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Factors and Trends of Innovative Developments of Health Care

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Abstract: The formation of knowledge economy is possible only on condition of formation and effective functioning of innovative systems of various levels. The service industry itself begins to feel the need for innovative solutions that allow improvements of the quality and develop the existing service offerings, develop a unique, entirely new types of services. The authors of this article identify factors that predict the development of innovative health care as one of the most extensive and socially important sectors of the modern economy. These factors include: scientific-technical progress, formation of consumer society, economic globalization, new requirements of the government and business. The authors determine specific trends that arise under the influence of these factors and cause the emergence of various kinds of innovative medical services: Increasing the level of technical and technological content in the structure of health services; increasing the share of intellectual work in the production of health care services; virtualization of the process of medical services; heterogeneity, image making nature and rapid obsolescence of medical services; internationalization and localization of medical services; greening of health care, standardizing and efficiency of health and patent-legal protection of medical services.

Key words: Knowledge economy · Healthcare · Innovative medical services

INTRODUCTION

The end of the last century and the beginning of this one were marked by the development of innovative processes determined by qualitative changes in various parameters of society. The main component of economic processes is information and the condition of its "production and development" is knowledge. Consequently, production, exchange, distribution and knowledge management are the basis of material and intellectual development. Different aspects of new qualities of society and the "new economy" are recorded by many researchers. Trends in post-industrial development and formation of "economic language" is studied by famous scientists A.L Gaponenko [1], V.L Inozemtsev [2], B. H. Milner [3], T. Stewart [4], Francis Fukuyama [5], etc.

As the researchers note [6], the formation of knowledge economy is possible only on condition of formation and effective functioning of innovative systems of various levels. This condition arises from the very nature of knowledge as the main resource of a new type of economy. Knowledge tends to change all the time, serves as the basis of emergence of new knowledge, therefore, becomes outdated quickly. Commodity as the subject of market demand in its pure form becomes, as a rule, a new knowledge. Its use in the production of goods and services provides their improved performance and at the same time creates a new value. In other words, the knowledge to be used is necessary to ensure its transformation into innovative solutions. Knowledge economy is the economy that constantly generates innovations, provides continuity of the process of conversion of new knowledge into new products and services. And it is important that it is not just the economy, providing growth of net "academic" knowledge as a result of a developed system of education and science. Fundamental knowledge, ultimately, is extremely important and necessary. However, the defining feature of knowledge economy is its ability to create on the base of new knowledge, the new value, eventually providing growth and prosperity.

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Since the organizations of the service sector form an integral component of innovative communication, the service industry is organically integrated into the innovation process by participating in the production and commercialization of new discoveries. Accordingly, the service industry itself begins to feel the need for innovative solutions that allow improvements of the quality and develop the existing service offerings, develop a unique, entirely new types of services.

This issue has a special timeliness for one of the most extensive sectors of the economy - the subjects of the health sector. At the present time this sphere is the 3rd on the number of employees in the structure of German economy, the U.S., France, 2nd place in the UK economy, 1st place - in Finland and Sweden. [7] Extremely high social importance of the industry predetermines a careful analysis of ongoing changes for reasons of decision making.

The Main Part: The overall dynamics of the growth of health care imposes on a number of key economic trends that predetermine the priority of vector orientations and medical organizations based on the development of innovative medical services.

In our opinion, the main factors that determine the development of innovative health care is a scientific-technical progress, formation of consumer society, economic globalization, new requirements of the state and business. Let's define them in details:

Scientific-technical progress that affects a new type of economy. As for the health care, this kind of influence is shown in the following trends:

- Increasing the level of technical and technological content in the structure of health services;
- Increasing the share of intellectual work in the production of health care services;
- Virtualization of the process of medical services, determined by a highly developed level of information and telecommunication technologies.

