

## SPORT AND HEALTH IN THE REPUBLIC OF SLOVENIA IN 2009

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### SUMMARY

Sport and health are often discussed as being related to each other. The Slovenian Olympic Committee, Department of Sport for All, wanted to determine whether the proportion of population engaged in organised sport activities in the region is correlated to the level of sickness in different disease categories. Municipal authorities provided the information on the number of sport clubs and the number of members they included in 2009. The Statistical Yearbook 2009 by the Statistical Office of the Republic of Slovenia supplied the social and demographic information on municipalities in 2009. The Agency for Public Finances offered data on the financing of sports programs in municipalities in Slovenia for 2009. The Institute of Public Health (Health Statistics Yearbook 2009) provided a summary of treatments for some diseases at the primary level as per diagnosis in accordance with the international ICD-10 classification. Results show that organized sports indeed decrease the level of some health conditions (such as respiratory). The proportion of public funds per member in sport societies is correlated with occurrences of digestive diseases, symptoms and abnormal clinical and laboratory findings not elsewhere classified. Higher wages for employees in such clubs also impact on occurrences of respiratory disease, musculoskeletal diseases, gastrointestinal diseases and injury- and poisoning-related problems due to external causes. These results support the view that sports clubs act as a natural pharmacy. Increased funding for sports clubs would probably lead to an improvement in national health and save resources now spent on treatments.

**Key Words:** sport clubs, finances, diagnosis.

### INTRODUCTION

Health by WHO definition WHO definition (World Helth Organization, 1986) is »[...] a resource for everyday life, not the objective of living, health is a positive concept emphasizing social and personal resources, as well as physical capacities.« European Sports Charter (Concile of Europe, 1992) defines »sport« as means of all forms of physical activity which, through casual or organized participation, aims to express or improve physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels. From both definitions it is obvious that health and sports are correlated.

There is a long list of research studies which proved that sport activity has a positive effect on improvement in health conditions; we will refer to those

which refer how physical activities improve health by general and specific diagnosis. Karacabey (2005) wrote that physical exercise has effects on general health and it plays a preventing role against various diseases; increases work efficiency all which would contribute positively to the national economy and the quality of life. Viru and Smirnova (1995) claim endurance exercise is the most important for health improvement. Gymnastic exercises are indispensable in regards to mechanical anti-sclerotic effects and the central nervous system. According to Tanaka (2009), swimming can improve cardiovascular health and according to Almeida et al. (2009) it also suppress tumour growth. Those women who are physical active have a lower risk of stroke claim Sattelmair, Kurth, Buring, and Lee (2010). With physical activity and proper diet we can improve the status of obese people and lower the risk of injuries (Finkelstein, Chen, Prabhu, Trogon,

& Corso, 2007; Gram, Cristensen, Christiansen, & Gram 2010; Miculis, Mascarenhas, Boguszewski, & de Campos, 2010; Snyder et al., 2010). Kano (1998), Nichols, Sanborn, and Essery (2007), and Roger and Hinton (2010) proved that physical activity facilitates better bone mineralization. Physical activity improves or is beneficial to those who suffer from depression ((Stammes & Spijker, 2009) or asthma (Juvonen et al., 2008; Weisberg et al., 2009), and it stimulates the gastrointestinal system (de Oliveira & Burini, 2009). As stated Vuori (2004), physical inactivity is a cause of and physical activity is a remedy for major public health problems.

On the other hand, it is also well-known that some sport activities (over-exercising) can also damage human health. Overload, injuries, collisions and even mortality are risk factors related to sport (Boughlat, Turmel, Levesque, & Boulet, 2009; Bučar Pajek & Pajek, 2009; Dowdel, 2011; Emery & Tyreman, 2009; Mafuli, Longo, Spiezia, & Denaro, 2010; Redelmeier & Greenwald, 2007).

