



## Self-Assessment of Health among the Citizens of Serbia in the Transition Period

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### Abstract

**Background:** The aim of the research was to compare the differences between the self-assessment of the health in the latest National Health Surveys research and in the one before that.

**Methods:** We used the database of the latest National Health Survey in the Republic of Serbia (2013) and of the one before that (2006), as cross-sectional studies (n=29485). Logistic regression was used to predict the relationship between self-assessment of health and independent predictors.

**Results:** Health condition of the interviewees improved according to their self-assessment. With aging respondents who poorly assessed their health; women assessed their health 1.7 and 1.6 times poorer in the latest research and in the one before that respectively. The odds ratio in patients diagnosed with some disease in the previous 12 months ranged from 2.15 (1.85 – 2.51) to 4.03 (3.22 – 5.05) in the latest research. The strongest predictor was sick leave in the past 12 months with 95% CI = 3.19 (1.87-5.44) in the latest research and 95% CI = 2.27 (1.67-3.08) in the one before that.

**Conclusion:** There was an improvement of the health condition of individuals. Female interviewees, less educated, unemployed, the ones who have some disease and who were on a sick leave rated their health as bad.

**Keywords:** Self-assessment of health; Health service; Health reforms; Serbia

### Introduction

In the era of globalization, socio-economic inequality related to health care is inevitable. The expression “Health for all” refers to the idea of creating a universal health care system for all people (1). Apart from all the problems along the way, this

remains a primary goal for the health care policy makers (2).

The overall reform of the society in Serbia started in the aftermath of democratic changes in 2000. Health economy has started to develop quickly.



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The creators of health policies as well as providers and users of health care services have gradually started to change their attitude. Namely, health care started to be perceived not as a sector for spending money but rather a sector for facilitating health. The main reform changes included: the change of health insurance system, means and conditions of paying for the health care services and strengthening primary health care (3). The results of the national research on the health of the population of Serbia, which was first conducted in 2000, contributed to this as well, after which a media campaign has been launched, which is still ongoing, whose main goal is to promote awareness in people with the position "I must live healthily" to position "I want to be healthy" (4).

Actual proofs of the success of the reforms conducted within health care systems in transition are rare, but it is possible to see the effects of the reforms by evaluating the quality of the given health care services (5-7). Self-assessment of health, as a subjective quality indicator, represents a measure of socio-economic inequality which depends on the health condition of an individual, their living standard, availability and accessibility of health protection, as well as on the balance between using health care services in private as opposed to public sector. Therefore, health-assessment of an individual's health-condition represents not only their own assessment of health condition but also an individual evaluation of different aspects of health – physical, emotional and social, so health assessment as such does not necessarily correlate with an actual health condition of an individual (8,9).

The aim of the research was to compare the differences between the self-assessment of the health in the latest National Health Surveys research and in the one before that.

## **Methods**

The research has used the databases of the latest National Health Surveys (2013) and the one before that (2006) in the Republic of Serbia, as cross-sectional studies.

Ethical approval was received from the Institute of Public Health of Serbia "Dr Milan Jovanović Batut", number 5996/1.

The research used the national representation sample, such as stratified two-phase sample without repetition. In order to obtain a random sample, two techniques have been used: stratification and multiple-phase sampling. Stratification was conducted in such a way that each of these geographical areas (Vojvodina, Belgrade, Sumadija and West Serbia, South and East Serbia) represented one main stratum in the sample. Then, each stratum was divided into urban and rural regions. Two-phase sampling includes local communities, as units of the first phase, selected on the basis of probability proportional to their size, and households as units of the second phase selected on the basis of linear sampling method with the random start and uniform selection steps.

The research excluded people with residents of Kosovo and Metohija.

In order to write this paper, a sample of adults aged 19 or more has been used, which makes 29,485 interviewees in total.

The research was conducted through an interview of a horizontal approach, using two types of questionnaires: a questionnaire about a household and the face to face interview.

Self-assessment of health condition of the interviewees, as a dependent variable in the research, was measured using Likert-type scale. Possible answers included: very good, good, not good nor bad, bad and very bad. For the purposes of this research, the categories of all the possible answers were divided in the following way: the interviewees who rated their health condition as: very good and good were put into one group (good health), and the interviewees who rated their health condition as: not good nor bad, bad and very bad were put into another group (bad health).

