**REPUBLIC OF AZERBAIJAN**

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# ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

# DIRECTIONS FOR ENHANCING THE ROLE OF THE HEALTHCARE SYSTEM IN THE DEVELOPMENT OF HUMAN CAPITAL

Speciality: 5307.01 – "Economic Theory"

Field of science: 53 – Economic

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**Baku – 2025**

The dissertation work was performed at the "Demography and employment problems" department of the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

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Dissertation Council ED 1.10 of Supreme Attestation Commission under the President of the Republic of Azerbaijan operating at the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

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## GENERAL CHARACTERISTICS OF THE RESEARCH WORK

**Relevance of the topic and level of development:** People, regardless of their socio-economic form, constitute the main productive force of all societies; the main goal of social progress is the improvement of people's well-being. The first prerequisite for the entire history of mankind is the existence of living human individuals[1]. Therefore, the study of man and his productive capacity has been considered one of the main tasks of economists at all times. However, in connection with the industrial revolution that took place in the 19th century, the development of the material and technical base of production took precedence over human development and his productive capacity, creating the illusion that physical capital was superior in ensuring economic growth, and therefore, for many years, human productive capacity was evaluated as a secondary factor of production. Since the end of the 20th century, as a result of innovations in the development of socio-economic progress and its technological base, the role and place of people in the process of social reproduction have changed radically, and they have begun to be evaluated as the main and main factor of economic development[2]. Therefore, since 1990, the United Nations Development Program (UNDP) began to publish and distribute the Human Development Report, and the methodology and socio-economic indicators of human development proposed by the UN have revealed the need to approach development not only as the development of material values and services, but also as the development of people. After that, there was a need to focus on the study of problems related to people and human capital.

**Level of study of the problem.** The idea of human capital was first reflected in the works of the classics of economic science - V.

[1]K. Marx and F. Engels. Selected works of In three volumes. Volume 1. Baku, 1978, p. 8.

[2] Sh.Muradov., R.Muradov. On human capital and some of its scientific-theoretical and conceptual foundations. News of ANAS. Economics series. Baku, 2022-1, p. 5.

Petty, A. Smith, I. Seg and D. Ricardo, and later K. Marx, A. Marshall and others. The first to stand out among those who laid the foundation for the theory of human capital were American economists - T. Schulz and G. Becker. This problem was reflected in the works of foreign scientists L. Satkina, S. Kurgansky, M. Kritsky, P. Heini, V. Korguniv, S. Ermak, Y. Shevchenko, S. Valentey, Yu. Yadgarov, S. Fisher, as well as in the works of Azerbaijani economists Sh. Muradov, R. Muradov, A. Muradov, G. Azizova and F. Musayeva. The point is that the expenses directed to the development of healthcare (medical services, disease prevention, dietary food, improvement of housing conditions) play an indispensable role in increasing people's working capacity and health, as well as extending their life expectancy. However, for some reason, healthcare expenses are still considered unproductive expenses. However, investments directed to healthcare should be approached from the perspective of maintaining and developing human capital aimed at the long-term development of the country, and special care and attention should be paid to the development of healthcare. However, unfortunately, despite the many achievements made in the healthcare system of our country during the years of independence, certain negative trends have emerged and increased in the development of this area in recent years. Thus, despite the fact that the population of our republic increased by 117.4 percent from 9,111.1 million to 10,180.8 million people in the period covering 2011-2023[3], the number of doctors of all specialties increased by only 101.5 percent from 33.1 thousand to 33.6 thousand people, while the number of paramedical staff decreased by 7.5 percent from 60.1 thousand to 55.6 thousand people; the number of doctors of all specialties per 10 thousand people of the population decreased by 10.3 percent from 36.8 to 33.0 people; the number of paramedical staff decreased by 18.3 percent from 66.8 to 54.6 people; the number of hospitals decreased by 2.5 times from 516 to 338; The number of hospital beds per 10,000 population decreased by 26.1 percent, from 50.9 to 37.5; the number of beds for sick children decreased by 42.2

[3]Demographic indicators of Azerbaijan. Statistical collection. Baku, 2024, p. 49.

percent, from 27.6 to 16.2. 75.7 percent of doctors of all specialties working in our republic are doctors of only 11 specialties. According to the data as of the beginning of 2024, 67.5 percent of doctors of all specialties working in our country; 44.1 percent of paramedical staff; 45.8 percent of operating hospitals; and 51.3 percent of hospital beds are in the city of Baku, where only 23.0 percent of the country's population lives[4]. It is no coincidence that the Human Development Report for 2022 shows that the Republic of Azerbaijan is ranked 91st among 191 countries[5]. All this shows how relevant the choice of the dissertation topic is and how important it is in terms of scientific, scientific-theoretical, and scientific-reading significance.

**The object** of the study is the healthcare system of the Republic of Azerbaijan, and the **subject** is the study of events and processes related to the impact of healthcare on the formation and development of human capital in the Republic of Azerbaijan.

**Research goals and objectives.** The main goal of the research work is to study in depth and generalize the ideas, views and approaches put forward in the works of classics and prominent economists on the subject and to develop proposals and recommendations on increasing the role of healthcare in the development of human capital in the future based on the analysis and assessment of the impact of healthcare on the formation and development of human capital in our country.

To achieve the goal set in the research work, the following tasks of scientific and practical importance have been put forward:

- Disclosure of the essence and content of the concept of human capital, as well as theories and views on human capital;
- Quantitative assessment of the impact of healthcare on the formation and development of human capital;
- Analysis and assessment of the level of development of healthcare in the Republic of Azerbaijan and the factors affecting it;

[4]Health, social protection and housing conditions in Azerbaijan. Statistical collection. Baku, 2024. p. 29

[5] https://ru.wikipedia.org/wiki/

- Comparative analysis of healthcare sub-indices of human capital in the Republic of Azerbaijan with countries around the world;

- Identification of the main determinants of the healthcare factor of human capital;

- Identification of directions for increasing the impact of healthcare on the formation and development of human capital in the Republic of Azerbaijan;

- Development of proposals and recommendations on increasing the impact of healthcare on the formation and development of human capital in the Republic of Azerbaijan.

**Research methods:** The research method was selected in accordance with each task set during the study. For example, when specifying the concept of *"human capital"* for our study, a comparative analysis of a large number of approaches existing in the economic literature was carried out. Such comparative analysis and classification methods were widely used when choosing a method for quantitatively measuring *"human capital"*, when studying the effects of human capital on economic and socio-economic development and macroeconomic indicators of health, as well as econometric methods, in particular, the linear regression method, the least squares method.

