

The Complementary Relationship between Health and Sustainable Development in Iraq: An Analytical Study for the Period (2006-2022)

Musa Khalaf Awad
Moosa0782m0@gmail.com

Nael Jabbar Bustan
Eco.stp24.2@qu.edu.iq

University of Al-Qadisiyah

Article history:

Received: 13/5/2025

Accepted: 28/5/2025

Available online: 15 /9 /2025

Corresponding Author : Nael Jabbar Bustan

Abstract : This research aims to examine the relationship between health indicators and the Sustainable Development Goals (SDGs) in Iraq over the period (2006-2022), in light of the development and health challenges facing the country. A set of health indicators directly related to the third goal of the Sustainable Development Goals was analyzed, such as maternal and child mortality rates, health spending, the number of doctors and beds per thousand people, and health infrastructure indicators. The results of the analysis revealed clear disparities in achieving these indicators. Iraq continues to suffer from deterioration in some health aspects, despite some relative improvements in specific periods. This reflects the need for fundamental reforms in health and development policies to achieve sustainability. The research recommends increasing health investments, improving the efficiency of public spending, and enhancing integration between health and development policies.

Keywords: Sustainable Development, Health Indicators, SDG 3

INTRODUCTION: The health sector is one of the fundamental pillars of achieving sustainable development. Effective economic or social development cannot be envisioned without a health system capable of meeting the needs of the population and achieving general well-being. The 2030 Sustainable Development Agenda has paid significant attention to health through Goal 3, which seeks to "ensure healthy lives and promote well-being for all at all ages." In this context, Iraq faces accumulated challenges in its health situation due to multiple factors, including deteriorating security, institutional weakness, and poor resource allocation. These factors have led to the failure to achieve many health indicators. Hence, the importance of this research lies in analyzing the reality of health indicators in Iraq and their compatibility with the requirements of the Sustainable Development Goals, over the period (2006-2022), to uncover gaps and identify priorities for future health policies.

First: The Importance of the Research

The Importance of this research stems from its addressing a vital topic, namely the connection between the health situation and the Sustainable Development Goals, particularly Goal 3 related to good health and well-being. The study's importance lies in its ability to highlight the Iraqi health system's ability to meet the requirements of sustainable development, given the economic, social, and institutional challenges facing the country. This makes it a useful tool for policymakers in the field of health and development.

Second: The Research Problem

The research problem is represented by the extent to which health policies contributed to supporting the path of sustainable development in Iraq during the period (2006-2022), the nature of the complementary relationship between them, and whether this relationship was effective enough to achieve progress towards the Sustainable Development Goals, particularly Goal 3 related to good health and well-being

Third: Research Objectives

The research aims to:

1-Analyze the impact of health policies in supporting the path of sustainable development in Iraq during the period (2006-2022).

2-Explore the nature of the complementary relationship between health sector indicators and sustainable development indicators, with a focus on the mutual interaction between them.

3-Evaluate the effectiveness of this relationship in achieving progress towards the Sustainable Development Goals, particularly Goal 3 related to good health and well-being.

Fourth: Research Hypothesis

The research is based on the main hypothesis:

"The reality of the health system in Iraq suffers from weak performance indicators compared to the level required to achieve the third Sustainable Development Goal, which necessitates the reformulation of health policies within the framework of sustainable development".

Fifth: Research Structure

The research is organized into an introduction, three main sections, and a conclusion that includes the most important conclusions and proposals:

Section One: The theoretical and conceptual framework for health and sustainable development.

Section Two: The most important factors influencing the provision of health services in Iraq.

Chapter Three: Analysis of the relationship between health status and sustainable development in Iraq for the period (2006-2022)

The first topic

The Theoretical and Conceptual Framework for Health and Sustainable Development

First: The Emergence and Expansion of Sustainable Development

Since the early 1980s, the world has begun to realize the magnitude of the worsening environmental crises that threaten the natural balance of life on planet Earth. This was a natural consequence of decades of neglect of environmental dimensions in development policies. Therefore, it became necessary to adopt a new approach that integrates sustainability into the development process, leading to the crystallization of the concept of "sustainable development." This concept was first clearly presented in the 1987 report of the World Commission on Environment and Development, "Our Common Future," which marked a turning point in global development thinking (Ghanem, 2014). The concept of sustainable development has spread rapidly throughout the world and has become widely accepted. The concept of sustainable development emerged in response to two main types of challenges facing many countries around the world. They are:

- 1- The widespread and increasing prevalence of poverty negatively impacts social and economic stability.
- 2- The ongoing degradation of the natural environment, which threatens natural resources and undermines the ability of future generations to meet their needs.

