

Morbidity and Mortality in the City of Zagreb, Croatia – Health Needs and Demands

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ABSTRACT

The aim of the study was to assess health indicators in the city of Zagreb in order to evaluate the population health status and health needs. A descriptive method was used to analyze data from regular health statistics. In the population of Zagreb, the life expectancy at birth is longer than the European average but shorter than that recorded in Austria and Slovenia. The standardized mortality rates of tracheal, bronchial and lung cancer, and of malignant diseases in the Zagreb population exceed the European average, whereas those of ischemic heart disease, cerebrovascular disease, uterine cervix carcinoma and breast cancer are lower than the European average. Circulatory diseases and neoplasms, the two most important groups of death causes, showed a constant rise during the 30-year period (1971–2001). The highest index of primary health care utilization (98.8%) was recorded for the ≥65 age group, with a mean of 7.5 primary health care visits per capita. The prevalence of hypertensive disorders and of intervertebral disk diseases and other dorsopathies was significantly higher in the oldest population group ($\chi^2=27.3$ and $\chi^2=13.43$, respectively, $p<0.05$ both). Considering the predominance of chronic widespread diseases that substantially influence the patient's quality of life, public health actions should primarily be focused on preserving personal autonomy of the old and sick man for as long as possible. As the standardized mortality rates of ischemic heart disease, cerebrovascular diseases, tracheal, bronchial and lung cancer, and malignant diseases exceed those reported from some neighboring countries, the highest priority and needs are now related to coping with unhealthy behavior of the population such as smoking, physical inactivity, and dietary issues that should be modified and controlled through implementation of preventive programs, along with appropriate organization and management of public health services.

Key words: aging, mortality, life expectancy, health care, public health service, Croatia

Introduction

In the runup to the 21st century, the proportion of individuals older than 65 in the general population has been on an ever growing increase, thus social care including medical and health care being ever more burdened with care for the elderly. The aging of the general population influences the type of morbidity and causes for seeking medical aid. According to the World Health Organization (WHO) criteria, the population of the Republic of Croatia turned »old« as early as the sixth decade of the past century, with 7% of the population aged over 65. In the 1980s, the Croatian population belonged to those termed »very old«, with 11.2% of individuals older than 65 in the general population. According to the 1991 census, this proportion increased to 13%¹, and the latest census from 2001 indicated this unfavorable tendency to continue with 15.7% of elderly population². The population pattern in general has been influenced by the longstanding birthrate decline, increased mortal-

ity among younger age groups during the war, and unfavorable migration patterns during the past decade. This is confirmed by demographic structure of the Zagreb population with 14.9% of the population older than 65². Obviously, the proportion of elderly patients and their health care utilization should be expected to rise³.

The aim of the study was to assess the main health care indicators in the city of Zagreb, the capital of Croatia, in order to identify the population health state and health care needs, to launch appropriate preventive measures, and to compare them with data on Croatia as a whole and those reported from other European countries.

Material and Methods

The population of the City of Zagreb served as study population. According to the 2001 census, there were

779,145 inhabitants, 22.1% in 0–19, 62.6% in 20–64, and 14.9% in ≥65 age group². Data on morbidity and visits recorded in Zagreb primary health care facilities including general medicine and preschool children health care were used in the study⁴.

Morbidity records include the leading diagnosis causing patient's presenting for medical aid. In case of acute disease, one diagnosis is recorded for all visits for this particular episode, whereas in case of acute disease recurrence it is recorded again (although it may have already been recorded on a single or more occasions during the year). In case of chronic disease, the diagnosis of the particular disease is recorded once, as a rule on the first visit, in a year. These are aggregated data used to get an insight in the rate of primary health care utilization for particular diseases and conditions⁵.

In addition, data of the National Bureau of Statistics on total mortality in the city of Zagreb were used. Variation in the mortality rate over a 30-year period (1971–2001) was analyzed according to age, sex and cause of death, expressed as percentage (variation real rate, VRR, in %). The age standardized death rate was calculated for particular diagnostic entities.

The International Classification of Diseases – Tenth Revision (ICD-X) codes were used on recording the leading diagnosis (morbidity and cause of death)⁶.

The following indicators of primary health care were calculated:

- primary health care utilization index: structure (%) of total population using primary health care in Zagreb in 2001,
- mean number of primary health care visits *per capita* in Zagreb in 2001 (total Zagreb population),
- mean number of primary health care visits *per* health care user in Zagreb in 2001.