**The main provisions defended:**

**Provision 1.** The need to study theories and views on human capital;

**Provision 2.** The formation and development of human capital depends to a large extent on the level of development of healthcare;

**Provision 3.** Negative trends are occurring in the main indicators characterizing the level of development of healthcare in the Republic of Azerbaijan and it is necessary to eliminate them;

**Provision 4.** In the Republic of Azerbaijan, payments by the population have a high specific weight in financing healthcare, which creates a risk to the population's use of healthcare services. In such a case, a decrease in the population's income may create serious problems for the realization of these payments;

**Provision 5.** The existence of a strong linear regression relationship between the human capital index and the logarithm of

health spending suggests that health spending, regardless of its source, should be increased to develop human capital;

**Provision 6.** There are mutual cause-and-effect relationships between human capital and its health components and GDP per capita in the Republic of Azerbaijan;

**Provision 7.** There are mutual cause-and-effect relationships between human capital and its health components and poverty levels in the Republic of Azerbaijan;

**Provision 8.** There is a mutual relationship between the health factors of human capital and economic growth in the Republic of Azerbaijan. Thus, an increase in GDP per capita has a positive effect on both components of the health factor of human capital ("survival" and "health status"). There is also an opposite effect between these indicators;

**Provision 9.** There are serious differences between the different economic regions of the country in the number of live births of children under 1 year of age and deaths from various causes per 1,000 population in the Republic of Azerbaijan, as well as in the level of development of key health indicators, and there is a great need to regulate them;

**Provision 10.** The health components of the human capital index depend on the share of compulsory insurance costs in health care costs. In countries with high compulsory health insurance costs, the number of child deaths under the age of 5 is low. Therefore, increased attention and care should be paid to regulating this issue in our country.

**Scientific novelty of the research:**

- The essence and content of human capital were clarified, and theories and views on human capital were analyzed and generalized;
- The level of development of human capital in the Republic of Azerbaijan was assessed by **two methods**: the expenditure method and human capital development;
- The empirical relationship of the human capital indicator calculated by the expenditure method with the volume of GDP per capita and the poverty level was studied;

- The impact of the dynamics of payments by the population in the health component of human capital on the indicators of *"survival"* and *"health status"* in the country was assessed by regression analysis;

- Based on the strict linear regression relationship between the human capital index and the logarithm of health expenditures, the development of human capital was predicted;

- The interaction between the development of human capital in health and economic growth and poverty level in the Republic of Azerbaijan was econometrically assessed;

- Suggestions and recommendations were given on increasing the impact of health development on human capital.

**Theoretical and practical significance of research.** During the study, the results of theoretical and empirical studies devoted to the problems of *"human capital", "human capital measurement methods", "human capital comparison methods of countries", "economic impacts of human capital", "socio-economic impacts of human capital"* in the economic literature, UN Human Development Reports, and data from the World Health Organization were used.

As a result of the study, it was found that the development of human capital in Azerbaijan as a whole, or its health factor in particular, has a positive effect on the volume of GDP per capita. Therefore, there is a need to develop these factors. The development of these factors, along with other factors, is also associated with an increase in health spending. Regardless of the source of such spending, its increase stimulates the development of human capital and gives impetus to economic development. One of such sources and an important one is the development of the health insurance system. This result, as a preliminary study, has both theoretical and practical significance. Because the fact that human capital leads to economic development, and economic development leads to the development of human capital, provides a basis for quantitatively assessing the nature of the cause-and-effect relationships between them. In our study, we only succeeded in studying the impact of human capital and its health components on the volume of GDP per

capita. However, there is a need to assess whether these relationships also exist with other economic indicators and what their nature is.

**Approval and application.** The main provisions of the dissertation work and the specific proposals put forward in the work were published in various rated scientific journals, including the journal included in the RINC database. Some provisions of the dissertation work were reported at scientific and practical conferences held in the country, discussed at meetings held in relevant economic institutions.

6 articles on the topic of the dissertation were published. One of them was published in a highly rated journal included in the RINS and Scopus databases. 3 theses on the topic of the dissertation were published as materials of 6 conferences held in the country.

**The name of the organization where the dissertation work was performed:** The dissertation work was carried out at the "Demography and Employment Problems" department of the Institute of Economics of the Ministry of Education of the Republic of Azerbaijan under the supervision of Corresponding Member of ANAS, Honored Scientist, Doctor of Economic Sciences, Professor Shahbaz Muradov.

**The total volume of the dissertation in characters, indicating the volume of the structural sections of the dissertation separately.** The dissertation consists of three chapters and nine paragraphs, an introduction, a conclusion and suggestions. The first chapter is 43 pages, the second chapter is 42 pages and the third chapter is 41 pages. The total volume of the dissertation is 163 pages or 230 thousand characters. The dissertation uses 29 tables, 18 graphs, 3 figures, as well as 158 sources.

## STRUCTURE OF THE DISSERTATION WORK

**INTRODUCTION.**

**CHAPTER I. SCIENTIFIC THEORY AND CONCEPTUAL BASIS OF HUMAN CAPITAL DEVELOPMENT**

1.1. The essence and content of the concept of "human capital"

1.2. Methods of measuring the human capital index and its health subindex

1.3. Some theoretical aspects of the impact of health on people's life expectancy, physical and mental health

**CHAPTER II. ANALYSIS AND ASSESSMENT OF THE IMPACT OF HEALTH ON HUMAN CAPITAL DEVELOPMENT IN THE REPUBLIC OF AZERBAIJAN**

2.1. Analysis and assessment of the level of development of health in the Republic of Azerbaijan and the factors affecting it

2.2. Assessment of the relationship of human capital with macroeconomic indicators in the Republic of Azerbaijan

2.3. Comparative analysis of the health factor of human capital in the Republic of Azerbaijan with countries of the world

**CHAPTER III. DIRECTIONS FOR INCREASING THE ROLE OF THE HEALTH FACTOR IN HUMAN CAPITAL DEVELOPMENT IN THE REPUBLIC OF AZERBAIJAN**

3.1. The main tasks facing healthcare in the future in the field of formation and development of human capital in the Republic of Azerbaijan

3.2 The health aspect of the human capital index in the Republic of Azerbaijan and its development

3.3. The role of the implementation of the health insurance system in the development of human capital (World and Azerbaijani experience)

**CONCLUSION**

**LITERATURE LIST**

## SUMMARY OF THE DISSERTATION

The introduction to the dissertation paper states the relevance and degree of development of the topic, the object and subject of the research, its goals and objectives, methods, the main provisions put forward for defense, the scientific novelty of the research, its theoretical and practical significance, its approval and application, etc.

In the first chapter of the dissertation entitled "Scientific theoretical and conceptual foundations of human capital development", the essence and content of "Human capital", theories and views on human capital, methods for measuring human capital and the health subindex of the human capital index, as well as some theoretical aspects of the impact of health development on people's life expectancy, physical and moral health, were investigated and relevant conclusions were drawn.

