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Original article

Comparative Analysis of Health Financing Indicators in Response to the COVID-19 Pandemic

[Serzhan Aidossov](#)

Member of the Board, Founder, Republican Public Association "Kazakhstan Association of Health Managers";
Master student of the Academy of Public Administration under the President of the Republic of Kazakhstan,
Astana, Kazakhstan. E-mail: serzhan.aidossov@gmail.com

Abstract

Financing has been critical in combating the pandemic's effects on a global scale. Investments in healthcare infrastructure, economic stimulus packages and research have played pivotal roles crisis response. It is essential to learn from these financing efforts to better prepare for future health emergencies and foster solidarity in times of crisis.

Objective. This paper provides a comparative analysis of healthcare financing among the group of countries in the context of the COVID-19 pandemic. It is part of a series of articles on healthcare financing and mandatory social health insurance implementation in the Republic of Kazakhstan.

Methods. Global healthcare expenditure database analysis

Results. Financial performance of health systems among a group of World Health Organization member states with similar levels of economic development is analyzed and compared.

Conclusions. Overall, the indicators of the Republic of Kazakhstan demonstrate the effectiveness of the response to the pandemic compared to the group.

Key words: healthcare financing, COVID-19 pandemic, healthcare spending, benchmarking, Kazakhstan.

Corresponding author: Serzhan Aidossov, Member of the Board, Founder, Republican Public Association "Kazakhstan Association of Health Managers"; Master student of the Academy of Public Administration under the President of the Republic of Kazakhstan, Astana, Kazakhstan. Postal code: 010000
Address: Kazakhstan, Astana city, Abay Ave., 33A
Phone:+7 7172 75 31 17
E-mail: serzhan.aidossov@gmail.com

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Introduction

The amount of spending on the health system is directly proportional to the availability and quality of medical services and the sustainability of the system itself. Insufficient funding for the healthcare system in Kazakhstan affects the quality and life expectancy of the population. Moreover, it contributes to other problems, such as low salaries of medical workers, which leads to lower motivation to improve services, lower prestige of medical education and profession, and brain drain [3]. These problems lead to skepticism and a lack of trust in medical personnel among the population. Equally important, lack of funding leads to a shortage of new technologies and the supply of essential medicines, not to mention the lack of financial support for research and innovation. Since the healthcare system in Kazakhstan is subsidized, it is not profitable. According to the Ministry of Health of the Republic of Kazakhstan, the economic growth rate outpaces the dynamics of public spending on healthcare, the level of which has a negative trend in GDP share [2]. Kazakhstan's health system revenues come from several prominent sources: the State budget at both the national and regional levels, private insurance, and pocket payments. The total health expenditures are constantly growing, exceeding one trillion tenge since 2014, and almost reached 2 trillion in 2019. At the same time, public spending on healthcare has exceeded one trillion tenge since 2017.

The existing package of State Guaranteed Free Medical Care (the GOBMP) included most of the medical care, but it regularly faced the problem of budget funding insufficiency, which at some point reached a 38% deficit or 540 billion tenge [2]. At the same time, according to the Ministry of Health, the share of "pocket" payments of the population in the structure of total healthcare costs increased, which became a real threat to the financial stability of households [2]. Over the past 20 years, the

Materials and methods

Financial indicators were compared among middle-income countries (LMICs) for the analysis. The World Bank defines middle-income countries by GDP per capita and divides them into two categories: countries with a GDP per capita ranging from \$ 1,036 to \$ 4,045 as low-middle income countries; and countries with upper-middle income with a GDP per capita from \$ 4,046 to \$ 12,535 [11]. These countries generate 30% of the world's GDP and are the main engines of global growth [11].

Results

Initially, we examined indicators of healthcare financing in the Republic of Kazakhstan for the past 20 years, to measure the healthcare expenditures growth. Country performance is illustrated below, based on the Global Health Expenditure Database (GHED) data (Table 1).