The epidemiologic descriptive observational method free from artificial manipulation of the study factor was used in the study⁷.

The study hypotheses were tested by use of χ^2 -test to determine statistical significance in the morbidity according to age groups.

Results

The mortality pattern in the city of Zagreb during the 1971–2001 period according to age and sex is presented in Table 1.

During the 30-year period, the overall mortality rate increased by 14.3%, the increase being higher in women than in men (16% vs. 12.6%). According to age groups, the mortality rate showed a decrease in all age groups, being greatest in the 0–19 age group (75.4%), i.e. three-fold that recorded in other age groups. The mortality pattern according to groups of diseases as causes of death is shown in Table 2.

The greatest decline of up to 82.1% was recorded for the groups of symptoms, signs and abnormal findings

unclassified elsewhere, followed by 79.6% for the group of particular perinatal conditions. The two most important groups of death causes, circulatory diseases and neoplasms, showed constant rise over the period of observation, and taken together accounted for 79.6% of all causes of death in Zagreb in 2001. The group of mental disorders showed greatest increase (303%), which was most pronounced in the last decade, with a predominance of psycho-organic syndrome and dementias, and mental disorders caused by alcohol and opiates.

Tables 3 and 4 present results on the indicators of primary health care utilization in Zagreb from January 1, 2001 till December 31, 2001.

During this period, primary health care services were used by 666,543 (85.6%) of 779,145 population. The mean number of visits was 4.5 *per capita* and 5.2 *per* health care user. Analysis of indicators according to age groups yielded highest index of health care utilization of 98.8% for the oldest age group (≥65 years), who also had highest mean number of primary health care visits of 7.50 *per capita* and nearly identical mean number of primary health care visits *per* user of 7.54. This group was immediately followed by the 0–19 age group with a mean number of 5 visits *per capita* and 6 visits *per* user, however, with a lower index of primary health utilization (83.15%) as compared with the 20–64 age group. This age group also had lowest mean number of visits *per capita* and *per* user (3.6 and 4.3, respectively), which was no surprise as this group includes working-age population. The 0–19 age group includes infants and young children. Since morbidity rate is usually focused on *in extremis vitae*, this could be considered to account for the relatively high number of visits in this age group.

The most common (the first twenty) causes of primary health care utilization in Zagreb are presented in Table 5.

Acute infections of upper airways were the leading cause with a rate of 452.95 patients *per* 1000 population. The second most common cause of primary health care utilization were hypertensive disorders with a rate of 79.23 *per* 1000 population, immediately followed by

TABLE 1
DEATHS IN ZAGREB 1971–2001 ACCORDING TO AGE AND SEX
(RATE PER 1000 POPULATION)

	1971	1981	1991	2001	VRR (%)*
	Rate per 1000 population				
Women	4.49	4.27	5.19	5.21	16.0
Men	4.54	4.57	5.46	5.11	12.6
Total	9.03	8.84	10.65	10.32	14.3
Age group (yrs)					
0–19	2.07	1.19	0.82	0.51	–75.4
20–64	4.72	4.32	5.53	4.04	–14.4
65+	63.90	58.44	63.77	51.54	–19.3

*VRR (%) – variation real rate in % (1971–2001)

TABLE 2
DEATHS IN ZAGREB 1971–2001 ACCORDING TO GROUPS OF DISEASES – CONDITIONS (RATE PER 100,000 POPULATION)

ICD group of diseases – conditions	1971	1981	1991	2001	VRR (%)
	Rate per 100,000 population				
Infectious and parasitic diseases	15.44	8.30	9.42	17.97	16.4
Neoplasms	174.86	196.13	240.81	271.19	55.1
Hematologic and hematopoietic diseases	1.33	1.17	0.54	1.16	-12.8
Endocrine diseases	10.30	15.08	17.45	15.66	52.0
Mental disorders	2.99	2.81	4.50	12.06	303.4
Nervous system diseases	8.80	7.83	6.42	11.29	28.3
Circulatory system disorders	381.10	410.14	511.50	547.78	43.7
Respiratory system diseases	53.64	58.79	38.23	34.40	-35.9
Gastrointestinal system diseases	53.64	58.79	60.61	45.69	-14.8
Cutaneous and subcutaneous tissue diseases	0.66	–	0.21	0.13	-80.3
Musculoskeletal system diseases	1.16	0.23	0.43	1.03	-11.2
Urogenital system diseases	22.25	11.57	10.60	9.75	-56.2
Pregnancy, delivery, puerperium	0.17	0.23	–	–	–
Certain perinatal conditions	23.25	9.58	5.35	4.75	-79.6
Congenital malformations	5.15	5.96	3.00	3.34	-35.1
Symptoms, signs and abnormal findings not classified elsewhere	44.50	23.49	34.37	7.96	-82.1
Injuries, poisoning and other consequences of external causes	103.95	74.45	121.53	47.74	-54.1

