Trapped between Tradition and Transition – Anthropological and Epidemiological Cross-sectional Study of Bayash Roma in Croatia

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Aim To assess the key characteristics related to living conditions and health in the Bayash Roma population in Baranja and Međimurje regions of Croatia and identify possible demographic and socio-economic sources of variance in self-reported health and reproductive profile.

Methods The study comprised a total of 266 adult Bayash individuals from Baranja and 164 from Međimurje (aged 41.3 ± 15.1 years). Data on ethno-historical and demographic background, self-identity, life and hygiene conditions, education, employment, health insurance, and health (dietary and smoking habits, reproductive characteristics, diagnosed and undiagnosed health problems, use of medications). were obtained through interviews. Bivariate and multivariate methods were used in statistical analyses.

Results The reported migratory pattern demonstrated that 88.8% of the examinees were born in the region of residence, which showed that the Bayash population was autochthonous and sedentary one. Financially, the Bayash primarily relayed on social welfare support allowance (84%) and child allowance (47%), while merely 2% were permanently and 23% occasionally employed. The proportion of the Bayash who had never attended school amounted to 33.3% (19.3% men and 40.6% women). The access to public water supply system was available to 52.5% of examinees, whereas only 1.7% had public sewage system, and 23.4% had private septic tanks. The most commonly reported health burden were frequent headaches (20.3%), stomach pain (16.3%), anxiety or insomnia (13.1%), hypertension (9.3%), and chronic obstructive pulmonary disease (COPD) (8.6%). The logistic regression identified level of education (odds ratio [OR], 0.77; 95% confidence interval [CI], 0.63-0.94) and access to health insurance (OR, 4.32; 95% CI, 1.46-12.77) as socio-economic/life-style factors playing a significant role in the occurrence of COPD.

Conclusion Our results indicate poor inclusion of the Bayash in the essential social service sectors such as health care, education, and employment, as well as substandard living conditions and unfavorable health-related behavior. Since education and health insurance were found to have significant effects on the observed reproductive status and self-reported health, they should be targeted in planning public health actions for socially marginalized and economically deprived groups.

The Roma are a widely dispersed transnational ethnic group with an estimated size of 8 to 10 million worldwide and at 7 to 9 million in Europe (1). Throughout their history, the Roma have been politically, economically, and culturally marginalized, ethnically stigmatized, discriminated, and persecuted. Without a nation-state of their own, due to various social and economic pressures within diverse societies, the Roma were gradually fragmented into numerous, geographically dispersed and socially and linguistically divergent groups.

The Bayash (in Croatian *Bajaš*) are one of many Romani branches. Between the 14th to 19th century, they lived in historical Romanian states Wallachia and Moldavia, where they were kept as slaves. After 1856, when the slavery in Romania was finally abolished, larger Bayash groups immigrated to Croatia (2). Besides Croatia, Bayash groups live in Hungary, Bosnia and Herzegovina, Serbia, Romania, Bulgaria, and to a lesser degree in Macedonia, Greece, Ukraine, Slovakia, and Slovenia, all speaking different dialects of the Romanian language. In Croatia, the Bayash speak a distinct archaic dialect *ljimba d'bjas*. Based on further subdialectal characteristics they identify themselves as either Munteni (*Munćani* – "hills people") and Ardeleni (*Ardeljani* – "forest people"). Even though the Munteni-Ardeleni subdivision is mainly linguistic (3,4), it can be religious and geographic as well. For example, the majority of the Bayash in Baranja declare themselves as Munteni of Orthodox religion, whereas the majority of the Bayash in Međimurje declare themselves as Ardeleni and are mostly Catholics (our unpublished data). However, a remarkable number of the members of both groups attend different Evangelist churches (our unpublished data). Despite subdialectal or religious divisions, it is important to note a strong cohesion of both Bayash groups and their opposition to other Romani groups, to whom they refer to as *Lăcătarii* and to their language (*Romani Chib*) as *Lăcătăreaşce*. They are strictly endogamous, ie marry almost exclusively between themselves.

According to the 2001 census, the Roma are a national minority making up 0.21% of the total Croatian population. However, estimates suggest a significantly larger number of the Roma in Croatia, between 30 000 and 40 000 (5). The reasons for the discrepancy between the census and estimates are complex and mostly arise from the decision by the Roma to ignore the census or declare themselves as members of some other nationality (etnomimicry). Another reason is that there is a lack of adequate social encouragement to increase the Romani awareness about the benefits of civil registration. The best estimates suggest that there are around 3000 Bayash Roma in Baranja and around 5000 in Međimurje.

