

Reorganization of Healthcare Facilities and its Economic and Medical Feasibility

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Abstract—The purpose of healthcare facility reorganization is optimization of the use of financial, human and material resources, improvement of treatment results and health care provision to a larger number of people. Depending on the type of diseases, intensity of diagnostic and treatment processes and a general state of patients, there are acute care, chronic care, and long-term care hospitals with different financial, personnel and material resources. Given that more than half of healthcare costs are accounted for in-patient medical care, the article aims to use research results for modernizing the structure of healthcare facilities based on the objective assessment of healthcare facility performance, accounting for needs of the population in various types of health care.

Keywords—reorganization, economic and medical efficiency, cost optimization in health care, diagnosis-related groups

I. INTRODUCTION

The main tasks of domestic health care reforming are improvement of the medical care quality and the level of public health and efficient use of available resources.

In most countries, the researchers have been dealing with these problems for a long time. Most of these problems have been solved.

After the end of the Second World War, due to financial difficulties, most North American and European countries began restructuring the hospital sector and strengthening outpatient care. The purpose was to optimize the use of financial, human and material resources, improve treatment efficiency and provide medical care to a larger number of people.

Taking into account the heterogeneity of the medical care, depending on the type and nature of pathological processes, age, general state and social and economic opportunities of the patient, since the 1940s, most Western countries began restructuring their hospitals. The dominant purpose was to reduce the cost of in-patient treatment. All hospitals were divided into three main categories: acute care hospitals (short-term care hospitals), aftercare and chronic care hospitals (medium-term care hospitals), and long-term care hospitals. This differentiation significantly reduced the total cost of inpatient care.

Acute care or short-term care hospitals are multidisciplinary highly specialized healthcare facilities of three main profiles –

therapy, surgery, obstetrics and gynecology. The patient day in these hospitals is the most expensive.

The main objective of these hospitals is elimination of acute pathology and restoration of the previous functional state of the patient. They use modern and most expensive diagnostic and therapeutic technologies and employ highly qualified medical personnel. The average patient stay does not exceed 6-8 days.

Aftercare hospitals (departments) treat patients received from acute treatment hospitals. Chronic care hospitals treat patients with chronic diseases who need constant medical care and uncomplicated medical procedures as well as those who are not able to receive treatment on an outpatient basis. Long-term care hospitals are tuberculosis sanatoria, psychiatric hospitals, hospices and homes for the disabled. These facilities provide long-term care for chronic patients with tuberculosis and mental illnesses. They also care for the elderly and the disabled, for people who lost the ability to live independently due to physical or mental reasons, need constant care and cannot stay at home due to various social reasons.

In addition, these facilities receive people in extremis [1]. It is evident that in aftercare, chronic care and long-term care hospitals, the staffing level and cost of the patient day is lower than in acute care hospitals.

II. METHODOLOGY

The international experience shows that the timely transfer of patients from the acute care hospitals to aftercare departments has several advantages in comparison with outpatient care. In the gerontological aftercare center in Victoria, Australia, advantages of the inpatient care for elderly patients were analyzed. It was found that the total cost of acute care and aftercare over the next six months was \$1,545 versus \$3,078 in the control group of patients discharged for outpatient treatment [2].

According to the statistical data on French hospitals for 1995, the average patient-stay in acute care hospitals was 6,1 days (of the therapeutic profile – 6,8 days, the surgical profile – 5,3 days, and the obstetric-gynecological profile – 4,8 days). In aftercare and chronic care hospitals, the average patient stay was 32 days [3].

One more important factor of inpatient treatment cost reduction was implementation of day and night hospitals and

home care. In 1995, in the USA, 60% of all surgeries were performed on an outpatient basis (ophthalmologic, ENT, orthopedic and pediatric pathologies). Thus, the “day surgery” became a real alternative to hospitalization and is widely used in many countries, including Great Britain, Switzerland, Belgium, and France [4, 5].

Since 1990, the United States have introduced a new type of inpatient care – nursing sub-acute treatment hospitals. These hospitals are designed for aftercare and treatment of patients received from acute treatment hospitals with pathologies requiring long-term complex treatment. In these hospitals, patients need skilled nursing care for 4-7 hours per day, while patients of acute hospitals need nursing care for 8-9 hours. The stay length can vary from several days to three months or two years. Compared with the acute care hospitals, the cost of treatment in these hospitals is lower by 30-50% [6].

In contrast to the nursing hospitals, the US Regency Hospital Company created a network of aftercare hospitals having qualified medical and nursing staff and equipped with diagnostic and treatment equipment, surgery and intensive care blocks.

Due to the fact that patients received from acute treatment hospitals are in a stable health state and do not need acute care, these hospitals need fewer financial resources. However, if necessary, the patient will be provided with acute medical care. It is one of the differences from nursing hospitals [7].

Taking into account the fact that due to complex pathologies patients need long-term treatment in acute care hospitals rather than in aftercare hospitals, in 2000 the United States created a new healthcare facility – a long-term acute care hospital. (LTACH). The average bed-day is 25 days or more. As a rule, they are autonomous departments of acute care hospitals [8].

