Clinical conditions and perceived well-being of the patients suffering from chronic diseases: An application to Multiple Sclerosis

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- The project aims at multidisciplinary investigation of clinical and psychological determinants of the well-being of patients suffering from chronic diseases, in an example of Multiple Sclerosis (MS).

- It combines efforts of economists and sociologists from NRU HSE and physicians, clinical and cognitive psychologists based at the Institute for Neurology of the Russian Academy of Medical Sciences, based in Moscow, which approved it as a research initiative.

- We combine survey data from the patients with their clinical indicators at the various stages of the disease, and look at the effect of psychological mood of the patient on subjectve well-being and objective health status
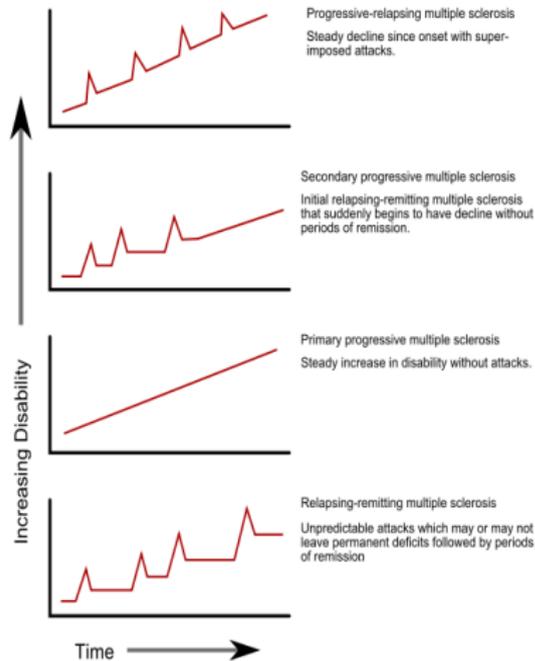
Multiple Sclerosis (MS) as chronical disease

- Autoimmune disease caused by deficit of myelin (prothein responsible fo isolating axones)

- Unexpected arrival, unknown causes, no known cure (at best, can be slowed down through medication)

- Symptoms include loss of visual fields or entire vision, blurred or double vision, muscle weakness, loss of balance, fatigue, memory disorders, and urinary incontinence
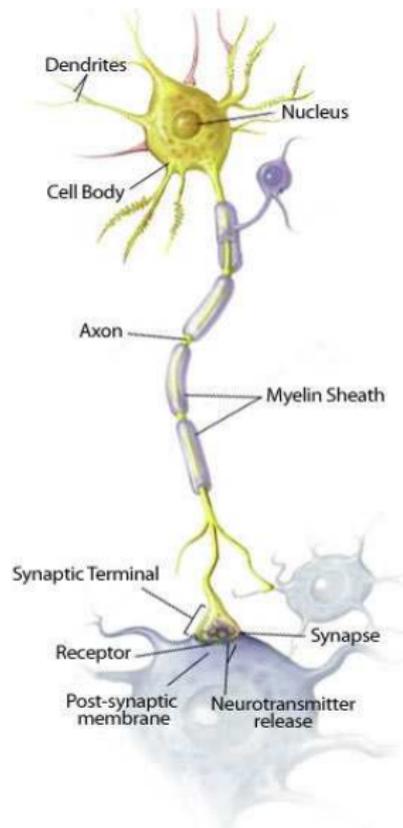
Multiple Sclerosis (MS) II

- Results in premature decay lasting from years to decades, develops in waves
- Early symptoms may be mixed with other diseases, and has to be confirmed by a set of tests (incl.fMRI) in 6-month time
- Per person healthcare expense of the government programme — 15 to 30 thousand Euro pa in Russia (about 200,000 patients, of whom 83,000 are covered by state program (7 nozologies) with annual budget of about 10 bln RuR.

Progressive-relapsing multiple sclerosis
Steady decline since onset with super-imposed attacks.

Secondary progressive multiple sclerosis
Initial relapsing-remitting multiple sclerosis that suddenly begins to have decline without periods of remission.

Primary progressive multiple sclerosis
Steady increase in disability without attacks.

Relapsing-remitting multiple sclerosis
Unpredictable attacks which may or may not leave permanent deficits followed by periods of remission

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Theoretical foundations

- As shown recently by Daniel Kahneman and his colleagues (Kahneman Wakker Sarin QJE 1997; Kahneman e.a., Science, 2006) as well as others (Oswald and Powdthavee, 2007; Clark e.a, JEL, 2007), 'utility' can be empirically measured as

  experienced , perception-based, or Benthamite: how do you feel here and now?

  evaluated : judgment about inner satisfaction, aggregated across moment utilities, but not identical to its integral, assessed through

We combine

- Measurements of long-term perceived health state
- Psychological portraits of individuals
- Clinical descriptions of individual health
- In the longitudinal study, **Day Reconstruction Method (ESM)** (Kahneman and Rijs, 2005): self-reported remembering of the previous day by episodes.

Survey tests

These strategies are revealed through a specially designed questionnaire (about 50 questions), together with a battery of psychological tests:

1. Monthreal Cognitive Ability test (MOCA, 10 questions) — to assess subjects' cognitive competence

2. Life quality scales (clinical tests SF-36, FAMS, MSIS-29, 50 questions)

3. Bechterew Institute Personality Questionnaire for Types of Attitude towards Illness (TOBOL, 12 questions)

4. Hospital Anxiety and Depression scale (HAD, 14 questions)

5. Self-assessment, Activity, Mood (SAM, 30 questions), patient's current mood and self-assessed ability to cope with life tasks.