There are several recent reports dealing with the Roma in Croatia and elsewhere in Central and Eastern Europe, but they tend to be fragmentary. Severe poverty, abject housing conditions, low educational status, extremely high unemployment rate, poor health status, short life expectancy, and long-term problematic relations with the majority population are emphasized as the most important problems of the Roma population (6-9). Due to the lack of comprehensive and comparative studies about health status and health-related bio-cultural and socio-economic characteristics of the Roma in Croatia, the scientists of the Institute for Anthropological Research, Zagreb initiated multidisciplinary anthropological, molecular-genetic, and epidemiological investigations of Romani biological and cultural heritage (10,11). The investigations were aimed at more detailed understanding of the subject, with the ultimate goal of improving the social inclusion, living conditions, and health of the Romani while preserving their tradition and identity. The present study is

particularly focused on assessing demographic and socio-economic status, reproductive characteristics, and basic self-reported health profile in the Bayash populations residing in the eastern and northwestern regions of Croatia (Baranja and Međimurje). Specific aims of this study are 2-fold: 1) to quantify key characteristics related to living conditions and health in the Bayash population from Croatia and 2) to identify possible demographic and socio-economic determinants of self-reported health and reproductive profiles variation.

Participants and methods

Sample and study design

The data set used in this study was a subset of extensive material collected in field studies carried out in 2005 to 2006 in Bayash settlements in Baranja and Međimurje (Figure 1). The study was conducted in cooperation with the Office for National Minorities of the Government of the Republic of Croatia and Croatian National Institute of Public Health. The study protocol was approved by the Scientific Board and Ethical Committee of the Institute for Anthropological Research in Zagreb.

Figure 1. Geographic location of the investigated Baranja and Međimurje regions.

Each adult Roma inhabitant of the villages of Darda, Beli Manastir, Torjanci, and Boldman in Baranja and Kuršanec in Međimurje were invited to participate in the study by a written invitation and, additionally, by an invitation advertised on a local radio program. However, the most important role in the recruitment belonged to "Roma for Roma," one of the major Romani associations in the Republic of Croatia, and local Romani organizations which explained the purpose of the investigations and motivated the population to participate in the study. All examinees voluntarily participated in the study and, before signing the informed consent, were informed about the goals, methods, and expectations of the project.

The research team consisted of a general practitioner and five anthropologists, in cooperation with an internal medicine specialist, laboratory technician, epidemiologist, sanitary engineer, and 5 trained, linguistically and culturally competent, Bayash activists.

Each examinee participated in an extensive interview about ethno-historical and demographic background, self-identity, living and hygiene conditions, education, employment, health insurance, and health (dietary and smoking habits, reproductive characteristics, diagnosed and undiagnosed health problems, use of medications). Additionally, short anthropometry was undertaken and body mass index (BMI) was calculated as weight/stature^2 (kg/m^2).

A total of 266 adult Bayash individuals from Baranja (95 men and 171 women, aged 18 to 84 years) and 164 from Međimurje (56 men and 108 women, aged 18 to 68 years) participated in field investigations. The sample size, gender, and age structure of the studied sample reflected voluntary participation. Whereas gender structure of the two regional samples was similar (almost 50% less men participated in the study both in Baranja and

Međimurje), age structure differed significantly. For achieving comparable sample sizes and inter-generational comparisons, the Bayash population was divided into two age groups with the cut off point of 35 years (ie, 26% of Baranja and 60% of Međimurje participants were younger than 35 years).

The selected indicators of living conditions were compared with the general population of Croatia by using the data from the Government of the Republic of Croatia and European Commission (12), as well as the Central Bureau of Statistics of the Republic of Croatia (13).

Statistical analyses

Collected data are presented as absolute numbers and frequencies are given for the qualitative variables, and means and standard deviations for the quantitative ones. Differences by region, sex, and age were tested using Fisher exact test for qualitative variables. Since quantitative variables showed deviation from normal distribution (Kolmogorov-Smirnov test), the non-parametric Kruskal-Wallis test (ANOVA by ranks) was used for group comparisons. The association of diseases and reproductive status with multiple demographic, socio-economic, and lifestyle variables was assessed by logistic regression analysis. All analyses were performed by Statistical Package for the Social Sciences for Windows, version 10.0 (SPSS Inc., Chicago, IL, USA), with statistical significance set at $P<0.05$.

Results

Demographic, socio-economic, and health-related characteristics

Basic demographic, socio-economic, and health-related characteristics of the Bayash populations from two investigated Croatian regions are shown in Table 1. The pattern of

semi-nomadic and nomadic life-style was not evident in the sampled Bayash population, which was shown to be both autochthonous and sedentary (Table 1). Reported migratory pattern revealed that almost 90% of the examinees were born within the region of residence and as much as 70% of the examinees' both parents were also born within the same region. The finding indicated that the Bayash population of Međimurje was almost entirely autochthonous with even 99% of examinees and 92% of both examinees' parents born within the same region.