Independent variables in the research were:

- The basic sociodemographic characteristics of the interviewees;
- Health condition of the interviewees (diseases such as: heart attack, stroke, asthma,

HTA, chronic bronchitis, cancer, diabetes, anxiety, kidney disease, allergies);

- Using hospital and non-hospital health care services (hospitalization and sick leave, chosen general practices in a public health institution, using health care services of private practices, check-up such as basic diagnostic and lab tests in the previous year, Pap tests and mammography);
- Unachieved need for health care (lack of some type of health care service in the last 12 months due to long waiting lists, financial reasons or unavailability of the health institution);

## Results

In the period of 2013 and 2006, health condition of the interviewees improved, according to their self-assessment ( $\chi^2=260.97$ ,  $df=4$ ,  $P<0.001$ ). Self-assessment of health condition increased in both with men and women. The interviewees who rated their health as bad were on average 4 years older in the latest research ( $56.89\pm 15.41$ , as opposed to  $60.72\pm 14.31$ ,  $P<0.001$ ). The residents of Belgrade, as well as people who live in urban place of residence rated their health better than people who live in other types of regions and in rural place. The poor rated their health as bad. In the latest research, 38.8% of the poor and 69% of the rich people rated their health as good, whereas in the research before that, 35.8% of poor people and 56.7% of rich people did so. The interviewees who had not been neither hospitalized in the last year nor on a sick leave, and who did not have any serious conditions rated their health better than the interviewees who had had some disease. As the number of patients who have their own GP increased in the researched period (93% in 2013 and 50% in 2006) (50% in 2006 as opposed to 93% in 2013) so the self-rated health improved. The interviewees who did not use the services of private

practices rated their health better. The percentage of the interviewees who did not get necessary health protection is reduced from 16.7% to 12.8% in the latest research. At the same time, there was a drop in the percentage of healthy interviewees although they did not get necessary health protection from 6.9% to 3.8% in the latest research.

In 2013, 38.8% of the poor and 69% of the rich people rated their health as good, whereas in 2006, 35.8% of poor people and 56.7% of rich people rated their health as good.

Regardless of the fact that they did not do basic diagnostic and lab tests in the last 12 months, in the latest research, almost two thirds of the interviewees (70.5%) rated their health as good, whereas in the research before that almost the half of the interviewees (43.8%) did so. Also, one could notice an increase in the number of women who did some screening tests. The percentage of women who did mammography increased from 14.3% to 27.9% in the latest research, and as for Papanicolaou test, the percentage increased from 41.4% to 63.9% in the latest research.

In the latest research every second woman considered her health condition to be good, although they had never done mammography, whereas in the research before that every third woman perceived her health condition as good, although they had never done mammography.

In the latest research, 63.9% of female interviewees did a Pap test, out of which 52.4% rated their health as good. In the research before that 41.4% of the female interviewees did a Pap test out of which 42.6% rated their health as good (Table 1). The results of the binary logistic regression show that with age, the interviewees rate their health condition as worse and that with every year the risk of rating their own health as bad increased, for 5% to 6% in 2013.

In the latest research, women rated their health condition as 1.6 times worse, whereas in the research before that women rated their health condition 1.7 times worse.

**Table 1:** The comparison of the self-assessment of health of the interviewees, the latest research and the research before that, Serbia

Variables	The research before last (2006)		The latest research (2013)		P
	Total (n)	Good health (% <sup>a</sup> )	Total (n)	Good health (% <sup>a</sup> )	
Total	15563	41.7	13922	52	<0.01
Female	7649	38.8	7512	46.1	<0.01
Male	6839	51.6	6397	59	
Primary education	5739	28.8	4033	29.3	<0.01
University education High education	6918	54.4	7581	59.6	
Secondary education	1831	58.9	2295	66.8	
Employed	5239	59.6	4528	71.8	<0.01
Unemployed	9238	36.4	9381	42.4	
Region South and East Serbia	3690	40.2	3356	47.3	<0.01
Region Vojvodina	3623	44.7	3384	53.3	
Region Belgrade	2609	51.8	2965	57.1	
Region Sumadija and West Serbia	4566	44.7	4204	51.1	
Urban place of residence	7508	46.8	7843	55.7	<0.01
Rural place of residence	6980	42.6	6066	47.3	
Poor	3227	35.8	3125	38.8	<0.01
Middle rich	8776	44.8	8356	52	
Rich	2485	56.7	2428	69	
Learning about health topics through media	10885	45.3	11529	50.7	>0.05
Don't learning about health topics through media	3545	43	2329	59	
Diseases in the last 12 months	2439	23.3	7257	29.8	<0.01
Without diseases in the last 12 months	12049	49.2	6652	76.2	
Sick leave in the last 12 months	238	24.4	657	49.3	<0.01
Without sick leave in the last 12 months	14250	45.2	3817	75.9	
Hospitalization in the last 12 months	969	19.4	1187	23.9	<0.01
Without hospitalization in the last 12 months	13439	46.7	12722	54.6	
Having a chosen GP in a public health institution	7571	50.8	12662	49.9	<0.01
No having a chosen GP in a public health institution	7204	36.7	1223	73.1	
Using services of private practices	2672	45.2	2144	44.4	<0.01
Without using services of private practices	11799	44.7	11765	53.4	
Unachieved need for the health care protection	2419	41.4	1765	29.8	<0.01
Without unachieved need for the health care protection	12052	45.5	12074	55.2	
Basic prevention diagnostics <sup>b</sup>	9267	45.5	9107	42.3	<0.01
Without basic prevention diagnostics <sup>b</sup>	5182	43.8	4752	70.5	
Mammography, anytime	1086	35	2067	47.8	<0.05
Mammography never	6533	39.4	5332	52.8	
Papanicolaou test anytime	3148	42.6	4653	52.4	<0.01
Papanicolaou test never	4462	36.1	2629	50.2	