6. Hardiness test by S.Maddi (45 questions), evaluating commitment (to life actions), control (over one's life), and challenge (willingness to accept).

7. Heims questionnaire of coping strategies (26 statements)

8. Asthenic State Scale (30 questions) to estimate self-assessed level of asthenia and fatigue

9. Eyseneck test of character, emotional stability and personality (57 questions), to measure emotional state and neurotism, robust to MS progression.

Data description

- 50 questionnaires collected from the patients in April-July 2012
- 70% female
- Mostly higher education (over 80%)
- 2/3 have families, over 90% live with somebody else
- 63% have children
- Mean age 41 year, ranging from 23 to 65 years
- Mostly muscovites (bias in sample).

Coping strategies of (MS) patients

On the basis of the preliminary interviews and reviews, we conjecture the following coping strategies of MS patients:

Family Cope with disease through family orientation

Work Cope with disease through work orientation

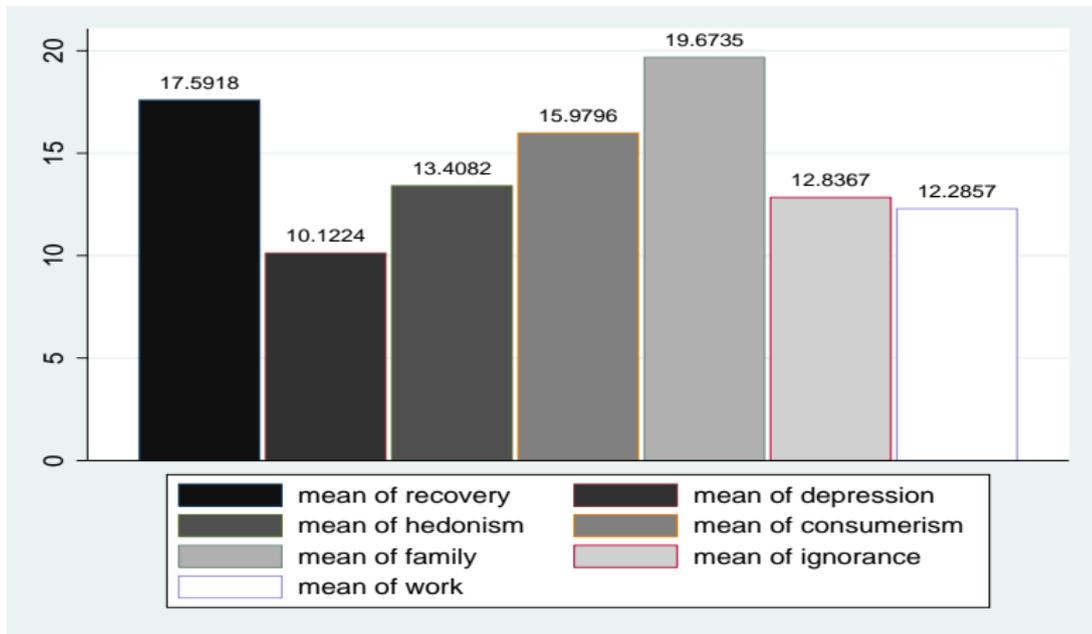Recovery Aspiration for recovery through own behaviour or medical advancements

Hedonism Take most of the remainder of one's life

Ignorance Live as if nothing happened

Consommation Everybody has the duty to support me in my disease

Desperation Giving up, and losing control of one's life and cure

Strategies distribution (of 25 points)

Compress via factor analysis to 2 dimensions: 0 for depression, 1 for coping

Determinants of health

Table: Estimation results : regress

Variable	Coefficient	(Std. Err.)
age	-0.031	(0.028)
gender	-0.825	(0.606)
firstdiag	-0.070	(0.036)
children	-0.279	(0.366)
education	0.127	(0.275)
hwload	-0.767	(0.698)
Intercept	206.286	(81.780)

Model

Estimate the following model:

$$health = \beta_0 + \beta_1 feel + \beta_2 pitrs + \lambda(\eta(\gamma heima) + \zeta) + \varepsilon \qquad (1)$$

where *health* is measure of patient's health, *pitrs* is medical treatment indicator, *heima* is Heim's index of cognitive coping strategy, λ is dummy for strategy (depression — 0, positive — 1), β and γ are coefficients, ζ is random effect.

Model estimate

Table: Estimation results : gllamm

Variable	Coefficient	(Std. Err.)
Equation 1 : resp		
feel	5.025	(1.393)
pitrsp	-0.595	(0.813)
Intercept	-0.397	(1.203)
Equation 2 : random intercept ζ		
Intercept	0.336	(0.343)
Equation 2 : γ		
psyche	-1.395	(0.229)
Equation 2 : random slope η		
heima	-0.078	(0.102)

Conclusion

- Data series are short, which preclude the possibility to run siginificant tests so far.
- Data generally do not contradict the initial hypotheses
- Multilevel latent mixed model suggests positive expected effect of mood on healt.
- More calibration is badly needed.

Thank you for your attention!