DOES IT PAY TO BE HEALTHY?
THE ECONOMIC RETURNS TO HEALTH IN RUSSIA

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Why the research is ACTUAL?

- *Health is a part of human capital*
- *Health influences economic activity*

   - on macrolevel

   - on microlevel

- *Negative tendencies during last year (high levels of morbidity and mortality, low life expectancy)*
- *Value of «non-lived years»*

Questions

- *Is health a type of human capital which gives returns in the labor market?*
- *Are there any economic incentives for individuals to invest in health?*
- *What are the prospects of transition from free to pay system of the public health, to insurance medicine?*

OBJECTIVES AND TASKS

The goal of the research:

to define to what extent individual's labor behavior and status are determined by his / her health status, whether health gives economic returns at micro-level.

Research tasks:

1) To create indicators of the health status, using objective health characteristics (chronic diseases, operations etc.).

2) To estimate influence of health on probability to be employed (measuring health status in several ways: on the base of self-reporting health level and using objective health characteristics).

3) To estimate influence of health on hours of working (also measuring health status in several ways: on the base of self-reporting health level and using objective health characteristics).

4) To estimate influence of health on earnings (measuring health with subjective as well as objective health characteristics).

THEORETICAL FRAMEWORK

Labor supply model with health factor

$$Hh=Hh(w, V, He, X), \quad He - \text{health status}$$

$$(dU/dL)/(dU/dC)=w/P2$$

$$(dI/dTH)/(dI/dM)=w/P1$$

Models explaining differences in wages

- heterogeneity of employees

- heterogeneity of working places

- inefficiency of markets

Selection models

- self-selection of employees

- selection from the employers' side

- segregation of workers with poor health on working places of lower quality

Consequences of expanded labor supply model:

- **longer "health time", that individual can spend for the labor market activity ($Y_d=wHhD <Y=wHhH$)**

- **raising the marginal costs of leisure ($Hh_d < HhH$)**

- **impact of the period of usage of human capital (length of individual's life) and the period of human capital accumulating $PV(Y_d)<PV(Y)$**

- **involving inadequate investment in human capital because of expecting fewer wages and because of limitations of time and physical strengths ($W_{dt}<W_t$)**

- **influences the choice of job and occupation adverse selection for people with health conditions and limit their access to high-waged jobs ($WtD < Wt$)**

- **Can involves adverse-selection of employers**

HEALTH MEASURES

- **HEALTH MEASURES** (Currie and Madrian (1999); Lambrinos (1981); Mossey and Shapiro (1982); Bound (1991); Mitchell and Burkhauser (1990); Stern, 1996).

- 1) self-reported health status (whether someone is in excellent, good, or poor health);
- 2) whether there are health limitations on the ability to work;
- 3) whether there are other functional limitations such as problems with activities of daily living (ADLs);
- 4) the presence of chronic and acute problems with health;
- 5) consumption of medical care;
- 6) clinical assessments of such things as mental health or alcoholism;
- 7) nutritional status (e.g., height, weight, or body mass index);
- 8) expected mortality;
- 9) integral health indicator (PCM).

HYPOTHESES

- **The following hypotheses are supposed to be tested in the research:**

1. Individual's health doesn't influence significantly the probability of employment; however, this probability considerably decreases in case of profound health deprivations such as disability. In general negative influence of poor health is much more significant than positive influence of good health.

- This hypothesis is based on evidence of relatively small health investments. If economic returns to health (including access to high-waged jobs) were significant, investments in health should be larger then they are at present. Health conditions also may have negligible effect on probability of employment because there is an opportunity to adopt employment conditions in accordance with health limitations.

2. There aren't significant differences between estimations of health influence on labor supply obtained with the use of self-reported health and of objective health measures because of absence of institutional factors which lead self-reported health to be underestimated (highly developed system of social security) except disabled individuals.

HYPOTHESES

3. Health status (measured with different ways) influences work hours significantly. Poor health reduces work hours. Changing work time is the main way of labor supply adjustment to poor health conditions.

4. Positive health status influences individual earnings positively, but returns to health are not significant. Influence of health on monthly earnings is mainly determined by influence of health on hours of working. Poor health leads to less intensive work and less long work time, and, thus, cut down aggregate monthly earnings.