The dissertation notes that the existing positions in the field of defining the concept of human capital can be conditionally divided into three groups. The basis of the opinions of specialists and scientists included in the first group is the set of abilities and skills, qualities possessed by people applied in the process of production and service production[6]. According to the second group of scientists, the concept of human capital is approached as an "investment", or rather as a set of people's creative abilities, entrepreneurial and managerial abilities[7].

Finally, the approaches of those speaking from the third position are considered as a combination of the two approaches mentioned earlier. All this gives grounds to say that human capital, when taken separately, should be considered not only at the level of the individual (person) and the elements he possesses, but also at the level of economic entities. That is, human capital should be

[6]Becker G. Human Capital: (Chapter from the book) USA: Economy, Politics, Ideology – 1993. No. 11, pp. 115-116.

[7]Kurgansky S.A. Human capital: methodological analysis of formation and assessment. Abstract of dis.doctor of economic sciences. SPbGIEU - SPb. 1999. p. 36..

considered both at the micro (individual, family, firm) and mero levels (region and large cooperations), as well as at the macro level (national economy - the totality of human capital)[8].

Thus, if we generalize all the above approaches and positions, we can conclude that when we say human capital, we mean the totality of abilities, knowledge, habits and motives formed in people, in other words, human capital is a measure of human abilities and skills that generate income.

There are various methods and techniques in the world's socio-economic literature. The most well-known and accepted method is based on the principle of capitalization of future income[9]. In this case, the value and volume of each asset are determined by the economic efficiency of its use. The amount of future income recorded is the amount of capital employed. The value of each worker's human capital at a given age is determined by the age-related decline in the person's ability to work, the total amount of wages for skilled labor, and the interest rate. The "human development index" currently used by the UN and the World Bank is also of great importance[10]. This index reflects the level of well-being and quality of life of the population and uses the following formula as an average of the three most reliable measures of human capital and the quality of life of the population:

$$HD\text{Э} = (\text{Э}_1 + \text{Э}_2 + \text{Э}_3) : 3$$

Here: $I_1$ - the expected average age index at birth;

$I_2$ - the education level index of the population (a combined indicator calculated as the sum of the literacy index of the adult population and the specific weight of those who have received primary, secondary and higher education);

$I_3$ - the real GDP per capita index for calculating the purchasing power of the population in US dollars[11].

[8]Shahbaz Muradov, Rovshan Muradov. On human capital and some of its scientific-theoretical and conceptual foundations. News of ANAS. Economics series. 2022-1, p. 9.

[9]Yaadgarov Ya.S. History of economic textbook. M. 1999, p. 380

[10] There again.

[11]The work shown by Shahbaz Muradov and Rovshan Muradov. p. 11.

In addition to the various features of measuring the level of human capital, many scientific works have been devoted to the study of the manifestations of socio-economic crises, the importance of human resources in stabilizing the economy, and the neutralization of destructive factors of sustainable development. One of the most important issues in the study of economic crises has been the compilation of an integral indicator that allows predicting unstable financial periods, one of the factors of which is the level of human capital. Based on the experience of the 20th century, it can be said that structural crises occur once every few decades (in the 1930s and 1970s) and lead to a radical restructuring of socio-economic, geopolitical balances, currency configurations, economic paradigms. Each economic crisis has had its own characteristics, and human capital has played its role as one of the main factors. Thus, its qualitative and quantitative characteristics have acquired more or less equivalent importance in ensuring the effectiveness of the anti-crisis strategy.

The market economy has brought a new economic mindset and new behavior to society. In addition to the education of the employee required in job advertisements, it is now often possible to see notes about his age and health. When hiring, the entrepreneur prefers an employee who is more highly qualified and experienced. The employee should be young and healthy so that he is able to work longer and does not miss work due to frequent illness and does not need additional payments.

Sometimes human capital is divided into three sub-capitals related to health, education and culture. Health-related capital is the amount of investments used to restore and maintain human health. V.I. Ilinsky considers health capital to be the basis of human capital. He even divides health capital into two parts: innate capital and later acquired capital. Innate health capital is associated with physiological characteristics and physical capabilities that are genetically transmitted to a person. Undoubtedly, the physical capabilities of a child born with a serious physical disability are not the same as those of children born healthy. On the other hand, in

many cases, genetically transmitted characteristics lead to faster or relatively slower acquisition of knowledge and skills in any field. For example, those with genetic musical abilities acquire musical art faster, while those without such abilities acquire it later.

Health capital manifests itself not only in the rapid and high-quality acquisition of knowledge and skills, but also in the longer use of acquired skills, thus, in the ability to create more value. Health capital, which is spent more in a certain period, means maintaining working capacity for a longer period. Thus, health capital has several different properties as a component of human capital. First, unlike the ability to get an education, health capital cannot be restored in a short time. On the other hand, health capital, unlike educational capital, is very unstable and sensitive to external influences. While the acquired educational capital can *"live"* in a healthy person for a long time, health capital can disappear or be seriously damaged as a result of any event affecting human health. Third, it is impossible to increase health capital beyond a certain level depending on the genetic condition of any individual. Educational capital can be increased infinitely.

It is now known to science that only 8-10% of human health depends on the healthcare system, 20% on the environmental situation, 20% on genetic factors, and the remaining 50% on a person's lifestyle. However, the need to improve the ecological situation, timely identification and control of genetic deficiencies, as well as measures aimed at maintaining a healthy lifestyle are indirectly related to the healthcare system. World experience shows that the state will have to pay for the finances it cuts from the healthcare system today in the future several times over due to disability, illness, and untimely death. Due to the lack of quality healthcare services, the workforce has to leave economic activity earlier. This means a significant loss of GDP.

Although protecting the health of the population is not a direct duty of the state, it is the responsibility of the state to control factors that negatively affect health and take necessary preventive measures. For example, Article 31 of the Constitution of Azerbaijan states that everyone has the right to live in safety. Part II of that article states

that *"except in cases provided for by law, it is prohibited to encroach on a person's life, physical and moral health, property, or housing, or to use force against them".* Articles 39 and 41 of the Constitution of the Republic of Azerbaijan also reflect the state's primary responsibility for the health of citizens. Article 41 states that Everyone has the right to protect their health and receive medical care.

In the second chapter, entitled **"Analysis and Assessment of the Impact of Healthcare on the Development of Human Capital in the Republic of Azerbaijan"**, the level of healthcare development in the Republic of Azerbaijan and the factors affecting it and the relationship between human capital and macroeconomic indicators were analyzed and assessed; as well as a comparative analysis of the impact of healthcare development on human capital in the countries of the world was conducted and summarized.

