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HEALTH CARE MARKET IN THE CZECH REPUBLIC IN THE INFORMATION SOCIETY

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Abstract. Heath care system is an area where typical market conditions cannot be found. Institutions which are part of the health care system have got their specifics, i.e. their activities and duties are, to a great extent, influenced by the state. The aim of the paper is to briefly describe the health care market in the Czech Republic in contemporary information society. The authors based the paper on the fact that an important role is played by the heterogeneity of health services and information asymmetry on the patients' side, which leads to them being disadvantaged on the health services market. There are applied methods of analysis, synthesis, primary and secondary research. For primary research purpose was done among the practitioners and this article shows some results of the subsequently performed analysis of the collected questionnaires. The secondary research was based on analysis of papers and literature published about health care market in the Czech Republic.

Keywords: medical care, health services, resource allocation, information society, uncertainty, risk.

JEL classification: A00, E21.

1. Introduction

The medical industry is one of the areas in which a typical market environment is not found. Organizations that are involved in the health care system have their own specificities. Their operations and responsibilities are often significantly influenced by the state. Health facilities, however, are obviously competing for available resources both among themselves and with other sectors. Market competition is therefore a phenomenon that also affects the medical industry.

In the past century, many prominent economists viewed the economics of medical care as a separate branch of microeconomics that analyzes the behavior of the participants in this environment in connection with the provision of health services. This branch stems from the conventional economic market environment and uses traditional methods to analyze the specific characteristics of the medical care as an economic asset.

These analysts believe that the basic cause of government interventions is the failure of the medical care market. The aim of the analysis is, therefore, to define the potential for health market failure and to identify its causes. The economists then based their findings on analyses that compared the allocation of health care resources under conditions governing the standard markets.

The American economist Kenneth J. Arrow is undoubtedly among the most frequently cited economists of this period. In December 1963, "The American Economic Review" published his article "Uncertainty and the Welfare Economics of Medical Care".

The objective of this paper is a brief description of the medical market in the Czech Republic in the context of the current information society. The authors of the paper refer to the fact that an important role in this system is played by the heterogeneity of health services, and information asymmetry on the side of the patients, which is the reason for their disadvantagement as consumers on the market of health services.

There are applied methods of analysis, synthesis, primary and secondary research. For primary research purpose was done among the practitioners and this article shows some results of the subsequently performed analysis of the collected questionnaires. The secondary research was based on analysis of papers and literature published about health care market in the Czech Republic.

2. Medical care markets

When the economics of the medical industry has begun to develop in the 1950s, economists devoted great attention to the analysis of medical markets. The economics of medical care has crystallized it-

self into a relatively independent branch of microeconomics, dealing with the issue of resource allocation in connection with the provision of health services. Analysts were looking for justification for the empirically observed massive government interventions, which were, more or less, common to virtually all health care systems. They pondered about their dynamics, forms and consequences. The basic consideration in this context was that of how the medical care would have (most likely) worked, if the allocation of resources was given to a standard mechanism, i.e. the market.

Typical market failures are described in the publications of Ginzberg (1951), (1954) and Arrow (1963), to mention just a few. It was K. Arrow who analyzed the American health care system in his paper Uncertainty and the Welfare Economics of Medical Care. He stated that medical markets differ from "normal" markets in particular in the nature of demand, the expected behavior of the physicians, final product uncertainty and supply conditions. In addition to the uncertainty factor of the final product itself, Arrow also pointed out that "even in purely market societies, advertising and overt price competition are virtually eliminated among physician".

Absence of competitiveness, or rather limited competitiveness, on potential and actual medical markets was also mentioned later by other authors, such as J.Stiglitz, who devotes much space to the comparison of medical care markets and standard competitive markets. The comparison of the markets, as performed by J.Stiglitz, is presented in the Table 1.

