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Self-perceived Health in Belarus: Trends and Determinants

Extended Abstract

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ABSTRACT

Despite extensive research on health and mortality in the countries of the former USSR there is still room for further investigations. First of all, there is a vast amount of literature on health and mortality in Russia whereas other countries of the region have received less attention. Secondly, most of these studies are based on aggregate mortality data while the available individual level data remain underexplored. Our study fills these gaps and provides new evidence on health and its determinants from Belarus. It relies on data from the five annual "Income and Expenditures of Households" surveys conducted between 1996 and 2007. The results suggest the compression of morbidity in Belarus. The proportion of person years lived in good health increased during the analyzed period for both sexes and all ages. Here we also show that in terms of healthy life expectancy Belarus still remains far behind Western Europe. Such disadvantage is determined by higher mortality of the working age population but health at older ages also plays an important role, especially among women. Regarding health determinants, there is a clear educational gradient for both men and women. Other predictors such as working at present and medical visits also demonstrate large impact on health status regardless gender or age of respondents. No obvious association between individual's current income and health was found. An alternative indicator of individual well-being, the index of living standards, has strong inverse association with self-perceived health but it holds for individuals above working age only. Unexpectedly, individuals residing in rural areas tend to report better health compared to people living in the capital.

DATA AND METHODS

One of few data sources in Belarus providing information by individuals is the 'Income and Expenditures of Household Survey' (IEHS). This cross-sectional survey has been conducted in Belarus annually since 1995 by the National Statistical Committee. The survey covers all types of households with the exclusion of those living in institutions (nursing homes, prisons, convents, etc.). It is restricted to one calendar year and designed as a sequence of four quarterly interviews for the same sample of households (for more details see Martini et al, 1996). The survey questionnaire contains a number of health (influence of health on ability to work, health self-evaluation, ability to get dressed without assistance, medical visits, expenditures on medical service, etc.), demographic (age, sex, place of residence), socioeconomic (working status, education, income, etc.), and lifestyle (smoking, sport practicing, etc.) variables which refer to individuals living in a household.

IEHS micro-files for 1996, 2000, 2003, 2005, and 2007 were at our disposal. We restricted our analysis to the individuals older than 20 years; males and females were analyzed separately. The number of individuals participated in the IEHS in these years are shown in table (1).

Table 1
Main characteristics of IEHS data used in the analysis

	1996	2000	2003	2005	2007
Total number of respondents	14893	13994	14575	14379	15566
among them: older than 20	10443	10267	10844	10768	11853
share of men, %	44.7	44.0	43.6	43.8	43.9
share of women, %	55.3	56.0	56.4	56.3	56.1

Source: from IEHS 1996, 2000, 2003, 2005 and 2007

IEHS is a representative national sample, which can be used in estimating the prevalence rates according to the health status. The sample size is large enough to allow generalizations, especially when comparing it to the datasets used in the similar studies on self-perceived health conducted in Russia (Andreev et al., 2003) and Ukraine (Gilmore et al., 2002). Furthermore, our study is not restricted to one period. It covers five time points allowing for more robust inferences to be made. The other important factor accounting to validity and reliability of IEHS data is the well-established system of data collection and proceeding.

It is very well known fact that the health status is highly subjective measure which can be estimated in different ways (Greiner et al., 1996). In our study, we assessed health using responses to the following question: "How do you evaluate your state of health?" Response: 'good', 'fair', 'bad', 'don't know (refuse to answer)'. The 'good' and 'fair' categories were recoded into 'good' category and 'bad' into 'bad' category, respectively.

In order to obtain relevant life table functions and estimate healthy life expectancy (HALE) we relied on the widely employed in research Sullivan's method (Sullivan, 1971). Data on age-specific mortality rates were taken from the Human Mortality Database. To decompose the difference in HALE between two groups (periods) into 'mortality' and 'health' components we used the algorithm of the step-wise replacement (Andreev et al., 2002).

To assess the impact of a number of socioeconomic, demographic and lifestyle variables on health at the individual level we applied a binary logistic regression model, where the

state of health was considered as the dependant variable. The demographic, socioeconomic, behavioral and other covariates entered in the statistical model are described below:

Demographic

Two variables are considered to capture the impact of the demographics: *age* and the *place of residence*. The first covariate is continuous variable measured in years, while the second is categorized to separate those who live in the capital (Minsk), large cities, small cities and rural settlements.

Socioeconomic

Four socioeconomic proxies are included in our model: *level of education, current working status, income quintile and index of living standards*. Five educational categories are defined: higher; secondary specialized; general secondary or vocational school; incomplete secondary and primary and incomplete primary education. Current working status (*work at present*) simply separates those who worked and did not work at the time of the interview.

Income quintile an individual belongs to is a variable which consists of five groups ranking individuals from lowest 20%-income group to the highest 20% income group.