One of the most important factors affecting the formation and development of human capital is the level of development of healthcare services provided to the population, which is the basis for ensuring people's health. Expenditures directed to the development of the healthcare sector (natural services, disease prevention, dietary foods, etc.) are of great importance and lead to an increase in people's working capacity and health, as well as an extension of their life expectancy, and therefore to people engaging in active labor activity. The health of the population is also one of the main factors of socio-economic development, encouraging people to get an education, engage in more active work, and improve their living conditions. However, despite this, for some reason, healthcare costs are still included in the list of unproductive expenses and considered mandatory expenses.

Since 1992, the Human Development Index (HDI) has been adopted by the United Nations Development Program as the most accurate and generalized indicator of social progress. According to the indicators of human development, the countries of the world are divided into very high, high, medium and low, as well as developing countries. Currently, the highest level of human development is considered to be countries with this index - 0.957-0.804; high level

- 0.796-0.703; medium level - 0.697-0.554; low level - 0.546-0.513. According to 2021 data, the Republic of Azerbaijan is currently included in the second group in terms of Human Development, that is, among highly developed countries, and ranks 91st among 191 countries[12].

As mentioned at the beginning of the dissertation, despite the positive changes that have occurred in the development of healthcare during the years of independence, certain negative trends have emerged in this area in recent years and continue to grow. This can be seen from the data in Table 1 below:

**Table 1**

**Dynamics of the main development indicators of healthcare in the Republic of Azerbaijan (2006-2023 - as of the year)[13]**

| Years | 2006 | 2011 | 2016 | 2020 | 2023 |
|---|---|---|---|---|---|
| Number of doctors of all specialties (thousand people) | 30,6 | 33,1 | 32,5 | 31,8 | 32,8 |
| Number of doctors of all specialties per 10,000 population (persons) | 36,3 | 36,8 | 33,9 | 32,0 | 32,4 |
| Number of secondary medical workers (thousand people) | 60,8 | 60,1 | 54,9 | 55,7 | 53,8 |
| Number of paramedical staff per 10,000 population (persons) | 72,1 | 66,8 | 57,3 | 55,9 | 53,1 |
| Number of hospital facilities (units) | 729 | 516 | 559 | 570 | 345 |
| Of which: Number of hospital beds (thousand units) | 68,9 | 45,8 | 44,9 | 44,3 | 38 |

[12]Human Development Report. 2020, pp. 16-19.

[13] Health, social protection and housing conditions in Azerbaijan. Statistical collection. Baku, 2024, p. 30.

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|---|---|---|---|---|---|
| Number of hospital beds per 10,000 population (unit) | 81,7 | 50,9 | 46,9 | 44,5 | 37,5 |
| Number of beds for sick children (unit) | 11,7 | 7,0 | 6,1 | 6,0 | 4,2 |
| Number of beds for pregnant and lactating women (unit) | 7,4 | 4,6 | 4,6 | 4,4 | 3,5 |
| Number of institutions providing outpatient and polyclinic care to the population (unit) | 1595 | 1688 | 1750 | 1726 | 1653 |
| Of which: number of women's counseling centers and institutions with women's counseling centers (unit) | 321 | 214 | 137 | 137 | 105 |
| Number of medical institutions with children's polyclinics and children's departments (unit) | 602 | 258 | 250 | 248 | 230 |
| Capacity of outpatient clinics (number of visits per shift) – thousand people | 104,1 | 102,1 | 107,0 | 106,5 | 106,6 |
| Per 10,000 population | 123,4 | 113,6 | 111,6 | 107,0 | 105,3 |
| Number of nurseries (unit) | 4 | 4 | 4 | 4 | 4 |
| Number of places in them (unit) | 37,0 | 355 | 215 | 215 | 215 |
| Number of children in them (persons) | 156 | 143 | 179 | 121 | 77 |

The data in that table shows that over the past 17 years (2006-2024), almost all of the indicators characterizing the level of development of healthcare have experienced negative trends, not positive changes. Thus, in 2006-2024, the number of doctors of all specialties in our republic increased by only 109.8 percent, the number of outpatient and polyclinic care institutions for the population increased by only 104.4 percent; except for the increase

in the capacity of outpatient and polyclinic institutions (number of visits per shift) by only 103.3 percent, the level of all other main indicators has significantly decreased. Suffice it to say that in 2006-2023, the number of doctors of all specialties per 10,000 people of the population in our country decreased by 9.1 percentage points, from 36.3 to 33.0 people; The number of secondary medical workers decreased by 24.3 percentage points from 72.1 to 55.9 people, and the number of hospital beds decreased by more than 1.5 times (54.1 percent) from 81.7 to 37.5 people. These indicators manifested themselves even more differently in different economic regions of the country. The number of doctors per 1000 people of the population, which was 33 people in the republic, fluctuated between 5.2 people (Sharqi-Zangezur) and 97 people (Baku city) in different economic regions; the number of secondary medical workers, which was 54.6 people in the republic, fluctuated between 17.9 people and 104.6 people (Baku city); the number of hospital beds, which was 37.5 people in the republic, fluctuated between 13.8 beds (Mil-Karabakh) and 83.5 beds (Baku city) in different economic regions. According to the data as of the beginning of 2024, 75.7 percent of doctors working in our republic belong to only 11 specialties; including 55.4 percent to doctors from 4 specialties. These include therapists (23.7 percent); dentists and dental practitioners (10.8 percent); pediatricians (10.5 percent) and surgeons (10.4 percent). Currently, 67.5 percent of all doctors working in our country; 44.1 percent of paramedical staff; 45.4 percent of operating hospitals, and 51.3 percent of hospital beds are in Baku, where only 23.0 percent of the country's population lives.

It should be noted that currently 55.2 percent of deaths in our country are due to circulatory diseases; 16.3 percent are from adolescents; 2.3 percent are from the digestive system; 2.0 percent of deaths are due to respiratory diseases and 1.3 percent to some infectious and parasitic diseases, requiring special attention to staff training in these areas.

As we noted in paragraph 2.2.2, 75-80% of total healthcare expenditures in Azerbaijan are realized through special payments. This means that it is 3 times more than budget expenditures. The

same picture can be seen in education expenditures. More than 70% of students studying at the higher education level, which is an important stage in the formation of human capital, study at their own expense. This means that at least twice as much money is spent from the family budget compared to the budget expenses during the higher education stage. If we add the expenses of students studying abroad at their own expense, it can be confirmed that the funds allocated from the family budget to the education sector are significantly higher than the funds allocated from the budget. However, since these expenses we mentioned are not reflected in official statistical reports, it is very difficult to calculate their impact on the formation of human capital. Therefore, we conducted assessments based only on official statistical data during this study. Another interesting fact is that since 2008, the share of education and health expenditures in the family budget has been continuously increasing. Against the background of a decrease in the total share of funds allocated to these areas in the state budget, the increase in the family budget is more related to the expansion of the level of liberalization in the economy. Despite the increasing trend of expenditures allocated from the family budget to education and health, the state budget expenditures in total consumption expenditures are still quite high.