Table 1. Differences between medical markets and standard competitive markets (source: taken from Stiglitz 1997: 344)

Standard competitive markets
Large number of seller
Companies doing business to maximize profits
Homogenous commodities
Well-informed buyers
Consumers pay directly
Medical markets
Limited number of hospitals (except for big cities)
Most hospitals are non profit
Heterogeneous commodities
Poorly informed buyers
Patients pay only part of the costs directly

3. Market failure in the context of the information society of the Czech Republic

According to Arrow, a key characteristic in the physician-patient relationship is the phenomenon of information asymmetry. Similar information asymmetry, of course, exists in other sectors, too. One can even say that in certain specific fields the information asymmetry is very high, and, in principle, surmountable only with great difficulty. For example, a similar situation can be found in the lawyer-client relationship according to Janda (2009), who models the information asymmetry in insolvency proceedings.

The definition of information asymmetry in the medical industry can be accepted for example in the form in which it is presented in (Shy 1995): "This is a situation where the sellers (physicians) possess more complete information on the services they provide than buyers (patients)."

In the medical industry, the information asymmetry usually lies in a completely different knowledge of the character and properties of the provided goods or services on the part of their supplier and the consumer / buyer. K. Arrow (1963) draws attention to the fact that, in contrast to other markets, the consumer (patient) cannot test the product before consuming it. Therefore the main decision-making tool of the consumer is an element of trust towards the physician.

And, clearly, the providers of goods / services possess better information about their nature than their recipients.

To this day, it is typical for health care services that they are provided by highly qualified professionals. The patient is generally not able to assess the adequacy of health care services and their benefits. This situation clearly leads to the so-called supply-induced demand, when the quantity of demanded care is influenced by the size of the supply, that is, to put it simply, the number of physicians and beds (Feldstein 1993: 86–95).

According to Arrow, the cause of the uncertainty of medical services is also associated with the fact that the *incidence* of *disease* and the efficacy of *treatment* are unpredictable. This is especially true for serious diseases. The physician often possesses much better information about the care the patient actually "needs". Information asymmetry of both parties involved is significant here. Today, on the one hand, known diseases and methods of their treatment are becoming less unfamiliar. On the other hand, new technologies of treatment again increase the difference in knowledge in the direction of patient - treatment. Thus, the patient usually has to sacrifice a huge amount of time and effort in order to be able, at least in part, to discuss the issue with a health professional. In addition, the persuasive ability of the physician often has a healing power evident in the well-known placebo effect, partially working even after the patient is told that it is a placebo (Kaptchuk *et al*. 2010).

Currently, information barriers are being eliminated through the influence of the increasing potential of information in different parts of the medical industry. Both the patients and physicians themselves and their representatives contribute to this fact.

The patients are trying to evaluate the work of the physicians and are getting registered at different patient web portals to provide their opinions on what is happening on the medical industry market.

Healthcare facilities, including private physicians, have their own websites where they try to promote their work.

Numerous healthcare organizations have adopted, as a part of strategic planning, plans for use of new technologies, which should, as a consequence, lead to the improvement of health care and reduction of operating costs (Goldschmidt 2005; Davidson *et al.* 2006; Klein 2007).

The idea that that it is necessary to adopt and adapt new methods and techniques in such a manner to make the medical personnel willing to embrace new technologies positively, has recently gained recognition (Karsh 2004; Ash, Bates 2005; Berner *et al.* 2005).

Computerisation in healthcare is linked to the general rapid progress of information and communication technologies. Increasing performance of both hardware and software elements and development of networks and their connections to mobile devices provide the theoretical possibility of access of healthcare professionals to highly secured information virtually anywhere and anytime. Information technologies facilitate both clinical and administrative processes, reduce human error rate on the part of doctors and reduce healthcare costs.

Electronic healthcare IT (eHealth) is a dynamically developing area using information technologies in the field of healthcare. The notion of eHealth asserted itself in medicine and healthcare at the turn of 20th and 21st centuries. The connection of computer technology and medicine then gave birth to a new branch of study called eHealth. The purpose of eHealth, following EU recommendation, is complete computerisation of healthcare related processes. This computerisation should ideally be coordinated centrally on the national level through definitions of certain standards for the relevant players.

There are many reasons for utilisation of eHealth technologies by healthcare professionals. eHealth represents an application of informatics and communication technologies across a whole range of functionalities that may support human health. eHealth is a tool of reaction to people´s needs in the area of healthcare. Electronic communication, data transfer, processing and storage play not only administrative role in healthcare. One of the main purposes is accumulation of extensive pools of information the doctor needs to know about every patient and that need to be recorded to meet all regulatory requirements for medical record keeping. Another purpose is the need to retrieve information about the particular patient´s health state, maintaining survey for example about drugs the patient has taken allergies or underlying illnesses the patient suffers from.