Due to modern equipment and qualified staff, this facility allows for reduction of the cost of inpatient care and rational use of hospital beds.

In these conditions, special attention should be paid to proper categorization of inpatients. For example, about 10% of patients admitted to the Australian acute care hospitals could receive alternative treatment in chronic care hospitals or on an outpatient basis. According to the American authors, 29% of patients of psychiatric acute care hospitals could be treated in other hospitals, and 24-58% of bed-days were not justified for short-term treatment [9]. In Italy, 14.2% of patients had to be treated on an outpatient basis, and 37.3% of bed-days were unnecessary [10]. In relation to acute care hospitals, these shares increased to 28.4 and 75.7%, respectively [11]. This unreasonable use of hospital resources is regarded as one of the main reasons for an unjustified increase in health care costs [12].

III. RESULTS AND DISCUSSION

At present, given the fact that beds are often used irrationally in Russia, the reorganization of hospitals is a crucial issue.

The issue of hospital reorganization was included in the national health care reform strategy [14] and considered in the

reports by the Russian Minister of Health at meetings of the Board of the Ministry of Health in March, 2000 [14] and October, 2001 [15]. The Minister said that by 2005 inpatient care facilities would have been restructured and divided into:

- intensive care hospitals (acute care or short-term care hospitals);
- rehabilitation care hospitals (aftercare);
- chronic care hospitals, medical and social care hospitals (long-term care hospitals).

However, these solutions were not implemented.

The healthcare facilities reorganization should be based on accurate knowledge of true needs of the population. For example, in 1994-1998 in Ontario (Canada), the closure of 45 hospitals with 5780 acute care beds and 2445 chronic care beds and reduction of healthcare budget by \$800 million without taking into account the real needs of the population caused a number of undesirable effects. They included short-term inpatient care causing unsatisfactory after-care treatment on an out-patient basis, a long wait for hospitalization and surgeries, a dismissal of thousands of health workers, a huge financial deficit [16].

When restructuring the hospital network, one should take into account the geographical location of healthcare facilities, their diagnostic and financial possibilities, as well as the opinion of the population served by this facility.

The reorganization of hospitals is a complex process that requires a detailed study of the needs of the population. These needs depend on a number of factors, including demographic characteristics of the population, climatic and environmental conditions, distances and road quality, etc.

Before 1980, in most countries, public hospitals were financed on the basis of the number of bed-days. The hospital budget increased as the number of bed-days increased. The bed-day was a measure of production for hospitals. Of course, this approach caused an unjustified increase in the number of bed-days and did not contribute to the improvement of internal hospital management.

In order to move from the production logic to the performance one, many Western countries, with the exception of the United States, implemented a hospital financing system based on the “global budget” or “global allocation” (Global Budget, Dotation global). The first country which implemented this system was Canada. Since 1983, most of the western countries, including Australia, Taiwan and New Zealand, have implemented this hospital financing system.

Each hospital has a fixed annual budget and performs all its activities within this budget. In countries having a public health system, the global budget is created from state budget funds. In countries where there is a system of compulsory health insurance, both government allocations and health insurance funds form the global budget. 35-50% of compulsory health insurance funds are allocated to the “global budget” to cover hospital expenses [17].

Taking into account that the initial global budget is created

according to the “historical” approach, i.e. accounting for a level of real expenditures for the last year (before budget creation), the hospitals that had the highest (but not always justified) level of expenditures turned out to be in more favorable conditions.

Implementation of the global budget has improved the budget management due to resource limitation. At the same time, it was an obstacle to the implementation of new diagnostic and treatment methods for the hospitals having limited budget resources [18].

This situation caused prosperity of the private hospital sector which began to implement new methods of diagnosis and treatment and carry out activities that were a prerogative of the public health sector. In addition, according to the Canadian experience, this system increased the waiting time for treatment. According to Frasier Institute (Vancouver), the average waiting time between the examination by a general practitioner and medical consultation is 16.5 weeks; patients wait for cancer treatment for 1-2 months. The waiting time for eye disease treatment is 7 months, and for orthopedic surgeries, it is 8 months. In 1993, in Ontario, by Christmas, all hospitals were closed as their global budget was exhausted [19].

Due to these shortcomings, in 1999, the Swiss Government refused to implement the global budget to finance health care institutions. Norway is implementing a case mix group financing system instead of the global budget.

Taking into account all the negative aspects that accompany the centralized allocation of the global budget to each hospital, many countries distribute the global budget by regions rather than by institutions taking into account regional needs. For example, France created Regional Hospitalization Agencies (RHA) in each region. They analyze and coordinate activities of hospitals and finance them according to the volume of their activities, including the number of inpatients.

In accordance with the French legislation, the volume of the global budget is reviewed annually taking into account an increase in expenditures. After that, the budget is distributed among regions in the form of regional global allocations. According to the law, the stipulated amount of the annual global budget is paid to each hospital in the form of monthly contributions in the amount of 1/12 of the total amount. This system of distribution of the global budget has been adopted in other countries as well.