Index of living standards (ILS). This variable is traditionally constructed from the information on household ownership of durable goods and its housing characteristics by means of the principal components analysis. The advantages, limitations, the choice of variables and applications of the ILS have been widely discussed in the literature (Filmer and Pritchett, 1998, 2001; Falkingham and Namazine, 2002; Vyas and Kumaranayake, 2006; Mishra, 2007). The housing conditions of the household (presence of central heating, bath or shower, hot-water and telephone), the ownership of durable goods (TV, refrigerator, washing machine and car), the ownership of land-plots, the per capita living space and the percentage of food expenditures in total custom expenditures are used for the computation of this index.

Behavioral and other covariates

Four explanatory variables are added here: *sport practicing, smoking, hospitalization, number of medical visits and the Body Mass Index (BMI)*. Sport practicing is dichotomized into those who practice and do not practice sport, while *smoking* defines the current status of a respondent and compares current smokers with non-smokers.

BMI is defined as the individual's weight in kilograms over the square of the height in meters. For the present analysis the index values are reclassified as recommended by the World Health Organization (WHO, Global Database on Body Mass Index) into four groups (underweight, normal weight, overweight and obese).

Staying in a hospital separates individuals stayed in a hospital from those who did not while the *number of medical visits* in the three months prior to the interview is used as a continuous variable mesured in times.

The analysis of health determinants is based on the pooled data from four cross-sectional surveys (2000, 2003, 2005, 2007) containing in total about 40 thousand individual records. The model was applied separately by sex and by individuals at working and above working ages.

SELECTED RESULTS

Determinants of Health

Individuals at working age

From statistical point of view, the model applied for individuas at working age is of high quality. The overall percentage of correctly classified cases for both men and women indicates that in about 94% of cases the covariates included in the model predict the outcome correctly (Table 2). Hosmer & Lemeshow and Omnibus tests also confirm that the models adequately fit the data.

According to the results, level of education, current working status and medical/hospital visits have the strongest impact on the probability of reporting poor health for both men and women. For instance, the risk of reporting poor health considerably decreases as the level of education goes up: if men with incomplete secondary education are 2 times more likely to report their health as poor compared to the highly educated men, being with primary or incomplete primary men increases the odds of reporting poor health by a factor of 5 (compared to men with higher education). The educational gradient in health is even more pronounced among women. Those with primary and incomplete primary education have 12.2 times greater chance of reporting poor health than highly educated women.

Not working at present also had a very strong impact on the risk of reporting poor health, particularly for men: they are 4 times more likely to state their health as bad compared to working men. Similar impact on the dependent variable also has being in a hospital some time prior to the interview. For men, the risk of having poor health is 5 times higher if they report staying in a hospital, while for women hospitalization increases the risk by 4 times.

The mixed findings emerged from the impact of the place of residence and BMI on the SPH. The respondents living in all places but not in the capital have the lower probability of reporting poor health. The probability to state bad health among individuals residing in rural areas is about 40-45% less than among people living in Minsk.

Regarding the impact of BMI on the SPH, the results reveal that the highest probability to report poor health is among men and women in the underweight BMI category (compared to people with normal weight). The BMI in the overweight range is associated with the lower probability of reporting worse health (statistically significant only for men though). In general, the association looks as a reverse J-shared, with the highest risk for those in underweight category followed by those who are in obese range.

There is no clear association between income and SPH. The results are strongly statistically significant only for women (except the 2nd income quintile). The probability of reporting poor health is higher for men and women in any quintile group if compared to those in the 5th quintile (with the highest income).

The association between the index of living standards and SPH is consistent but statistically insignificant for both men and women. In case of women, statistically insignificant association is also found for smoking and sport practicing. The impact of smoking on men's health has unexpected direction: non smoking men reported worse health than smokers.

Table 2
Odds ratios for 'bad' self-perceived health (individuals at working age)

Covariates	Men		Women	
	Odds ratio	95% Confidence interval	Odds ratio	95% Confidence interval
Age	1.04***	(1.03-1.05)	1.08***	(1.07-1.09)
Residence				
Minsk-city	1		1	
Large city	0.72**	(0.56-0.94)	0.82*	(0.65-1.03)
Small city	0.68***	(0.52-0.89)	0.74**	(0.58-0.94)
Rural	0.55***	(0.41-0.74)	0.59***	(0.45-0.78)
Education				
Higher education	1		1	
Secondary specialized education	1.35**	(1.01-1.80)	1.50***	(1.18-1.89)
General secondary education/Vocational school	1.35**	(1.04-1.75)	1.59***	(1.26-2.00)
Incomplete secondary education	2.03***	(1.39-2.96)	3.03***	(2.00-4.59)
Primary and incomplete primary education	5.1***	(2.20-11.83)	12.24***	(4.96-30.18)
Index of standards of living	0.97	(0.86-1.08)	0.96	(0.86-1.07)
Income				
First quintile(lowest income)	1.32*	(1.00-1.74)	1.40***	(1.09-1.80)
Second quintile	1.19	(0.89-1.58)	1.18	(0.91-1.53)
Third quintile	1.35**	(1.02-1.78)	1.38**	(1.07-1.78)
Fourth quintile	1.30*	(0.99-1.71)	1.51***	(1.19-1.92)
Fifth quintile (highest income)	1		1	
Smoking				
Yes	1		1	
No	1.30***	(1.09-1.55)	0.98	(0.75-1.28)
Sport practicing				
Yes	1		1	
No	1.94***	(1.47-2.55)	1.19	(0.93-1.52)
Body Mass Index (BMI)				
Normal weight	1		1	
Underweight	2.40**	(1.18-4.90)	1.96***	(1.29-2.98)
Overweight	0.70***	(0.58-0.85)	0.91	(0.75-1.09)
Obese	1.04	(0.80-1.36)	1.20*	(0.98-1.47)
Work at present				
Yes	1		1	
No	4.14***	(3.46-4.96)	2.57***	(2.14-3.09)
Staying in a hospital				
No	1		1	
Yes	5.1***	(4.27-6.08)	4.07***	(3.48-4.76)
Medical visits	1.40***	(1.33-1.46)	1.29***	(1.25-1.33)
Constant	0.002***		0.001***	
Overall percentage of correctly classified cases	94.6		93.9	