The basic assumption of quality healthcare is availability of this information from other healthcare centres, registers and information about healthcare as such. High-standard software can make doctor ´s work much easier.

Technological and research progress allows for more and more accurate diagnosing and applications of new and more effective therapeutic technologies (Singh *et al.* 2008). As a consequence current medical care is becoming more and more complex and expensive. (Douglas, Ryman 2003) All that is closely related to increased demand for healthcare contrasting to lack of qualified healthcare professionals, doctors and nurses. This very conflict is one of the biggest issues faced by healthcare providers (Young 2003; Healthcast 2006). Healthcare facilities are interested in information technologies facilitating logistic planning, patient management, laboratory result communication, sending of electronic messages between radiology, pharmacy and carer departments and hospitals and other healthcare facilities and general communication between them. .(Iakowidis *et al.* 2004). Application of eHealth may also support clinical decisions and minimise the risk of human error caused by inaccuracy or incompleteness of paper documents (Thompson, Brailer 2004; Kawamoto *et al.* 2005; Ohsfeldt *et al.* 2005).

Nevertheless the effects of utilisation of eHealth technologies need not by themselves mean improvement of healthcare itself (Linder *et al.* 2007). All largely depends on the standards of the whole system and impact of its use in healthcare by individuals. In addition to material background successful practical launch of the eHealth system is further conditioned by willingness and skills of healthcare professionals using it. Without complex understanding of experience of the end user it is not possible to propose and implemented eHealth technologies. It is the very human factor and organisational issues that partly explains why most private medical surgeries use eHealth options much less than they could and should (Middleton *et al.* 2005; Jha *et al.* 2006).

Though the unpredictability of health failures is reduced by increased amounts of information obtained in educational activities of prevention, in the case your health fails and the consequences are

permanent and irrevocable, the factor of human behavior itself, in terms of economic rules, is unpredictable.

Health insurance companies as a significant player in the medical market are, by their very existence, a result of this market failure.

Also, Arrow `s conclusions regarding the inflexibility of administratively set prices remain unchanged. The Czech medical market is affected by price regulation, in particular by the prices specified in pricing regulations (point system).

If the law allows for less strict price control, it can be assumed that the participants will act in accordance with the market laws. In the case of a less strict price control for specific health care services, a significant price competition can occur. The government seeks through its interventions to remove the information barriers regarding pricing. For example, based on the amendments to Act No. 48/1997 Coll., in effect as of December 1, 2011, the provider of the "economically challenging alternatives of health care services" must publish their price list in a manner allowing remote access. Nevertheless, the limited awareness of the "buyers" is at the same time still another obstacle to the functioning of price competition.

Even if we accept the idea that patients can easily obtain information about (different) prices of individual providers and that it is for some reason relevant for them (e.g. that a significant portion must be paid in the form of direct payment), it is not certain whether the price would play its regulatory role.

On the other hand, economic incentives can play a very important role for the patient. Situations in which the patient neglects the treatment for economic reasons (in other words, for fear of what the physician will charge him/her in excess of what is covered by compulsory or insurance covered medical care), are fairly common in the USA. (See, for example Hadley 2003).

4. Information technologies in the Czech medical industry

The purpose of this paper is to determine whether any changes have occurred in the Arrow's conclusions due to the rapid development of ICT. The main cause of the changes can be attributed to the current rapid development of education and technologies that push us towards the information society.

The basic precondition for the success of our analysis is the identification of market participants. On one side there is a health care facility that is represented by a physician, and on the other side there is an individual, who is considered a patient. It is likely that the two participants in this market are, as a result of changes in society, in different positions in terms of possibilities to obtain information than they were at the time of Arrow`s observations.

5. Use of medical care

We will try to find out which age group of the population uses health services more often, and where we can expect a significant proportion of changes caused by the development of the society.

The Czech Statistical Office (CZSO) annually publishes information describing the level of average expenditure per insured person. This is shown in Fig. 1.

