

# Body Mass Index and Nutritional Status of the Bayash Roma from Eastern Croatia

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## ABSTRACT

*This study examines anthropometrically assessed nutritional status of the Bayash, the Roma population from the eastern Croatian region of Baranya, and compares it to the non-Roma general population of eastern Croatia. The analysis of nutritional status and diets is a segment of multidisciplinary anthropological and epidemiological survey of the Roma minority population in Croatia began in 2005. The Bayash are an ethnic group that arrived to Croatia from Romania most likely in the 19th century and speaks a distinct archaic dialect of the Romanian language. The Roma population of Baranya approximates 1,000 according to the 2001 census. The Bayash sample comprised 227 adults aged 18–65 yrs. The women fall below the Croatian 10th percentile for stature and men track about the 10th percentile. Both sexes approximate the 25th percentile for body weight. Despite their diminutive size, the Bayash appear to have adequate nutritional status until the age of 35 yrs after which their average BMI exceeds the value of 25 kg/m<sup>2</sup> and falls in the overweight category. However, 8% of Bayash are underweight (BMI < 18.5) in contrast to 1% of the majority population in the region. Underweight rates are especially high in women (11%) compared to men (4%). The prevalence of overweight (BMI 25.0 to 29.9) of 30% is considerably lower than in the majority population (42%) while the prevalence of obesity (BMI ≥ 30.0) of 23% is approximately equal. Overall unsatisfactory nutritional status of the Bayash merits attention. It appears to be the product of unhealthy dietary habits and their socio-economic deprivation that resulted from their poor education and extremely high unemployment.*

**Key words:** Roma minority, Bayash, nutritional status, BMI, Croatia

## Introduction

Roma, an ethnic minority of northern Indian origin, live in many countries throughout the world and are well known for remarkably preserved traditions and resistance to assimilation<sup>1</sup>. They are most often marginalized economically, spatially, politically and in terms of culture<sup>2</sup>. Croatia has a substantial Roma population, the exact size of which is uncertain. In the 2001 Census, only 9,463 people declared being Roma (0.21% of the total population of Croatia). Another official estimate puts the Roma population at 30,000 to 40,000 (about 1% of the total population of Croatia)<sup>3</sup>. Whilst it is widely believed that the health of Roma people is often poorer than that of the majority population<sup>4</sup>, these inequalities remain largely unresearched.

Beginning in 2005, multidisciplinary anthropological and epidemiological survey of the Roma minority population has been undertaken in Croatia. One segment of this survey relates to their health status and includes the analyses of nutritional status and diets. The first phase of the survey focused on the Roma population in the eastern Croatian region of Baranya, approximating 1,000 according to the 2001 census. It is a Bayash ethnic group that arrived to Croatia from Romania most likely in the 19th century and speaks a distinct archaic dialect of the Romanian language<sup>1</sup>.

Nutritional status of the majority population in the region of eastern Croatia is well documented but little is

known about the Bayash population. The purpose of this report is to present the initial information on nutritional status of the adult Bayash from Baranya assessed by the body mass index (BMI) and to compare it with the general population of eastern Croatia.

### Subjects and Methods

The data reported here are a subset of the extensive material collected in the Bayash population which is settled in six villages and small towns of the eastern Croatian region of Baranya (Figure 1). Subjects, aged 18 to 65 yrs (mean: 40.5±13.4 men, 42.4±12.2 women), were all volunteers. The sample comprised 227 subjects (80 men and 147 women). Age and sex distributions of the sample are shown in Table 1.

Weight and stature were measured following standard International Biological Programme Protocol<sup>5</sup>. Weight was determined to the nearest 0.5 kg using a portable scale. Stature was measured to the nearest mm using a fixed stadiometer. The body mass index (BMI) was calculated as weight[kg]/stature[m]<sup>2</sup>. In order to define the categories of nutritional status based on BMI, the WHO<sup>6</sup> cutoff points were used. For comparative purposes, the representative sample of the general population from the region of eastern Croatia aged 18–65 yrs was utilised<sup>7</sup>. Numerical descriptions of the distributions of body measurements include means, standard deviations and selected percentiles.

### Results

The age- and sex-specific descriptive statistical parameters for stature, weight and BMI are reported in Table 1. In general, the Bayash show low values of both primary anthropometric dimensions. This point is particularly evident in Figure 2, showing stature for Bayash



Fig. 1. Geographical map showing the location of Baranya in eastern Croatia.

men and women relative to the Croatian 5th and 15th percentiles. As shown, Bayash women fall below the Croatian 10th percentile and men track about the 10th percentile. Both sexes approximate the 25th percentile for body weight.