VRR (%) – variation real rate in % (1971–2001)

TABLE 3
INDICATORS OF MORBIDITY IN OUTPATIENT HEALTH CARE IN ZAGREB IN 2001

	Rate			
	Total population	0–19 years	20–64 years	65+ years
Index of primary health care utilization (%) (structure of the population using primary health care in 2001)	85.55	83.15	83.81	98.80
Mean number of visits per capita	4.47	5.0	3.61	7.50
Mean number of visits per user	5.23	6.0	4.31	7.54

TABLE 4
NUMBER OF PRIMARY HEALTH CARE USERS AND VISITS IN ZAGREB IN 2001

	Total	0–19 years	20–64 years	65+ years
Population	779,145	172,472	487,472	115,980
Number of primary health care users	666,543	143,412	408,538	114,593
Number of primary health care visits	3,487,860	860,376	1 761,365	864,521

intervertebral disk disorders and other dorsopathies (78.46/1000), dermatitides, eczemas and urticarias (56.72/1000), acute bronchitis and bronchiolitis (56.21/1000), otitis media and mastoiditis (55.49/1000), and cataract and other lens diseases (47.38/1000). Excluding unclassified symptoms and underdefined conditions, neuroses and affective disorders – although frequently unrecognized in primary health care – ranked eighth most common cause of primary health care visits with a rate of 38.35 patients *per* 1000 population.

The most common reasons for primary health care utilization according to age groups are illustrated in Table 6.

Acute infections of upper airways ranked first in all age groups, whereby the rate of affection *per* 100 population was considerably lower in the ≥65 age group than in the 0–19 age group (27.82/100 *vs.* 111.20/100 age-matched population). Hypertensive diseases ranked second most common with a rate of 23.09 *per* 100 age-matched population in the oldest age group (age

TABLE 5
MOST COMMON CAUSES OF OUTPATIENT HEALTH CARE UTILIZATION IN 2001

No.	Rate per 1000 population	ICD classification	Cause of disease
1	452.95	J00–J06	Acute infections of upper airways
2	79.23	I10–I15	Hypertensive disorders
3	78.46	M50–M54	Intervertebral disk diseases and other dorsopathies
4	56.72	L20–L30, L50	Dermatitides, eczemas and urticarias
5	56.21	J20–J21	Acute bronchitis and bronchiolitis
6	55.49	H65–H75	Otitis media and other middle ear and mastoid diseases
7	47.38	H25–H28	Cataract and other lens diseases
8	43.94		Other symptoms, signs, clinical and laboratory findings not classified elsewhere
9	40.27		Other infectious and parasitic diseases
10	38.35	F40–F48	Neuroses and affective disorders
11	35.61	J10–J11	Influenza
12	31.96	L00–L08	Skin and subcutaneous tissue diseases
13	30.25	H52	Refraction and accommodation errors
14	28.90	J40–J44, J 47	Bronchitis, emphysema, asthma and other chronic obstructive pulmonary diseases
15	27.67	A00–A09	Gastrointestinal infectious diseases
16	27.52	D50	Iron deficiency anemias
17	25.74		Other respiratory diseases
18	23.41	M15–M19	Arthroses
19	22.60	K25–K27	Gastric and duodenal ulcer
20	21.64	E10–E14	Diabetes mellitus

TABLE 6
MOST COMMON CAUSES OF OUTPATIENT HEALTH CARE UTILIZATION IN 2001
ACCORDING TO AGE GROUPS (RATE PER 100 POPULATION)