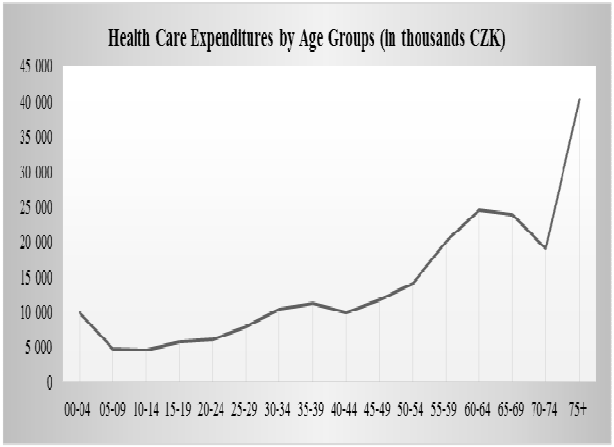

Fig. 1. Health Care Expenditures by Age Groups in thousands CZK (source: Czech Statistical Office 2013)

As the chart shows, the consumption of health services is naturally more expensive for people in higher age groups. They take the largest share of health care costs from medical institutions, thus increasing their importance as potential customers, i.e. participants in the medical market.

In terms of the distribution of the participants in the market according to age, it is necessary to take into account the other side of the medical market. According to a survey published in 2012, VZP (the largest health insurer in the country), the age group of 50-64 years includes 40 percent of all physicians, while every sixth doctor is in the age group of 55-59. Contrary to that, the lowest age groups, i.e. up to 35 years of age, include less than 18 percent of all physicians.

The uneven age structure is also reflected in the calculation of the average age of physicians, which was nearly 50 in mid-2011 (49.6 years for men and 48.6 years for women).

6. Information technologies in doctor's offices

The Czech Statistical Office, in cooperation with the Institute of Health Information and Statistics, has been annually collecting data on the adoption

and use of information technologies in the health care system since 2003.

As regards the availability and use of information technologies, the level of IT facilities available and used in independent doctors' offices differs with different specializations of physicians. Gynaecologists have the best IT equipped offices.

Based on the results of 2011, it can be stated that 9 of 10 independent doctor's offices were equipped with a personal computer. It is therefore evident that it has become necessary for physicians to own a PC and use it in their practice, and the number of doctor's offices without PCs is decreasing. The number of doctor's offices with a PC that is not used is really insignificant.

Out of the offices equipped with a PC, 8 had an Internet connection at the same time, and 8 out of 10 independent physicians communicated via electronic mail, which was used mainly for communication with health insurance companies. Only 5 out of 10 offices had a high-speed Internet connection. Less than a quarter (23%) of independent doctor's offices has a website (Ezdrav 2013).

In 2013, the authors of the paper conducted a survey among physicians engaged in private practice, in order to determine the level of use of e -health in the country. A questionnaire was developed for this survey comprising twenty questions, some of which were used for verification of input data and removal of random answers. The survey interviewed 400 physicians who run private medical practices in the Czech Republic. 373 completed questionnaires were returned, of which 12 were discarded for incompleteness before further processing.

In this paper, we present findings relating to electronic communication between physicians and patients, and we have come to a conclusion that information technologies are increasingly used to facilitate communication between health facilities and the public, and to ensure the maximum possible education and comfort of the patient (Fig. 2).

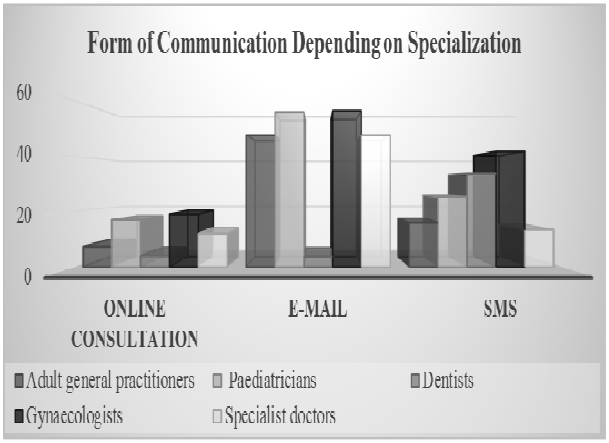

Fig. 2. Individual forms of communication depending on the physician's specialization (source: own processing)

Novelties are appearing such as on- line consultations, or improved websites of hospitals and individual outpatient physicians. Email communication between physicians and patients has been established as a standard; gynecologists and pediatricians communicate with patients via email the most frequently.