Sustainable development, as a new development approach, has provided an opportunity to reconsider methods of economic and social development, achieving a balance between meeting the needs of the present and ensuring the rights of future generations to a healthy environment and sustainable resources. Therefore, sustainable development, as a modern development philosophy, has opened the door to new perspectives on the future of planet Earth. It is a mistake to believe that economic growth equates with development; they are two distinct concepts that should not be used synonymously. Development goes beyond mere growth, as it aims to achieve economic and social goals through specific qualitative and quantitative change processes that contribute to improving the living standards of the population within a specific time and geographic framework. Although economic growth can contribute to development, its failure to achieve it does not necessarily mean the absence of development. Society may witness an improvement in development indicators, even in the absence of economic growth. This confirms that development is a more comprehensive and complex process than simply increasing production or gross domestic product (Kozlowski, 2014)

Second: The Definition and Importance of Sustainable Development

Sustainable development has been defined in many ways, with more than sixty definitions being offered. However, its use has not always been accurate or consistent. The concept of sustainable development first appeared formally in the 1987 World Commission on Environment and Development report, where it was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1989, 83). Webster's Dictionary defines sustainable development as "development that utilizes natural resources without permitting their depletion or partial or total destruction" (Kutzmark, 1997). William Rollins House, Director of the US Environmental Protection Agency, offered another definition of sustainable development as "a process that recognizes the necessity of achieving economic growth commensurate with environmental capabilities, based on the premise that economic development and environmental protection are complementary, not contradictory, processes" (Al-Hiti, 2009, 14). Based on this, it can be said that sustainable development seeks to improve the quality of human life without harming the environment. It means the

rational use of natural resources so that consumption does not exceed their natural replenishment rates, especially in the case of non-renewable resources, which should be used with caution. As for renewable resources, their use must be rationalized, while sustainable alternatives must be sought to ensure continued development without harming life-supporting ecosystems. From this standpoint, resource sustainability requires the search for complementary alternatives to preserve them for as long as possible. In both cases, resources must be exploited in ways that reduce waste production to levels that the environment can absorb, decompose, and recycle naturally. The future and security of the population in any region are closely linked to the health of the environment in which they live. Since the Earth Summit in 1992, sustainability has become a global trend, and its principles have spread widely, especially in Europe and the United States, where many official and civil society organizations and institutions have adopted them and sought to implement them practically. The issue was not limited to developed countries, but rather extended to include many developing countries, including some Arab countries. The spread of sustainability ideas globally has led to the emergence of new concepts, such as sustainable culture, the philosophy of sustainability, and sustainable communities, which are societies that adopt the principles of sustainable development.

Third: The Concept of Health

There are many interpretations of the meaning of health. Some believe it aims to achieve a certain level of weight, height, and fitness, while others say it is the individual's freedom from disease. Others believe it is a state of relative balance in the functions of the body's organs, and others believe otherwise. However, the World Health Organization (WHO) defines health as a state of complete physical, mental, occupational, and social well-being, not merely the absence of disease and infirmity. Health is a fundamental human right and a global social goal. It is essential to meet basic human needs. Therefore, every person deserves to enjoy a higher level of health, which is what countries and human rights organizations strive for through their health policies (Abu Al-Ayoun, 19.2013).

Fourth: The Concept of Sustainable Health Development

The International Conference on Primary Health Care, held in Alma-Ata in 1978, marked an important milestone in the struggle for health, as stated in the text: "Governments are responsible for the health of their people, and this responsibility can only be fulfilled by taking adequate health and social measures. All people of the world must achieve this by the year 2030." Two thousand levels of health can lead to a socially and economically productive life (Muhanna 6.1999). Many reports and studies have proven that the differences in health indicators between countries are merely reflections of the differences in economic and social development. Therefore, health was a basic goal of development, as the ability to develop itself depends on health. On this basis, successive global summits and conferences emphasized the Importance of sustainable health development. This was confirmed by the World Bank, the International Monetary Fund, and the World Health Organization on the pivotal role of investment in human capital through health as a basic requirement for achieving sustainable health development (Hamaizia et al. 2015 257).

