

## Self-rated health and social classes in Slovenia: is there any relationship?

## Zaznavanje zdravja in družbeni razredi v Sloveniji: ali obstaja povezava?

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### Abstract

**Background.** Self-rated health is an established measure of health status and can be influenced by several social determinants. As countries remain culturally, politically, and economically distinct, previous findings on self-rated health and social class may not be directly applicable to Slovenian population. The aim of this study was to evaluate the relationship between self-rated health and social class in Slovenian adults.

**Methods.** The study was based on the Countrywide Integrated Non-communicable Diseases Intervention (CINDI) Health Monitor database, which is updated approximately every 3 years by a cross-sectional survey. During 2008, 7,633/15,591 (49.0%) of posted self-administered questionnaires were retrieved. Prevalence per 100 population of poor self-rated health was determined. Logistic regression was used to determine unadjusted and adjusted (gender, age, marital status, educational level, kind of work, residence community, geographical region) estimates of association between poor self-rated health and social class.

**Results.** Question about self-rated health was answered by 7,302 participants and 701 (9.6%) reported to have poor self-rated health. A clear decrease in prevalence of poor self-rated health from 34.2% in lower to 3.1% in upper-middle/upper social class was observed. In an unadjusted model, the association between poor self-rated health and social class was significant across all social classes. After adjustment for potential confounders, the odds remained highest for those in the lower social class who rated their health as poor more than six times as frequently as those in upper-middle/upper social class (OR=6.10, 95% CI 3.34-11.16;  $p < 0.001$ ).

**Conclusions.** Our study confirmed large differences in the prevalence of poor self-rated health across social classes. Participants from lower social class most frequently reported poor self-rated health. In the future, public health policy will have to address the incentives to reduce the social gradient in health.

**Key-words:** cross-sectional survey; self-rated health; social class; social determinants; Slovenia

### Povzetek

**Izhodišča.** Na zaznavanje zdravja, ki je uveljavljen kazalnik zdravja prebivalstva, vplivajo številne družbene determinante. Države se razlikujejo na kulturnem, političnem in ekonomskem področju, zato rezultatov tujih raziskav o zaznavanju zdravja v različnih družbenih razredih ne moremo neposredno prenesti na slovenske razmere. Namen raziskave je oceniti povezanost med zaznavanjem zdravja in družbenimi razredi pri odraslih prebivalcih Slovenije.

**Metode.** Raziskava temelji na slovenski podatkovni bazi Countrywide Integrated Non-communicable Diseases Intervention (CINDI) Health Monitor, ki jo praviloma vsako 3. leto dopolnimo z rezultati nove presečne pregledne raziskave. Leta 2008 je bilo vrnjenih 7,633 (49.0%) od 15,591 poslanih vprašalnikov. Določili smo pogostost zaznavanja zdravja kot slabo. Za določitev povezanosti med zaznavanjem zdravja kot slabo in družbenimi razredi smo uporabili logistično regresijo.

**Rezultati.** Na vprašanje o zaznavanju zdravja je odgovorilo 7,302 anketirancev, od katerih jih je 701 (9.6%) svoje zdravje zaznavalo kot slabo. Opazili smo jasen padec pogostosti zaznavanja zdravja kot slabo od 34.2% v spodnjem na 3.1% v višjem srednjem/višjem družbenem razredu. V neprilagojenem modelu logistične regresije je bila povezava med zaznavanjem zdravja in družbenim razredom značilna v vseh družbenih razredih. V modelu, ki je bil prilagojen na moteče spremenljivke, so anketiranci iz spodnjega družbenega razreda v primerjavi z anketiranci iz višjega družbenega razreda šestkrat pogosteje zaznavali zdravje kot slabo (RO=6.10, 95% IZ 3.34-11.16;  $p<0.001$ ).

**Zaključki.** Potrdili smo velike razlike v zaznavanju zdravja kot slabo med družbenimi razredi. Najpogosteje so zdravje kot slabo zaznavali anketiranci iz spodnjega družbenega razreda. Javnozdravstvena politika bo morala v prihodnje dodatno spodbuditi zmanjševanje razlik v zdravju.

