

## Study of Actor Behavior Institutional Factors at Medical Services Market

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**Abstract:** The rapid growth of health care spending during the decrease of the treatment overall effectiveness and the reduction of health care access in developed countries led to the need of traditional approaches review in respect of financing and the organization of health care. Focusing mainly on the payment methods, the algorithms and the standardization of medical services provision processes, the healthcare management ignores the peculiarities of a doctor behavior and a patient as rational actors trying minimize their personal costs and work together to achieve common goals. The study describes the model of market equilibrium in the industry, explaining the reasons of medical services “overconsumption”; two possible aspects of health “state” management are described affecting the total national expenditure on healthcare; the dilemma “doctor-patient” is considered, illustrating the key problem concerning the impossibility of solving the public health issues by the increase of funding.

**Key words:** Health care, medical services, market equilibrium in the industry, costs on health care, institutional factors

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### INTRODUCTION

The monographic analysis of the scientific literature is necessary to perform, starting with the works of such economists as Schultz (1961) and Nobel laureate Gary (1975) who proved the importance of investing in human capital (including healthcare) to ensure the economy development, indirectly created the preconditions for the formation of ideas about “health” as an economic resource which needs to be managed.

### MATERIALS AND METHODS

Grossman (1972) started to work in the same trend by developing the model of demand for health as a consumer good within the neoclassical economic theory. According to his opinion, the investment in health capital are identical to the investments in physical capital and the amount of investment is determined by the marginal utility ratio and the cost of capital based on the rational behavior of an individual. This hypothesis was criticized many times, however in general it corresponded with the economic ideology of the Western countries in the middle and in the end of the 20th century, aimed at the stimulation of consumption which made it a dominating one in the methodology of industry management for a long time. Therefore, some insoluble problems appeared the inefficient and uncontrolled growth of health care costs during the reduction of access to healthcare. For example in the USA with the highest health care costs in the world (2013 \$3 trillion) the level of medical service and

healthcare of citizens are not the best ones. The proof of this are the results of the study conducted by commonwealth fund (Ginsburg *et al.*, 2008; Leatherman and Sutherland, 2005). When 18 countries are compared according to >30 indicators such as preventable mortality, infant mortality, life expectancy, patient satisfaction, health care safety etc., the overall rating of the USA (unlike the indicators of the best countries) made 66%. Besides, it was found out that there is a directly proportional relationship of life expectancy at the level of public spending per capita in the range from 0 to \$1,500 a year. This dependence is not observed with the growth of this indicator over \$1500 (Ulumbekova, 2012).

### Research methods:

- Empirical methods (description and identification of relevant institutions)
- Methods of classical and evolutionary game theory
- Microeconomic modeling as neo-classical economics (equilibrium analysis methods)
- Comparative method (that is based on the analysis of the space-time relations comparative study)
- Historical method (study of history role in the development, maintaining and changing of institutions)

### RESULTS AND DISCUSSION

When you calculate the per capita expenditures (conventional average costs of medical services per citizen), the state is focused on subsidizing of the existing

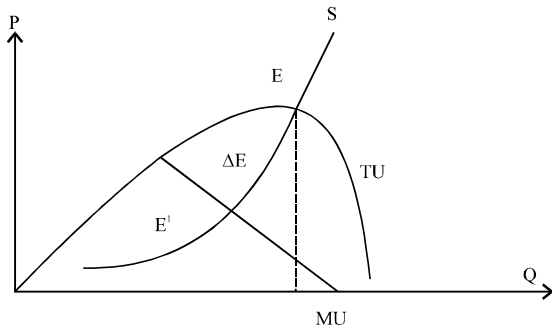


Fig. 1: Market equilibrium model in the healthcare sector

health care organizations and their infrastructure that the overall usefulness of medical care is taken into account. This usefulness largely exceeds the marginal utility for the vast majority of citizens. The state provides money to the healthcare of society as a whole which is composed of individual health for each person.

At high Total Utility (TU), developed by the variety of socio-economic factors and the characteristics of the healthcare sector, the overconsumption of medical services takes place. Graphically, this is shown by Fig. 1 where, MU is the Marginal Utility of medical services, E, E' are the equilibrium points, S is the supply curve, ΔE is the amount of medical services overconsumption.

At that the volume of overconsumption (ΔE) depends on the kind of target prevailing in the national health care system:

- The maintaining of state within the physiological or empirical “norm” depends largely on a person (“H” aspect (Human) based on the marginal utility
- The elimination of deviations from the “standard” depends on the level of medicine development, the results of scientific and technical progress (“M” aspect (Medication) based on the general usefulness

The combination of two aspects constitutes one of the possible models for national healthcare (public, private, social insurance or mixed one) (Tanner, 2008) which determines the dominant type of behavior within the relationship “doctor-patient” (Fig. 2).