Thus, it is necessary to develop and use methods of financing hospitals based on the actual volume of their activities. The urgent task is to determine expenditures on each inpatient based on the case mix group financing system. It is necessary to assess expenditures of each hospital. This approach is used in the context of the global budget in such countries as Italy, France, Australia, Norway, Finland, Sweden, Canada, and Peru.

To implement this approach, various patient classification systems were developed. They are homogeneous in terms of hospital expenditures on inpatient treatment. Such systems are called case mix groups systems, or patient typology systems. Case-mix grouping methodologies help health care facilities plan and manage their services. They are used to categorize

patients into statistically and clinically homogeneous groups based on the collection of clinical and administrative data. Taking into account different care requirements of patients, the basis for comparing health care organizations and case mix-adjusted resource use is formed.

The most well-known system of patient classification used for determining required resources for each inpatient is classification by diagnostically related groups (DRG).

We studied a number of hospitals in Irkutsk region in order to restructure them. The system of diagnostically related groups (DRG) was chosen as a methodological tool for analyzing hospitalized patients and needs of the population.

The DRG system is used as a method for paying hospital services at a fixed rate based on characteristics of hospitalized patients. It takes into account neither the volume of services provided, nor the number of bed-days. Using a special software, each patient is included into a specific group with a predetermined cost coefficient and a rate.

Thus, this payment method differs from traditional payment methods as it allows for advance assessment of the expected cost of each hospitalized patient. The system of clinical and statistical groups used to pay for patients treated in the Russian Federation is based on this principle.

A significant disadvantage of using the DSH system to Finance hospitals is the lack of a differentiated structure of hospitals depending on the nature and complexity of the care provided to patients. Unlike most foreign countries, where all hospitals are divided into hospitals of acute (short-term) treatment, aftercare and chronic (medium-term) treatment and long-term treatment, with the appropriate material, personnel and financial support, in Russia, all hospital beds are classified as acute treatment, although there may be chronic patients, and even people hospitalized for medical and social reasons.

However, payment of DSG (or clinical-statistical groups) are only applicable for hospitals, acute treatment, then as the financing of hospitals chronic treatment (offices treatment) and long-term treatment should be specially stipulated rate bed day, not DSG.

Thus, and in view of the fact that in countries using the DSH system, it is only available in acute care hospitals, the most significant point in the transition to payment for the completed case (DSG) is the initial restructuring of hospitals.

Inpatient care for diagnostic-related groups (DSH). To analyze the characteristics of hospitalized patients and assess the required volume of various types of inpatient care when restructuring the hospital network, we studied healthcare facilities.

In the hospitals of Irkutsk region, a software for determining the DSG (Grupper) was implemented to register basic clinical data on each patient and determine its DRG. The study analyzed information on 31,915 patients discharged from six hospitals.

We determined the share of patients who really needed inpatient acute treatment (therapeutic, surgical, obstetric-gynecological) and the share of patients who needed inpatient care, chronic care or outpatient care.

Based on the analysis of data obtained from six hospitals, it can be concluded that the distribution of beds is quite similar when designing a new district hospital. [13].

A significant decrease in the total number of existing acute care beds when implementing a new healthcare system can be observed. The number of reduced beds varies from 31% to 58% for various hospitals. As a result, aftercare and chronic care departments and hospitals are created. Human, material and financial resources are redistributed. Cost cutting has to be assessed.

Despite the differences in the functions of hospitals (inter-district, district, city and central district), the distribution of beds by their profiles is similar for all the hospitals. For example, 50-60% were therapeutic beds, 15-23% – surgical beds, 18–25% – obstetric-gynecological beds. The ratios differ from those presented in the literature. For example, according to the Regional Hospitalization Agency of a large French region, in acute-treatment hospitals, therapeutic beds make up from 44 to 53% of the total bed capacity, surgical beds – from 34 to 46%, and obstetric and gynecological beds – from 10 to 13% [17]. In the hospitals of Friborg (Switzerland), these shares were 40, 46 and 14%, respectively [18]. These differences can be explained by a large variety of the range of patients admitted to city hospitals and a large number of surgeries in these countries.

In addition, it turned out that there is a relationship between the number of acute care beds and aftercare beds. 100 beds of acute care department. One should plan the number of chronic care beds within the same range. Based on the experience of public hospitals in Paris and Ile de France, it is known that acute care beds make up about 63% of the total bed capacity of 25,841 beds in 41 hospitals; after care beds (medium-term stay) – 15% and chronic care and long-term care beds – 22% [19].

IV. CONCLUSION

The results do not exclude other ratios in regional hospitals, especially, in city ones. The volumes calculated based on the expert analysis are indicative and may undergo significant changes. For example, it might be necessary to receive a large number of “acute” patients as a result of industrial accidents or epidemic outbreaks.

In addition, some “chronic” patients might have to be hospitalized to the acute care departments. In these cases, some aftercare beds located in short-term care hospitals can be temporarily transferred to the category of acute care beds.

When restructuring hospitals, special attention should be paid to the categorization of hospital patients. It can be concluded that the reorganization of hospitals is a complex

dynamic process accompanied by changes in inpatient and outpatient care. This process undergoes various changes under the influence of time and other circumstances.

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