Fifth: Health Development Indicators

A number of Indicators have been developed to define the health status of various countries. These indicators serve as indicators for measuring sustainable health development in a country. The most important of these indicators include the following:

- 1- Life Expectancy at Birth: This represents the number of years a newborn child is expected to live if the prevailing death patterns at the time of birth remain the same throughout their life.
- 2- Infant Mortality Rate: This indicator measures the number of deaths of infants under one year of age who are born alive. This indicator is calculated per thousand live births over a period of one year.
- 3- Under-Five Mortality Rate: This represents the average annual number of deaths of children under five per thousand live births over the previous five years.
4. Maternal Mortality Ratio: This indicator measures the number of maternal deaths during pregnancy or within forty-two days of pregnancy, regardless of the duration and location of pregnancy, and is calculated per 100,000 live births over a one-year period.
- 5- Access to Health Services: This is the percentage of the population with access to health services. Access to appropriate health services, whether on foot or by local means of transportation, takes no more than an hour.
- 6- Health expenditure ratio: This refers to spending on hospitals, health centers, clinics, health insurance plans, and family planning, relative to total government spending or gross domestic product.

There are also differences among international institutions interested in using such indicators. For example, UNICEF uses the infant mortality rate as an indicator of a country's health status and health development, while the World Health Organization uses life expectancy at birth as an indicator, after adjusting it to take into account information about the environment and disease history. Mortality indicators have also been used to explore the most important determinants of health status at the country level. (Noor Al-Huda et al. 55.2020)

Sixth: Foundations for Achieving Sustainable Health Development

Strengthening the capacity of health systems to provide essential health services for all, based on efficiency, accessibility, and affordability, to prevent, control, and treat diseases in a manner consistent with human rights and fundamental freedoms and in accordance with local laws, cultural, and religious values, requires a set of measures at all levels. Based on this, we find widespread attention in conference reports, as well as relevant United Nations conferences and special sessions of the General Assembly, to the following:

- 1- Improving and developing the management of human resources working in the health sector services
- 2- Promoting equitable and improved access to efficient and affordable health services, including prevention at all levels of the health system and access to essential medicines at affordable prices
- 3- Integrating health issues into strategies, policies, and programs related to poverty eradication and achieving sustainable development
- 4- Directing research efforts toward priority health issues and applying research findings, especially those affecting vulnerable population groups and those at risk of disease
- 5- Promoting equal opportunities in access to health services, education, training, treatment, and medical technology, and addressing the side effects of malnutrition
- 6- Providing technical and financial assistance to developing countries and countries with economies in transition to implement the Health for All strategy, including health information systems and integrated databases on the adoption of healthy development.
- 7- Launching international capacity-building initiatives that help assess the links between health and the environment and leverage the knowledge gained to develop more effective responses to environmental threats to human health.
- 8- Transferring and disseminating technology on mutually agreed terms, including establishing multi-sector partnerships with the public and private sectors to ensure access to health services.
- 9- Strengthening the programs of the International Labour Organization and the World Health Organization to reduce occupational deaths, injuries, and diseases, and linking occupational health to improving public health as a means of promoting public health and health awareness. (Zarqin et al. 259.2015)

Seventh: Development, Health, and the Relationship Between Them

The relationship between health and sustainable development is intertwined and interdependent. Both consider human beings as the ultimate goal. Ensuring the necessary level of public health contributes to increased production and productivity, on the one hand, and to achieving advanced levels of economic and social well-being for members of society, on the other. Therefore, health has become one of the most important conditions in the field of development, as it is one of the factors contributing to sustainable development and one of its indicators. Sustainable development cannot be achieved without a healthy population. While health represents a value in and of itself, it is also considered a key to productivity and economic, social, and cultural prosperity, as many cases of poor health and ill health significantly impact growth and development. For the first time, meetings of the Security Council, the G8, the World Economic Forum, and the Organization for Economic Cooperation and Development explicitly addressed health issues as development issues (WHO 1.2001). The first principle of the Rio Declaration on Environment and Development states that “human beings are at the heart of sustainable development concerns and have the right to live healthy and productive lives in harmony with nature” (UN Environment and Development 4.1992). Sustainable development cannot be achieved with the spread of deadly diseases, and it is impossible to maintain the health of populations without sustainable development in economic, social, cultural, and environmental terms. For example, HIV has killed millions of people in their most productive years, and water and air pollution continue to claim the lives of millions each year, most of them in developing countries (Kazem 5.2007). In this context, Dr. Margaret Chan, Director-General of the World Health Organization, emphasized that “the healthy development of the individual leads to economic, social, cultural, and political development” (Al-Shabib 8.2007). Good health promotes economic, social, and cultural development and contributes to stability. Economic and environmental protection. Therefore, one of the most important goals of sustainable development is the right of every human being to enjoy the highest attainable standard of health, especially since the concept of health has expanded. It is no longer limited to the absence of disease, but rather includes a complete state of mental and physical performance. Thus, the concept of health expands to include other areas that have a direct impact on it, as many of the decisive factors in the field of health and disease lie outside the direct control of the health sector, and are linked to the environmental sectors, water, sanitation, agriculture, education, urban and rural life, and others.