A high percentage of the Bayash in both regions (85%) chose Croatian citizenship, most likely to obtain social welfare support allowance (84% beneficiaries). In contrast, the overall low number of health insurance beneficiaries (40% in Baranja and 67% in Međimurje) reflects high unemployment rate in the Bayash, whereas clear regional differences reflect lower employment possibilities in the less developed labor market in Baranja. The extent of the Bayash exclusion from the formal labor market was evident in their staggering unemployment rate (Table 1). For example, only a single male person in Baranja and 3 male and 3 female persons in Međimurje had permanent jobs. A larger share of population was only occasionally employed (23%) in seasonal agricultural activities, trading in consumer goods, or collecting and trading in secondary processed materials. More Bayash men than women were occasionally employed (38% men vs 15% women), which is not surprising since women in the Bayash society are still expected to perform the traditional role of taking care of the household and children. Almost one half of the studied population received child allowance. There were almost three times more women in Međimurje than in Baranja who received this benefit, reflecting the reproductive and age differences among regions (Table 2).

Table 1. Demographic, socio-economic, and health-related characteristics of the total Bayash population with regional, sex, and inter-generational differences

Characteristics	Total sample	Baranja	P	Međimurje	Men	P	Women	<35 years	P	>35 years
Demography:										
gender (% male)	35.1	35.7	0.741*	34.2	–	–	–	37.9	0.336*	33.3
age (years; mean±SD)	41.3±15.1	45.5±15.7	<0.001†	34.4±11.2	39.4±15.0	0.057†	42.3±15.1	26.9±4.8	<0.001†	50.5±11.9
age <35 y (%)	39.3	26.7	<0.001*	59.8	42.4	0.336*	37.6	–	–	–
number of examinees born within the region (%)	88.8	83.1	<0.001*	98.7	90.2	0.502*	88.0	94.4	0.004*	85.1
number of examinees whose both parents were born within the region (%)	69.4	57.3	<0.001*	91.7	63.0	0.061*	72.9	80.2	<0.001*	62.3
Social inclusion:										
Croatian citizenship (%)	85.0	84.5	0.720*	85.8	83.2	0.448*	86.0	80.8	0.053*	87.7
social support (%)	83.6	82.6	0.505*	85.1	81.9	0.511*	84.5	86.1	0.279*	82.0
child allowance (%)‡	47.0	24.7	<0.001*	80.2	-	-	-	77.0	<0.001*	28.7
health insurance (%)	50.6	40.4	<0.001*	67.3	43.0	0.021*	54.7	47.9	0.374*	52.3
Employment:										
permanent (%)	1.7	0.4	0.012*	3.7	2.8	0.222*	1.1	3.8	0.010*	0.4
occasional (%)	23.0	18.6	0.009*	29.8	38.2	<0.001*	14.8	24.1	0.700*	22.4
other sources of income (%)	6.4	9.7	0.001*	1.2	10.4	0.014*	4.2	1.9	0.003*	9.2
Education:										
ever attended school (%)	66.7	60.8	0.001*	76.4	80.7	<0.001*	59.4	87.6	<0.001*	53.2
schooling years in total population (0-12 y) (mean±SD)	3.6±3.4	3.6±3.6	0.528†	3.5±2.9	4.4±3.4	<0.001†	3.1±3.2	5.0±3.2	<0.001†	2.6±3.2
schooling years in those who ever attended school (1-12 y) (mean±SD)	5.3±2.7	5.9±2.9	<0.001†	4.7±2.4	5.5±2.9	0.727†	5.2±2.6	5.7±2.7	0.013†	5.0±2.7
Health related characteristics and life style conditions:										
smokers (%)	70.2	65.3	0.005*	78.1	71.5	0.650*	69.4	71.0	0.758*	69.6
age at initiation smoking (years; mean±SD)	16.9±7.3	18.1±8.2	0.001†	14.3±3.9	16.8±6.1	0.278†	16.9±7.9	15.2±3.6	0.241†	17.6±8.4
BMI, kg/m^2 (mean±SD)	25.6±5.7	25.9±6.1	0.321†	25.1±5.1	25.7±5.3	0.648†	25.6±6.0	24.0±4.7	<0.001†	26.7±6.1
BMI<18.5 (%)	6.9	8.1	0.200*	4.9	3.4	0.036*	8.8	7.7	0.579*	6.3
BMI≥30 (%)	21.0	22.8	0.270*	18.3	18.1	0.277*	22.6	14.2	0.005*	25.6
water supply system (%)	52.5	63.9	<0.001*	25.5	53.9	0.512*	50.0	49.2	0.576*	52.3
public sewage system (%)	1.7	2.5	0.087*	0	1.0	0.494*	2.1	0.8	0.284*	2.3
private septic tanks (%)	23.4	21.3	0.171*	27.8	24.8	0.846*	23.8	30.0	0.045*	20.5