Table 1 - Indicators of healthcare financing in the Republic of Kazakhstan

Year	Expenditures on healthcare, million tenge	% of GDP spent on healthcare			% state expenditure
		Public expenditure	Private expenditure	Total	
2000	108 164	2.12	2.04	4.2	50.9
2001	112 827	1.97	1.50	3.5	56.6
2002	136 505	1.93	1.68	3.6	53.5
2003	171 720	2.04	1.68	3.7	54.8
2004	233 812	2.32	1.66	4.0	58.2
2005	296 164	2.53	1.37	3.9	64.9
2006	347 088	2.31	1.08	3.4	68.1
2007	347 349	1.79	0.91	2.7	66.3
2008	489 538	2.27	0.78	3.0	74.3
2009	595 121	2.66	0.84	3.5	75.9
2010	596 963	1.84	0.89	2.7	67.4

median value of out-of-pocket spending on healthcare has been 32.8 %.

Previous research indicates that the introduction of social health insurance can significantly reduce mortality due to the broader use of medical care through the reduced financial burden of obtaining medical care [1]. Compulsory social health insurance (OSMS) was designed to serve as a source of financing for health care through individuals' and employers' contributions; that would attract additional resources for the development of health care and restrain further growth of budget expenditures. Among the fundamental principles of the Kazakhstani social health insurance model, social justice was the critical component. The state covers payments for 15 vulnerable categories of citizens. Thus, about 11 million citizens participate in the compulsory health insurance system free of charge, which should reduce out-of-pocket health care costs. However, the introduction of OSMS fell in a year that changed the course of history, which was a great challenge for the country.

Since March 2020, the COVID-19 pandemic has begun to overwhelm health systems in most countries and has led to substantial economic losses. [6]. In this context, the sustainability of health systems was critical in dealing with the consequences of emergencies and ensuring access to healthcare services for the population [8]. In 2020, almost all WHO member states covered the increased need with budget allocations [9, 10]. Some resources were allocated to social protection and economic stabilization.

The purpose of this paper is to study and compare the financial performance of health systems in Kazakhstan in the context of a group of WHO member countries with similar levels of economic development.

Health expenditure indicators that show resource flow were selected to assess the performance. The Global Health Expenditure Database (GHED) was thoroughly examined to study these indicators [7]. This electronic database provides data on health expenditure for more than 190 WHO Member States and is available to the public. For comparison, only 2020 was estimated.

One of the most important indicators is out-of-pocket spending, that is measuring how much of the financial burden population experiences. The result of the analysis is presented in the graph below (Figure 1).

Table 1 - Indicators of healthcare financing in the Republic of Kazakhstan (Continuation)

Year	Expenditures on healthcare, million tenge	% of GDP spent on healthcare			% state expenditure
		Public expenditure	Private expenditure	Total	
2011	734 988	1.84	0.76	2.6	70.8
2012	942 012	2.07	0.97	3.0	68.1
2013	958 606	1.85	0.82	2.7	69.4
2014	1 180 231	2.13	0.84	3.0	71.7
2015	1 243 087	1.92	1.12	3.0	63.1
2016	1 607 520	2.04	1.38	3.4	59.6
2017	1 659 885	1.89	1.16	3.1	62.0
2018	1 741 988	1.71	1.10	2.8	60.8
2019	1 938 192	1.67	1.12	2.8	59.9
2020	2 676 850	2.51	1.28	3.8	66.2

The growth of healthcare costs is growing every year in Kazakhstan as well. New technologies that improve the quality of medical services enter the market; high

expectations for quality and other factors contribute to the cost rise.

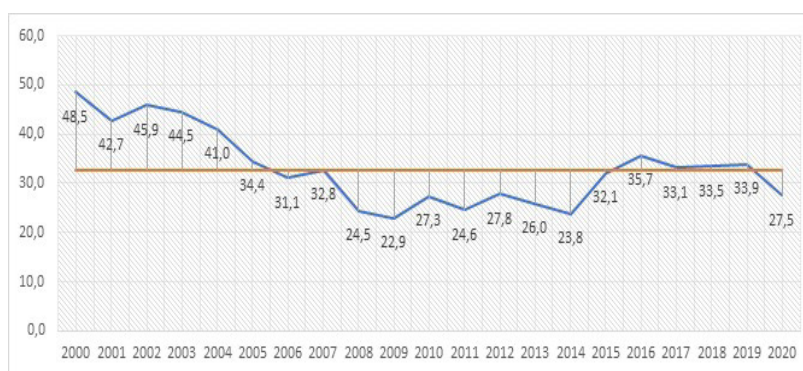


Figure 1 - Out-of-pocket healthcare expenditures dynamics, %

High costs have improved health outcomes, but the financial sustainability of health systems is under threat. In the Republic of Kazakhstan, per capita expenditures are

expanding in government and out-of-pocket spending (Figure 2).