n (%<sup>a</sup>) - number (percentage) of those who rated their health as good in comparison to a total number of the interviewees  
b - blood pressure, cholesterol, blood sugar levels

Patients who only have elementary school education twice as often rated their health as bad (in both surveys) whereas patients with high school education rated their health as bad 1.5 to 1.7 time more often (in the research before the latest one and in the latest research, respectively) in comparison to highly educated interviewees.

The poor think that their health condition is better. In both of the surveys, upper middle class rated their health as bad 1.8 times more often,

while the rich did so 1.5 times in the survey prior to the latest one and 1.6 times in the latest survey in comparison to the poor. Odds ratio with patients who had been diagnosed with some disease in the last 12 months is between 2.15 (1.85 – 2.51) in the survey prior to the latest one and 4.03 (3.22 – 5.05) in the latest survey. In the same time, the interviewees who had been absent from work in the past 12 months, rated their health as bad 3.2 times more often in the survey prior to the latest

one and 2.3 times more often in the latest survey in comparison to the interviewees who had not been on a sick leave.

In the research before the last one, people from Vojvodina, Belgrade and Sumadija and West Serbia rated their health as bad 0.7, 0.5 and 0.8 times less often than the interviewees coming from South and East Serbia, respectively. People who live in the urban type of residence rate their health as bad 1.1 times more often than the residents of rural areas. Odds ratio with patients who had been hospitalized in the last 12 months was 1.78 (1.39 – 2.29). Patients who had their own GP in the public health institutions rated their health as bad 0.6 times less often in comparison to the interviewees who did not have their own GP. Patients who used the services of private practices rated their health as bad 1.4 times more often. Women who had

done Pap test rated their health as bad 1.3 times more often than women who had not done it. Basic diagnostic and lab tests in the last 12 months had been done by people who rated their health as bad. Odds ratio with patients who had done basic diagnostic and lab tests in the past 12 months was 3.28 (2.55 – 4.22).

In the latest research, people who did not get the necessary health care services and the interviewees who had done the basic diagnostic and lab tests in the past 12 months rated their health as bad 2.6 and 3 times more often than the interviewees who did not have any problems with getting the necessary health care services (OR=2.64 (1.89-3.69) and who had not done any diagnostic or lab tests in the last 12 months (OR=3.28 (2.55-4.22), respectively (Table 2).

**Table 2:** Binary logistic regression for self-assessment of health, the latest research and the research before that, Serbia

<i>Predictors (reference category)</i>	<i>The research before last (2006)</i>		<i>The latest research (2013)</i>	
	OR (95% CI)	P	OR (95% CI)	P
Age (yr)	1.05 (1.05-1.06)	<0.01	1.06 (1.05-1.07)	<0.01
Sex (female)	1.68 (1.58-1.8)	<0.01	1.63 (1.3-2.04)	<0.01
Primary education (secondary)	2.18 (1.77-2.69)	<0.01	2.06 (1.34-3.17)	<0.05
University education (secondary)	1.50 (1.26-1.79)	<0.01	1.66 (1.26-2.19)	<0.01
Employed (unemployed)	0.86 (0.75-0.98)	<0.05	0.29 (0.27-0.31)	<0.01
Vojvodina (South and East Serbia)	0.7 (0.6-0.81)	<0.01	>0.05	
Belgrade (South and East Serbia)	0.51 (0.43-0.61)	<0.01		
Sumadija and west Serbia (South and East Serbia)	0.77 (0.67-0.9)	<0.05		
Rural place of residence (urban)	1.14 (1.0-1.28)	<0.05		
Middle rich (poor)	1.77 (1.42-2.2)	<0.01	1.82 (1.15-2.88)	<0.05
Rich (poor)	1.53 (1.30-1.80)	<0.01	1.59 (1.19-2.12)	<0.05
Diseases in the last 12 months (no)	2.15 (1.85-2.51)	<0.01	4.03 (3.22-5.05)	<0.01
Sick leave in the last 12 months (no)	3.19 (1.87-5.44)	<0.01	2.27 (1.67-3.08)	<0.01
Hospitalization in the last 12 months (no)	1.78 (1.39-2.29)	<0.01	>0.05	
Using services of private practices last 12 months (no)	1.37 (1.2-1.57)	<0.01	>0.05	
Unachieved need for the health care protection (no)	>0.05		2.64 (1.89-3.69)	<0.01
Basic prevention diagnostics in the last 12 months (no)	>0.05		3.28 (2.55-4.22)	<0.01
Mammography, anytime (never)	>0.05		>0.05	
Papanicolaou test anytime (never)	1.26 (1.11-1.44)	<0.01	>0.05	