Along with the expenses that have a positive impact on the formation and development of human capital, there are also expenses that have a negative impact. Usually, the state, showing serious interest in the development of human capital, tries to reduce and prevent all expenses that may hinder its development. One of the serious obstacles to the formation and development of human potential and human capital is the support of harmful habits at any level. Preventing any measures that promote an increase in the tendency to drink alcohol and use cigarettes, including advertising and propaganda, is one of the important tasks of state bodies. However, despite this, the expenses on such harmful habits in the family budget are not so small. Although the expenses per capita on such harmful habits may seem small at first glance, their overall volume and dynamics are alarming. For example, according to the data of the State Statistical Committee of the Republic of Azerbaijan,

in 2018, more than 186 million US dollars were spent on such harmful habits in Azerbaijan. If we take into account that the main part of this fund is taken out of the country for goods imported to Azerbaijan, then we can be sure of how ineffective such expenses are from an economic point of view.

It has been established that the existence of a serious linear regression relationship between the human capital index and the logarithm of health care expenditures gives grounds to say that in order to develop human capital, health care expenditures should be increased, regardless of the source. The main reason why Azerbaijan has a low rating among the countries of the world in the human capital index is the small share of the state in health care expenditures.

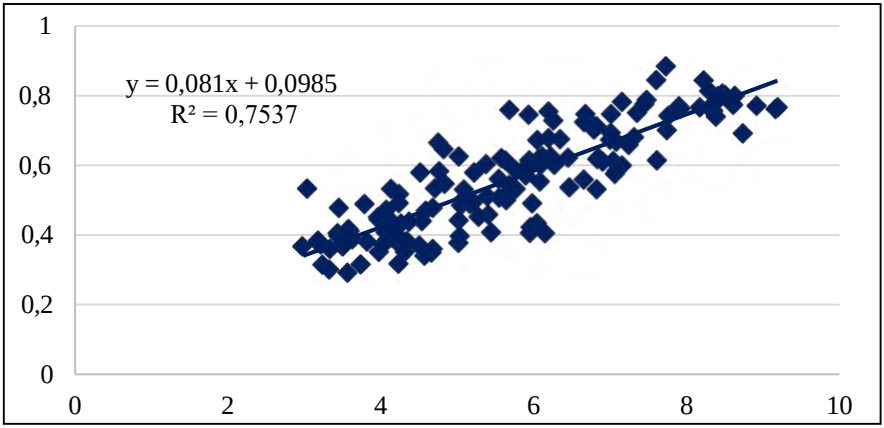
Noting the important role of health care expenditures in the formation of human capital, let us trace the relationship between health care expenditures and the human capital index in countries. The relationship between the logarithm of per capita health care expenditures and the Human Capital Index for 155 countries shows that there is a significant correlation between these two indicators (graph 1). If we express this relationship like this

$$HCЭ_i = a + b * Ln(HEPC)_i + \varepsilon_i \qquad (1)$$

We can express the relationship between per capita health expenditure and human capital index for 155 countries

$$\hat{HCI} = 0.0985 + 0.081 * \mathrm{Ln(HEPC)} \qquad (2)$$

Here, HCI is the Human Capital Index in the i-th country, and HEPC is the health expenditure per capita.




**Graphic 1. Dependence of the Human Capital Index (Y) on the logarithm of per capita health expenditure (X)**

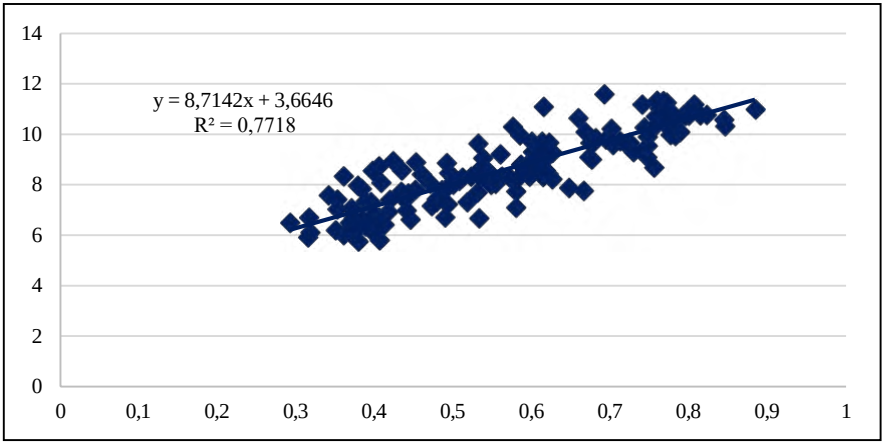
There is a mutual cause-and-effect relationship between human capital and its health component and GDP per capita in Azerbaijan. Research shows that there is a significant correlation between the human capital index and GDP per capita (GDPPC) in 2023 (Graphic 2). We can express this relationship like this

$$ln\,GDPPC_i = a + b * HCƏ_i + \varepsilon_i \qquad (3)$$

An analysis of the dependence of the logarithm of GDP per capita on the human capital index for 155 countries suggests that (3) can be expressed as a dependence.

$$\widehat{\ln GDPPC} = 3.6646 + 8.7142 * HCİ \qquad (4)$$

At this time, the correlation coefficient between these two indicators is equal to R=0.8785. In general, it can be argued that an increase in the Human Capital Index also leads to an increase in GDP per capita.



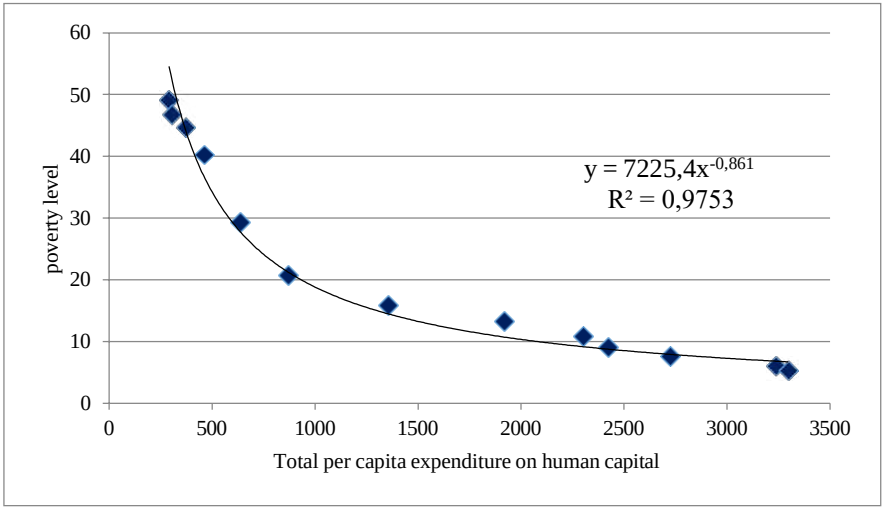

**Graphic 2. Relationship between the Human Capital Index and the logarithm of GDP per çapıta**

Among the 155 countries studied, Chad has the lowest human capital score (0.29), while Singapore has the highest (0.88). Azerbaijan ranks 69th among these countries with a score of 0.60.