*Fisher exact test.
†Kruskal-Wallis test (ANOVA by ranks).
‡Reported for women only.
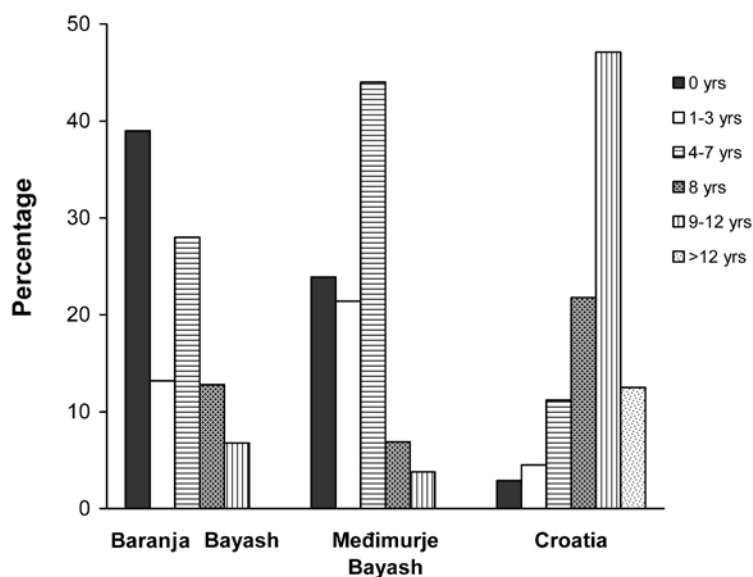
Figure 2. Years of education in the Bayash, compared with the general population of Croatia. Data from Central Bureau of Statistics of the Republic of Croatia (13).

The proportion of the Bayash who never attended school amounted to 33.3% (19.3% men and 40.6% women) and the average number of schooling years for those who attended school amounted to 5.3±2.7 years. The overall average time that the Bayash spent in the formal education system was 3.6±3.4 years (Table 1), only 10% completed 8-year elementary education, 4.4% enrolled in secondary school, whereas no examinees reported university level education (Figure 2). This compares with twice as many people who successfully completed their elementary education and ten times as many who completed secondary education in Croatia's general population (12). Despite a relatively modest level of education, the disappearance of gender differences in education and increase in the number of school-

Table 2. Female reproductive characteristics of the total Bayash population with regional, sex, and inter-generational differences

Characteristics	Total sample	Baranja	P	Međimurje	<35 years	P	>35 years
Women in menopause (%)	35.5	48.0	<0.001*	15.7	0.0	<0.00*	56.9
Menarcheal age (years; mean±SD)	13.2 ± 1.7	12.8 ± 1.6	<0.001†	13.7 ± 1.7	12.9 ± 1.5	0.027†	13.3 ± 1.7
Menopauseal age (years; mean±SD)	47.5 ± 6.1	47.9 ± 6.1	0.158†	45.3 ± 5.8	–	–	47.5 ± 6.1
Length of reproductive period (years; mean±SD)	34.1 ± 5.9	34.8 ± 5.7	0.044†	30.8 ± 6.2	–	–	34.1 ± 5.9
Number of spontaneous abortions (mean±SD)	0.5 ± 1.1	0.4 ± 1.2	0.355†	0.5 ± 0.9	0.3 ± 0.9	0.154†	0.5 ± 1.2
Number of induced abortions (mean±SD)	2.3 ± 4.2	3.2 ± 5.1	<0.001†	0.9 ± 1.5	0.8 ± 1.3	<0.001†	3.2 ± 5.0
Number of alive children (mean±SD)	3.8 ± 2.4	3.0 ± 1.9	<0.001†	5.1 ± 2.4	3.7 ± 2.0	0.617†	4.0 ± 2.5
Number of deceased children (mean±SD)	0.1 ± 0.4	0.1 ± 0.4	0.640†	0.2 ± 0.5	0.1 ± 0.2	0.076†	0.2 ± 0.5
Total number of born children (mean±SD)	3.9 ± 2.5	3.1 ± 1.9	<0.001†	5.3 ± 2.5	3.8 ± 2.0	0.605†	4.1 ± 2.7
Percentage of deceased children (mean±SD)	96.4 ± 14.1	95.4 ± 17.6	0.802†	97.9 ± 5.9	97.9 ± 11.2	0.080†	95.5 ± 15.6
Age at first marriage – men (years; mean±SD)	19.2 ± 4.3	20.0 ± 4.2	<0.001†	18.0 ± 4.2	18.8 ± 4.0	0.090†	19.5 ± 4.4
Age at first marriage – women (years; mean±SD)	16.8 ± 3.2	17.1 ± 3.0	0.002†	16.4 ± 3.3	16.2 ± 2.6	0.001†	17.2 ± 3.4
Age difference between husband and wife (years; mean±SD)	2.4 ± 3.4	2.9 ± 3.6	0.001†	1.7 ± 3.0	2.6 ± 3.5	0.711†	2.3 ± 3.4
Total number of siblings (mean±SD)	5.0 ± 2.7	3.8 ± 2.0	<0.001†	6.7 ± 2.7	5.3 ± 2.7	0.030†	4.7 ± 2.7
Number of living siblings (mean±SD)	4.1 ± 2.5	3.0 ± 1.9	<0.001†	5.8 ± 2.4	5.0 ± 2.5	<0.001†	3.5 ± 2.3
Number of deceased siblings (mean±SD)	0.8 ± 1.6	0.8 ± 1.4	0.564†	0.9 ± 1.8	0.3 ± 0.8	<0.001†	1.1 ± 1.8