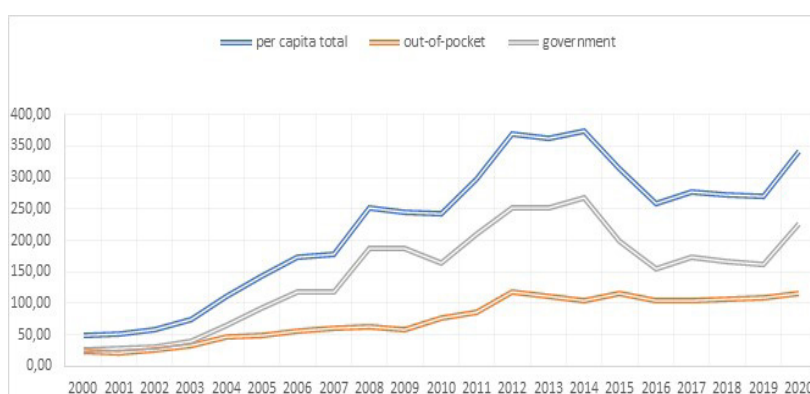


Figure 2 - Healthcare costs growth in Kazakhstan, per capita, in US dollars

To study and compare the financial performance of health systems in Kazakhstan in the context of a group of WHO member countries with similar levels of economic development, we took two basic indicators (1) GDP per capita in USD, and (2) healthcare spending in GDP %. We compared middle-income countries (LMICs) for the analysis. Countries that fall under the definition, are compared in a table below (Table 2).

According to WHO, the total number of cases in Kazakhstan was 1.502.857. The total number of deaths was 19,072. In addition to the countries with an above-average income according to the World Bank classification, comparing standardized indicators with the European region makes sense.

Out of the 56 countries included in the group, countries that did not have data were excluded, and countries that did not have social health insurance were excluded. In the final analysis, 36 WHO member countries were examined. Regarding expenses, the Republic of Kazakhstan ranked 11th in its group. At the same time, Kazakhstan's spending was higher than that of 80.7% of the countries in the group. Current expenditures per capita ranged from \$142.5 to \$1214.5, with a median value of \$468.4.

Table 2 - Comparison of healthcare funding indicators

	Country	GDP per capita in \$	Health Spending, % GDP
	median	6 786.3	6.7
1	Kazakhstan	9 014.2	3.8
2	Botswana	863.25	6.2
3	Equatorial Guinea	6 of 279.2	3.8
4	Gabon	6 681.1	3,4
5	Mauritius	414.68	6,7
6	Namibia	4 266.3	8,9
7	South Africa	5 704.6	8,6
8	Argentina	8 650.7	10.0
9	Brazil	6 794.5	10.3
10	Columbia	5 307.2	9.0
11	Costa Rika	12 132.9	7.9
12	Cube	9 499.6	12.5
13	Dominic	7 557.2	5.6
14	Dominican Republic	7 167.9	4.9
15	Ecuador	645,2 5	8,5
16	Grenada	436.98	5,8
17	Guatemala	469.64	6,5
18	Guyana	863.1 6	5,5
19	Jamaica	4 Of 926.4	6,6
20	Mexico	628.0 8	6,2
21	Panama	12 569.2	9,7
22	Paraguay	5 353.3	7,6
23	Peru	163.36	6.3
24	Saint Lucia	019.79	6.7
25	Saint Vincent and the Grenadines	336.18	4.8
26	Suriname	786.36	6.8
27	Venezuela (Bolivarian Republic of)	3 733.1	3.8
28	Iraq	3 978.6	5.1
29	Jordan	3 998.4	7.5
33	Lebanon	503.612	8.0
34	Albania	5 278.2	no data
35	Armenia	4 505.7	12.2
36	Azerbaijan	4 151.0	4.6
37	Belarus	370,4 6	6.4
38	Bosnia and Herzegovina	6 009,5	9.8
39	Bulgaria	054.510	8.5
40	Georgia	4 207.9	7.6
41	Montenegro	7 583.5	11.4
42	The Republic Of Moldova	4 523,3	6.8
43	Romania	12 907,2	6.3
44	Russian Federation	10 187.6	7.6
45	Serbia	7 699.9	8.7
46	Republic Of North Macedonia	5 741.4	7.9
47	Turkish	558.88	4.6
48	Turkmenistan	509.38	5.7
49	The Maldives	7 275.5	11.3
50	Thailand	6 998.5	4.4
51	China	10 430.4	5.6
52	Fiji	4 969.9	3.7
53	Malaysia	10 150.8	4.1
54	Marshall Islands	620,4 5	13.0
55	Tonga	664.6 4	5.3
56	Tuvalu	973.8 4	21.5