For example in general terms in a private model a physician is focused on the broad diagnosis and the high-tech treatment (“M” aspect) in the state model a physician is aimed to cover the greatest number of people by routine inspections to avoid later a costly high-tech treatment (“H” aspect). But in any case, the determining factor is the financing of healthcare. The management believes that the more public or private funds will be invested into the industry, the better the population

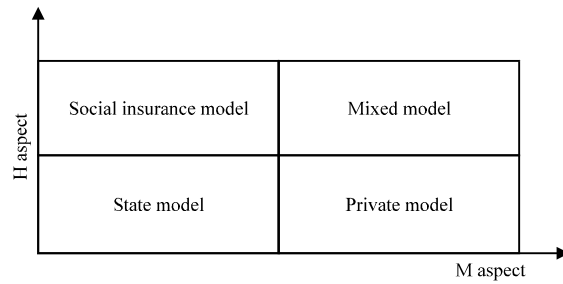


Fig. 2: Healthcare model matrix within “H” and “M” aspects

health will be. However as we examined above, the situation is quite different one. And the satisfaction of population with the quality of healthcare within all models, according to the estimations of various experts, remains a low one and is not increased with the growth of funding. The patients are not inclined to estimate the complexity or processibility of the treatment process. “To be healthy for them means to be free from some constraints and challenges” (Yudin and Stepanova, 2004) and no matter how it is achieved and by what technology (which is indirectly confirmed by the growing popularity of alternative medicine).

The researchers propose to consider the weaknesses of the modern Russian healthcare not from the point of underfunding or inefficient management but from an institutional point of view, the interaction of the treatment process main actors (in the context of individual interests and objectives implementation) (Axelrod, 1981; Tkhorikov and Lomovceva, 2014). We use for this the so-called “Prisoner’s dilemma”. “Prisoner’s dilemma” is the situations with interaction participants who are interested in the co-operation with each other by force but decline from cooperation taking into account the subjective rationality and judgments.

It is assumed that an actor tries to maximize his own gain without caring for the benefit of others. The behavior of each individual is a rational one but participants come together to an irrational decision: if they betray both, they will receive a lesser prize than during the cooperation (the only equilibrium in this game does not lead to a Pareto optimal solution).

By adapting the “prisoner’s dilemma” for the situation within the health care market, we see that there are only four possible models of interaction between a doctor and a patient.

One can not definitely say that a doctor is always striving to make every possible effort and use all available means (intellectual or material resources) to cure a patient. The same is true for the patients: a patient will not always

Table 1: “Prisoner’s Dilemma” in relation to the interaction of actors at the market of medical services

		Doctor	
		“Cooperation”	“Betrayal”
Patient	“Cooperation”	Doctor and patient use resources efficiently patient health improvement	Doctor keeps resources patient loses resources and does not reach the improvement of health state
	“Betrayal”	Doctor loses resources patient keeps resources but does not reach the improvement of health	Doctor and patient keep resources patient does not achieve the improvement of health state

follow a doctor’s orders to comply with the required medical treatment or bear any additional expenditure. The reluctance of a physician and a patient to work properly to improve the health status is denoted as a “betrayal”. The opposite of “betrayal” is the focus of a doctor or a patient on the use of all available resources to ensure the improvement of the health status (“cooperation”).

As we see from Table 1, a patient does will not get a proper medical care within three models cooperation. The improvement of health state will be achieved not through the efforts of a doctor but due to the natural, physiological reserves and a body ability to heal itself.

The dilemma “doctor-patient” clearly shows that the amount of resources loss or the overconsumption of medical care in the health care models with a predominant aspect “M” will be higher than in the models “H” as in the absolute value terms the “betrayal” on the part of a doctor or a patient becomes more expensive.

The developed dual scheme of “doctor-patient” relations analysis suggests that the increase of spending on health care is economically viable only if a mutual rational behavior of actors is manifested: a doctor will always try to cure and a patient will always try to recover.

**Summary:** The efficiency of the national health care functioning is determined not only by the scope and structure of financing but also by the development of its adequate possible model a public, a private and a social insurance or a mixed model as each of them mediates an appropriate system of relations between the treatment process actors. It is impossible to make medical personnel, management and the patients use all the available resources of each party to ensure the improvement of the nation health as a whole, ignoring the peculiarities of a doctor and a patient behavior as the rational actors who try to minimize their personal costs and not always to cooperate with each the other in order to achieve common goals under various institutional factors as it requires further research and development of methodology analysis.

**CONCLUSION**

The search for medical help should be a conscious choice of a patient involving the comprehensive

adherence to doctor’s instructions and the observance of a therapeutic regime. Otherwise, the efficiency of the interaction between a doctor and a patient is not going to happen. The number of such patients is small and requires a special assessment within each territory, however, their number should be fundamental during the calculation of the planned healthcare sector financing. The financing of ambulance services, the services fighting against social diseases, healthcare centers and smaller healthcare centers should be calculated according to the total amount of patients.

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