## Discussion

Since the moment of introducing the term 'health care quality' in 1965, there is a tendency to understand it and measure it (10). Self-assessment of health as a subjective indicator mostly correlates with the real health condition of an individual. Therefore, it is used for assessing the general health condition of the population in many important National researches (11).

Unlike many European countries where there was a significant drop in the number of interviewees who rate their health as good, namely after the world economic crisis, in Serbia, self-assessment of health increased in the latest National Health Surveys (12).

The most common determinants of the self-assessment of health are: age, gender, education, employment status, health condition, habits and life-style (13-15).

The presence of chronic diseases is negatively connected with the self-assessment of health, and that older, less educated and unemployed people rate their health as bad (16-18).

Researching the predictability of the self-assessment of health has shown that the risk of mortality with people who rate their health as bad is twice as bigger than with the interviewees who rate their health as good. The reason for this is the fact that an individual rates an overall health condition while medical staff, using preventive check-ups and screening tests, determine only the presence of some risk factors or disorders (19). The research conducted in the USA shows that the predictability of self-assessment of health increases with higher education and knowledge of an individual. The main source of information today, besides TV, is internet and the number of users in the world, as well as in Serbia, has been growing day to day (20). As far as health is concerned, people use internet in two ways. Firstly, for a quick self-assessment of health and elimination of certain disorders, they use numerous applications, but the reliability of the information they find remains questionable. Secondly, via internet, especially via

social networks, people share their experience regarding health care system and the health care services they have been provided (21-25).

Gender analysis shows that women rate their health worse and they visit primary health care institutions more often than men, who usually underestimate the importance of health and they use the services of the secondary health care more often (26,27). Simultaneous research conducted in Slovenia, Lithuania and Great Britain which included population older than 65 years of age who live in urban areas showed that the highest number of older interviewees who rate their health as bad was in Lithuania and that the main factor connected to bad evaluation of health was female gender (28).

Poverty and bad health condition are inseparable. Moreover, poverty can be the cause of bad health condition. Namely, the lack of finances increases the possibility of not getting the necessary health care services which consequently leads to delayed diagnosis and bad prognosis (29). Analysis of the impact of the World Crisis on the self-assessment of the health of the working population was conducted in 23 European countries and it shows that the economic crisis has a negative impact on the health self-esteem of the employees (30).

Meta-analysis of the health care services provided in public and private sector in undeveloped and medium developed countries in relation to the satisfaction and self-assessment of health of patients shows equal efficiency. Patients state that the main advantage of using services of private practices is better communication and politeness, as well as the lack of crowd in the waiting rooms and long waiting time (31).

Unachieved need for health care protection influences negatively the self-assessment of health. Waiting lists are an important indicator of the efficiency of the health care system. In Serbia there is a "Regulation on waiting lists" which defines the maximum time of waiting for certain health care services, and the self-assessment of health is dropping along with the increased waiting time. The research conducted among 12 countries, members of OECD group, shows that waiting time has been

significantly reduced in Great Britain, Finland and the Netherlands in the past decade (32).

## Conclusion

There was an improvement of the health condition of individuals according to their self-assessment. Female interviewees, less educated, unemployed, rich and medium rich people, the ones who were diagnosed with some disease in the last 12 months and who were absent from work due to illness rated their health as bad. The strongest predictors of the self-assessment of health of the interviewees in the survey prior to the latest one were presence of some disease and absence from work in the previous 12 months, while in the latest survey, apart from the factors already mentioned, there were predictors such as unachieved need for health care services due to waiting lists, unavailability of the medical institution due to financial reasons and lack of basic diagnostic and lab tests. Using private practice services did not have any influence on the self-assessment of health.

## Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Conflicts of interest

The authors declare that no conflicts of interest exist.

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