**Ključne besede:** presečna pregledna raziskava; zaznavanje zdravja; družbeni razred; družbene determinante; Slovenija

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## INTRODUCTION

Self-rated health refers to a single item health measure that is based on asking individuals to evaluate their health status on a four- or five-point scale (1). Self-rated health is generally considered to be a valuable source of data on subjective health status, and is popular due to its simplicity to collect. In epidemiological and medical research it began to gain currency when several studies demonstrated its strong association with all-cause mortality (2, 3). Since then, it has been shown that self-rated health independently predicts disability, functional decline, morbidity, mortality, and health care utilization in general population (4, 5), as well as in patients with some chronic disease (6-10). Therefore, self-rated health is recommended as a measure of health status for public health research and clinical purposes by the World Health Organization, Centers for Disease Control and Prevention in the United States, and European Union Commission (11).

Poor social and economic circumstances affect health throughout life. Lower education, unemployment, material hardship and inferior social position have been shown to be important determinants in the perception of poor self-rated health (12-17). People further down the social ladder usually run at least twice the risk of serious illness and premature death as those near the top (18). Generally, people from lower social classes also rate their health poorer when compared to those from higher social classes (19, 20).

Most of the previous studies used individual objective measures like education, income, occupational position, or composite surrogates for assessment of social class (12, 13, 15-17). Recently, subjective perception of social class has been proposed by some to have a stronger influence on health than objective measures of social status (21-23). There is compelling evidence for association between various surrogates of social class and self-rated health in long-standing (15, 17) and recently joined (12, 13) European Union member states. As countries remain

culturally, politically, and economically distinct, previous findings may not be directly applicable to Slovenian population.

Aim of this study was to examine the association between self-rated health and social class in Slovenian adult population.

## METHODS

### *Study design and participants*

The study was based on Slovenian Countrywide Integrated Non-communicable Diseases Intervention program (CINDI) Health Monitor database (24). Data are collected on approximately 3-year interval by cross-sectional survey using a self-administered questionnaire. For the purpose of this study data collected in 2008 were used. The stratified simple random sampling from the Republic of Slovenia Central Population Registry was performed by Statistical Office of the Republic of Slovenia (25). Sample included 15,963 participants, aged 25-74 years. The National Medical Ethics Committee approved survey protocol in 2008.

A self-administered postal questionnaire, based on the CINDI Health Monitor Core Questionnaire (26), was mailed to the participants. To increase the response rate, media campaign and reminder letters for non-respondents were applied. After 14 days, all non-respondents were reminded by a repeated invitation and a new issue of a questionnaire. Second reminder to non-respondents was sent after additional 7 days and was by invitation only.

### *Health status assessment*

Participants rated their health status by answering the question: "How would you assess your present state of health?" We used a 5-grade rating scale with the following options: 1 – very good; 2 – good; 3 – fair; 4 – poor; 5 – very poor. For the needs of this study, a pre-defined subgroup of poor self-rated health was formed by pooling those participants who rated their health as poor or as very poor.

### **Social status assessment**

Social status of the participants was assessed by self-classification into one of the predefined social class categories. The questionnaire included the following question: "In your opinion, which social class do you belong to?" For assessment, a 5-grade rating scale was used: 1 – lower; 2 – labor; 3 – middle; 4 – upper-middle; 5 – upper. In case of uncertainty, participants could choose the answer "I don't know".

### **Statistical analysis**

In the analysis, poor self-rated health was treated as an outcome, and social class was treated as an independent variable. Those who could not classify themselves in one of the pre-defined social classes were excluded from the analysis. Due to the low number of participants in the upper social class who rated their health as poor or as very poor, we additionally pooled the participants from upper-middle and upper social classes.

Differences in prevalence of poor self-rated health between different social classes were analyzed using binary multiple logistic regression (27). Two models were performed: unadjusted (Model 1), and adjusted for the effects of gender, age, marital status, educational level, kind of work, residence community, and geographical region (Model 2). The dummy variables were created for all independent variables considered in the model. The simple method was applied. The group with the lowest frequency of observed outcome was assigned as the reference group (28). We report odds ratio (OR) and 95% confidence interval (CI) with corresponding p-value for analyzed variables. In all statistical tests a p-value 0.05 or less was considered significant. SPSS statistical package for Windows Version 17.0 (SPSS Inc., Chicago, IL, USA) was used for analysis.

## **RESULTS**

### **Study sample**

Overall, 15,963 questionnaires were mailed and 15,591 (97.7%) of them were actually delivered. The response rate was 49.0% and was slightly lower among men (42.2%) than among women (55.6%). Nevertheless, the overall representativeness of the sample was assessed as good. The questionnaires of 7,352 respondents were eligible for analysis.