Despite their diminutive size, the Bayash appear to have adequate nutritional status until the age of 35 yrs after which their average BMI exceeds the value of 25 kg/m<sup>2</sup> and falls in the overweight category (Table 1). Their BMI ranges between the Croatian 50th and 75th percentile (Figure 3). The obtained prevalence within WHO nutritional status categories raises concern. The prevalence by sex and the combined prevalence are presented in Table 2. As much as 8% of Bayash are under-

TABLE 1. AGE-SPECIFIC MEANS AND STANDARD DEVIATIONS OF ANTHROPOMETRIC DIMENSIONS FOR BAYASH MEN AND WOMEN

Age (y)	N	Stature (m)		Weight (kg)		BMI (kg/m <sup>2</sup> )	
		X	SD	X	SD	X	SD
Men	80						
18–24	12	1.690	0.078	65.9	14.2	23.0	4.3
25–34	16	1.705	0.061	72.6	17.0	23.9	4.7
35–44	25	1.670	0.060	80.7	20.5	28.5	6.5
45–54	14	1.679	0.046	77.5	13.5	27.5	4.7
55–65	13	1.626	0.051	71.0	11.2	26.9	4.5
Women	147						
18–24	9	1.595	0.089	56.2	12.7	22.0	4.1
25–34	32	1.564	0.055	56.1	10.2	22.9	4.1
35–44	39	1.534	0.054	63.3	16.2	26.8	6.4
45–54	35	1.528	0.048	60.3	13.1	26.0	6.5
55–65	32	1.524	0.067	68.6	18.6	29.4	7.7

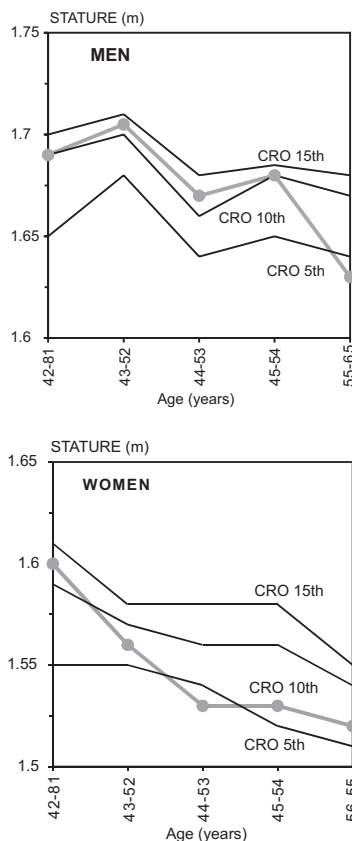


Fig. 2. The Bayash population means (—●—) and the selected Croatian percentiles (---) for stature.

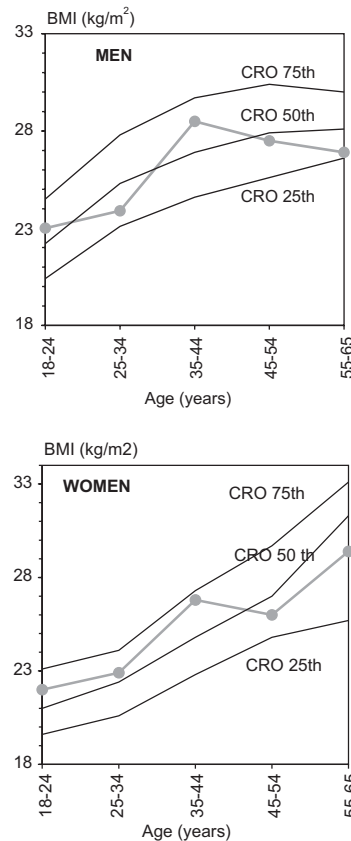


Fig. 3. The Bayash population means (—●—) and the selected Croatian percentiles (---) for BMI.

weight in contrast to 1% of the majority population in the region. Underweight rates are especially high in women (11%) compared to men (4%). The prevalence of overweight of 30% is considerably lower than in the majority population (42%) but the rate is markedly higher in men compared to women (40% vs. 24%). The prevalence of obesity among the Bayash approximates the rate in the Croatian majority population.

### Discussion

The research on the nutritional status and dietary habits among the Roma is limited and difficult to access. Findings for the Bayash Roma from eastern Croatia re-

vealed greater occurrence of underweight compared to the local majority population but also a relatively high prevalence of obesity, and suggest inadequate nutrition. The problem of underweight is striking among women.

