



Morbidity of Native, Immigrant, and Returned Refugee Populations in Family Medicine Practice in Croatia after 1991-1995 War

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Aim	To examine the differences in the morbidity among 325 native inhabitants, 231 immigrants, and 145 returned refugees in Komarevo, Croatia.
Methods	The data on patients older than 45 years and their chronic diseases classified according to the 10th revision of International Classification of Diseases and Related Health Problems were collected from the medical files in a family practice in Komarevo. The patients were grouped according to their status (natives, immigrants, and returned refugees) and age (45-64 and ≥ 65 years). The differences in diagnoses between the groups of the same age were analyzed by descriptive statistics, Kruskal-Wallis test, and χ^2 test.
Results	In the 45-64 age group, hypertension was diagnosed in 67 out of 183 (36.6%) natives, 22 out of 108 (20.4%) immigrants, and 12 out of 50 (24%) returned refugees ($\chi^2_2 = 9.48$; $P = 0.008$). In the same age group, ischemic heart disease was found in 21 out of 183 (11.4%) natives, 3 out of 108 (2.8%) immigrants, and 3 out of 50 (6.4%) returned refugees ($\chi^2_2 = 7.34$, $P = 0.025$). In those aged ≥ 65 , intervertebral disc disorders, dorsalgia, and dorsopathy were found in 61 out of 169 (36.1%) natives, 26 out of 123 (21.1%) immigrants, and 15 out of 90 (15.8%) returned refugees ($\chi^2_2 = 15.44$, $P < 0.001$). Ischemic heart disease was found in 20 out of 169 (11.8%) natives, 4 out of 123 (3.3%) immigrants, and 16 out of 90 (16.8%) returned refugees ($\chi^2_2 = 11.40$, $P = 0.003$). Five (56%) and six (67%) out of nine groups of diagnoses had the lowest prevalence in immigrants aged 45-64 and ≥ 65 , respectively.
Conclusion	Native inhabitants had the highest prevalence of observed chronic diseases, whereas the immigrant adult population had the lowest. Such differences should be kept in mind in the approach to war-affected populations.

The health of an individual and society is based on the interaction of biological and environmental factors, such as socio-economic circumstances, living conditions, political and cultural environment, and the health care system. The results of many studies clearly show the influence of socioeconomic status, psychosocial factors, and economic inequality on health (1). Health inequalities are caused by socioeconomic differences and

exposure to different factors during life (2). Hippley-Cox et al (3) showed that there were significant differences in the health care of male and female patients with ischemic heart disease. The study showed that men were more frequently treated with lipid lowering drugs, although the concentration of serum cholesterol was more frequently increased in women. Furthermore, women were less likely to have cardiovascular risk factors

and serum cholesterol concentration recorded. Similar gender-based effects were found in diabetic patients: women received appropriate health care less often than men (4). Health inequalities pose a great challenge to the stakeholders in the health system. Therefore, the research on health and disease differences and possible causes of these differences are prerequisites for implementing effective interventions in health system (5). The link between social deprivation and mortality has been well documented (6). The association between social deprivation and morbidity was less studied. These studies mainly used general health and disease indicators or a few diseases as the specific measures of morbidity. The prevalence of most diseases increased with the increase of material deprivation (7), and the increased prevalence of chronic diseases put more pressure on health care resources (8).

The impact of war on the health of population is undoubtedly a cause of health inequalities. Many studies confirmed the impact of war on changes in morbidity, especially in mental health (9-11).

Komarevo village is located in the Sisak-Moslavina County, which was the area of intense military operations during the 1991-1995 war in Croatia. Many native inhabitants were killed or disappeared in the war, and a major part of the population was displaced, first forcibly and later voluntarily. The number of immigrants, mostly refugees from neighboring Bosnia and Herzegovina, increased. These were significant demographic changes that took place in the region. Some of the displaced natives returned after a few years of living in other regions of Croatia or in other countries. Today, according to their migration status, inhabitants of Komarevo can be divided into natives, immigrants, and returned refugees. The hypothesis of this study was that these three groups differed in morbidity.