Respondents in final sample of 7,352 participants were equally distributed across age groups whilst there was a slight female predominance (57.6% vs. 42.4%). Most of the respondents were married (62.1%) and completed vocational (26.1%) or secondary education (28.5%). Majority of respondents classified themselves to labor (36.5%) or middle

(45.3%) social class whilst only 3.4% and 0.5% reported to be in lower and upper social class, respectively. Further details are presented in Table 1.

### **Self-rated health and social class**

The question about social class was answered by 7,197/7,352 participants (97.9%). Of those, 354 participants could not classify themselves to one of the pre-defined social classes and were therefore excluded from the analysis. Self-rated health was reported by 7,302/7,352 participants (99.3%). After cross-matching, both questions were adequately answered by 6,801/7,352 participants (92.5%). Complete data for logistic regression analysis were available for 6,540/7,352 participants (89.0%).

### **Prevalence of poor self-rated health across social classes**

In participants that answered question on self-rated health, 701 (9.6%) of them reported poor self-rated health. In participants that answered both question on self-rated health and social class, 625 (9.2%) of them reported poor self-rated health. Table 2 presents the estimates of prevalence of poor self-rated health across social classes according to various social determinants. A clear decrease of poor self-rated health from 34.2% in lower to 3.1% in upper-middle/upper social class was observed. The highest prevalence of poor self-rated health was observed in participants aged 70-74 years, divorced, unemployed and those with the lowest educational level.

In an unadjusted model (Model 1), the association between poor self-rated health and social class was significant across all social classes. However, after adjustment for the effects of potential confounders (Model 2), the odds for poor self-rated health decreased importantly. Association remained significant for lower (OR=6.10, 95% CI 3.34-11.16;  $p<0.001$ ) and labor social class (OR 2.16, 95% CI 1.26-3.71;  $p=0.005$ ) whilst middle social class was not associated with poor self-rated health (OR 1.10, 95% CI 0.66-1.83;  $p=0.730$ ). Other results on logistic regression analysis are presented in Table 3.

## **DISCUSSION**

Our study confirmed previous reports on large differences in prevalence of poor self-rated health across social classes. In contrast to most of the previous surveys, both self-rated health and social class were evaluated by a single question, which increases the applicability in everyday public health practice and policy planning.

Although educational qualifications, occupational class and material resources are key variables in determining the social position of an individual, there has been a lot of discussion on which measures best represent social status

and relate it to health outcomes. Researchers may assign individuals to social classes on the basis of various social determinants such as occupation, education, income, wealth, and place of residence. Certain social determinants may indicate social position in long-standing and stable communities, but can not be easily applicable to the countries recently exposed to transitional changes (12). In former communist countries, the concept of social position was heavily influenced by the official ideology. Thus, the correlations between education, occupation, and income have not been the same as in western communities, finally favoring the subjective assessment of social class (12, 13). In view of Slovenia's political history and available evidence supporting the self-assessed social classes we argue our decision for subjective assessment of social position as appropriate.

Irrespective of the methodology used, the association between social class and self-rated health seems to be straightforward (12, 20, 21). As expected, we found a strong decrease of poor self-rated health prevalence across social classes from 34.2% in lower to only 3.1% in upper-middle/upper social class. Whilst the trend was the same for most of observed social determinants, we consider figures for participants aged 70-74 years, divorced, those with incomplete primary education and unemployed as determinants that need additional attention. According to McFadden and colleagues, the prevalence of poor self-rated health is greater in manual class workers than the non-manual social classes (29). Heavy work is frequently performed by people with lower educational level in branches where workforce fluctuation is higher, which in turn is associated with limited job security (30). Recently published prospective cohort study of representative sample of Danish workforce showed that job insecurity had stronger effect on health, when it was combined with poor chances on the labor market (31). The health effects start when people first feel their jobs are threatened, even before they actually become unemployed (18). Additionally, health effects of unemployment are linked to both the financial problems and its psychological consequences. Being lonely, old and unemployed have detrimental effects on health (32, 33). Unfortunately, these disadvantages often tend to concentrate among the same people, and their effects on health accumulate during life. The greater the length of time that people live in such disadvantaged circumstances, the more likely they are to suffer from a range of health problems and the less likely they are to enjoy a healthy old age (18).

Results of an adjusted multivariate model were generally consistent with previous findings, which identified specific sub-populations with highest attributable risk of poor self-rated health (15, 34). Generally, marginal subgroups of individual social determinants had highest

risk for reporting poor self-rated health. This finding is shared with previous reports of subjective (16, 21) and objective (15, 34) social class assessment from developed countries or countries in transition. Elderly and poorly educated individuals, frequently without job, and belonging to lower social class should be primary target for interventional programs.

