eur. J. Occup. Environm. Med. 21(3-4): 147-173

UNGVÁRY, GY., MORVAI, V., HEGEDŰS, I., et al. (2016).: Etiology, Factors Modifying the Etiopathogenesis of Health Impairment Caused by Unemployment in Roma and non-Roma Unemployed in a Hungarian Small Area with High Density of Roma Population. Diseases caused by unemployment and unemployment-related diseases. Centr. Eur. J. Occup. Environm. Med. 22 (3-4): 118-149

UNGVÁRY, GY., SZAKMÁRY, É., HEGEDŰS, I., et al. (2018). Public health situation of the Roma and non-Roma unemployed in a Small Area of Hungary densely populated by Roma people. Summarized observations of the research performed in Ózd Small Area. Centr. Eur. J. Occup. Environm. Med. 24(1-2): 58-75