Participants and Methods

Komarevo family medicine practice had 1,319 registered patients in 2003. Of them, 740 (56.1%) were women and 579 (43.9%) were men. According to the migration status, there were 663 (50.3%) natives, 485 (36.8%) immigrants, and 171 (12.9%) returned refugees. We compared the data of participants in two age groups, one 45-64 years and the other 65 years or more (Table 1). The aver-

Table 1. Persons aged ≥ 45 years registered with a family physician in Komarevo by age and migration status

Migration status	No. (%) of subjects in age group (years)		
	45-64	≥ 65	total
Natives	183 (52.0)	169 (48.0)	352 (100.0)
Immigrants	108 (46.8)	123 (53.2)	231 (100.0)
Returned refugees	50 (34.5)	95 (65.5)	145 (100.0)
Total	341 (46.8)	387 (53.2)	728 (100.0)

age age of participants in 45-64 age group was 55.2 ± 6.0 years for natives; 53.9 ± 6.2 years for immigrants, and 54.3 ± 5.7 years for returned refugees ($P=0.380$). The average age of participants in the ≥ 65 age group was 73.5 ± 6.3 years for natives; 72.5 ± 5.6 years for immigrants, and 74.8 ± 5.6 years for returned refugees ($P=0.224$).

The data on the patients and chronic diseases were collected retrospectively from the medical files saved in an electronic format. The diagnoses were classified according to the International Classification of Diseases and Related Health Problems, 10th revision (ICD-10; ref. 12). The most common diagnoses or groups of diagnoses were intervertebral disc disorders, dorsalgia, and dorsopathy (M51-M54); hypertension (I10); depressive, anxiety and neurotic disorders, and disorders of personality (F32-F69); disorders of lipoprotein metabolism and other lipidemias (E78); gastric and duodenal ulcer, and gastritis (K25-K29); arthroses (M15-M19); cardiomyopathy (I42-I43); ischemic heart diseases (I20-I25), and diabetes mellitus (E10-E14). For each diagnosis or group of diagnoses, we calculated the prevalence rates for natives, immigrants, and returned refugees in both age groups. Based on the prevalence rates calculated for all three groups of people, we ranked prevalence rates for each diagnosis or group of diagnoses.

Descriptive statistics, Kruskal-Wallis test, and χ^2 test were used for statistical analyses. Descriptive statistics was used for presenting the distribution of chronic diseases according to the patients' status and age, χ^2 test was used to test the differences in disease prevalence, and Kruskal-Wallis test to compare the groups by the sum of ranks of diseases prevalences.

SAS statistical package (SAS System for Windows, release 8.02, SAS Institute Inc., Cary, NC, USA) was used for all statistical analyses. The level of statistical significance was set at $P < 0.05$.

Results

Chronic diseases were found in 297 (89%) out of 341 patients in the 45-64 age group. There was a total of 815 diagnoses of chronic diseases. The most frequent diagnoses were intervertebral disc disorders, dorsalgia and dorsopathy, found in 160 (47%) participants; hypertension in 101 (30%); depressive, anxiety and neurotic disorders, and disorders of personality in 89 (26%); disorders of lipoprotein metabolism and other lipidemias in 65 (19%); gastric and duodenal ulcer, and gastritis in 61 (18%); cardiomyopathy in 29 (9%); ischemic heart diseases in 27 (8%); arthroses in 21 (6%), and diabetes mellitus in 19 (6%) participants.

The differences in disease prevalence among the three groups (Fig. 1) were significant for hypertension ($\chi^2_2 = 9.48$; $P = 0.008$) and ischemic heart diseases ($\chi^2_2 = 7.34$; $P = 0.025$), which were significantly higher in natives than in immigrants or returned refugees.

The highest prevalence of disorders of personality and depressive, anxiety, and neurotic disorders was found in natives, followed by returned refugees and immigrants, but the differences were not significant ($\chi^2_2 = 5.75$; $P = 0.056$).

The sum of ranks for all groups showed that the prevalence of observed chronic diseases was highest among natives, followed by those in

returned refugees, whereas the lowest prevalence was found in immigrants (Kruskal-Wallis $\chi^2 = 6.74$; $P = 0.034$).

None of the diagnoses groups had the highest prevalence among immigrants, and five of the nine groups of diagnoses (56%) had the lowest ranks. There was no difference between natives and returned refugees in all groups of diagnoses taken together (Kruskal-Wallis $\chi^2 = 3.48$; $P = 0.062$).

Out of 387 persons in the age group ≥ 65 , chronic diseases were found in 349 (89%). There were altogether 1,222 diagnoses of chronic diseases recorded. The most frequent diagnoses were hypertension in 194 (50%) participants; cardiomyopathy in 142 (37%); depressive, anxiety and neurotic disorders, and disorders of personality in 120 (31%); arthroses in 107 (28%); intervertebral disc disorders, dorsalgia and dorsopathy in 102 (26%); gastric and duodenal ulcer, and gastritis in 80 (21%); disorders of lipoprotein metabolism and other lipidemias in 57 (15%); diabetes mellitus in 46 (12%); and ischemic heart diseases in 40 (10%) participants.