The main directions of innovative approaches to the treatment and diagnosis that will shape the innovative medical services in the near future are:

- Methods of therapy and diagnosis based on nuclear medicine with the use of external sources of ionizing radiation and drug therapy with radioactivity. Now more than 130 different radiodiagnostic methods are used in the world; the nuclear medicine market is about $12 billion. According to forecasts of the head of the state corporation "Rosatom" Sergey Kiriyenko, by 2030, the world market of nuclear medicine will have been increased more than fivefold to $68 billion [8];
- Robotic medicine. Achievements of robotic surgery were demonstrated at the exhibition in the field of medical technology innovations in the UK in 2010. [9] The use of robots enables to carry out surgical operations more precisely, reducing the load on doctors and reducing the probability and number of errors. In 2009 Russian Ministry of Industry and Trade supported the project "Development of technologies and creation of prototypes of artificial tactile mechanicoreceptors for cardio and angiosurgery, intensive care, extreme and space biology and medicine." Within the framework of this project a robotic system is developed to assist those who suffer sudden illness (in the common means of transport: plane, train, coach, ship) injured people (technogenic accident, at the stage of evacuation) and complex patients who are undergoing intensive treatment [10];
- Nanotechnology in medicine. Nowadays this dimension is being developed rapidly.

A great number of scientific evidence of high efficiency nanotechnology in treatment of a number of diseases including cancer, multiple sclerosis, meningitis, AIDS, tuberculosis, etc. are reported by the Institute of Biomedical Chemistry. As the result of American studies also-called a nanoshell that destroys cancer cells, dendrimers - branched nanoscale polymers for the treatment of eye injuries have been already created. A nanotechnology-based biochip offering the possibility to diagnose a number of socially dangerous diseases, etc. was created by the Institute of Molecular Biology of Russian Academy of Sciences [11];

- Telemedicine technologies offering possibility to provide a highly skilled professional help of leading medical centers for patients living in remote areas and ensure the exchange of specialized information among health care professionals. The main areas of telemedicine are telemedicine consultations (planned, emergency videoconsultations, videoconsultations on-line, multipoint modes, etc.), teleeducation and

telementoring, telemedicine dynamic observation systems (patients with chronic diseases, health condition of workers, etc.), telesurgery and remote patient work-up [12]. There are more than 300 telemedicine projects in the USA and Europe and the market for such services is growing rapidly. In consideration of "Concept of development of telemedicine technologies in the Russian Federation" approved in 2001 by joint decree of the Ministry of Health and the Russian Academy of Medical Sciences, a regional telemedicine network is being formed in Russia. Its establishment will allow the most economical and efficient use of intellectual and resource capacity of health institutions [13];

- The development of high-tech medical equipment, devices and instruments, for example, a number of innovative projects in the field of medical industry are commercialized in Russia at present time [10]. These include: the development of medical software and hardware for computer-aided diagnosis of breast cancer, the production of bivalve and development of tricuspid prosthetic heart valves, development of diagnosis of myocardial infarction, the creation and organization of mass production portable low-dose X-ray machines, modernization of injection needles for single use etc.

Formation of consumer society. We consider the second important factor in changing the health sector is the signs of existence of so-called "consumer society", its phenomenon was scrutinized by French scientist Jean Baudrillard [14]. As the author notes, the use of goods, including services in such a society are not exhausted by their simple and practical application and utilitarian purpose (that was the case in previous historical eras), consumerism knows no limit and saturation as it does not deal with things in themselves but with cultural signs that are being exchanged continuously and incessantly with increasing speed. A man's choice in the sphere of consumption, under apparent freedom, in fact is the result of a certain compulsion to differentiation. This, according to the researcher, explains the unlimited nature of consumption, leads to the fact that consumer demand is ahead of a giant productivity growth, accounting for the production of the "reserve army" needs stimulating economic growth.

It should be noted that the author of a consumer society concept and other modern scholars emphasize the danger of such trends in the society development. [15] However, the presence of consumer society features identifies a number of trends in the health sector as a response to specific requests:

- Heterogeneity of medical services, that is diversity, opportunity and necessity to consider the individual characteristics and consumer needs;
- Image making nature of medical services, in the first place, exclusive services involving the use of innovative products and technologies, as confirmation of service consumer's status as a leader, a representative of the elite;
- Rapid obsolescence of medical services, pre-determined by the pursuit of excellence in the symbols of prestige and wealth, typical for the representatives of consumer society.