The second topic

The Most Important Factors Influencing the Provision of Health Services in Iraq

Health services provided to individuals in Iraq, whether in the public or private sectors, are influenced by numerous economic, social, and environmental factors. This section will address these factors and their impact on the country's health sector.

First: Economic Factors

1- Income

Studies and research indicate that income has a clear impact on the health services provided to citizens, and this impact applies to both developed and developing countries. The Impact of income on health services can be demonstrated through its relationship to certain indicators, such as life expectancy at birth and infant mortality rates. There is a direct relationship between income levels and life expectancy at birth, while there is an inverse relationship between income levels and infant mortality rates. According to Table (1), it is clear that the per capita share of GDP at constant prices has witnessed a significant increase, reaching 3,747,000.9 dinars in 2006, equivalent to 2,554 US dollars. In 2007, it reached (3,754,986.0) Iraqi dinars, equivalent to (2,966) US dollars, with a continued rise, reaching (4,961,133.3) dinars in 2015, equivalent to (4,251) dollars, which is the highest value it reached.

Table (1) Average per capita GDP at constant prices, life expectancy, and infant mortality in Iraq for the period (2006-2022)

Years	Average per capita GDP at constant prices Dinars	Dollar exchange rate against the Dinar	Average per capita GDP in dollars	Life expectancy at birth	Infant mortality rate per 1000 live births
2006	3.747.000	1477	2554.2	59.14	53
2007	3.745.986	1266	2966.0	61.0	30
2008	3.944.879	1206	3271.0	68	32
2009	3.938.233	1183	3366.0	71.9	25
2010	4.083.937	1187	3490.5	72.8	24
2011	4.280.310	1199	3658.4	69.0	22
2012	4.753.014	1234	4076.3	69.4	20.6
2013	4.986.075	1233	4276.2	72.77	18.5
2014	4.869.812	1218	4176.5	72.57	17.4
2015	4.961.133	1251	4251.2	72.69	19.7
2016	5.431.093	1281	4308.8	71.2	18.1
2017	5.214.638	1256	4725.2	70.3	18.6
2018	5.228.601	1215	5601.5	71.1	18.6
2019	5.392.802	1201	5621.2	71.4	19.6
2020	4.639.561	1240	4250.7	71.5	18.5
2021	4.604.882	1455	4816.8	72.5	17.8
2022	4.844.289	1480	6441.9	75.3	19.8

Source: Ministry of Planning, Central Statistical Organization, National Accounts, unpublished data for various years

2- Malnutrition

Malnutrition is considered a major factor affecting the health of individuals and communities. Diseases caused by malnutrition can be divided into two main types:

A- Diseases resulting from malnutrition: These diseases are often observed in children and newborns and can lead to delayed growth, a weakened immune system, and an increased risk of disease.

B- Diseases resulting from excess nutrition: These diseases often affect adults and include health problems such as obesity, diabetes, and heart disease. They are often caused by unhealthy lifestyles and the consumption of foods rich in sugars and fats.

According to a 2007 Food and Agriculture Organization (FAO) report, Iraq suffers from a food shortage, which has led to the spread of many diseases among children and adults. It is noted that the symptoms of malnutrition vary between governorates, being higher in areas suffering from food shortages and lower in areas where food is abundant. From Table (2), it is clear that the majority of diseases caused by malnutrition were on the rise during the study period, while there were some other diseases that showed fluctuating or declining movement.