On the national (state) level, there is only sparse information on how sports affect national health. Owen, Bauman, Brown, and Trost (2003) discussed this subject in their article Physical activity and population health outcomes of positive and negative sides of sport and physical activity and they agreed physical activity (moderate one) should be enforced as it has much more positive outcomes, but no data has been provided. Zheng, Ehrlich, and Amin (2010) wrote economic evaluation of the direct healthcare cost savings resulting from the use of walking interventions to prevent coronary heart disease in Australia, a huge benefit was in money savings. A very interesting research study was published by Lambert et al. (2009). They analyzed the quantity of physical activity of adult members of South Africa's largest private health insurer ( $n = 948.974$ ) and medical claims data related to hospital admissions between active and inactive groups after adjustment for age, sex, medical plan, and chronic illness benefits; hospitalization costs per member were lower in each activity group compared with the inactive group. Powell, Salter, Chalupka, and Harper (2006) found out that lack of availability of facilities that enable and promote physical activity may, in part, underpin the lower levels of activity observed among populations of low socio-economic status and minority backgrounds.

While physical activity and sport have influence on human health (positive and negative) despite search in various databases (Web of Science, PUBMED) did not produce data on how sports activity and number of sport active people is related to national health of

any country. There are many reasons why there is no such data. Probably the most important reason is the fact that national governments do not keep statistics on numbers of persons involved in sport, and the second reason is the lack of health statistics.

Slovenia is a small nation in the middle of Europe, bordering Austria to the North, Italy to the West, Hungary to the East and Croatia to the South. In 2009 it had 2.032.362 inhabitants. In year 2000, the Olympic Committee of Slovenia – Association of Sports Federations and its Sport for All Department initiated an action called »Sport Prescription for Health«, with an aim to make about 6.000 sport clubs in Slovenia contribute toward improvements in national health by promoting the idea that Sport Club can serve as a natural pharmacy. The government at the time did not accept our argument that sport clubs can serve as a natural pharmacy and improve health as the negative perspective on high performance competitive sports was to overpowering. In Slovenia, health statistics is the responsibility of the Institute of Public Health of the Republic of Slovenia (Inštitut za varovanje zdravja – IVZ), which publishes its annual Health Statistics Yearbook. Demographic and economic statistics are in the domain of the Statistical Office of the Republic of Slovenia which publishes Statistical Yearbooks. The Agency of the Republic of Slovenia for Public Legal Records and Related Services provided data on funding spent on organized sports in Slovenia regions in year 2009. Nobody in Slovenia is responsible for sports statistics. For this reason, we obtained our own data on the number of active members in sport clubs in Slovenia.

By using merged data from different areas we wanted to investigate: whether the proportion of organized active sport members was related to the health status as defined by ICD-10; whether the amount of public money per active sport member was related to the health status by ICD-10, and whether the level of employee salaries was related to the health status by ICD-10.

## METHODS

Slovenia is divided into 12 statistical regions: Pomurska, Podravska, Koroška, Savinjska, Gorenjska, Zasavska, Osrednja, Spodnje posavska, Jugovzhodna, Gorška, Obalno-kraška and Notranjsko-kraška. These regions comprised our sample ( $N = 12$ ). The 2009 Health Statistics Yearbook supplied data on the reasons for attendance in out-patient health care facilities on the primary level as defined by ICD-10 chapters. ICD-10 categorises diagnoses as follows:

**TABLE 1**

*Regions demographic and sport characteristicse*

Region	1	2	3	4	5	6
Pomurska	119537	313	18813	157.38	73.18	784.68
Podravska	322900	617	72841	225.58	85.14	933.09
Koroška	72481	218	12783	176.36	176.36	806.23
Savinjska	258845	566	50148	193.74	193.74	813.35
Zasavska	44750	125	7453	166.55	166.55	851.85
Spodnjeoposavska	69900	166	9030	129.18	129.18	838.46
Jogovzhodna	141166	213	17910	126.87	126.87	839.75
Osrednjeslovenska	521965	912	87204	167.07	167.07	938.29
Gorenjska	201779	634	41450	205.42	205.42	868.03
Notranjsko-Kraška	51728	122	6059	117.13	117.13	806.12
Goriška	118533	389	22275	187.92	187.92	876.74
Obalno-Kraška	108778	193	21508	197.29	197.29	893.69
Σ	2032362	4468	367474	Average	113.64	

Legend: **1** – Number of inhabitants; **2** – Number of sport clubs; **3** – Number of sport club members; **4** – Number of members/1000 inhabitants; **5** – Public financies per person in Sport Club per year (EUR); **6** – Average net wage per employedperson per month (EUR); **Σ** – Total.