*Fisher exact test.
†Kruskal-Wallis test.

ing years in younger Bayash generations is encouraging (Table 1).

The Bayash had adequate nutritional status, ie average BMI, by the age of 35, after which their BMI exceeded the value of 25 kg/m² (Table 1). However, 7% of the examined Bayash individuals were underweight (BMI<18.5 kg/m²). The underweight rate was especially high in women (8.8% women vs 3.4% men). In parallel to considerable rate of underweight, the presence of obesity (BMI≥30 kg/m²) was assessed in 21% of the total Bayash, with an increasing trend in older population.

Smoking, as a part of traditional Roma lifestyle, was recorded in 70% of the examinees regardless of sex (Table 1), as opposed to 38.7% in the general population (14). Regional differences in the smoking pattern were evident in the 4-year later onset of smoking, as well as in approximately 13% less smokers in Baranja.

The lack of essential housing facilities was illustrated by alarming figures reported in this study (Table 1). For example, the access to public water supply was available to 52.5% of the examinees, whereas only 1.7% examinees had public sewage system and 23.4% had private septic tanks. Overall, public water supply and sewage disposal were more accessible to the Bayash population in Baranja. Curiously, almost the same percentage of the Bayash pos-
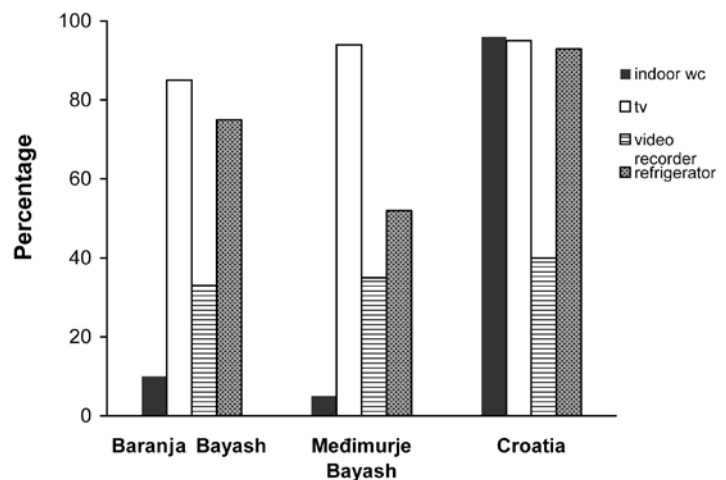

Figure 3. Selected indicators of living conditions in the Bayash, compared to the general population of Croatia. Data from the Government of the Republic of Croatia and European Commission (12) and Central Bureau of Statistics of the Republic of Croatia (13).

sessed TVs and video recorders as the general population, whereas the latter had ten times more water toilets and one third more refrigerators in their homes (Figure 3).

Reproductive status

The indicators of reproductive status reported by the Bayash women (Table 2) reflect their traditional life-style and the multichildren family model. The Bayash women marry very young, at the age of 16.8 ± 3.2 years on average with a tendency of even lower marital age in younger generation (Table 2). The marital

age in men was on average only 2.4 ± 3.4 years higher. The mean menarcheal age, often related to socioeconomic factors, in the younger generation shifted toward earlier age. It was lower in Baranja women, who had 4 years longer reproductive period than women in Međimurje. A high share of children in the Bayash population is indicated by the average birth rate of 3.9 ± 2.5 children per woman. The rate was markedly lower in Baranja (3.1 ± 1.9 in Baranja vs 5.3 ± 2.5 in Međimurje) where the number of induced abortions per woman equaled the number of born infants. Furthermore, women from Međimurje reported a more than three times lower rate of induced abortions. In fact, the rate of induced abortions was higher within the older age group. The difference in reproductive pattern between the two populations was outstanding and persisted over at least two generations, as can be seen from the number of siblings in the woman's family which in Baranja amounted to 3.8 ± 2.0 and in Međimurje to 6.7 ± 2.7. Although the number of children born per woman is not directly comparable to the number of siblings in the woman's family due to the incomplete reproductive period in 65% of the Bayash women, children mortality has reduced (0.1 deceased children per woman vs 0.8 deceased siblings per woman's family).

