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System analysis of organisational and economic mechanisms for managing health care resource provision

**KEYWORDS**
health care system; resource provision; regulation; cancer care; analysis of organisational and economic mechanisms; international experience

**ABSTRACT**

**Introduction.** In shaping a strategy for the socio-economic development of countries and enhancing the level and quality of life of the inhabitants, advancing the health care system is one of the vital national challenges.

The purpose of the article – to analyse data on the provision of medical care to citizens, including the "oncology" profile, for 2019–2021.

**Materials and methods.** A theoretical analysis of research materials (publications in periodicals, conference materials and analytical materials) was used, as well as a descriptive statistical analysis of data from the World Health Organisation, the United Nations, and the World Bank.

**Results.** The country rating of the world in terms of the health care system effectiveness, in which the leading positions are taken by Hong Kong (87.3 points), Singapore, and Spain, is presented. South Sudan ranks first in the ranking of countries in terms of mortality rates, i.e. 7.8 people in 2020 for 1,000 population. The country with the most hospital beds is Monaco, a country and micro-state in Western Europe with 13.8 beds per 1,000. Spending on oncology will reach nearly $240 billion by 2023, an increase of 9–12%. Spending on all medications used to treat cancer patients reached nearly $150 billion in 2020, an increase of 12.9% year over year from treatment medications.

**Conclusion.** An important condition for improving the health care system is the development of the health insurance system, the introduction of new regulation principles, the creation of a unified field of supervision over the medical insurance organisation activities.

INTRODUCTION

Normally, crisis phenomena in the economy and the subsequent market transformations lead to a change in the existing social protection concept for inhabitants or the creation of a new one. The ways of creating and establishing a social protection system are primarily based on the imperative of the time, the created level of the society’s socio-economic development, the existing systems of medical and social protection of citizens, and the emerging socio-political activities of the state.

Global trends in the development of the social sphere of the knowledge society determine the need for development and health care. The emergence of a new economy also leads to changes in management in various areas including healthcare. The health care system development level can be assessed based on the analysis of the number and level of health institutions, the percentage of deaths from diseases, and the availability of innovations [1].

In order to develop the health care system at the present stage, an obligatory element for every health institution to operate is the introduction of measures aimed at increasing their operational efficiency [2]. Health institutions, which have switched to such a management tool, have managed to significantly increase the key performance indicators in their activities.

METHODS

The research is based on general scientific methods of analysis and synthesis, statistical methods of comparative analysis, comparative historical methods.

The data from such periodical publications as The Lancet Global Health, Health Services Research, Social Indicators Research, BMC Health Services Research, The Review of Black Political Economy, BMC Medical Education, Journal of the American Medical Association, International Journal for Equity in Health, Journal of Public Health Policy, etc., as well as conference materials (E3S Web of Conferences), educational publications and analytical materials, were used as materials for the research.

The analysis methodology is based on the research into the health care system development highlights, such as the number of doctors of all specialties, including oncologists, the incidence rate, the average salary of doctors and employees of health institutions, etc. in 2019–2021.

SOURCE ANALYSIS

Over the past decades, the health and social well-being of the population has become essential. Governments, public or private organisations, with both political and social measures, are trying in every possible way to find effective levers of influence on
individual and public health, social security in order to improve its condition. Pandemics and infectious diseases pose a threat to countries and increasingly require an immediate response from national health systems.

Health and well-being contribute to economic and social progress and, in turn, economic security and social cohesion are two key health determinants [3].

Because the economic and social consequences and benefits of health systems are poorly understood, they are often overlooked in major development processes and investment decisions at the local, national, and European levels. Instead, the main discussion focuses on the cost of health systems; and as a result, in many countries, public health spending is questioned and at risk of falling.

International social non-governmental organisations are increasingly involved in addressing health challenges, which play the role of global parties involved in public health policies. However, the implementation of international obligations, standards, programmes, and model legislation for health care and social problems in specific countries largely depends on not the aptness of social and medical interventions but the local context, sociocultural traditions, and ideological preferences [4].

It is important to uphold the human right to health and social justice on the basis of multi-level partnerships, lobbying for favourable government policies and supporting them, developing appropriate recreational infrastructure, and activating communities in terms of training leaders and volunteers in the field of healthy and sound lifestyles. A significant drawback in the public health and social well-being policies is the lack of understanding by a person at all levels of the value of his/her own health and social well-being, the lack of conditions for shaping positive thinking for the preservation of such values.