- I - Infectious and parasitic diseases;
- II - Neoplasms;
- III - Diseases of the blood and blood-forming organs and disorders involving the immune mechanism;
- IV - Endocrine, nutritional and metabolic diseases;
- V - Mental and behavioural disorders;
- VI - Diseases of the nervous system;
- VII - Diseases of the eye and adnexa;
- VIII - Diseases of the ear and mastoid process;
- IX - Diseases of the circulatory system;
- X - Diseases of the respiratory system;
- XI - Diseases of the digestive system;
- XII - Diseases of the skin and subcutaneous tissue;
- XIII - Diseases of the musculoskeletal system and connective tissue;
- XIV - Diseases of the genitourinary system;
- XV - Pregnancy, childbirth and the puerperium;
- XVI - Certain conditions originating in the perinatal period;
- XVII - Congenital malformations, deformations and chromosomal abnormalities;
- XVIII - Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified;
- XIX - Injury, poisoning and certain other consequences of external causes.

The Statistical Yearbook 2009 provided data on the number of inhabitants per region and the avera-

ge income per employed person. The Agency of the Republic of Slovenia for Public Legal Records and Related Services supplied data on public funding allocated to organized sport in regions in 2009. By using a questionnaire and a personal interview, we asked all Slovenia municipal authorities how many sports clubs in their municipality were financed from the municipality budget and how many members they had in 2009 (interviews were conducted in April and May 2010). Out of 210 municipalities 207 responded (99% response which is virtually the whole population of municipalities). Municipal data were then included in regional data. All data was then normalized to 1.000 inhabitants in region. Statistical analyses were conducted with SPSS 17.0. Descriptive statistics and Pearson correlation coefficients were calculated. Pearson correlation coefficient is significant at  $p < .05$  when the correlation coefficient value is higher than .506.

## RESULTS

Slovenian regions have quite varied basic demographics and sports characteristics (Table 1). Same relate to reasons for attendance on the primary level (Table 2). Very few correlations between demographics, sports variables and reasons for attendance in out-patient health care facilities on the primary level were statistical significant (Table 3).

**TABLE 2**

*Regions causes for attendances in out-patient health care at primary level by ICD-10 chapters (per1000 inhabitants)*

Region/Diagnosis	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX
Pomurska	172.7	42.8	12.2	57.6	68.5	23.1	64.5	95.2	252.7	513.1	115.9	135.3	262.5	146.5	11.8	.6	142.3	198.0	
Podravska	196.8	33.7	8.1	43.2	42.0	16.4	54.4	93.7	149.3	379.0	89.8	114.0	206.2	113.8	8.8	1.5	142.7	179.3	
Koroška	141.9	33.0	8.4	33.7	44.8	23.1	65.9	99.2	142.1	457.5	103.8	145.3	233.9	118.8	11.4	1.2	165.1	231.0	
Savinjska	150.1	39.2	7.7	34.5	41.1	20.8	60.6	99.9	145.0	428.1	93.4	120.6	230.5	147.0	14.5	4.4	150.9	249.9	
Zasavska	170.9	49.0	10.1	57.7	70.7	22.3	67.8	95.4	212.7	390.3	108.9	144.0	231.5	204.3	18.5	.5	205.8	211.6	
Srednjeopavska	131.0	34.6	7.4	41.4	40.0	21.3	60.4	87.8	158.7	456.8	95.1	130.0	209.8	117.8	9.0	3.5	232.4	233.2	
Jugovzhodna	199.4	35.0	9.1	32.9	44.5	19.1	61.7	89.9	184.8	386.3	103.6	128.3	211.6	125.8	11.6	2.2	163.1	227.3	
Osrednjeslovenska	203.3	45.4	10.3	56.2	44.1	22.2	76.8	92.3	153.1	358.4	93.3	129.2	202.1	130.6	12.3	4.8	208.4	143.4	
Gorenjska	212.6	45.4	9.9	40.9	40.6	20.8	59.1	85.1	152.6	333.4	96.6	119.7	208.0	149.4	17.4	.5	159.5	219.7	
Notranjsko-Kraška	216.7	46.8	10.6	47.6	56.8	23.0	81.3	102.0	138.0	454.8	87.3	146.7	230.8	177.7	11.5	1.9	188.8	236.2	
Goriška	200.9	42.2	10.3	45.2	50.7	23.5	64.2	95.4	191.8	381.6	84.1	129.9	221.6	131.9	15.6	.9	191.9	246.3	
Obalno-Kraška	184.3	48.4	10.6	61.0	51.1	24.6	74.3	98.8	154.5	348.2	101.7	136.3	243.3	146.6	14.4	.7	202.9	174.1	