Table (2) Number of people infected with some diseases resulting from malnutrition in Iraq for the period (2006-2022)

Years	Food poisoning	Weakness resulting from malnutrition	Anemia	high blood pressure	Diabetes
2006	NA	NA	NA	278171	139075
2007	NA	NA	NA	614331	449031
2008	2205	581	28944	786399	632036
2009	NA	NA	NA	988939	813781

2010	3656	921	32446	1147317	918190
2011	2704	577	25966	1273784	1148256
2012	2112	888	34123	1315940	1190985
2013	1600	1172	31029	1451495	1333947
2014	763	1013	35951	903508	896652
2015	98	672	38774	1141674	1053090
2016	4254	759	22110	828077	754150
2017	4876	730	20101	787456	822739
2018	3214	724	1577	805950	853811
2019	21417	716	22101	833942	887753
2020	13119	708	30112	629344	745469
2021	16714	670	30301	764682	890877
2022	39114	650	30425	885949	1045348

Source: 1- Republic of Iraq, Ministry of Health, Annual Reports, various years, 2- Republic of Iraq, Ministry of Health, Planning and Resources Development Department, Health and Life Statistics Division, Health Statistical Abstract 2000-2006

Second: Social Factors

1- Education

Education is a basic human need and one of the important indicators that contribute to raising the level of human development. There is also an interconnected relationship between health and education, as education can directly impact the improvement of health services through certain health indicators. In this context, the focus will be on the following two indicators:

A- Life Expectancy at Birth

Table (3), which presents data on the illiteracy rate, life expectancy at birth, and infant mortality rate during the period (2006-2015), shows that the illiteracy rate in 2006 reached (21.8%), while life expectancy at birth was (59) years. During the period (2006-2010), the illiteracy rate remained stable at (21.8%), but life expectancy at birth witnessed a gradual increase to reach (59.14, 61.0, 68, 71.9, 72.8) years. This growth is attributed to the improvement of health services, which led to a decrease in mortality rates and an increase in life expectancy. In 2011, the illiteracy rate rose to (22.4%), which was accompanied by a decrease in life expectancy at birth from (72.8) years in 2010 to (69.0) years. However, the following year (2012) witnessed an improvement in life expectancy, reaching (69.4) years, coinciding with a decrease in the illiteracy rate to (21%). The above indicates an inverse relationship between the illiteracy rate and life expectancy at birth. Educated people are usually more aware and concerned about their health, which positively reflects on their general health and contributes to increasing life expectancy, which enhances human development.

B- Infant Mortality Rate

A relationship can be observed between the infant mortality rate and the illiteracy rate, based on the data in Table (3). In 2006, the illiteracy rate reached (21.8%), and this rate remained stable until 2010. In contrast, the infant mortality rate per 1,000 live births showed significant fluctuations. In 2006, the infant mortality rate was (53) deaths per 1,000 live births, but subsequently, the rate witnessed a significant decline to (30) deaths in 2007, before rising again to (32) deaths per 1,000 live births in 2008. These figures indicate the Impact of the illiteracy rate on mortality rates, as illiteracy can contribute to poor health awareness and child care, which increases mortality rates, while improvements in education and health services lead to a reduction in these rates. The infant mortality rate then continued to decline steadily, reaching (25) deaths per 1,000 live births in 2009. It then declined to (24) deaths per 1,000 live births in 2010, reaching (19.7) deaths per 1,000 live births by 2015. These data show that as the infant mortality rate declines, the illiteracy rate also declines. For example, in 2011, the illiteracy rate declined to (21%), down from (22.4%) in 2010. This indicates a direct relationship between the illiteracy rate and the infant mortality rate, as a high illiteracy rate may be associated with increased mortality rates due to poor health awareness and poor care, while a low illiteracy rate leads to improved health awareness and services provided, which contributes to reducing mortality rates.

Table (3) Illiteracy Rates and Infant Mortality Rates in Iraq for the Period (2006-2022)

Years	Illiteracy Rate(%)	Life Expectancy at Birth	Infant Mortality Rate per 1,000 Live Births
2006	23	59	53
2007	25	61.0	30
2008	20	68	32
2009	21	71.9	25
2010	20.5	72.8	24
2011	20.3	69.0	22
2012	20	69.4	20.6
2013	20.5	72.7	18.5
2014	20	72.5	17.3
2015	20.3	72.6	19.7

2016	23	71.2	18.1
2017	14	70.3	18.6
2018	26	71.1	18.6
2019	15.3	71.4	19.6
2020	20	71.5	18.5
2021	12	72.5	17.8
2022	12.3	75.3	19.8

Source: Column (1) Ministry of Planning, Central Statistical Organization, Directorate of Social and Educational Statistics. Column (2) is the researcher's work based on: 1- Republic of Iraq, Ministry of Health, Annual Reports, various years. 2- Republic of Iraq, Ministry of Health, Department of Planning and Resource Development, Health and Life Statistics Division, Statistical Abstract, 2000-2006.