ICD classification	Cause of disease	Rate per 100 population			
		Total population	0–19 years	20–64 years	65+ years
J00–J06	Acute infection of upper airways	45.29	111.20	26.43	27.82
I10–I15	Hypertensive disorders	7.92	0.17	7.11	23.09
M50–M54	Intervertebral disk disorders and other dorsopathies	7.85	0.40	8.81	15.10
L20–L30, L50	Dermatitides, eczemas and urticarias	5.67	8.62	4.47	6.51
J20–J21	Acute bronchitis and bronchiolitis	5.62	11.75	3.35	6.20
H65–H75	Otitis media and other middle ear and mastoid diseases	5.55	15.29	2.52	3.94
H25–H28	Cataract and other lens diseases	4.74	0.03	0.35	3.14
F40–F48	Neuroses and affective disorders	3.84	0.45	4.39	6.63

≥65), followed by intervertebral disk diseases and other dorsopathies (15.10/100), and neuroses and affective disorders (6.63/100). In the oldest age group (≥65), hypertensive diseases as well as intervertebral disk diseases and other dorsopathies showed multiple prevalence recorded in other age groups. The rate of hypertension varied from 0.17 in the youngest age group through 23.09 in the oldest age group, yielding a statistically significant age-group difference ($\chi^2=27.3$, $p<0.05$). A statistically significant age-group difference was also recorded for the prevalence of intervertebral disk diseases and other dorsopathies ($\chi^2=13.43$, $p<0.05$), ranging from 0.40 in the youngest age group through 15.10 in the oldest age group. In contrast, there was no statistically sig-

nificant difference among the three age groups in the prevalence of neuroses and affective disorders, and cataract and other lens diseases.

Discussion

Public health planning includes four types of activities: analysis of the present population health state, defining the future desired health state, specifying the health care interventions required, and evaluation of the measures and programs performed⁸. The present epidemiologic study has an important role in identifying the present population health state and evaluating the interventions performed.

The Zagreb population aging has entailed an increase in the total mortality rate and a decrease in the standardized mortality rate according to age groups. This could be explained by improved living and health care conditions which have reduced the probability of lethal outcome and prolonged life expectancy in both sexes. This process has also been recognized in other similar studies^{8–11}. According the general theory of epidemiologic transition, the longterm changes in health and disease patterns in society are related to demographic and social conditions in the country. Mortality is considered to be the major factor in population change. Medical progress is less responsible for the change than improvement in living conditions and changes in the nature of certain diseases¹².

In the population of Zagreb, the life expectancy at birth is longer than the life expectancy in the population of Croatia for both sexes (Table 7).

When compared with the same parameter in some neighboring countries, the life expectancy at birth in the population of Zagreb was shorter than that in Austria and Slovenia but longer than that in Hungary for both sexes.

The greatest mortality rate decline during the 30-year period was recorded in the 0–19 age group, which suggests considerable advancement in the young population health care and is consistent with the general tendency in Croatia characterized by the nearly fourfold infant mortality rate decrease from 29.5 *per* 1000 livebirths in 1971 to 7.7 *per* 1000 livebirths in 2001¹³. An epidemiologic shift in the causes of death with an increase in circulatory and malignant diseases has been reported from both industrialized and developing countries¹⁴.

According to the causes of death, the public health advancement is evident from the reduced prevalence of

underdefined causes of death and great reduction in deaths due to perinatal conditions. Also, there is a steep increase in the mortality associated with alcoholism and drug abuse, which is comparable to some other transition countries^{15,16}. Violent deaths showed a tendency to decline over the 30-year period of observation (by 54%), however, with an abrupt increase recorded in 1991, which could be explained by the war in Croatia. In contrast to industrialized countries, the mortality rate due to circulatory diseases is still quite high in Croatia⁹.

The standardized mortality rates for all causes of death observed in the study were lower in Croatia. Compared with the European averaged rates, the standardized mortality rates in Zagreb were higher for tracheal, bronchial and lung cancer, and for malignant diseases, and lower for ischemic heart disease, cerebrovascular disease, uterine cervical cancer and breast cancer. Comparison of standardized mortality rates between the city of Zagreb and some neighboring Central European countries revealed higher standardized mortality rates for ischemic heart disease and cerebrovascular disease in Zagreb as compared with Austria and Slovenia. The same held for the mortality rates of tracheal, bronchial and lung carcinoma as well as of malignant diseases, whereas the mortality rates of uterine cervix cancer and breast cancer were lower in Zagreb than in the respective countries. When compared with Hungary, the population of Zagreb had lower standardized mortality rates of all the diseases mentioned above (Table 8).