Legend: **I** – Certain infectious and parasitic diseases; **II** – Neoplasms; **III** – Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism; **IV** – Endocrine, nutritional and metabolic diseases; **V** – Mental and behavioural disorders; **VI** – Diseases of the nervous system; **VII** – Diseases of the eye and adnexa; **VIII** – Diseases of the ear and mastoid process; **IX** – Diseases of the circulatory system; **X** – Diseases of the respiratory system; **XI** – Diseases of the digestive system; **XII** – Diseases of the skin and subcutaneous tissue; **XIII** – Diseases of the musculoskeletal system and connective tissue; **XIV** – Diseases of the genitourinary system; **XV** – Pregnancy, childbirth and the puerperium; **XVI** – Certain conditions originating in the perinatal period; **XVIII** – Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified; **XIX** – Injury, poisoning and certain other consequences of external causes.

**TABLE 3**

*Person Correlation Coefficient between demographic, sport characteristics and causes for attendances in out-patient health care at primary level by ICD-10 chapters (only significant correlations  $p < .05$ )*

Diagnosis	4	5	6
VI		.512	
X	-.508		-.806
XII	-.553		
XIII			-.507
VIII		.812	.533
IX			-.570

Legend: **4** – Number of members / 1000 inhabitants; **5** – Public financies per person in Sport Club per year (EUR); **6** – Average net wage per employed person per month (EUR); **IV** – Endocrine, nutritional and metabolic diseases; **X** – Diseases of the respiratory system; **XII** – Diseases of the skin and subcutaneous tissue; **XIII** – Diseases of the musculoskeletal system and connective tissue; **XVIII** – Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified; **XIX** – Injury, poisoning and certain other consequences of external causes.

## DISCUSSION

Our results (Table 1) show a slightly different picture to what some previous statistics showed. The biggest difference is in the number of sports clubs and the number of those financed by municipalities (4.468 municipality-financed clubs compared to 6.115 official sport clubs) (Kolar, Jurak, & Kovač, 2010). Sport clubs membership includes 18% of the nation. Podravska and Gorenjska have the highest numbers of members in sport clubs per 1.000 inhabitants, and Notranjsko Kraška, and Jugovzhodna Region the lowest. In comparison with the results by Sila (2010), and Doupona Topič (2010) (data collected via stratified sample of 1.286 persons), 6% of Slovene adults were competing in organized sport and 19.1% participated in organized recreational sport. In other words, 25.1% of the Slovenian population is supposed to be involved in organized sport clubs; our data, however, showed lower numbers. According to Kolar et al. (2010), there are 87.520 registered athletes in Slovenia which represents 4.3% of the population. According to the same source, only 6.4% (state and municipal funding) of the budget (excluding investments in buildings) on the national level is spent on recreational sports, the rest is allocated to high performance sports, athletes with special needs, school sports, educational programs and the operation of sport organizations (mostly on the national level). No person can compete on any level unless he or she is a member of a sport club (sport clubs are included in national competitions and financed by municipalities). It can therefore be concluded 23% of sport clubs members are high performance athletes (this data is