The influence of the number of years of education and health insurance on the reproductive status was assessed using a forward stepwise method of multivariate logistic analysis in which reproductive status was represented by the total number of children born in the family, categorized as high (5 and more children) and low (less than 5 children). The cutoff of 5 children was arbitrary and represented the 75th percentile of the total number of children born in the family. Age, region, income, smoking, and BMI were also considered as the independent variables. The lower level of fertility was associated with higher

number of schooling years (odds ratio [OR], 1.14; 95% confidence interval [CI], 1.03-1.27, $P = 0.011$) and possession of health insurance (OR, 2.03; 95%CI, 1.13-3.63, $P = 0.018$). The role of age and region also showed to be significant. Obtained data indicated that older people had more children and that more children were born in families in Međimurje (data not shown). All four significant variables explained 46% of variance of the dependant variable, 17% of which was explained by age alone.

Self-reported health

The participants most frequently reported the following 5 diagnoses: hypertension, chronic obstructive pulmonary disease (COPD), stomach pain, frequent headaches, and anxiety or insomnia. Hypertension and COPD were registered only if the examinees were taking medications for these diseases (ie, antihypertensives, bronchodilatators) – implying that the diagnosis was performed by medical practitioners. On the other hand, stomach pain, frequent headaches, and anxiety or insomnia formed a group of frequently reported health problems which were mostly undiagnosed (ie, subjective). The Bayash reported hypertension in 9.3% and COPD in 8.6% individuals, whereas, a markedly higher percentage of them complained of the three above mentioned subjective sources of ill health, pain, and discomfort (Table 3). As expected, hypertension was more prevalent in older individuals, but it was interesting to find that significantly more Bayash women than men were hypertensive, and that there were five times more people with hypertension and three times more people suffering from COPD in Baranja than in Međimurje.

Self-reported diseases were analyzed as the functions of several demographic socio-economic, lifestyle, and reproductive variables. Hence, apart form age, sex, and region, as independent variables, we included in multivar-

Table 3. The most frequently reported health problems of the total Bayash population with regional, sex, and inter-generational differences

Health problems	Total sample	Baranja	P*	Medimurje	Men	P*	Women	<35 years	P*	<35 years
Diagnosed hypertension (%)	9.3	13.6	<0.001	2.4	4.6	0.014	11.9	0.0	<0.001	15.4
Diagnosed chronic obstructive pulmonary disease (%)	8.6	11.7	0.004	3.7	10.6	0.284	7.6	4.1	0.008	11.5
Stomach pain (%)	16.3	20.8	0.002	9.2	13.9	0.320	17.6	13.6	0.221	18.1
Frequent headaches (%)	20.3	24.9	0.002	12.8	9.9	<0.000	25.9	17.8	0.294	21.9
Anxiety/insomnia (%)	13.1	16.2	0.013	7.9	8.0	0.021	15.8	9.5	0.075	15.4

*Fisher exact test.

Table 4. Multivariate screening for predictor variables for selected diseases by logistic regression*

Predictor variable	Predictors (OR, 95% CI)[†]		
	Hypertension	COPD	Psychosomatic symptoms[‡]
Age (years)	1.07 (1.02-1.12) *P* = 0.004	1.01 (0.97-1.05) ns	1.01 (0.99-1.03) ns
Sex:			
male (referent)	1.00*	1.00	1.00
female	4.53 (1.23-16.66) *P* = 0.023	0.46 (0.16-1.31) ns	2.84 (1.61-5.02) *P*<0.001
Region:			
Medimurje (referent)	1.00	1.00	1.00
Baranja	2.70 (0.64-11.43) ns	5.55 (1.15-25.88) *P* = 0.033	2.27 (1.14-4.49) *P* = 0.019
Education (years)	1.09 (0.93-1.30) ns	0.77 (0.63-0.94) *P* = 0.010	1.00 (0.92-1.09) ns
Income:			
none or social aid (referent)	1.00	1.00	1.00
temporary or permanent jobs	0.47 (0.12-1.89) ns	2.17 (0.72-6.53) ns	0.91 (0.51-1.61) ns
Health insurance:			
not insured (referent)	1.00	1.00	1.00
insured	1.49 (0.52-4.23) ns	4.32 (1.46-12.77) *P* = 0.008	0.61 (0.36-1.03) ns
Migration status:			
autochthonous (referent)	1.00	1.00	1.00
immigrant	2.55 (0.59-10.82) ns	1.56 (0.40-6.08) ns	1.73 (0.81-3.69) ns
Smoking status (pack-years)[§]	1.01 (0.98-1.03) ns	1.02 (0.99-1.04) ns	1.01 (0.99-1.03) ns
Total number of children	1.02 (0.86-1.34) ns	1.03 (0.82-1.28) ns	1.02 (0.90-1.16) ns
Living children (%)	1.02 (0.98-1.05) ns	0.99 (0.97-1.01) ns	1.01 (0.99-1.03) ns
Body mass index	1.16 (1.10-1.25) *P*<0.001	0.96 (0.88-1.04) *P* = ns	0.99 (0.96-1.04) ns