**The third chapter, entitled "Directions for Increasing the Role of the Health Factor in the Development of Human Capital in the Republic of Azerbaijan"**, analyzes the future tasks in the field of human capital development in the Republic of Azerbaijan, shows the health aspect of the human capital index in Azerbaijan and the ways to develop it, and the role of the implementation of the Health Insurance System in the development of human capital (World and Azerbaijani experience)

In Azerbaijan, there is an inversely proportional and mutual cause-and-effect relationship between human capital, especially its health component, and the poverty level. An increase in per capita spending on human capital contributes to poverty reduction. The decrease in the poverty level from 49% to 5.3% during 2001–2023 demonstrates the impact of this process. This decline is not only due to oil revenues, but also to additional revenues from investments in human capital. Statistical indicators confirm a strong correlation between these two factors. However, a decrease in oil revenues can reduce the allocation to human capital, thereby increasing poverty.

Therefore, diversifying the sources of investments in human capital and reducing dependence on oil revenues is of strategic importance.




**Graphic 3. Relationship between total per capita expenditure on human capital and poverty rate**

There is a mutual relationship between the health factors of human capital and economic growth in Azerbaijan. Thus, an increase in GDP per capita has a positive effect on both components of the health factor of human capital ("survival" and "health status"). There is also an opposite effect between these indicators.

An increase in GDP per capita in the country sharply reduces the number of deaths under 5 years of age per 1,000 births (graph 5). However, the relationship between GDP per capita and this indicator does not provide a mutually necessary and sufficient condition. Thus, in some countries, for example, in Qatar, although the GDP per capita is close to 69 thousand US dollars, the child mortality rate under 5 years of age (6.8) is higher than in many European countries with a lower GDP per capita and the United States. This fact is also characteristic of the UAE. The necessary, but insufficient, relationship between GDP per capita and the fact of child mortality under 5 years of age may depend on other factors, such as health care costs, environmental conditions, and other factors.

Over the past 28 years, the number of deaths per 1,000 children born in Azerbaijan under 5 years of age has sharply decreased, falling significantly below the world average. Undoubtedly, the main reason for this is the increase in GDP per capita.

The results obtained in the diagrams in graphs 4 and 5 prove that the number of deaths per 1,000 children born under 5 years of age depends on many factors, and each of these factors has varying degrees of impact. In order to reduce this indicator, it is important to take action on each of these factors. However, since the volume of health care costs and household incomes depend on the first factor, i.e. the volume of GDP, ensuring economic development has a stronger impact.

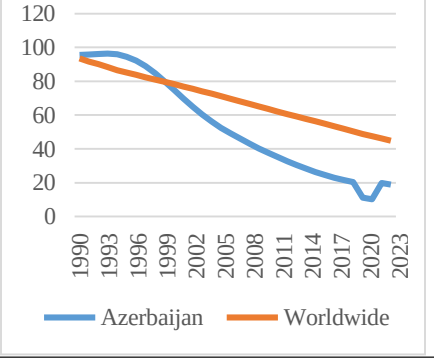
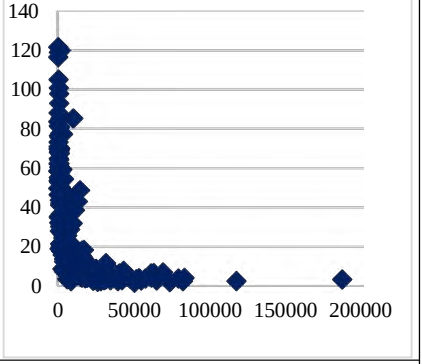
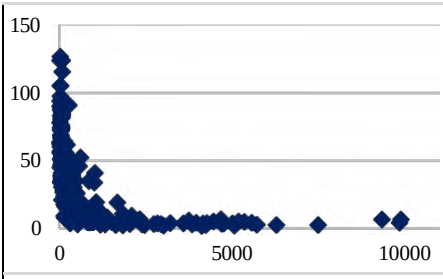



**Chart 4. Number of deaths under 5 years of age per 1,000 births**

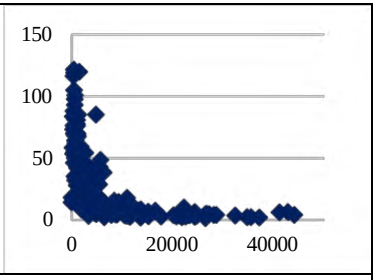



**Graph.5. Dependence of the number of deaths under 5 years of age per 1000 births (Y) on GDP (X)**

Other factors, including health care spending, increasing incomes, and improving the quality of health services, also depend on GDP per capita. The dependence of the number of deaths under 5 years of age (Y) per 1,000 live births on health care spending (Figure 4) and household health care spending (Figure 5) also shows that increasing health care spending and household health care spending are necessary conditions for reducing under-5 mortality. However, none of these factors can be considered sufficient conditions. These dependencies also prove that increasing health care spending and increasing household per capita spending do not reduce under-5 mortality to the same extent in all countries.




**Graphic 6. Dependence of the number of deaths under 5 years of age per 1000 births (Y) on health care expenditures (X) in the United States**




**Graphic 7. Dependence of the number of deaths under 5 years of age per 1000 births (Y) on household expenditure (X)**

The management of the third component of the human capital index, namely the "under-5 mortality" indicator, indirectly has a positive impact on productivity and economic development. The least squares method was used to study the effects of GDP per capita, health expenditure and household expenditure per capita on the level of child mortality in Azerbaijan.

The calculations show that the regression dependencies of the relationship between the number of deaths under 5 years of age per 1000 births ({CM}_t) and GDP per capita ({GDPPC}_t), health expenditure ({HEXPC}_t) and household expenditure per capita ({HHEPC}_t) can be expressed as equations (5), (6) and (7), respectively.

| | | | | |
|---|---|---|---|---|
| CM= | 84.65554 | - 0.00859* (0.001087) | GDPPC | ( 5) |
| CM | 67.02134 | - 0.10146 (0.009971) | HEXPPC | (6) |
| CM | 88.52863 | - 0.02143 (0.002379) | HHEPC | (7) |

(5), (6) and (7) regression dependence shows that the number of deaths under 5 years of age per 1000 births decreases depending on the increase in all three indicators. The significance level in the

regression relationship with these indicators is quite small and the coefficient of determination is strong (table 2).