The share of expenditures in the GDP structure of countries ranged from 3.4% to 13 %, with a median value of 6.6%. The population's out-of-pocket payments per capita

ranged from \$8.22 to \$ 439.5 capita, with a median value of \$155,6.

Table 3 - Comparison of some financial indicators

	Average indicator in the group of countries	KAZ
Current expenditures per capita, in USD	468.4	342
Current expenditures on health care in % of GDP	6.6	3.8
Out-of-pocket payments per capita in US dollars	155.6	93.9
Out-of-pocket payments in %	27.55	27.55
Social insurance contributions in US dollars	101	25

As a percentage, out-of-pocket payments ranged from 1.1% to 77.7 %, with a median value of 27.55%. Social security contributions in the group of countries totaled up to \$ 613 per capita, with a median value of \$ 101.

A comparison of financial indicators, as well as some pandemic indicators, is presented in tables 3 and 4.

Table 4 - Comparison of some pandemic indicators

	Incidence per 100,000 population	mortality per 100,000 population	Vaccines-Total doses administered per 100 population
Worldwide	9.855. 45	89.11	172.7
RC	8.003. 84	101.57	204.3
WHO European region	29.638. 36	240.38	185.25
Upper-middle-income countries	46.467. 55	669.64	205.853

Discussion

Pandemics brought significant challenges for healthcare services delivery in low and low-middle income countries [13]. Health care delivery systems were and remain unready for outbreaks of this scale [14]. The pandemic highlighted gaps in health surveillance systems and disease prevention as well [15]. Healthcare expenditures have increased in response to growing prevention, detection, and treatment needs. It should be noted that the increase in public health spending was part of a much broader budget response to the pandemic. In addition, social security spending has increased dramatically that year. Governments have tried to help the population to cope with the harsh economic consequences of COVID-19. Despite responding effectively to the challenges of the first year of the pandemic, Governments face the challenge of maintaining the growth of public spending on health and social services.

According to WHO, the total number of cases in Kazakhstan was 1,502,857. The total number of deaths was 19,072. In addition to the countries with an above-average income according to the World Bank classification, comparing standardized indicators with the European region makes sense.

Kazakhstan is implementing health financing reforms to improve the availability and quality of health services. The Government has introduced mandatory social

Conclusions

Based on the comparative analysis, it can be assumed that the country has coped well with the tasks set during the pandemic. The country demonstrates effectiveness compared to a group of WHO member countries with similar income levels. Further in-depth study of the subject is needed. It is recommended to publish the missing indicators from the databases in open access.

In the end, it is important for the government to monitor the progress towards reaching progress in healthcare. Observations should include details, such as data from regions, and out-of-pocket payments. This surveillance is recommended to member states of the WHO as a part of SDG-3 monitoring. For the countries with emerging economies, monitoring of the SDG 3.8.1

health insurance to finance health services and expand public access to health care during the most challenging times for the global economy. As in many countries of the world, Kazakhstan's healthcare system is facing a series of challenges of varying complexity due to the COVID-19 pandemic. The country has taken various measures to respond to the crisis, including strengthening testing and contact tracing, setting up quarantine facilities, increasing the capacity of hospital beds, and launching vaccination campaigns. The pandemic was followed by geopolitical tensions in the region, which also put pressure on the healthcare system and public administration.

These events highlight the importance of sufficient funding for health care and ensuring that the country is prepared for various challenges. Experience in the COVID-19 response affects health policy in Kazakhstan and has the potential to lead to improvements in health financing reforms.

"Coverage of essential health services" and SDG 3.8.2 "Catastrophic health spending" are recommended to ensure reaching of the sustainable development goals in healthcare and social justice.