2- Population

It is well known that population growth leads to an increase in the number of poor people and deprives many people of their basic needs, such as food, potable water, and education. This deficiency negatively impacts the level of health services, as population growth requires the provision of more curative and preventive health services, especially for children who require continuous follow-up in health centers and hospitals.

Third: Environmental Factors

Environmental factors are among the fundamental factors that greatly impact the health of individuals and society. The impact of environmental pollution on human health is due to the infiltration of various pollutants into the body through the digestive system, the respiratory system, or through the skin. The impact of the environment on human health will be addressed through the effects of water and air pollution, as follows:

1- Water Pollution

Water pollution is one of the most prominent environmental challenges facing developing countries, including Iraq. This problem is manifested in the scarcity of potable water and the lack of health resources necessary to treat water pollution. The availability of clean water has a significant impact on human development, as water is a vital factor in enhancing human capital.

2- Air Pollution

Air pollution is a major risk factor for many respiratory diseases, including cancer. Respiratory diseases are serious health conditions that negatively impact workers' physical abilities, leading to decreased productivity and a decline in their role in human development. There is a direct relationship between air pollution and increased incidence of respiratory diseases, as increased pollution leads to increased infections and, consequently, a negative impact on individual and societal performance.

Fourth: Political Factors

1- Political instability, due to fluctuating health policies and frequent changes in leadership, affects the continuity of health programs

2- Political conflicts among members of the ruling class have caused widespread destruction of health infrastructure.

3-Weak governance and administrative corruption affect the distribution of resources and the effectiveness of health spending.

The third topic

Analysis of the Relationship between the Health Situation and Sustainable Development in Iraq for the Period (2006-2022)

First: The State of the Health Sector in Iraq

The health sector in Iraq is of great importance because it has a direct and influential connection to human life. This context includes providing health care to citizens, which is one of the basic human rights guaranteed by the Constitution and international conventions. Achieving this is linked to government policies (Al-Shaibani 3.2014). The health sector in Iraq, like other sectors, suffers from major problems and crises that have escalated significantly in recent years due to widespread administrative and financial corruption and weak deterrent laws, which have enabled some parties and influential figures to achieve private gains at the expense of Iraqi citizens. Three decades ago, the health system was among the best in the Middle East, as some sources report, as it was based on concentrated capital and a sound and free hospital system (Al-Moussawi 65.2007).

Second: Analysis of the reality of health sector indicators in Iraq for the period (2006-2022)

The health sector is considered one of the vital basic sectors due to its close connection to the lives of individuals and society. It is one of the most prominent indicators of human development, along with education and income. Therefore, the health sector is considered a basic human need due to its vital role in combating disease. The primary function of the health sector is to provide the best medical and health services, as development indicators are reflected through health service indicators such as the number of doctors and dentists, the number of hospitals and centers, the

number of nurses, and spending on health services. These indicators are also closely linked to the development of human capital, which means that achieving positive results in these indicators is of paramount importance. Health services positively impact other human development indicators (Khader 291.2017). Health is an essential component of human life, which is the primary goal of development and a means to achieve social, material, and cultural foundations. Health also plays a pivotal role in promoting economic growth and increasing productivity. Thus, the relationship between health and human development is closely linked; Both are goals that people strive to achieve. Providing a high level of public health leads to increased production and productivity, which contributes to achieving advanced levels of economic and social well-being for individuals in society (Al-Shammari, 17/2020). The following are some of the key Indicators that reflect the health situation in Iraq:

1- Doctor/Individual Index

The doctor index is considered one of the health indicators that reflects the level of health progress in any country. This index reflects the adequacy of the population of doctors. The greater the number of doctors relative to the population size, the more it indicates the development of health in the country (Al-Ani, 82/2016). The standards differed from one country to another, with numbers ranging from 1 doctor per 5,000 people in African countries to 1 doctor per 170 people in Cuba, 1 doctor per 220 people in Belarus, and 1 doctor per 300 people in Germany and France (m.alsharq). The World Health Organization's standard indicates that countries with fewer than 23 doctors per 10,000 people will not be able to secure adequate coverage rates for health services according to the priorities of the Millennium Development Strategy (Kitan 122.2003)

