Cardiovascular risk factors in Croatia: struggling to provide the evidence for developing policy recommendations

Josipa Kern, Marija Strnad, Tanja Coric, Silvije Vuletic

Reliable epidemiological data on cardiovascular risk factors in Croatia have been lacking. This new study identifies targets for interventions

Andrija Stampar School of Public Health, Zagreb University School of Medicine, Rockefellerova 4, 10000 Zagreb, Croatia
Josipa Kern *professor of medical informatics*
Croatian Public Health Institute, Rockefellerova 7, 10000 Zagreb
Marija Strnad *associate professor of epidemiology*
Tanja Coric *epidemiologist, Social Medicine Service*
Zagreb University School of Medicine, Zagreb
Silvije Vuletic *professor emeritus*
Correspondence to: J Kern jkern@snz.hr

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Cardiovascular disease is the major cause of death in most European transitional countries.[1] Among these countries, standardised mortality from cardiovascular disease is highest in Hungary (508 per 100 000 population) and Croatia (500/100 000) and lowest in Slovenia (295/100 000) and central European countries (238/100 000). In Croatia, cardiovascular disease is the leading cause of death and accounts for more than half the overall mortality.[1] Furthermore, cardiovascular mortality has been constantly rising since the 1970s.

Tackling the problem

Until recently, no reliable epidemiological data were available on the prevalence of cardiovascular risk factors in the Croatian population. The existing studies only comprised small unrepresentative samples and provided conflicting results. Hence, there was no evidence base for developing policy on reducing the burden of cardiovascular disease in the future and recommending interventions for people with cardiovascular risk factors.[2 3]

In collaboration with the Canadian Society for International Health, we conducted the Croatian adult health survey in the summer of 2003 among citizens aged 18 and older. After we stratified the country by region (as defined by the Croatian Central Bureau of Statistics), the sample comprised 10 766 randomly selected households; 9070 individuals agreed to participate (overall response rate 84.2%). This was the first representative population survey to be conducted in Croatia.

Croatia is a sickle shaped country with two distinct geographical regions that traditionally differ in many aspects, including diet and general lifestyle. The people in the "continental" part of the country bear similarities with their northern neighbours in Hungary, whereas those in the coastal part beside the Adriatic Sea traditionally share the lifestyle of Mediterranean people.[4–6] Zagreb, the capital, is in the northern part and is home to about a quarter of the total population (about four million) of Croatia. We analysed our data separately for three areas: continental (eastern, northern and central regions); Adriatic (south and west); and the city of Zagreb.[7]

Traditional Croatian food: consume sparingly

The survey enabled us to estimate the prevalence of six main cardiovascular risk factors: obesity, high blood pressure, smoking, physical inactivity, high alcohol consumption, and inadequate nutrition. We defined obesity as body mass index of 30 or higher, and the cut-off point for high blood pressure was 130/85 mm Hg. Current daily smokers and those who quit less than 10 years ago were classified as smokers. Those who fulfilled at least three of the following criteria were counted as physically inactive: driving to work, working in white collar occupations, taking less than two 30-minute sessions of exercise weekly in their leisure time, and having someone constantly advising them on the need for more physical activity. High alcohol consumption was defined as having a binge of heavy drinking at least once a week, drinking alcohol daily, or having someone constantly advising them on the need to cut down on alcohol consumption. Finally, those who fulfilled at least three of the following criteria were classified as having an inadequate diet: regularly eating food prepared with animal fat, regular consumption of

Percentage (95% confidence intervals) of the Croatian population aged 18 and over with cardiovascular risk factors by geographic area