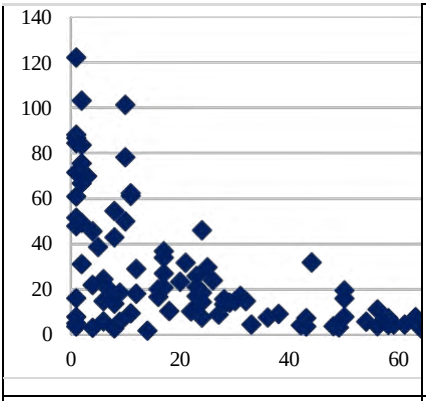
**Table 2**

**Regression dependences of the relationship between the number of deaths under 5 years of age per 1000 births and GDP per çapıta**

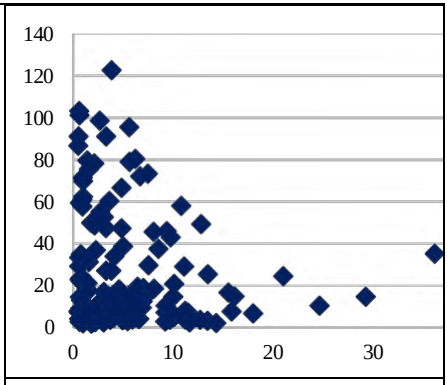
| | R-squared | F-significance | t-statistic |
|---|---|---|---|
| $GDPPC_t$ | 0.698098 | 1.71E-08 | -7.90146 |
| $HEXPC_t$ | 0.873458 | 3.97E-08 | -10.1754 |
| $HHEPC_t$ | 0.750254 | 1.28E-09 | -9.0061 |

Economic development has a positive effect on the increase in human capital and, consequently, on the improvement of the health indicators of the new generation. An increase in GDP per capita is associated with a decrease in child mortality under 5 years of age, but this relationship, although necessary, is not a sufficient condition. Additional factors such as health and household spending also affect this indicator. However, none of these factors can be considered sufficient on its own to reduce child mortality.

The structure of health spending, especially the share of compulsory health insurance, plays an important role in the development of human capital. Child mortality rates are lower in countries with high compulsory health insurance costs. This indicates the importance of the scale and efficiency of health spending, rather than the source of health spending. However, in countries with the same level of compulsory health insurance, human capital indicators and child mortality can differ significantly. For example, although the share of these costs in Canada and Burundi is the same (1%), child mortality rates are different (5 and 61). This shows that not only ratios, but also the absolute volume of health spending and the quality of services play a decisive role.




**Graphic 8. Dependence of the "survival" indicator (Y) on the share of compulsory health insurance costs in total health care costs (X)**




**Graphic 9. Dependence of the "health status" indicator (Y) on the share of compulsory health insurance expenditures in total health expenditures (X)**

Voluntary health insurance is widely used in many countries of the world to ensure access to quality health services. This indicator varies regardless of the level of economic development of the country. Although it is assumed that interest in insurance will increase with increasing income, experience shows that the country where the share of voluntary health insurance in total health expenses is the highest is Namibia. (38%). In Sweden, this indicator is only 1%.

Although there is no direct relationship between mortality among children under 5 years of age and the share of voluntary health insurance in health expenses in developing countries, an increase in this indicator may be one of the important conditions for reducing these deaths.

Considering the impact of compulsory health insurance on human capital, the Republic of Azerbaijan has begun to implement this mechanism since 2020. Its legal basis was determined by the Law "On Health Insurance" signed by the National Leader H. Aliyev in 1999. The law covers the organizational, legal and economic foundations of health insurance, as well as voluntary and mandatory forms.

The introduction of compulsory health insurance will contribute to the increase in healthcare costs and the population's access to timely, high-quality medical services. Within the framework of the Services Envelope, 2,550 types of medical services, including emergency care, outpatient and inpatient services, diagnostic examinations, physiotherapy and surgical operations, become available to the population. In accordance with the Presidential Decree dated September 6, 2017, the State Agency for Compulsory Health Insurance is being developed as a public legal entity to manage and finance these processes.

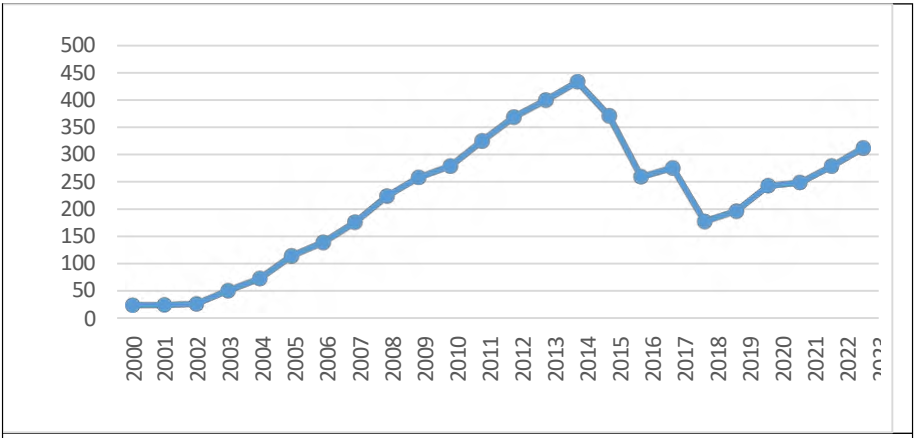



**Chart 10. Total health expenditure per capita (USD)**

According to the Strategic Roadmap, a number of measures are planned to be implemented to develop the healthcare system. These include the creation of an electronic healthcare program and a Central electronic medical record system, the integration of various platform information systems into the national healthcare network, the formation of a common standardization system, and the introduction of digital prescriptions. These measures will contribute to the development of human capital in the short, medium, and long term.

## CONCLUSION

**The results obtained as a result of the study can be grouped as follows:**

1. The level of human capital in Azerbaijan has been assessed over the past 20 years by a) the expenditure method and b) the human capital index. Calculations conducted by both methods show that this indicator has been steadily increasing. In the expenditure method, the increase in health care expenditures, and in the income method, the increase in the average age and life expectancy of the employed population are the main factors. The decrease in mortality rates under the age of 5 and the improvement in health status also confirm the increase in human capital.

2. The development of the health factor of human capital is closely related to the increase in the level of education. The development of education has created conditions for the application of new technologies in health care management, the training of professional medical personnel, and the use of modern equipment. At the same time, the increase in the availability of medicines has had a positive impact on the quality of health services. Liberal reforms in the field of foreign trade have allowed the import of higher quality medicines into the country at affordable prices.