Table (4) Doctor/Person Index in Iraq for the period (2006-2022)

years	Doctors Index	Number of Population	Doctor/ Individual
2006	16518	28,810,441	1744
2007	15994	29,682,081	1855
2008	19334	31,895,637	1649
2009	22396	32,326,011	1443
2010	24750	32,941,376	1330
2011	26081	33,226,884	1273
2012	28897	34,207,248	1183
2013	30913	35,095,772	1135
2014	30083	36,004,552	1196
2015	26975	36,933,714	1369
2016	27208	37,883,543	1392
2017	31451	37,139,519	1180
2018	34807	38,124,182	1095
2019	36297	39,127,889	1077
2020	38865	40,150,174	1033
2021	42329	41,190,658	973
2022	45038	42,248,883	938

Source: Ministry of Planning and Development Cooperation, Central Statistical Organization, Environment and Development Indicators Priority in Iraq, various years, various pages

Table (3) shows that the number of doctors began to decline in 2006 and 2007, and this decline was due to the deterioration of the security situation and instability. After that, the number of doctors began to rise again, reaching (19,334) in 2008. This increase continued until it reached (30,913) in 2013, with a ratio of (1,135) doctors per capita. However, in the years (2014-2015), it witnessed a noticeable decline, with the numbers reaching (30,083-26,975), with a ratio of (1,196-1,369) doctors per capita. However, indicators show the keenness of the government and the Ministry of Higher Education to increase the number of Iraqi doctors. This interest resulted in a noticeable increase in the number of doctors in the years (2017-2018), as the number reached (31,451) and (34,807), respectively, despite the critical circumstances that Iraq is going through and the challenges of confronting terrorist groups such as ISIS. The World Health Organization has set a target of (700) physicians per doctor, with the ratio of physicians reaching (1,095) physicians per (capita) in 2018, compared to (30) physicians in Bahrain, (24) in Egypt, and (9) in Iran. Therefore, Iraq needs to graduate a greater number of physicians in the coming years to reach the specified ratio of (1) physician per (700) population, which places Iraq among middle-income countries.

2- Hospital/Person Index

Hospitals are one of the primary health indicators. Increasing their numbers, proportionate to the population size, indicates the efficiency of the services they provide to the population. Conversely, their small numbers indicate a lack of treatment capacity. The World Health Organization also defines hospitals as an essential part of a social and health system whose goal is to provide comprehensive health care to the population. This care includes preventive and curative services, as well as outpatient services that extend to families in their home environments (Taher 306.2022). This criterion demonstrates the relationship between the number of hospitals and the population size, revealing significant variations in this relationship. In developing countries, the average ranges from 50,000 to 100,000

individuals per hospital, while in other countries, it drops to between 5,000 and 25,000 individuals per hospital. In countries such as Sweden, Norway, Finland and Britain, the rate is less than 6,000 individuals per hospital (Al-Dulaimi 150.2009). The World Health Organization standard indicates that one hospital should cover (50,000) individuals from the population.

Table (5) Hospital Index in Iraq for the period (2006-2022)

Years	Number of Government Hospitals	Number of Private Hospitals	Total Number of Government and Private Hospitals	Number of Population	Hospital/Individual
2006	155	64	219	28,810,441	131554
2007	156	60	216	29,682,081	137417
2008	208	80	288	31,895,637	110748
2009	220	100	320	32,326,011	101018
2010	229	92	321	32,941,376	102621
2011	231	96	327	33,226,884	101611
2012	239	96	335	34,207,248	102111
2013	255	105	360	35,095,772	97488
2014	257	111	368	36,004,552	97838
2015	253	119	372	36,933,714	99284
2016	260	121	381	37,883,543	99431
2017	273	127	400	37,139,519	92848
2018	281	135	416	38,124,182	91644
2019	286	143	429	39,127,889	91207
2020	295	155	450	40,150,174	89222
2021	312	170	482	41,190,658	85457
2022	222	194	416	42,248,883	101559

Source: Ministry of Planning and Development Cooperation, Central Statistical Organization, Statistical Aggregates for Various Years

Table (4) shows the status of hospitals in Iraq. Their numbers were low after the American colonization of the country, as hospitals faced sabotage and destruction. In 2006, their number reached (219). However, the following years witnessed a significant increase in the number of hospitals, reaching (400) hospitals in 2017. This increase continued until it reached (450) government and private hospitals in 2020. The table shows that government hospitals are constantly increasing, with the exception of 2015, when their number decreased to (253) hospitals. This is due to the consequences of the wars against the criminal ISIS gangs during this period. Despite these improvements, there is still a need to develop specific measures to help health authorities in Iraq prepare for and mitigate the negative effects that could lead to a worsening of health conditions. This requires strengthening health systems and improving public health services in all hospitals.