Risk factors	Zagreb	Continental area			Adriatic area	
		Central Croatia	Northern Croatia	Eastern Croatia	Western Croatia	Southern Croatia
High blood pressure:						
Men	56 (51 to 62)	63 (56 to 70)	56 (48 to 64)	51 (45 to 58)	56 (49 to 62)	59 (53 to 65)
Women	46 (42 to 49)	51 (46 to 56)	48 (44 to 51)	52 (47 to 56)	46 (39 to 54)	44 (41 to 47)
Obesity:						
Men	17 (13 to 21)	23 (19 to 27)	25 (21 to 29)	19 (16 to 22)	17 (14 to 19)	20 (14 to 26)
Women	21 (19 to 24)	26 (22 to 30)	26 (23 to 28)	24 (21 to 27)	15 (11 to 18)	12 (10 to 15)
Physical inactivity:						
Men	40 (34 to 46)	25 (16 to 33)	33 (24 to 42)	29 (21 to 36)	17 (11 to 23)	29 (22 to 36)
Women	43 (40 to 47)	33 (26 to 39)	31 (26 to 35)	19 (14 to 24)	25 (19 to 32)	33 (28 to 38)
Smoking:						
Men	25 (20 to 31)	28 (23 to 33)	28 (22 to 34)	33 (25 to 41)	28 (23 to 33)	27 (20 to 33)
Women	22 (18 to 25)	13 (11 to 16)	10 (8 to 13)	17 (14 to 20)	22 (19 to 26)	17 (13 to 20)
High alcohol consumption:						
Men	20 (15 to 24)	15 (11 to 19)	27 (22 to 31)	17 (10 to 25)	19 (16 to 23)	42 (36 to 49)
Women	3 (2 to 5)	3 (2 to 4)	7 (5 to 9)	3 (1 to 4)	5 (3 to 6)	17 (12 to 21)
Inadequate nutrition:						
Men	11 (8 to 15)	28 (20 to 37)	26 (22 to 30)	29 (24 to 34)	20 (16 to 24)	8 (3 to 13)
Women	7 (5 to 9)	16 (12 to 21)	18 (14 to 21)	19 (14 to 24)	8 (4 to 11)	6 (3 to 9)

full-fat (at least 3.2%) milk and milk products, low consumption of fruits, eating smoked meat at least twice a week, and adding salt to food before tasting.

Ranking the prevalence of risk factors and summarising the ranks showed that the patterns differed between the areas and by sex (table) (further data available from authors). In men, the most prominent risk factor was high blood pressure, followed by smoking, physical inactivity, high alcohol consumption, inadequate nutrition, and obesity. The hierarchy was somewhat different in women, with high blood pressure again being the most prevalent risk factor, but followed by physical inactivity, obesity, smoking, inadequate nutrition, and high alcohol consumption. The prevalence of hypertension in all regions exceeded 50% in men and 44% in women.

Our results primarily demonstrated the heterogeneity of the country with respect to the prevalence of cardiovascular risk factors. In particular, people in the southern region had an extremely low prevalence of inadequate nutrition. Zagreb showed the typical characteristics of urban areas, with physical inactivity being the most prevalent risk factor—almost double the rate in other regions. The east led in unhealthy nutrition and the south in high alcohol consumption.

Interestingly, our survey showed that obesity was one of the most common risk factors in women but the least prevalent in men. Further differences among sexes included smoking, inadequate nutrition, and alcohol in particular, which were consistently less prevalent among women than among men.

Summary points

- Cardiovascular mortality is the leading public health problem in Croatia
- Prevalence of cardiovascular risk factors is generally high, but the hierarchy varies between regions and by sex
- The prevalence of hypertension in all regions exceeds 50% in men and 44% in women
- Public health programmes should be targeted at reducing the prevalence of hypertension, obesity, smoking, and alcohol drinking, and promoting physical activity and healthy diet
- Local governments should adjust the national recommendations to fit the specifics of their region

Policy recommendations and implementation

Despite a national cardiovascular disease prevention programme in Croatia, the prevalence of cardiovascular diseases has risen consistently since the 1970s and the evidence base for the programme was poor. The Ministry of Health has now tackled the problem by commissioning the first nationally representative survey focusing on cardiovascular risk factors. The ministry is now adapting the healthcare intervention programme according to the results of the survey. The results will also play a crucial role in determining the conditions of contracts for compulsory health insurance.