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COVID-19 пандемиясы кезіндегі денсаулық сақтауды қаржыландыру тиімділігін салыстыру

Айдосов С.С.

Қазақстандық денсаулық сақтау менеджерлерінің қауымдастығының кеңес мүшесі, негізін қалаушысы; Қазақстан Республикасы Президентінің жанындағы Мемлекеттік басқару академиясының магистранты, Астана, Қазақстан.

E-mail: serzhan.aidosov@gmail.com

Түйіндемe

COVID-19 пандемиясының бұрын-соңды болмаған жаһандық салдары болды, бұл елдердің экономикасы мен денсаулық сақтау жүйелеріне әсер етті. Осы мәселелерді шешу үшін мемлекеттер мен халықаралық ұйымдар ресурстарды жұмылдыру мен қаржыландыруға үлкен күш жұмсады. Жауап беру денсаулық сақтау инфрақұрылымын қолдау, экономикалық қиындықтарды жеңілдету және зерттеулер мен әзірлемелерді ынталандыру үшін үйлестірілген күш-жігерді қажет етті.

Қаржыландыру жаһандық ауқымдағы пандемияның салдарымен күресу үшін өте маңызды. Денсаулық сақтау инфрақұрылымына инвестициялар, экономикалық ынталандыру пакеттері және зерттеулер төтенше жағдайға жауап беруде шешуші рөл атқарды. Болашақ денсаулық сақтау төтенше жағдайларына жақсы дайындалу және дағдарыс кезінде ынтымақтастықты нығайту үшін сабақ алу маңызды.

Мақсаты. Бұл мақалада COVID-19 пандемиясы аясында елдер тобындағы денсаулық сақтауды қаржыландырудың салыстырмалы талдауы келтірілген. Бұл - денсаулық сақтауды қаржыландыру және Қазақстан Республикасында міндетті әлеуметтік медициналық сақтандыруды енгізу туралы мақалалар сериясының бөлігі.

Әдістері. Денсаулық сақтаудың жаһандық шығындары туралы GHED мәліметтер базасын талдау.

Нәтижелер. Дүниежүзілік денсаулық сақтау ұйымына мүше мемлекеттер тобындағы денсаулық сақтау жүйелерінің қаржылық көрсеткіштері экономикалық дамудың ұқсас деңгейімен салыстырылды.

Қорытынды. Жалпы, Қазақстан Республикасының көрсеткіштері топтың көрсеткіштерімен салыстырғанда пандемияға ден қою шараларының тиімділігін көрсетеді.

Түйін сөздер: денсаулық сақтауды қаржыландыру, COVID-19 пандемиясы, денсаулық сақтау шығындары, салыстырмалы сараптау, Қазақстан.

Сравнительный анализ показателей финансирования здравоохранения в период пандемии COVID-19

Айдосов С.С.

Член Совета, учредитель Казахстанской ассоциации менеджеров здравоохранения; Магистрант Академии государственного управления при Президенте Республики Казахстан, Астана, Казахстан. E-mail: serzhan.aidossov@gmail.com

Резюме

Финансирование имеет решающее значение для борьбы с последствиями пандемии в глобальном масштабе. Инвестиции в инфраструктуру здравоохранения, пакеты экономических стимулов и исследования сыграли ключевую роль в реагировании на чрезвычайную ситуацию. Важно извлечь уроки, чтобы лучше подготовиться к будущим чрезвычайным ситуациям в области здравоохранения и укрепить солидарность во время кризиса.

Цель исследования. В данной статье представлен сравнительный анализ финансирования здравоохранения в группе стран в контексте пандемии COVID-19. Это - часть серии статей о финансировании здравоохранения и внедрении обязательного социального медицинского страхования в Республике Казахстан.

Методы. Анализ базы данных о глобальных расходах на здравоохранение GHED.

Результаты. Сравнены финансовые показатели систем здравоохранения в группе государств-членов Всемирной организации здравоохранения с аналогичным уровнем экономического развития.

Выводы. В целом показатели Республики Казахстан демонстрируют эффективность мер реагирования на пандемию по сравнению с показателями группы.

Ключевые слова: финансирование здравоохранения, пандемия COVID-19, расходы на здравоохранение, сравнительный анализ, Казахстан.