5. There are gender differences in health influence on labor market outcomes. Russian phenomenon of extremely high male death-rate allows us to suppose that males are less concentrate on self-protection and they reduce their labor supply only in the case of profound health deterioration. However, influence of general health characteristics shouldn't differs significantly, but influences of self-rated health should be different since men tend to overestimate their health. There are differences in influence of separate diseases.

DATA

- **RLMS:** 4000 households; 1994-2006 years.

Data on:

- self-reported health status (5 levels of health)

- disability, chronic disease

- other diseases, operations, hospitalizations

- limitations

- labor status, economic activity and income of respondents

- For the purposes of econometric analysis we used the sample of 18-75 aged individuals.

Econometric models

1. Estimation of health impact on probability to be employed with lagged health variables

H=H(w, V, Het-n, X), He=Hes, или He=Hej, или He=Hei

   n=1,3,5

2. Estimation of health impact on working hours with lagged health variables

   Hh=Hh(w, V, Het-n, X), He=Hes, или He=Hej, или He=Hei

   n=1,3,5

3. Estimation of health influence on earnings (Mincer's wage equation, OLS Model)

   w=w(Het-n, X, N), He=Hes, или He=Hej, или He=Hei
   n=1,3,5

All estimations were made on the base of panel data with fixed effects

To correct for selection bias we used Heckman procedure
   H=H(w, V, Het-n, X), He=Hes, или He=Hej, или He=Hei

To correct for health endogeneity we used lagged health variables

Influence of different health characteristics on probability of employment

Females	Males
Poor health (1 year lag)*	Poor health (self reported) (1 year lag)
Disability	Disability (1, 2 year lags)
Diabetes (1, 3 years lags)	Diabetes (1 year lag)*
	Cardiac infarction (1 year lag)
	Operations incurred (2 year lag)
	Insult (2 year lag)
	Anemia (2 year lag)
	Integral health factor (2 year lag)
Insult (1 year lag) (+)	Tuberculosis (1 year lag) (+)
	Other chronic diseases (1 year lag) (+)

Influence of different health characteristics on working hours

Females	Males
Good health (1,3 years lags)	Hypertension (1 year lag)
Chronic diseases of kidneys (1 year lag)	Good health, self-reported (1 year lag) (-)
Poor health, integral indicator (3 years lag)	Poor health, self-reported (1 year lag)(+)
Good health, integral indicator (3 years lag) (-)	Disability (1,2,3 years lags) (+)
Other chronic diseases (3 years lag)	Insult (1,2,3 years lags) (+)
Operations incurred (1 year lag)*	Tuberculosis (1,2 years lags) (+)
Anemia (2,3 years lags)*	
Cardiac infarction (1 year lag) (+)	
Chronic disease of heart (1 year lag) (+)	

Influence of different health characteristics on wages

Females	Males
Good health (1,2,3 years lags)	Good health (1,2,3 years lags)
Poor health (1,3 years lags)	Poor health (1,2,3 years lags)
Disability (1,2,3 years lags)	Disability (1,2,3 years lags)
Anemia (1,2,3 years lags)	Integral health indicator (1,2,3 years lags)
Insult (1,3 years lags)	Poor health, integral indicator (1,3 years lags)
Operations incurred (3 years lag) (+)	Good health, integral indicator (1,2,3 years lags) (-)
Hypertension (2,3 years lags)	Anemia (2 years lag)
Integral health indicator (1,2,3 years lags)	Chronic diseases of lungs (1,2,3 years lags)
Poor health, integral indicator (1 year lag)	Chronic diseases of liver(1,2,3 years lags)
Good health, integral indicator (1,2,3 years lags) (-)	Chronic diseases of kidneys (2,3 years lags)
Chronic diseases of heart (1 year lag)	Chronic diseases of spin (1 year lag)
Chronic diseases of liver (1,3 years lags)	Chronic diseases of gastrointestinal tract (2,3 years lags)
Other chronic diseases (1 year lag)	Other chronic diseases(1 year lag)

Main conclusions

1) **Gender differences are high:**

   - relatively less influence of health on employment for women

   - law elasticity of working hours by health for men

2) **Week influence on working hours**

   - probably lack of flexible adjustment mechanisms of labor supply of people with different health problems

2) **Expected positive influence of health on wages**

3) **Positive** impact of good health is in absolute values less than negative impact of poor health

4) **Significant influence of profound health deteriorations**

5) **Estimations of self-reported health influence and objective health measures influence are comparable**