*Coding: 1 – no disease, 2 – disease.
†Abbreviations: OR – odds ratio; CI – confidence intervals; COPD – chronic obstructive pulmonary disease; ns – not significant.
‡Stomach pain, frequent headaches, and anxiety/insomnia.
§Pack-years were counted as the number of cigarettes smoked daily multiplied by years of smoking and divided by 20.

iate logistic regression analysis, length of education, source of income, health insurance status, migration status, smoking status, BMI, number of children, and percentage of the living children (Table 4). Stomach pain, frequent headaches, and anxiety/insomnia were united in a combined dependent variable to indicate the presence of any of the three self-perceived psychosomatic symptoms, while hypertension and COPD were analyzed separately.

As expected, age and BMI were significant predictors of hypertension. Unexpectedly, the OR of 4.53; 95% CI, 1.23-16.66 was associated with female sex. However, none of the tested socio-economic variables was a signifi-

cant predictor. On the other hand, the length of education, health insurance, and region appeared to be significant predictors for COPD. The diseased status was associated with lower education level (OR, 0.77; 95% CI, 0.63-0.94) and health insurance (OR, 4.32; 95% CI, 1.46-12.77). Additionally, the region, as a significant predictor, indicated that COPD was more prevalent in Baranja (OR, 5.55; 95% CI, 1.15-25.88). Similarly, the variable psychosomatic symptoms - which comprises either of three most frequent subjective symptoms (stomach pain, frequent headaches and anxiety/insomnia) – also appeared to be more prevalent in Baranja (OR, 2.27; 95% CI, 1.14-

4.49). Apart from region, female sex was also a significant positive predictor of psychosomatic symptoms (OR, 2.84; 95% CI, 1.61-5.02).

Discussion

The focus of the present study was to assess the key demographic, socio-economic, reproductive characteristics, and basic self-reported health profile in the adult Bayash population of Croatia residing in Baranja and Međimurje. Although the Roma often do not have a legal permanent address (6), either because of their nomadic tradition, searching for work in economically more prosperous regions, seasonal migrations, or war-caused displacements, our data indicate that the Bayash population in Croatia was mainly autochthonous and sedentary which follows the linguistic (4) and historic (15,16) line of evidence of their continuous presence in northwestern Croatia since the time of their first major and sizeable immigration wave. Furthermore, the data testify that the Bayash in Croatia recognize the benefits of civil registration, such as the inclusion in the essential social services comprising health care, social welfare, education, and employment. The advantage of civil registration of Roma population in Croatia is evident, since as many as 84% of the Bayash in Croatia receive social welfare, in comparison with only 10% in Romania, 40% in Hungary, 44% in Bulgaria, 56% in the Czech Republic, and 83% in Slovakia (9). The exceptionally high number of social welfare beneficiaries among the Croatian Bayash testifies to their social inclusion, but at the same time, their dependence on the state. The massive unemployment of the Bayash in Croatia, which is within the limits of the reported unemployment rates of the Roma throughout Central and Eastern Europe (9), may be seen as one part of a multidimensional and complex pattern. On the one hand, the majority of the Bayash have difficul-

ties in finding their place on the Croatian labor market, where the lower demand for unqualified labor force is sometimes coupled with discrimination and the lack of confidence in the Roma as reliable employees. On the other hand, social benefits for families with children exceed the minimum wages for the workers with low qualifications and the Bayash tend to lean on their social benefits while searching to improve the living standard by working in the informal sector, usually selling second-hand goods on the street, collecting metal, and performing seasonal agricultural work (our unpublished data).

The fact that only 51% of the Bayash included in the study reported having health insurance may also be related to their exclusion from the formal labor market, and traditional fatalistic views on ill health and death. The only conditions when the Bayash consider health care necessary are motherhood and serious illness. Besides the long-lasting negative attitudes and distrust in non-traditional health practices, the Roma are less interested in obtaining health care than in obtaining regular flow of cash money through social welfare system, which causes the observed discrepancy in the number of health care and social welfare beneficiaries. This trend is avoided in Romania where Roma families, by receiving social support, receive health care at the same time (9). Elsewhere in Central and Eastern Europe, the number of Roma receiving health insurance ranges from 54% in Bulgaria to 97% in Slovakia (9). The solution to increasing the percentage of the health-insured Bayash in Croatia would be to direct social security and unemployment money into health education and schooling, which would enable better employment possibilities, as well as into teaching the population how to successfully follow the administrative procedures.