This can be explained by the fact that those who communicate very often with this kind of physicians are young women, who consider this form of communication as standard.

Besides, they make use of this possibility to discuss minor issues without having to visit a doctor's office, and are not tied to a specific time.

One of the many attributes that can be identified as the potential of the fact that we are entering a new phase of society is the more intensive use of ICT / IT. The Czech Statistical Office made a survey in this regard. From the point of view of our paper, the most interesting part of the survey is the use of ICT / IT by age range. Some results of the latest published survey of the Office in 2010 are presented in Fig. 3 and Fig. 4.

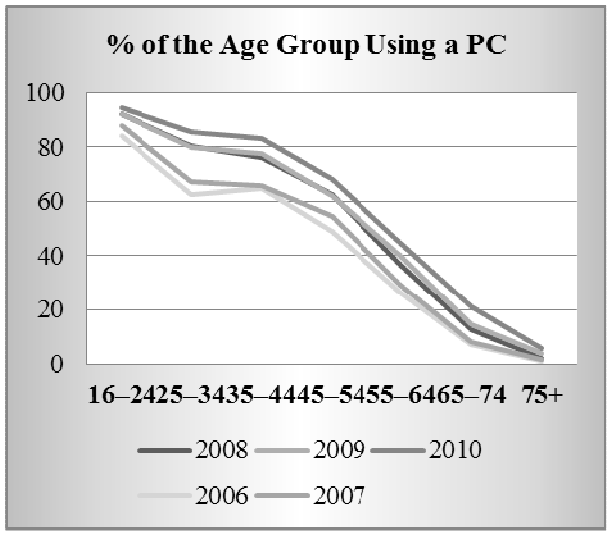

Fig. 3. % of the Age Group Using a PC (source: Czech Statistical Office 2010)

The profile of the graphs clearly shows the trend of computer and Internet use among age groups. It demonstrates the conservative approach of elderly people to the use of ICT / IT. The phenomenon is natural, since the advent of information technologies is too fast to show equally in all age groups.

However, if we observe the intensity of growth for the various age groups, we come to the opposite conclusion (the oldest age groups show the highest growth intensity) – Fig. 5. and Fig. 6.

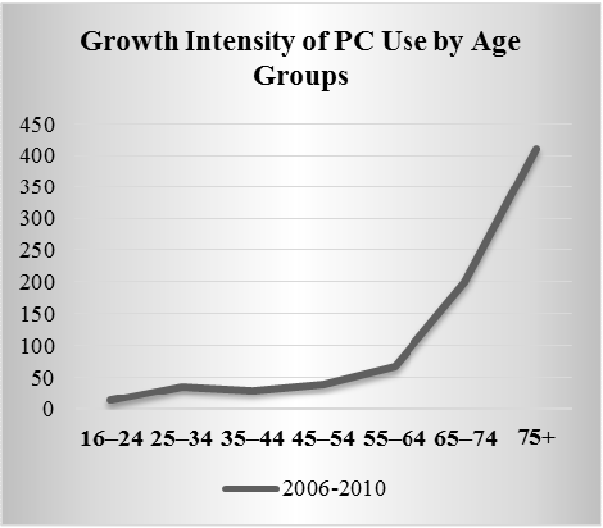

Fig. 4. Growth Intensity of PC Use by Age Groups (source: Czech Statistical Office 2010)