Health and social welfare policies are complex phenomena determined by various and complex factors. In the modern context, it is based on a multifaceted and extradepartmental approach, since everywhere in the world health, and well-being have become a social issue and an area of focus of officials responsible for ensuring the health and social well-being of the population; moreover, this is used as an indicator of the humanisation of public relations, social health the whole society [4].

It is essential to formulate the health care and social responsibility policy goals, which consist in the development and implementation of the most effective measures aimed at ensuring the safety and development of the human gene pool. Now the humanistic orientation of the activities of the executive authorities and the subjects of the creation of health care and social security policies, in the present context, is embodied in the updated management functions. International agencies, such as WHO (World Health Organisation) and the World Bank, recognise the powerful role of government systems in health and education, measuring the economic benefits of investment in human capital through education, training, and professional development. At WHO, empirical research shows how investments made by health systems bring benefits beyond improved health outcomes [5].
Health expenditures are often a significant part of national budgets and are usually one of the largest expenditures in the public governance sector thus providing significant opportunities for influencing the national economy.

Health systems make a net contribution to economic and social progress as they contribute to sustainable development and equitable economic growth. They achieve this by:

- increasing employment opportunities and implementing inclusive employment policies;
- improving the skills in regional and local labour markets;
- targeting investments in disadvantaged areas or areas with relatively low productivity;
- higher use of micro, small, and medium-sized enterprises in procurement;
- improving social cohesion in disadvantaged communities.

It has an important impact on the resulting economic, social, and human benefits how health systems use and invest in their resources (new technologies, human capital). By leveraging resources and assets in communities, and by adopting a responsible approach to employment, job creation, and the production of goods and services, health systems can transform local economies in order to benefit all.

**RESULTS**

The authors list the world’s countries in terms of the effectiveness of health systems. Table 1 presents the ranking of countries in the world in terms of the effectiveness of health systems based on a synthesis of data from WHO, the UN, and the World Bank [6]. The effectiveness of the health system according to this rating is determined on the basis of three main indicators, average life expectancy at birth, government spending on healthcare as a percentage of GDP per capita, and the cost of healthcare services per capita.

**Table 1**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Country</th>
<th>Effectiveness in 2019, %</th>
<th>Life expectancy in 2019, %</th>
<th>Relative cost, %</th>
<th>Absolute cost, US dollar (exchange rate RUB 65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hong Kong</td>
<td>87.3</td>
<td>84.3</td>
<td>5.7</td>
<td>2.222</td>
</tr>
<tr>
<td>2</td>
<td>Singapore</td>
<td>85.6</td>
<td>82.1</td>
<td>4.3</td>
<td>2.280</td>
</tr>
<tr>
<td>3</td>
<td>Spain</td>
<td>69.3</td>
<td>82.8</td>
<td>9.2</td>
<td>2.354</td>
</tr>
<tr>
<td>4</td>
<td>Italy</td>
<td>67.6</td>
<td>82.5</td>
<td>9</td>
<td>2.700</td>
</tr>
<tr>
<td>5</td>
<td>South Korea</td>
<td>67.4</td>
<td>82</td>
<td>7.4</td>
<td>2.013</td>
</tr>
<tr>
<td>6</td>
<td>Israel</td>
<td>67</td>
<td>82</td>
<td>7.4</td>
<td>2.756</td>
</tr>
<tr>
<td>7</td>
<td>Japan</td>
<td>64.3</td>
<td>83.8</td>
<td>10.9</td>
<td>3.733</td>
</tr>
<tr>
<td>8</td>
<td>Australia</td>
<td>62</td>
<td>82.4</td>
<td>9.4</td>
<td>4.934</td>
</tr>
<tr>
<td>9</td>
<td>Taiwan</td>
<td>60.8</td>
<td>79.1</td>
<td>6.2</td>
<td>1.401</td>
</tr>
<tr>
<td>10</td>
<td>UAE</td>
<td>59.1</td>
<td>77.1</td>
<td>3.5</td>
<td>1.402</td>
</tr>
</tbody>
</table>
In 2015, Russia ranked worst, and it was included for the first time by having got only 24.3 points. The main criterion for including countries in this rating is life expectancy, which should be at least 69 years; therefore, Russia was included only in 2015, since it had had an average life expectancy much lower than necessary before. According to this rating, Russia is in the last five along with such countries as Serbia, Azerbaijan, the USA, and Bulgaria. However, compared to the 2017 estimate, Russia rose by 3 points in 2019, and the effectiveness itself increased by 7 points [8].