According to WHO criteria, mortality data are considered reliable if the category of Symptoms and Inadequately Defined States (R00-R99) in total mortality does not exceed 5%. In 2000, the proportion of this category in total mortality was 2.0% for Croatia and 1.5% for Zagreb, which is considered a high quality structure of mortality data¹².

TABLE 7
LIFE EXPECTANCY AT BIRTH IN CROATIA AND SOME OTHER EUROPEAN COUNTRIES IN 2000 (IN YEARS)

Sex	Zagreb	Croatia*	Austria*	Slovenia*	Hungary*	European average*
Male	71.85	69.12	75.60	72.30	67.61	69.71
Female	77.35	76.68	81.47	80.05	76.25	77.86

*Source: Croatian Health Service Yearbook, 2001

TABLE 8
STANDARDIZED AGE RATES, ALL AGES, PER 100,000 INHABITANTS FROM DIFFERENT DISEASE CATEGORIES IN CROATIA AND SOME OTHER EUROPEAN COUNTRIES IN 2000

Disease	Zagreb	Croatia*	Austria*	Slovenia*	Hungary*	European average*
Ischemic heart disease	175.11	201.14	132.22	104.89	226.88	222.23
Cerebrovascular disease	109.71	176.35	67.81	85.04	141.74	138.80
Malignant neoplasms	214.20	248.99	174.19	204.21	268.16	181.27
Lung cancer	45.84	53.14	32.73	40.38	64.96	36.60
Cancer of cervix uteri	2.38	3.57	2.51	5.04	7.25	4.92
Female breast cancer	22.1	30.77	27.62	26.89	32.48	25.08

*Source: Croatian Health Service Yearbook, 2001

The other part of the study was focused on the analysis of health care needs and requirements on the basis of morbidity records and health care utilization.

As expected and confirmed by literature reports, elderly people use the available health care services to a considerably greater extent than those from younger age groups^{8,17}. The higher prevalence of particular disease at an advanced age could be attributed to the pre-existence of chronic diseases and conditions¹⁸.

The generally high index of primary health care utilization could be explained by the very idea of primary health care which in Croatia represents the first contact of the patient with health service, and presuming that up to 80% of health care needs are covered at this health care level¹⁹. It should also be noted that the Croatian health insurance system provides primary health care utilization not only according to the place of residence but also according to the location of school and work. As the city of Zagreb is an economic and education center, this index also included persons residing elsewhere but seeking medical aid in Zagreb.

The sequence of the main causes of specific mortality in the elderly was consistent with the results of gerontologic studies conducted elsewhere^{8,10}. Comparison with a study conducted in Spain revealed a somewhat lower prevalence of neuroses and affective disorders, and of gastric and duodenal ulcers in Zagreb. The high prevalence of neuroses and affective disorders reported from the Spanish study could in part be explained by the study being conducted in a remote rural area, where their lonely life entails a high frequency of depression and other mental disorders in the elderly^{8,20}. Mental disorders are characterized by a high rate of morbidity in the general population. Many mental disorders, especially depression and anxiety disorders, are frequently predominated by physical symptoms, which may mask the true clinical picture and mislead the physician to extensive somatic examinations, thus enhancing the risk of inappropriate treatment and development of chronic morbidity. Thus, it is concluded that the proportion of mental disorders recorded in general medicine offices is considerably underestimated^{21,22}. Anxiety disorders were most common in the subgroup of neuroses and affective disorders, representing a special group of conditions predominated by fear and anxiety, including phobic anxiety disorders, panic disorders, obsessive-compulsive disorder, acute stress reaction, posttraumatic stress disorder (PTSD), etc. The prevalence of anxiety disorders varies among different settings. The prevalence of specific or simple phobias is about 10%, of social phobias 13%, of panic disorder 3.5%, and of PTSD 1%–14%²¹.