Traditionally the eating habits of Roma have been conditioned by their nomadic way of life and their diet has consisted largely of what was readily available<sup>8</sup>. As the Roma have gradually settled, their eating habits have gradually conformed to those of the majority population in the region of their residence. The anthropological and epidemiological survey of the Roma population from Baranya included examination of its nutritional habits<sup>9</sup>. The collection of these data presented many difficulties because this kind of information is believed to be very in-

TABLE 2.  
PREVALENCE BY NUTRITIONAL STATUS CATEGORIES IN THE BAYASH AND THE MAJORITY POPULATION IN THE REGION

BMI	Bayash			Croatian
	Men	Women	Both sexes	Both sexes
<18.5 (underweight)	4%	11%	8%	1%
18.5 – 24.9 (normal)	36%	40%	39%	35%
25.0 – 29.9 (overweight)	40%	24%	30%	42%
≥ 30.0 (obesity)	20%	25%	23%	22%

timate. However, it pointed to the unhealthy dietary habits. Their main characteristics are irregular meals, high consumption of animal fat but low consumption of meat and milk products, low consumption of fresh vegetables and fruit, and high consumption of coffee and alcohol. It seems that the Bayash people in Baranya experience nutritional problems similar to other Roma groups in Central European countries<sup>10–13</sup>.

There are many reasons to suppose that the unsatisfactory nutritional status and unhealthy dietary habits observed among the Bayash people can be associated with poverty. The Bayash minority has, with very few exceptions, a low socio-economic status resulting from prevailing unemployment (registered 79%), low levels of education (35% without any formal education), and the majority living from social welfare (69%)<sup>9</sup>. It seems that these problems are shared by the Roma living in transitional as well as in industrialized countries<sup>4,14</sup>.

In conclusion, the findings of nutritional status of the Bayash Roma merit attention and reflect their socio-economic deprivation. It is partly due to their poor education and extremely high unemployment as well as to the

economic and social difficulties the region of Baranya is going through in the process of transition. Overall, the results highlight the importance of further work on determining body composition and sex differences in lifestyle correlates of nutritional status of the Bayash.

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### INDEKS TJELESNE MASE I PREHRAMBENO STANJE ROMA BAJAŠA IZ ISTOČNE HRVATSKE

#### SAŽETAK

U radu je ispitivano antropometrijski procijenjeno prehrambeno stanje Roma Bajaša iz Baranje te uspoređeno s prehrambenim stanjem opće populacije istočne Hrvatske. Analiza prehrambenog stanja i prehrambenih navika Bajaša sastavni je dio multidisciplinarnih antropoloških i epidemioloških istraživanja romskog manjinskog stanovništva Hrvatske koja su započeta 2005. godine. Bajaši su doselili u 19. stoljeću iz Rumunjske i govore specifičnim arhaičnim dijalektom rumunjskog jezika. Procjenjuje se da je veličina današnje romske populacije u Baranji oko 1000 osoba. Uzorač je obuhvatio 227 odraslih Bajaša u dobi od 18–65 godina života. Visina tijela žena kreće ispod 10. percentila opće populacije istočne Hrvatske, a visina muškaraca kreće se oko 10. percentila. Težina tijela kreće se oko 25. percentila u oba spola. Prehrambeno stanje Bajaša, procijenjeno na temelju indeksa mase tijela (BMI), zadovoljavajuće je do dobi od

35 godina, nakon čega prosječne vrijednosti BMI premašuju vrijednost od 25 kg/m<sup>2</sup> i ukazuju na prekomjernu težinu. Utvrđeno je, međutim, da 8% bajaške populacije ima sniženu tjelesnu težinu (BMI<18.5) u usporedbi s 1% u općoj populaciji istočne Hrvatske. Smanjena tjelesna težina znatno je učestalija kod žena (11%) nego kod muškaraca (4%). Učestalost prekomjerne težine (BMI 25.0 to 29.9) od 30% kod Bajaša znatno je niža nego što je to slučaj u općoj populaciji regije (42%), dok je učestalost pretilosti (BMI≥30.0) od 23% podjednaka u obje populacije. Prehrambeno stanje Bajaša općenito nije zadovoljavajuće i posljedica je nezdravih prehrambenih navika i lošeg socioekonomskog statusa čiji su primarni uzroci nedostatan obrazovanje i visoka stopa nezaposlenosti pripadnika ove romske populacije.