The differences in disease frequency between population groups (Fig. 2) were significant for intervertebral disc disorders, dorsalgia, and dorsopathy ($\chi^2_2 = 15.45$; $P < 0.001$), which were significantly higher in natives than in immigrants and returned refugees.

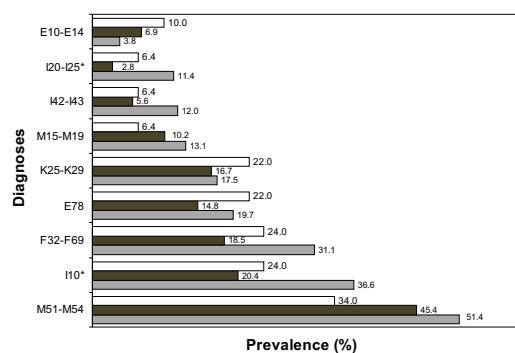


Figure 1. Prevalences of most frequent chronic diseases among 50 returned refugees, 108 immigrants, and 183 natives in the 45-64 age group. Asterisk indicates $P < 0.05$ (χ^2 test). Open bars – returned refugees; closed bars – immigrants; grey bars – natives. Disease codes (according to ICD-10, ref. 12): E10-E14 Diabetes mellitus; I20-I25 Ischemic heart diseases; I42-I43 Cardiomyopathy; M15-M19 Arthrosis; K25-K29 Gastric or duodenal ulcer, gastritis or duodenitis; E78 Disorders of lipoprotein metabolism and other lipidemias; F32-F69 Mental and behavioral disorders; I10 Essential hypertension; M51-M54 Intervertebral disc disorders, dorsopathies and dorsalgias.

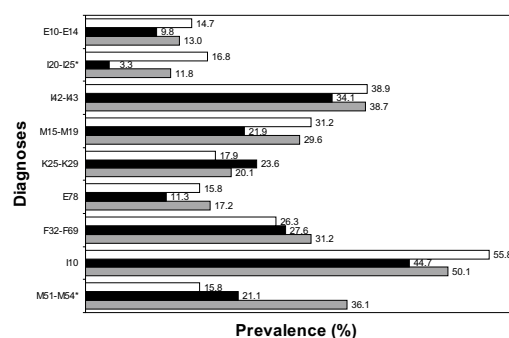


Figure 2. Prevalences of most frequent chronic diseases among 95 returned refugees, 123 immigrants, and 169 natives in the ≥ 65 age group. Asterisk indicates $P < 0.05$ (χ^2 test). Open bars – returned refugees; closed bars – immigrants; dotted bars – natives. Disease codes (according to ICD-10, ref. 12): E10-E14 Diabetes mellitus; I20-I25 Ischemic heart diseases; I42-I43 Cardiomyopathy; M15-M19 Arthrosis; K25-K29 Gastric or duodenal ulcer, gastritis or duodenitis; E78 Disorders of lipoprotein metabolism and other lipidemias; F32-F69 Mental and behavioral disorders; I10 Essential hypertension; M51-M54 Intervertebral disc disorders, dorsopathies and dorsalgias.

Significant difference in disease frequency between the groups was also found for ischemic heart diseases ($\chi^2_2 = 11.40$; $P = 0.003$), which was significantly higher in returned refugees than in natives and immigrants.

The sum of ranks for all groups showed that the prevalence of observed chronic diseases was highest among natives, followed by those in returned refugees, whereas the lowest prevalence was found in immigrants (Kruskal-Wallis $\chi^2_2 = 6.09$, $P = 0.047$).

The sum of ranks of prevalence was again lowest in the immigrant group. Among immigrants, six of the nine groups of diagnoses (67%) had the lowest ranks, and only one group of diagnoses (K25-29) had the highest prevalence. There was no difference between natives and returned refugees in all groups of diagnoses taken together (Kruskal-Wallis $\chi^2_1 = 3.02$, $P = 0.082$).

Discussion

Our study showed that natives, immigrants, and returned refugees differed in morbidity, despite the fact that all three groups had been exposed to war stress.

Prevalences of observed chronic diseases were the highest among natives, followed by those in returned refugees, whereas the lowest prevalences were found in immigrants.