Source: estimated from IEHS

Note: P<0.01 ***; 0.01<P<0.05 ** ; 0.05<P<0.10 *;

Individuals above working age

The overall percentage of correctly classified cases for both models for individuals above working age is considerably lower than in the two previous models. It is 73% for women and 76% for men (Table 3). Hosmer & Lemeshow test does not confirm the adequacy of the model fit. Only the Omnibus test shows that at least one of the predictors is significantly related to the dependent variable. The results of the regressions are provided here more to evaluate the directions of associations rather than assess health determinants.

Compared the results with the previous models, the variation in the size of odds is considerable. Among the factors that have different direction of association with SPH are the place of residence and income group. For instance, men and women living in a small or a large city have a greater probability to report poor health than people from the capital city (Minsk). The results, however, are not statistically significant.

There is also education gradient but it is less pronounced if compared to the people at working ages. Both men and women above the working age have about two times higher probability to report poor heath compared to people with higher education.

There is a significant impact of the index of living standards on SPH. As ILS increases by one unit, the probability of reporting worse health decreases by 13-14% for men and women.

In terms of smoking, the findings still illustrate a contradicting picture: non-smoking men have higher probability to report poor health compared to the smokers. On the other hand, the impact of sport practicing is more pronounced. The probability of reporting poor health is 92% and 37% higher for men and women who do not practice any sport, if compared to people having sport activities.

The impact of BMI on the SPH for people above the working age is lower compared to those at working age. Men and women in underweight category are again found more likely to report worse health if compared to people with normal weight.

Table 3
Odds ratios for 'bad' self-perceived health (individuals at above working age)

Covariates	Men		Women	
	Odds ratio	95% Confidence interval	Odds ratio	95% Confidence interval
Age	1.05***	(1.03-1.06)	1.06***	(1.05-1.07)
Residence				
Minsk-city	1		1	
Large city	1.11	(0.82-1.51)	1.10	(0.90-1.33)
Small city	1.19	(0.87-1.64)	1.02	(0.83-1.25)
Rural	0.65**	(0.45-0.92)	0.68***	(0.55-0.85)
Education				
Higher education	1		1	
Secondary specialized education	1.06	(0.77-1.46)	1.68***	(1.34-2.10)
General secondary education/Vocational school	1.50***	(1.11-2.02)	1.91***	(1.52-2.39)
Incomplete secondary education	1.75***	(1.30-2.35)	2.22***	(1.76-2.78)
Primary and incomplete primary education	2.22***	(1.63-3.02)	2.45***	(1.95-3.09)
Index of standards of living	0.87**	(0.77-0.98)	0.86***	(0.80-0.92)
Income				
First quintile(lowest income)	0.87	(0.61-1.23)	1.22*	(1.00-1.50)
Second quintile	0.81	(0.61-1.07)	1.00	(0.83-1.21)
Third quintile	0.88	(0.68-1.15)	1.09	(0.91-1.32)
Fourth quintile	0.81*	(0.63-1.06)	0.97	(0.81-1.17)
Fifth quintile (highest income)	1		1	
Smoking				
Yes	1		1	
No	1.00	(0.83-1.19)	1.21	(0.70-2.12)
Sport practicing				
Yes	1		1	
No	2.08***	(1.46-2.97)	1.44***	(1.14-1.81)
Body Mass Index (BMI)				
Normal weight	1		1	
Underweight	2.50*	(0.97-6.45)	1.31	(0.64-2.65)
Overweight	0.85*	(0.71-1.01)	0.84***	(0.74-0.95)
Obese	0.79*	(0.60-1.03)	1.03	(0.89-1.18)
Work at present				
Yes	1		1	
No	3.11***	(2.25-4.30)	2.26***	(1.80-2.84)
Staying in a hospital				
No	1		1	
Yes	2.79***	(2.33-3.34)	3.05***	(2.69-3.46)
Medical visits	1.33***	(1.27-1.40)	1.29***	(1.25-1.32)
Constant	0.001***		0.001***	
Overall percentage of correctly classified cases	76.2		73.2	

Source: estimated from IEHS

Note: P<0.01 ***; 0.01<P<0.05 ** ; 0.05<P<0.10 *;

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