A large proportion of the studied Bayash were not enrolled in school at all (33.3%) or

they dropped out after only 5.3 years on average. The major obstacles in successful education of the Bayash children, as reported by their mothers, were insufficient knowledge of the Croatian language, inadequate social skills, the lack of adequate home environment for studying, and modest school accessories and clothing that are likely to cause contempt. However, the most important obstacle in continuing education seems to be a lack of encouragement from parents and members of wider community that arises from the belief that children contribute more to the survival of the family by working than by continuing school. Apart from the absence of vocational education leading to the unsatisfactory position of the Bayash on the Croatian formal labor market, low education level has also consequences on general quality of life, living conditions, and health.

Whereas some Bayash families report to reside side by side with the majority population of Croatia, the vast majority of the population lives in large groups, completely segregated from the rest of population, in the outskirts of villages (eg, village of Kuršanec in Međimurje or Torjanci in Baranja) or small towns (eg, settlements of Zlatnica and Groblje in Darda or Rupa in Beli Manastir) with non-existent or unsatisfactory essential facilities, such as sewage, waterworks, garbage collection, or roads. Noteworthy is the fact that the Bayash (as well as Croatian economically unprivileged) families sometimes cannot afford connection to the existing public utilities such as waterline and electricity (our unpublished data).

Poverty and cultural specificities of the Bayash are the major reasons for the persistence of traditional family values in this community. Demographic studies show that the Roma generally maintain a progressive type of the age structure characterized by a high share of children and low share of the elderly (7). The tradition of multi-children fami-

lies is preserved in the Bayash population, in which women marry young (16.8 years) and give birth to many children (3.9). The average fertility is high, especially when compared with 1.5 children per woman in the general population of Croatia (12). In the Bayash population, higher maternal educational status leads to the lower number of deliveries. Unfortunately, the generally unsatisfactory education level, traditional attitudes toward female reproductive health, as well as a limited access to health services lead to exceptionally high rate of induced abortions (especially in Baranja) that appear to be main regulators of delivery.

Apart from trying to identify the main components of the Bayash health burden, we attempted to assess the influence of socio-economic conditions on their most commonly reported health-related problems. Bearing in mind the low percentage of examinees with health insurance, the reported prevalence of hypertension and COPD was expected to be significantly lower than the actual prevalence. Therefore, it is not surprising that the prevalence of people with hypertension in Baranja was 13.6% – almost twice less than in the majority population of comparable age (14). The higher education level is connected with lower number of children (0-4) and with less frequent occurrence of COPD. Moreover, the level of education and the possession of health insurance are the only socioeconomic and lifestyle variables that play a significant role in fertility and the occurrence of COPD. The higher percentage of persons suffering from COPD in Baranja than in Međimurje – despite the lower proportion of smokers in the former – is an unexpected finding that points to possibly different household environmental exposures (eg, pollution, fumes, dust) and/or host factors (genetic factors, repeated respiratory infections, stress). Surprisingly, disadvantageous socio-economic conditions, smoking

habits, and reproductive history do not appear to have any influence on the distribution of the most commonly self-reported health burdens within the studied populations. It seems that this is due to poor living conditions and unfavorable health-related behavior that are homogenously distributed across the entire population.

The data obtained in this study are especially interesting in the context of common characteristics of the Roma, the Bayash specificities, as well as their relationship to the majority population of Croatia. Common characteristics of the Roma, determined largely by their shared origin and ancestral migration history, are reflected not only in common genetic (disease) heritage, but also in social organization and traditional culture. Specific characteristics of the Bayash, however, are a consequence of more recent migration patterns and the particular socio-economic position resulting from local legislatures and common practices.

Although far from systematic, this study attempts to assess the key characteristics of demographic and socioeconomic status, reproductive history, and self-reported health profile in the adult Bayash Roma in Croatia. Our results indicate poor inclusion of the Bayash in essential services of society, such as health care, education and employment, as well as substandard living conditions and unfavorable health-related behavior. Poor education, traditional attitudes toward female reproductive health, as well as the limited access to health services contribute to high fertility and exceptionally high rate of induced abortions. Among the tested demographic, socio-economic, lifestyle, and reproductive variables, only the level of education and the access to health insurance were shown to have an influence on health status. This finding deserves to be taken into consideration in planning public health policies on socially marginalized and economically deprived groups.

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