Differences in morbidity can be examined from several points of view. The study of Lopes Cardozo et al (13) showed the differences in the intensity of trauma in Kosovo's ethnic Albanians exposed to 1998-1999 war events. Internally displaced people had poorer health status, as measured by the General Health Questionnaire (GHQ-score), than refugees to another country or people who stayed at their homes. Most studies of wartime and postwar morbidity focus on post-traumatic stress disorder (PTSD), which significantly increases the risk of depression, anxiety, and alcohol and drug dependence (14-16). PTSD is also associated with higher rates of hypertension, bronchial asthma, and peptic ulcer, as well as with other diseases (17). We found high prevalence rates of peptic ulcer diseases and depressive and neurotic disorders. In the 45-64 age group, depressive, anxiety and neurotic disorders, and disorders of personality (F32-F69) had the highest prevalence in the group of natives. In the ≥ 65 age

group, the prevalence of gastric and duodenal ulcer and gastritis (K25-K29) was higher in the group of immigrants. Significantly lower prevalence rate of hypertension in immigrants and returned refugees than in natives can be partly explained by poorer control of chronic diseases during the war. For example, tuberculosis mortality in wartime is three times higher than in peacetime, when patients can take regular treatment (18). The difference found in the prevalence rates of hypertension can also partly be explained by the lack of continuous health care for the immigrants and returned refugees. To provide continuous and comprehensive health care, the general practitioner has to use all knowledge about the patient, his or her family, and social environment. Through many encounters with a patient over a longer period of time, the general practitioner should enable the patient to assume part of the responsibility for a long-term treatment of chronic disease (19).

Immigrants and returned refugees have had regular access to the health care system and are registered with their chosen physician, but it is obvious that the duration and continuity of health care for natives is much better than for the other two population groups. Furthermore, there is a problem of inadequate registration of chronic diseases in patients with lower socio-economic status (20).

During the war in Bosnia and Herzegovina, elderly refugees represented a greater health care burden because they had more difficulties in adapting to the new environment (21). This study showed that the immigrant population had prevalence rates of chronic diseases lower than natives and returned refugees. A possible explanation of a lower disease burden among immigrants was that the healthiest survived the war and immigrated to Croatia (22). In a study on quality of life in Croatia after the war, the population living in the areas directly affected by the war achieved lower total health-related quality-of-life scores (23).

According to the data of the Croatian Institute of Public Health, out of 4,437,460 inhabitants of Croatia, 3,869,472 (87%) were registered on the patient lists of 2,402 family physicians in 2003. The average number of patients per family physician in Croatia was 1,610. One of the most important limitations of this study was that it included a rather small patient population, registered with a single family physician. Furthermore, the proportion of people > 65 years of age in the

study was 29%, whereas the proportion of that age group in the total population in Croatia is 15.7%. Also, the frequencies of some chronic diseases were greater in the ≥ 65 age group included in the study than in the rest of the Croatian population. For example, in Komarevo, 13% of population had diabetes mellitus vs 8% of total population in Croatia, 11% had ischemic heart disease vs 8% in Croatia, 24% had arthrosis vs 8% in Croatia, 50% had hypertension vs 32% in Croatia, and 24% had intervertebral disc disorders, dorsopathies and dorsalgias vs 16% in Croatia (24). In a Croatian study conducted on a population of 500 patients aged ≥ 65 years registered with 52 family physicians, 3.5 chronic diseases were diagnosed per patient (25). In our study, we found 3.2 chronic diseases per person aged ≥ 65 .

The prevalence of chronic diseases at the national level in Croatia is lower than expected, according to the results of studies and the data found in international literature. For example, in Croatia in 2003, 2.1 chronic diseases were diagnosed per person aged ≥ 65 , and hypertension was found in 12.1% of the population. This could be partly explained by insufficient coverage of the population by the family medicine service. On the other hand, insufficient detection of chronic diseases is partly a reflection of the orientation of family medicine toward patients who actively seek health services. Family medicine practices give the most valuable data on prevalence of chronic diseases in the population because the medical records kept by family physicians include details of all diagnoses, prescribed drugs, etc. Data from general practice, therefore, offer unique opportunities to plan and monitor health services and undertake population-based research (8).

The results obtained in this study showed that the prevalences of observed chronic diseases were the highest among natives and the lowest among immigrants. For a more detailed analysis of the differences found in the morbidity of natives, immigrants, and returned refugees, further studies should be conducted in other war-affected areas. Since all participants in our study were affected by the war, it would be useful to compare their health status with a health status of population that was not directly exposed to the war activities. This control group should be comparable in age, sex, and main chronic diseases. On the basis of such an expanded study, the view-

points, opinions, and behavior of the three groups of participants should be investigated by the qualitative research methods.

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