similar to Sila (2010), and Doupona Topič (2010). Average municipal financial support per person in sport clubs in Slovenia is €113.64 per annum. In sport clubs, most of the money is spent on high performance athletes. It is obvious that very little (€8.97) is spent on an average person involved in recreational sports. Average net wage per employed person per month in regions is between €784.68 (Pomurska region) and €938.29 (Osrednjeslovenska region). Bednarik, Kolar, and Jurak (2010) report in 2005 the average Slovene household spent €496 on sport per year, of that €375 Euros on sports goods and €121 Euros on services. As there are differences in average wages between regions it can be presumed that differences also exist in the ratio of spending on sports goods and services.

The highest rate of reasons for attendance in out-patient health care on the primary level (Table 2) is due to diseases of the respiratory system, followed by diseases of the musculoskeletal system and connective tissue and injury, poisoning and certain other consequences of external causes, and the lowest rate was due to certain conditions originating in the perinatal period.

The correlation between the number of club members/ 1.000 inhabitants and diseases of the respiratory system was negative which means that the region with more sport clubs members had less treatment for diseases of respiratory system. The three main diagnoses of respiratory system include acute infection of upper respiratory organs, acute tonsillitis and acute pharyngitis. General resistance to acute respiratory infections is higher among those who actively participate in sports (Karacabey, 2005; Viru

& Smirnova, 1995; Vuori, 2004). Higher club member numbers indicate fewer occurrences of diseases of the skin and subcutaneous tissue. The three main diagnoses of the skin and subcutaneous tissue include dermatitis (L30), urticaria and unspecified contact dermatitis. It seems that sport clubs members actively involved in sports are more aware of skin maintenance.

Public funding per person in sport clubs is positively correlated to diseases of the nervous system (VI) and symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (XVIII). The three main diagnoses in this group include mononeuropathies of upper limbs, epilepsy and migraine. The three main diagnoses in group XVIII include pains in abdomen, headache and high body temperature for no known reason. It seems that money spent on and by clubs is not used effectively to have a positive impact on health. One reason for such correlations can be relatively low budgeting for recreational sports and high budgeting for competitive sports. Redistribution and a better control of municipal financing in sport clubs should be one of the aims of municipal sports and health authorities.

Average net wage per person in region is of all demographic and sport variables the one that is most closely related to the health status. The higher the earnings, the lower the occurrence of diseases of the respiratory system; diseases of the musculoskeletal system and connective tissue; and injuries, poisoning and certain other consequences of external causes. Those who have money seem to care about their life and adopt a healthy lifestyle. It is obvious that they have fewer respiratory diseases as they probably spend more free time engaged in indoor and outdoor sports activities and they have very high level general resistance to acute infections. More sport activity does not equal more problems with musculoskeletal system and connective tissue; on the contrary, a well prepared human body has fewer problems in general. In other words, a reverse U-curve is important for good body fitness: too low (no activity) or too high (high performance sport) loads may be damaging to human body, whereas everything in between is beneficial. Good fitness means fewer injuries due to external causes. Our findings are in agreement with Powell et al. (2006), and Lambert et al. (2009). However, there is positive correlation with symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (PXVIII), that could be connected to stress factors.

## CONCLUSIONS

According to our analysis, the following can be concluded for 2009:

- higher numbers of sport members in clubs mean fewer respiratory diseases and diseases of the skin and subcutaneous tissue;
- municipal finances for sport clubs are from the national health perspective wasted and not based on any concept;
- financial support for sports clubs should take more account of recreational sports and health-promoting sports than it does at the moment;
- high wages are a pre-condition for fewer occurrences of diseases as those with higher socio-economical status live a healthier lifestyle (sport activity, free time activity, better housing, diet, etc.);
- higher numbers of members in sports clubs are important for disease prevention on the national level;
- if recreational sports and health-promoting sports fully follow the user-pay concept with no public support, higher occurrences of diseases can be expected;
- sport clubs might act as natural pharmacies.

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