This study has a number of limitations. Firstly, the cross-sectional design of our study limits conclusions on causality between self-rated health and social class. Secondly, our study used the self-assessment questionnaire thus socially desirable answers can not be excluded. Additionally, final sample could be confined to those who were more willing to participate. As first argument would lead to under estimation of poor self-rated health, the second could level off for this bias. Thirdly, response rate and thus the nationwide applicability of the findings could be argued as borderline. Fourthly, absolute numbers of participants in few subgroups of social determinants have been low. Fifthly, we can not exclude potential impact of an acute transitional health condition at the time of the study (e.g. viral infection in an otherwise healthy person). Finally, we did not control for possible influence of mental diseases or type of personality.

Although medical care can prolong survival and improve prognosis after some serious diseases, more important for the health of population as a whole are the social and economic conditions that make people ill and in need for medical or social care. Increasing social inequalities in health, coupled with growing inequalities in income and wealth, should refocus attention on social class as a key determinant of population health.

## **CONCLUSION**

In conclusion, our results confirmed large differences in the prevalence of poor self-rated health across social classes. Even after adjustment for various social determinants, there was still strong evidence of a social gradient, with participants in the lower social class approximately six times as likely to report poor self-rated health as those in upper-middle/upper social class. In the future, public health policy will have to address the incentives to reduce the social gradient in health.

## **ACKNOWLEDGEMENT**

This study was a part of a joint project of CINDI Slovenia Preventive Unit, Institute of Public Health of the Republic of Slovenia, with participation of Chair of Public Health, Faculty of Medicine, University of Ljubljana. It was supported financially by the Ministry of Education, Science and Sport and

by the Ministry of Health of the Republic of Slovenia (Applied Research Project V3-0545).

The authors would like to thank Cirila Hlastan-Ribic, BSc, PhD, CINDI Health Monitor Survey 2008 Project Manager and Jozica Maucec-Zakotnik, MD, Head of CINDI Slovenia Preventive Unit at the Institute of Public Health of the Republic of Slovenia. The authors are also grateful to Janet-Klara Djomba, MD for her help with data collection.

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**TABLES**

**Table 1.** Study population characteristics. Data are presented as number of participants (%).

Determinant	N		(%)
Gender	7,352	men	42.4
		women	57.6
Age (years)	7,352	25-29	8.9
		30-39	18.4
		40-49	20.8
		50-59	24.6
		60-69	19.6
		70-74	7.8
Marital status	7,285	married	62.1
		consensual union	14.4
		single	12.3
		divorced	4.5
		widowed	6.6
Educational level	7,233	incomplete primary	4.3
		primary	16.6
		vocational	26.1
		secondary	28.5
		college	8.5
		university	16.1
Kind of work	7,202	heavy work in agriculture	4.7
		heavy work in industry	6.8
		administrative/intellectual work/student	51.1
		housekeeper	4.2
		pensioner	29.3
		unemployed (job seeker)	4.0
Social class	7,197	lower	3.4
		labor	36.5
		middle	45.3
		upper-middle	9.3
		upper	0.5
		undetermined	4.9
Residence community	7,176	urban	31.5
		suburban	23.2
		rural	45.3
Geographical region	7,352	western	22.0
		central	29.4
		eastern	48.6

**Table 2.** Estimates of prevalence of poor self-rated health across social classes. Data are presented as number of participants (%).