By assessing the effectiveness of health care systems around the world, one can see that Hong Kong has the most effective system, which is estimated at 87.3 points, which is higher than the system of the most ineffective system in Bulgaria by almost three times (29.4 points).

By analysing the ranking of countries by mortality rate (see Table 2), it can be seen that the Russian Federation is in the Top 10 countries with the highest mortality rate, having an indicator of 13.4, which is much higher than the average death rate worldwide, which is 8.6.

### Table 2

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Country</th>
<th>Deaths/1000 population, 2018</th>
<th>Deaths/1000 population, 2020</th>
<th>Deaths/1000 population by the profile “oncology”, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>South Sudan</td>
<td>19.3</td>
<td>7.8</td>
<td>2.2</td>
</tr>
<tr>
<td>2</td>
<td>Lesotho</td>
<td>15.1</td>
<td>13.6</td>
<td>2.4</td>
</tr>
<tr>
<td>3</td>
<td>Lithuania</td>
<td>14.8</td>
<td>13.5</td>
<td>2.5</td>
</tr>
<tr>
<td>4</td>
<td>Bulgaria</td>
<td>14.5</td>
<td>10.0</td>
<td>2.3</td>
</tr>
<tr>
<td>5</td>
<td>Latvia</td>
<td>14.5</td>
<td>14.3</td>
<td>2.4</td>
</tr>
<tr>
<td>6</td>
<td>Ukraine</td>
<td>14.3</td>
<td>13.4</td>
<td>2.1</td>
</tr>
<tr>
<td>7</td>
<td>Serbia</td>
<td>13.6</td>
<td>12.4</td>
<td>2.7</td>
</tr>
<tr>
<td>8</td>
<td>Russia</td>
<td>13.4</td>
<td>13.4</td>
<td>1.9</td>
</tr>
<tr>
<td>9</td>
<td>Afghanistan</td>
<td>13.2</td>
<td>7.5</td>
<td>2.5</td>
</tr>
<tr>
<td>10</td>
<td>Belarus</td>
<td>13.2</td>
<td>13.4</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Source: Compiled by the authors.
However, the quality of health services provided and the availability of up-to-date medical equipment in those countries is much higher than in Russia. Therefore, a contradictory situation has arisen, when against the backdrop of a large number of health specialists for treatment with the latest equipment, there is not enough personnel with the necessary level of professional knowledge and skills [9]. In addition to the above, all over the world, there is an acute issue of bed availability in countries; for this, the hospital bed dynamics by countries for 2021 can be analysed (see Figure 1).

![Hospital beds in 2021](image)

**Figure 1** Countries with the largest number of hospital beds in 2021, for 1,000 people [10]

The country with the most hospital beds is Monaco, a country and micro-state in Western Europe with 13.8 beds per 1,000 people. It is followed by Japan at 13.4 and North Korea at 13.2. Belarus ranks fourth with 11.3 per 1,000 people, followed by South Korea with 10.3. Ukraine has 8.9, followed by Russia with 8.4 beds per 1,000 people.

Other countries, such as Canada, had 2.7 beds per 1,000 people at the time of this writing, based on the latest World Bank data, which ranked 67th in the list of countries for hospital beds per capita.

The number of inpatient oncological beds in oncological health organisations and federal cancer treatment institutions of Russia as of December 31, 2020 was: in total – 43,179 beds, including cancer beds for adults – 33,236 beds, oncology beds for children – 2,020, radiological beds – 7,923 (2005 – 7,856 beds; 2015 – 7,786 beds). In 2019, compared to 2018, the number of inpatient oncological beds increased by 185 (by 0.4%).

The main problem of the world’s economy is the definition of social welfare. It has an important impact on the resulting economic, social and human benefits of how the health system uses and invests its resources. By using resources and assets in communities, and by adopting a responsible approach to employment, job creation, and the production of goods and services, the health system can transform the national economy so that it works for all [11].
Approaches to development in the 21st century include the idea of improving the well-being of society by creating a more inclusive and sustainable economy [12]. This is reflected in the growth of development strategies and policies such as the community wealth-building (CWB) and the circular economy. The CWB is a development model that focuses on local stakeholders getting together to organise community assets and circulate wealth within local communities [13]. The inclusive concept of the circular economy demonstrates the link between sustainable growth, good health, and decent jobs, as well as improving the environment and conserving the planet’s natural resources [14].