These trends reinforce the need for innovative healthcare solutions.

Jean Baudrillard emphasized health, associated with the idea of the body as the prestigious value, becomes a functional requirement of status. Therefore, it is the subject to competitive logic and turns a potentially unlimited medical demand and pharmaceutical services - a status requirement, the result of process of personalization and social mobility. According to Jean Baudrillard, todays health is not only and not so much a biological imperative, dictated by the need to survive as social imperative dictated by the struggle for social status [14].

Globalization. Another important factor determining the need for health care in innovative solutions is globalization of the modern economy, which is manifested in the increasing internationalization of means of production markets, goods and services, financial systems, capital mobility, growing interconnection of national markets. Globalization caused by deregulation and liberalization of international trade and capital flows is reflected primarily in the growth of international trade and foreign direct investments. These processes are noticed to be very contradictory in its effects by many researchers [16].

However, under the influence of these trends, volume of world trade of goods and services for the post-war decades has increased more than thirtyfold. The total export of services in world trade grew from $155 billion in 1975 to more than $1 trillion in 1982-1992. The share of developed countries in the international exchange of services is about 80% [17].

As a result, we can state the following strengthening of trends in the health sector:

- Internationalization of medical services involving the use of language and cultural adaptation for any customer in the world economy;
- Localization of medical services – their modification based on special requests of individual groups of consumers, taking into account national and territorial traditions, rituals, identity.

The combination of these, in some degree are ambivalent trends, activation of international trade of health services, provoking the need for growth of innovative component of health care services.

Dumoulin I.I., a researcher of international trade problems of services, notes that the country's competitiveness in the field of health care is primarily dependent on the level of staff and technical equipment of medical institutions. In addition, knowledge of foreign languages, national culture peculiarities, vehicle access, capacity and ability to advertise their medical achievements play a considerable role. Many states authorize foreign activity in the field of health care mainly due to the lack of their own medical facilities and personnel for improving their own health technologies. In particular, above-mentioned telemedicine technologies, providing cross-border transmission of medical services, require an intensive exchange of information among professionals and require appropriate technical and telecommunication facilities. The future potential volume of global market for telemedicine is more than $1 trillion [17].

Government and business priorities. It is recognized that the change of priorities and requirements of the state and the business community to the service sector is an important factor in the development of health care.

In this case, first of all we have in mind changes in government regulation of business entities in the direction of tighten the legislation aimed at protecting consumers and employees, protection of the environment. We also should notice that today business focus on enhancement of improving the quality of business products, focusing attention on consumers' needs, a significant increase in demand for business services, etc. These priorities form a number of trends in services. These trends involve:

- Greening of health care services;
- Standardizing and efficiency of health services;
- Patent-legal protection of medical services.

I.M. Sheyman, having examined the practice of market-based models of health care in Western countries, asserts that the role of the state control action on the system of health care increases. It is observed either as a managed care arrangements (as, for example, in the USA), or based on the state management and planning sectors (Europe). Stimulating competition, the government has to improve simultaneously the quality of health system management: identify new approaches to industry planning, cost management at all levels, standardization and quality assurance of care, pricing, etc. Sellers and buyers' competition of medical services, in turn, complements and reinforces focused arrangements of all stakeholders of the health care industry for a more rational system of medical care [18].

Accordingly, the need for innovative solutions to ensure the improvement and development of health services as well as the emergence of fundamentally new types of them is further amplified.

CONCLUSION

Thus, it can be argued that four main factors impact the modern field of health care. These factors include: scientific-technical progress, formation of consumer society, economic globalization, new requirements of the state and business. Submitted factors are characterized by integration - interconnection and compatibility and, ultimately, form a holistic unity in the regard of need for innovative solutions that generally forms the innovation-oriented development of the health sector.

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