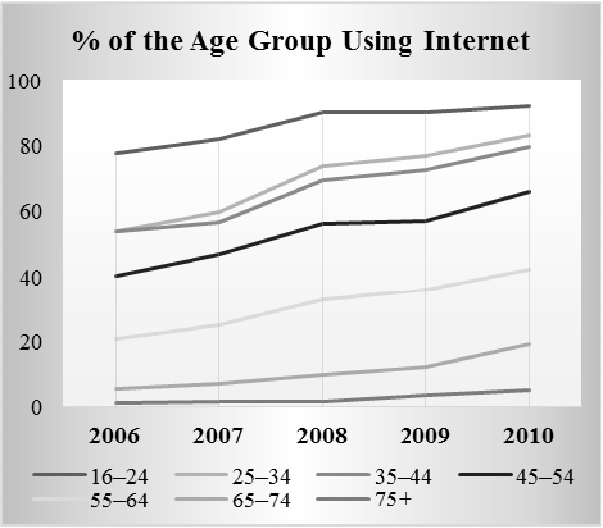

Fig. 5. Percentage of the Age Group Using Internet (source: Czech Statistical Office 2010)

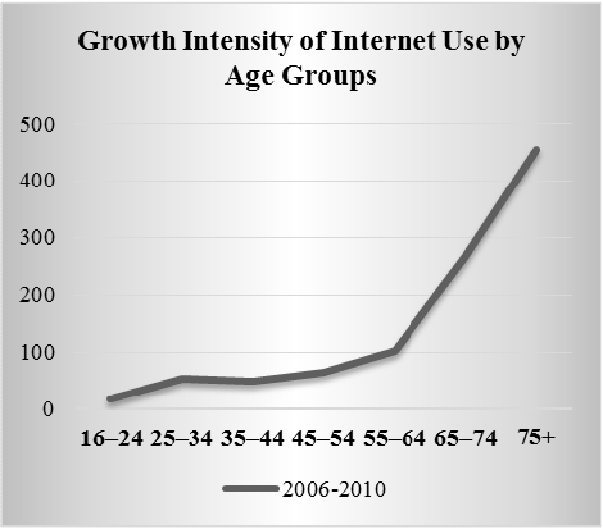

Fig. 6. Growth Intensity of Internet Use by Age Groups (source: Czech Statistical Office 2010)

Shifts between individual age groups as a result of natural aging, and also the support of the development of people's skills making use of the state grant programs, can be considered the source of the high intensity of growth in older age groups.

It can be assumed that in a relatively short period of time, persons with high knowledge of ITC / IT will move into older age groups that always use medical care the most.

7. Conclusions

It is generally understood that none of the healthcare systems is perfect, because each emphasizes a different aspect of medical care, from equality to efficiency and motivation.

As Arrow has observed, there are several reasons for market failure due to the influence of information. In the current Czech society, all information handling practices are significant economic, political and cultural activities.

In this paper, we presented findings relating to electronic communication between physicians and patients, and we have come to a conclusion that information technologies are increasingly used to facilitate communication between health facilities and the public, and to ensure the maximum possible education and comfort of the patient.

It can be assumed that in a relatively short period of time, persons with high knowledge of ITC / IT will move into older age groups that always use medical care the most.

It can thus be assumed that these age groups will in several years significantly help to eliminate the environment with imperfect information in the medical market.

The information asymmetry in the physician - patient relationship, but also in their relationships with other participants in the medical industry, is therefore an important feature of the health care having an impact on the functioning of the entire industry.

The patient, as a consumer, certainly does not see the added value only in the treatment itself, but also in the knowledge he/she gains about the issue that will allow him/her to get to know himself/herself better, and thus identify himself/herself with the medical treatments proposed by the medical professional.

We can conclude from the above that a partial mitigation of this information asymmetry can be achieved, for example, by the duty of the health professionals to better inform the patients about all aspects of their treatment and put the information in the proper context.

In other words, there should be an effort to ensure that the patients are not only aware of the process of their treatment, but that they understand it within the bounds of their "pos-sibilities".

Furthermore, it would certainly be beneficial to support the independence of the patients in terms of their own education, i.e. by improving their awareness of treatments and the health care system.

Here it is important to note that the actual acquisition of information does not necessarily mean "knowledge", and space must be given to health professionals to put the information into the proper context.

Though the information asymmetry in medical industry is generally surmountable only with great difficulty, it can at least be partially mitigated. In particular, the awareness of prices of medical services may be influenced.

Furthermore, the effectiveness of non-price competition can be increased, in which health care facilities with higher quality and broader scope of health services will distinguish themselves more effectively.

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