The new revised intervention programme provides national guidance for prevention of and health promotion in cardiovascular health. It emphasises the need for a holistic approach to each patient and the general need to promote healthier lifestyles—reducing tobacco use and alcohol consumption and promoting healthy nutrition and physical activities. We recommend that general practitioners and public health workers, who will be expected to implement the programme, bear in mind the heterogeneity of the country with respect to cardiovascular risk factors. The evidence calls for decentralised implementation through alerting and mobilising local governments to adjust their programmes and choose priorities for health care. This simple cross sectional survey was a big

and costly task for Croatia's healthcare system and represents an important local advance in monitoring the population's health. Its results must be fully used to improve the population's health.

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Public health reforms in Estonia: impact on the health of the population

Kaja Põlluste, Georg Männik, Runo Axelsson

Department of Public Health, University of Tartu, Ravila 19, 50411 Tartu, Estonia
Kaja Põlluste *assistant professor of health care management*

ERGO Insurance Co, Estonia
Georg Männik *member of managing board*

Nordic School of Public Health, Gothenburg, Sweden
Runo Axelsson *professor of health management*

Correspondence to: K Põlluste kaja.polluste@ut.ee

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The health of the population has worsened in most countries in central and eastern Europe during the transition period, but little has been written about the reforms in the field of public health during this time, and little evidence has been presented on the links between these reforms and the health of the population.

We describe public health reforms in Estonia, focusing on the institutional structure, the reform rationale, the specific proposals and reform processes, the achievements and limitations, and the wider impact of the reforms.[1] To describe trends in the health of the population, we use life expectancy, infant mortality, rate of abortions per 100 live births, morbidity rates (tuberculosis, HIV, sexually transmitted diseases), and the level of individual risk factors (smoking, diet, alcohol consumption). The study is based mainly on an analysis of previously published reports and official statistics.

Institutional structure

After the political changes in the beginning of the 1990s, the importance of a population based approach to public health was recognised in Estonia, and the understanding and application of the concept of health promotion became more comprehensive.[2–4]

In 1993 the Ministry of Social Affairs was established and included a Department of Public Health (fig 1, box 1), which was seen as a source of modern health promotion in Estonia. Health promotion was introduced in the curriculum of medical and nursing training at the University of Tartu, and public health training for civil servants and teaching staff was started.[4 5]

The reform rationale

In general, democracy is considered to be good for the health of the population.[6] When starting to build up a democratic society in the beginning of the 1990s, Estonia, like most other countries in central and eastern Europe, experienced a rapid worsening in population

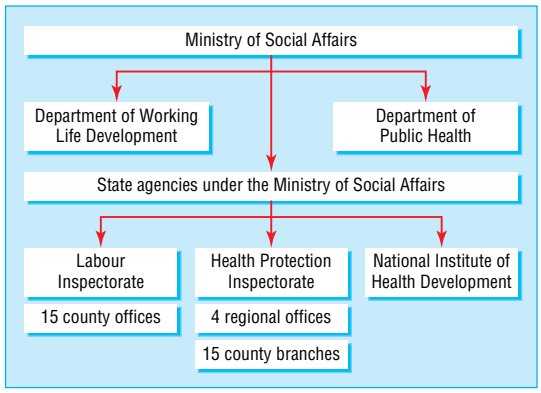

Fig 1 Organisation of health services in Estonia

health indicators. From 1988 to 1994, the life expectancy of males decreased by 5.5 years, due mostly to increased mortality in men of working age. The average life expectancy of men and women showed a big difference.[7]

In 1994, 56% of the male population died before the age of 65. Most of these deaths were caused by external factors, particularly at younger ages, where injuries, poisonings, homicides, and suicides made up about three quarters of the causes of death.[7] Compared with Sweden, for example, the injury death rate for men was about six times higher, and for some types of injuries, such as alcohol intoxication and homicide, death rates were 10 times higher.[8]

Another serious public health problem since the beginning of the 1990s has been the continual increase in new cases of tuberculosis,[7] especially multi-drug resistant tuberculosis. About half of these patients are alcohol misusers, but homeless and poor people are also at great risk.[9]

Reproductive health and sexual behaviour in the first half of the 1990s was described by high numbers of

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