If one talks about the Russian Federation, then, in accordance with the Cancer Fighting Strategy until 2030, the number of employees in the healthcare sector will also grow, as in European countries. An increase of 3% is expected compared to 2020 [15]. Measures to centralise cancer treatment in dedicated health institutions and promote the collaboration between oncologists and health specialists of other profiles will be taken. America and Great Britain have almost the smallest number of oncologists per capita among all the world’s developed countries. In these states, there are 2.6 and 2.8 doctors per 1,000 citizens, respectively. This is much worse than in countries such as Costa Rica, Lithuania, and Russia [16]. It should be noted that in Russia, according to this report, there are four oncologists per 1,000 citizens. The largest proportion is observed in Greece, which has been suffering from an economic crisis for many years. There are more than 6.1 doctors per 1,000 citizens [17].

As a result of negative economic trends in recent years, the lack of state distribution of specialists, the outflow of health workers to other areas, the average age of health workers has significantly increased. The share of doctors over 55 years old is more than 26%, and it is significantly higher in some specialties. The average age of surgeons, anesthesiologists, radiologists, neurologists, ophthalmologists, and a number of doctors of other specialties in central district hospitals is significantly higher than the average for the region and is approaching retirement age. This circumstance dictates the need to train doctors who are ready to replace retiring specialists [18; 19].

Now that an acute shortage of medical personnel has become apparent in industrialised countries [20; 21], developing countries also face growing migration of skilled workers who are attracted or actively recruited by industrialised countries with better earning opportunities and working conditions [21]. In many countries, the employee attrition rate is disastrous [22]. In Europe, the ratio of skilled health workers to population is 18.9 per person per 1,000.

To solve the accumulated problems in the health care system, an effective regulatory tool is to draft national development strategies and programmes for the area [23].

In the Russian Federation, the Healthcare Development Strategy for up to 2025 is being implemented [15], which includes an assessment of the current state, challenges, and threats to the development of the healthcare system, determines the goal, key tasks, priority areas, and mechanisms for implementing healthcare development.

Comprehensive measures to improve the units of the volume of health care and methods of payment for that were aimed at increasing the efficiency of the healthcare system, creating economic incentives for rational spending of financial resources by health organisations.
Another important parameter of resource provision is the provision of medicines. Spending on oncology will reach nearly $240 billion by 2023, an increase of 9–12%. Spending on all drugs used to treat cancer patients reached nearly $150 billion in 2020, an increase of 12.9% year over year due to treatment medications.

**DISCUSSION AND CONCLUSION**

Today, the prevailing opinion is that the improvement of the entire health care system is of paramount importance for improving the key indicators in the health care system, including the health of citizens and compulsory health insurance.

Along with the management of changes in the health care system, it is also proposed to improve the implementation of project management, the main purpose of which is to enhance the efficiency of the implementation of the socio-economic development goals and objectives.

An essential pre-condition for improving the health care system is the development of the health insurance system, the introduction of new regulation principles, and the creation of a unified field of supervision over the activities of medical insurance organisations.

New ideas are needed to invest in the future, build resilient health systems, tackle inequalities, and provide an inclusive and resilient economy in which everyone can succeed and thrive. Services, that make people "alive, healthy, and civilised", are those that are often taken for granted until they fail (for example, water, infrastructure, or health services). One has to pay for these services, but such large budgets are often viewed only as costs. In fact, they represent an unrecognised potential that can bring significant economic and social benefits to local, regional, and national economies. More holistic approaches, which focus on sustainable development, as well as creating systems in which funding remains in local communities, are in demand.

Thus, among the negative trends in the health care development, one can single out a shortage of health care workers and nurses, an imbalance in the training and employment of health care workers, a shortage of specialists in outpatient clinics, a low level of remuneration of health care workers, as well as a decrease in the provision of the population with beds. However, there are also positive trends in healthcare, such as a decrease in overall morbidity and an increase in the facilities and resources of healthcare institutions.

**REFERENCES**


**INFORMATION ABOUT THE AUTHORS**

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