Determinant	Social class			
	Lower	Labor	Middle	Upper-

		middle/upper			
Total sample		83 (34.2)	355 (13.6)	165 (5.1)	22 (3.1)
Gender	men	34 (33.7)	193 (15.6)	57 (4.4)	13 (4.4)
	women	49 (34.5)	162 (11.8)	108 (5.5)	9 (2.2)
Age (years)	25-29	0 (0)	2 (1.5)	11 (3.0)	1 (1.1)
	30-39	1 (5.3)	24 (6.6)	15 (2.2)	4 (2.1)
	40-49	20 (45.5)	77 (13.2)	27 (4.0)	3 (2.2)
	50-59	29 (32.6)	119 (15.6)	46 (6.9)	7 (4.5)
	60-69	22 (34.9)	85 (15.3)	40 (6.6)	4 (4.3)
	70-74	11 (47.8)	48 (22.5)	26 (11.1)	3 (7.7)
Marital status	married	44 (37.9)	240 (14.1)	115 (5.8)	10 (2.4)
	consensual union	8 (32.0)	30 (10.3)	15 (2.8)	5 (3.9)
	single	13 (29.5)	33 (11.4)	15 (3.8)	1 (1.1)
	divorced	11 (47.8)	22 (19.8)	7 (5.1)	2 (6.9)
	widowed	5 (15.6)	26 (13.2)	11 (7.0)	3 (10.0)
Educational level	incomplete primary	18 (43.9)	51 (25.2)	3 (15.8)	0 (0)
	primary	29 (33.3)	126 (16.4)	22 (11.5)	1 (16.7)
	vocational	23 (30.7)	123 (11.6)	36 (5.6)	4 (15.4)
	secondary	10 (34.5)	48 (10.1)	68 (5.1)	4 (3.1)
	college	1 (33.3)	2 (4.2)	19 (4.7)	6 (4.4)
	university	2 (33.3)	2 (5.4)	13 (2.0)	7 (1.7)
Kind of work	heavy work in agriculture	13 (35.1)	26 (13.4)	7 (9.9)	0 (0)
	heavy work in industry	2 (20.0)	46 (13.4)	5 (4.5)	0 (0)
	administrative/intellectual work/student	7 (17.5)	89 (9.3)	65 (3.3)	12 (2.2)
	housekeeper	7 (31.8)	20 (15.7)	7 (7.7)	0 (0)
	pensioner	36 (40.0)	131 (16.0)	69 (7.8)	10 (7.8)
	unemployed (job seeker)	18 (50.0)	34 (29.3)	11 (13.3)	0 (0)
Residence community	urban	18 (30.5)	100 (16.1)	61 (5.5)	9 (2.6)
	suburban	18 (40.9)	57 (11.9)	45 (5.2)	7 (3.6)
	rural	47 (35.6)	194 (13.2)	58 (4.7)	5 (3.0)
Geographical region	western	13 (28.3)	62 (10.4)	18 (2.6)	3 (2.0)
	central	24 (40.7)	78 (12.3)	48 (4.4)	9 (3.5)
	eastern	46 (33.3)	215 (15.6)	99 (6.8)	10 (3.3)

**Table 3.** Logistic regression models with odds ratios and their 95% confidence intervals of poor self-rated health according to social determinants.

Determinant		Model 1	p	Model 2	p
Social class	upper-middle/upper	1.00		1.00	
	middle	1.67 (1.06-2.63)	0.026	1.10 (0.66-1.83)	0.730
	labor	4.90 (3.16-7.61)	<0.001	2.16 (1.26-3.71)	0.005
	lower	16.15 (9.79-26.64)	<0.001	6.10 (3.34-11.16)	<0.001
Gender	women			1.00	
	men			1.18 (0.97-1.43)	0.101
Age (years)	25-29			1.00	
	30-39			1.61 (0.83-3.13)	0.161
	40-49			3.40 (1.81-6.39)	<0.001
	50-59			3.71 (1.96-7.03)	<0.001

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	60-69	3.68 (1.86-7.27)	<0.001
	70-74	6.46 (3.17-13.16)	<0.001
Marital status	widowed	1.00	
	married	1.50 (1.03-2.17)	0.035
	consensual union	1.66 (1.02-2.68)	0.040
	single	1.75 (1.08-2.81)	0.022
	divorced	2.29 (1.39-3.78)	0.001
Educational level	university	1.00	
	incomplete primary	4.43 (2.44-8.05)	<0.001
	primary	2.94 (1.72-5.03)	<0.001
	vocational	2.22 (1.33-3.70)	0.002
	secondary	2.10 (1.28-3.43)	0.003
	college	1.50 (0.84-2.71)	0.174
Kind of work	administrative/intellectual work/student	1.00	
	heavy work in industry	1.15 (0.80-1.65)	0.449
	heavy work in agriculture	1.21 (0.80-1.82)	0.365
	housekeeper	1.30 (0.82-2.10)	0.272
	pensioner	1.34 (0.99-1.82)	0.058
	unemployed (job seeker)	2.88 (2.00-4.16)	<0.001
Residence community	rural	1.00	
	urban	1.27 (1.02-1.58)	0.036
	suburban	1.16 (0.91-1.47)	0.243
Geographical region	western	1.00	
	central	1.46 (1.09-1.94)	0.010
	eastern	1.83 (1.42-2.37)	<0.001