Evaluation of functional ability along with the identified health state is an important indicator in the assessment of the health needs in the elderly. According to the results of the epidemiologic study of the health, social psychologic state of the elderly in the city of Zagreb,

conducted in the 1980s according to WHO methodology in 11 European countries, a number of the individuals older than 60 were not able to perform physical activities necessary for normal daily living. Those who were unable to perform heavy housework accounted for the highest percentage (34%), followed by those unable to carry heavy burden (19%), to cook for themselves (12%), to go outdoors without other person's help (6%), to climb stairs (7%), and to put clothes on and off and use bathroom independently (4%). The proportion of persons able to perform some activities only with other person's help or unable to perform them at all was found to abruptly rise with age²³. According to the latest data, the proportion of disabled people (according to physical status) in 2001 was 10.28% of the Zagreb population. According to age groups, the rate of functionally disabled persons increased proportionally with age, amounting to 22.25% and 25.24% in the 65–69 and >85 age groups, respectively. Within the group of functionally disabled persons older than 65, 2.30% suffered permanently limited movement by use of wheelchair, 4.88% were permanently immobile, whereas 31.39% were limited in movement by use of cane. Although data from the presented studies are not fully comparable, they suggest that the proportion of semimovable and immobile persons did not change substantially during the period of observation²⁴. Results of a study performed in the United States point to a continuous decrease in the rate of disability among the individuals aged >65, i.e. from 1982 to 1989 by 0.26%, from 1989 to 1994 by 0.38%, and from 1994 to 1999 by 0.56% per year²⁵.

The aging of the population has been associated with ever growing needs and requests for health care services from the oldest age groups. Considering the predominance of chronic diseases that substantially influence the quality of life, the public health activities should be directed not only to providing appropriate health care but also to preserving the diseased elderly personal autonomy for as long as possible.

During the period of observation, the mortality due to circulatory and malignant diseases, mental disorders and endocrine diseases increased which, in the context of the population aging, points to the need of ever more intensive public health focusing on the prevention of widespread chronic diseases at large.

As the standardized mortality rates of ischemic heart disease, cerebrovascular disease, tracheal, bronchial and lung cancer, and malignant disease were found to exceed those reported from some other neighboring countries, the highest priority and needs are now focused on coping with the unhealthy behavior of the population, such as smoking, inadequate physical activity, and dietary habits, which should be modified and controlled by the implementation of preventive programs, and appropriate organization and management of public health services.

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POBOL I SMRTNOST U GRADU ZAGREBU – ZDRAVSTVENE POTREBE I ZAHTJEVI

SAŽETAK

Cilj je bio istražiti zdravstvene pokazatelje u Zagrebu radi utvrđivanja zdravstvenog stanja i zdravstvenih potreba stanovništva. Upotrebljena je opisna epidemiološka metoda. Rabe se podaci vitalne statistike i redovitih zdravstveno statističkih istraživanja. Očekivano trajanje života pri rođenju kod Zagrepčana je dulje u odnosu na europski prosjek, a kraće nego kod Austrijanaca i Slovenaca. Standardizirane stope smrtnosti od raka traheje, bronha i pluća, kao i od malignih bolesti veće su od europskog prosjeka, dok su stope mortaliteta od ishemične bolesti srca, cerebrovaskularnih bolesti, raka vrata maternice i raka dojke manje. Dvije najznačajnije skupine uzroka smrti, cirkulacijske bolesti i neoplazme, bilježe u Zagrebu od 1971. do 2001. godine stalan rast. Najveći indeks uporabe primarne zdravstvene zaštite je iznad 65 godina (98.8%) sa 7,5 izvršenih pregleda po stanovniku. Hipertenzivne bolesti su u primarnoj zaštiti značajno više zastupljene u najstarijoj populaciji ($\chi^2=27.3$, $p<0.05$), kao i bolesti intervertebralnih diskova i ostalih dorzopatija ($\chi^2=13.43$, $p<0.05$). S obzirom na prevlast kroničnih masovnih bolesti koje bitno utječu na kvalitetu života, javnozdravstvene akcije treba usmjeriti na što dulje očuvanje osobne autonomije bolesnog starog čovjeka. S obzirom na to da su standardizirane stope smrtnosti od ishemične bolesti srca, cerebrovaskularnih bolesti, raka traheje, bronha i pluća, kao i od malignih bolesti veće nego u nekim susjednim zemljama, javnozdravstvene prioritete treba usmjeriti na mijenjanje štetnih navika i nezdravog ponašanja stanovništva uključujući pušenje, tjelesnu neaktivnost i lošu prehranu. To se uz dobru organizaciju javnozdravstvene službe može postići provedbom odgovarajućih preventivnih programa te procjenom postignutih rezultata.