3. Although the population's use of health services mainly with personal funds (approximately 80%) is explained by income growth, this poses a risk for low-income families. A decrease in income or an increase in food costs during inflation can limit access to health services. Therefore, it is important to reduce the burden of health care costs on the population through compulsory health insurance and alternative sources of financing. The strong linear relationship between the human capital index and health care costs indicates that investments in this area should be increased, regardless of their source. The main reason for Azerbaijan's low position on the index is the low share of state health care costs.

4. Studies show that there is a strong inverse relationship between total health care costs and the poverty level. However, the main source of income for households is the oil sector, and these

revenues are directly or indirectly transferred to households. The additional revenues generated by increasing human capital are mainly formed from the service sector. The dependence of oil and gas revenues on price fluctuations in the world market poses a risk to the reduction of primary incomes and, as a result, to the development of human capital. For this reason, it is important to reduce the dependence of investments in human capital on oil revenues.

5. The empirical relationship between the human capital indicator calculated by the expenditure method and GDP per capita and poverty level was investigated. The human capital index was calculated based on the components of "survival", "duration of education" and "health status", and it was determined that these indicators are mutually correlated with economic growth. Also, the development of human capital was predicted based on a strong linear regression between the index and the logarithm of health expenditures. The relationship between health factors of human capital and economic growth and poverty level in Azerbaijan was econometrically assessed.

6. The dual management model in the health sector in Azerbaijan – the division of powers between the Ministry of Health and TABIB – has both positive and negative effects on the formation of human capital. The establishment of TABIB increases the professionalism of medical personnel by creating opportunities for the development of regional management and quality-based assessment systems. However, the uncertainty of the division of powers between these two institutions and the weakness of coordination can complicate decision-making and resource management. Consequently, the impact of this structure on human capital is both encouraging and restrictive and largely depends on the effectiveness of management.

6. There is a mutual cause-and-effect relationship between human capital and its health component and GDP per capita in Azerbaijan;

7. There is a mutual cause-and-effect relationship between human capital and its health component and poverty level in Azerbaijan.

**Proposals and recommendations**

1. Health In Azerbaijan, the development of human capital as a whole, or its health factor in particular, is important in order to increase the volume of GDP per capita and the costs of poverty in the country, and to develop the compulsory health insurance system and expand the types of services covered by insurance costs year by year.

2. The state should increase spending on the health sector. In particular, expanding the compulsory health insurance system and increasing the state's share in health care costs can make a significant contribution to the development of human capital.

3. Since the financing of health services is mainly at the expense of the population's own funds, the opportunities for low-income families to benefit from these services are limited. It is important for the state to allocate subsidies for health care costs and increase free or discounted medical services for socially vulnerable groups.

4. It is advisable to expand programs focused on the health sector in the education system and organize additional training to improve the knowledge and skills of personnel working in the health sector.

5. Alternative financial mechanisms should be created to reduce the dominant role of oil revenues as the main source of investments in human capital. In order to ensure stable financing of health and education expenditures from the state budget, revenues from the non-oil sector should be increased.

6. Investments in human capital have a direct impact on poverty reduction. Therefore, the funds allocated to the health and education sectors within the framework of the state's long-term strategy should be continuously increased.

7. The introduction of new technologies and modern medical equipment in the health system should be accelerated, and

cooperation between the state and the private sector in this area should be strengthened.

8. Studies show that health factors directly affect economic growth. Therefore, the role of the health sector in the state's economic development strategies should be increased, and health policy should be coordinated with economic development programs.

9. The "Regional Medical Personnel Development and Integration Program" should be adopted and implemented. The main goal here will be to increase the number of qualified medical personnel in order to ensure the sustainable and effective operation of healthcare institutions in the regions, stimulate their long-term activity in the regions, and increase their ability to effectively use modern medical technologies.

10. For the effective development of human capital in healthcare, it is important to clearly define the powers and improve coordination mechanisms between the Ministry of Health and TABIB. For this purpose, it is necessary to manage human resources on the basis of a single strategy, implement collaborative management, and establish common standards for professional development.

**The results and proposals obtained from the dissertation work are reflected in the following published scientific works.**

1. Alishova Ch. A. The health factor of human capital and its financing // - Baku: News of the Azerbaijan National Academy of Sciences, Economics series, - 2015. No. 5, - pp. 98-105

2. Alishova Ch. A. Human capital strategy as a priority in the development concept "Azerbaijan 2020: A Look into the Future" // - Baku: Journal of Scientific Works of the Azerbaijan National Academy of Sciences, - 2015. №1, - 119-125p.

3. Alishova Ch. A. Human capital and some methods of its measurement // - Baku: Journal of Scientific Works of the Azerbaijan National Academy of Sciences, - 2015. №5, -106-111p.

4. Alishova Ch. A. Assessment of the relationship of human capital with macroeconomic indicators in Azerbaijan // - Baku:

Journal of Scientific Works of the Azerbaijan National Academy of Sciences, - 2015. №6, - 145-154p.

5. Alishova Ch. A. Proceedings of the Republican Scientific Conference on the topic of the health factor of human capital /Personality, society, state: modern approaches to mutual relations/ materialsI December 6-7, 2019 // Ministry of Education of the Republic of Azerbaijan, Mingachevir State University, - Mingachevir: Sada,-2020, -p.390-392

6. Alishova Ch. A. Human capital measurement methodology // - Baku: Scientific and practical Journal of Cooperation, Azerbaijan University of Cooperation. Azerittifaq, - 2016. No. 1 (40), - 30-37p.

7. Alishova, Ch.A. Индекс человексого развития//Инновационное развитие образования, науки и технологии,- Moscow: Center of Prospective Scientific Publications, international scientific-practical conference,-31 January 2020,- 2020,-213-218p.

8. Musaeva, F. Gyulaliev, M. Alyshova, Ch. Evaluation of the relationship between human capital and some macroeconomic indicators in Azerbaijan //- Moscow: Human capital and professional education,-2016,- No. 2 (18),- 28-41c.

9. Alishova Ch. et al. Features to the impact of the quality of human capital on the developing economy of Azerbaijan for the COVID-19 pandemic. JOURNAL OF EASTERN EUROPEAN AND CENTRAL ASIAN RESEARCH Vol.8 No.1 (2021)

The defense will be held on June 27, 2025 at $11^{00}$ AM at the meeting of the ED 1.10 Dissertation Council operating under the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

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The dissertation can be reviewed at the library of the Institute of Economics of the Ministry of Science and Education of the Republic of Azerbaijan.

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Abstract was sent to the required addresses on May 14 2025

Signed for print: 05.05.2025
Paper format: A5
Volume:42 664 characters
Number of hard copies: 20