Third: Key Indicators for Measuring Sustainable Development

The current status of sustainable development in any country is measured using a set of economic, social, environmental, and institutional indicators. These indicators reflect the extent to which countries have achieved sustainable development. Some economic indicators are measured through quantitative criteria that are calculated and monitored, providing a clear picture of the state of sustainable development in a country.

1- Economic Indicators

Economic indicators are an essential part of measuring sustainable development. They represent a key tool for setting strategic goals for achieving a diversified economy that optimally utilizes natural resources to meet the needs of individuals and protect the environment. These indicators include (Planning and Development Cooperation, 29.2017)

A- Per capita GDP

The annual per capita GDP reflects the amount of goods and services enjoyed by an individual during the year, making it a key indicator of economic growth and a measure of total production. Although this indicator does not provide a comprehensive assessment of sustainable development, it is an important factor in determining quality of life. Continued increases in average per capita GDP are a necessary, though not sufficient, condition for assessing sustainable development, given the lack of inclusion of environmental variables in national accounts. Furthermore, this indicator suffers from several shortcomings, most notably its inability to reflect the true distribution of income among individuals. Average income may be far from the actual reality experienced by most of the population, especially in cases where income is concentrated in the hands of a limited group (Samaka, P.184, 2006).

B- Ratio of Gross Fixed Investment to GDP

This indicator refers to the formation of gross fixed capital, which refers to the investment of a portion of the current productive capacity in the production of capital assets, such as buildings, construction, equipment, machinery, and means of transportation. This formation is divided into two main types: the first is net capital formation, which

contributes to expanding production capacity by adding new assets, and the second is compensatory capital formation, which aims to maintain the current level of production by replacing worn-out or depreciating assets.

Fourth: Analysis of Health Sector Indicators and Sustainable Development in Iraq for the Period (2006-2022)

Table (6) Analysis of Some Health Sector Indicators and Sustainable Development in Iraq for the Period (2006-2022)

Year	Health Sector Indicators		Number of Population	Sustainable Development Indicators	
	Doctor/Individual Index	Health Spending Index of Government Spending		Gross Domestic Product at Current Prices(GDP)	Average Per Capita
2006	1744	2.83	28,810,441	95588.0	3274.2
2007	1855	3.16	29,682,081	111455.8	3754.2
2008	1649	3.73	31,895,637	157026.1	5135.2
2009	1443	7.48	32,326,011	130643.2	4125.8
2010	1330	8.20	32,941,376	162064.6	4988.1
2011	1273	5.48	33,226,884	217327.1	6518.7
2012	1183	5.54	34,207,248	254225.5	7431.9
2013	1135	5.68	35,095,772	273587.5	7795.4
2014	1196	4.15	36,004,552	266332.7	7649.0
2015	1369	5.74	36,933,714	194681.0	5528.7
2016	1392	7.52	37,883,543	196924.1	5444.5
2017	1180	5.07	37,139,519	221665.7	5968.5
2018	1095	4.13	38,124,182	268918.8	7053.8
2019	1077	4.73	39,127,889	276157.9	7057.8
2020	1033	7.56	40,150,174	215661.5	5371.4
2021	973	7.27	41,190,658	301152.8	7311.2
2022	938	7.04	42,248,883	383064.2	9066.8

Sources: Prepared by the researcher based on: 1- Central Bank of Iraq, General Directorate of Statistics and Research, Statistical Bulletin for the years (2003-2008-2010)

2- Central Bank of Iraq/General Directorate of Statistics and Research/Statistical Bulletin for the years (2003-2005-2018)

3- Annual growth rate = $\frac{\text{Current period value (GDP) at current prices} - \text{Previous period value}}{\text{Previous period value}} \times 100$

Previous period value

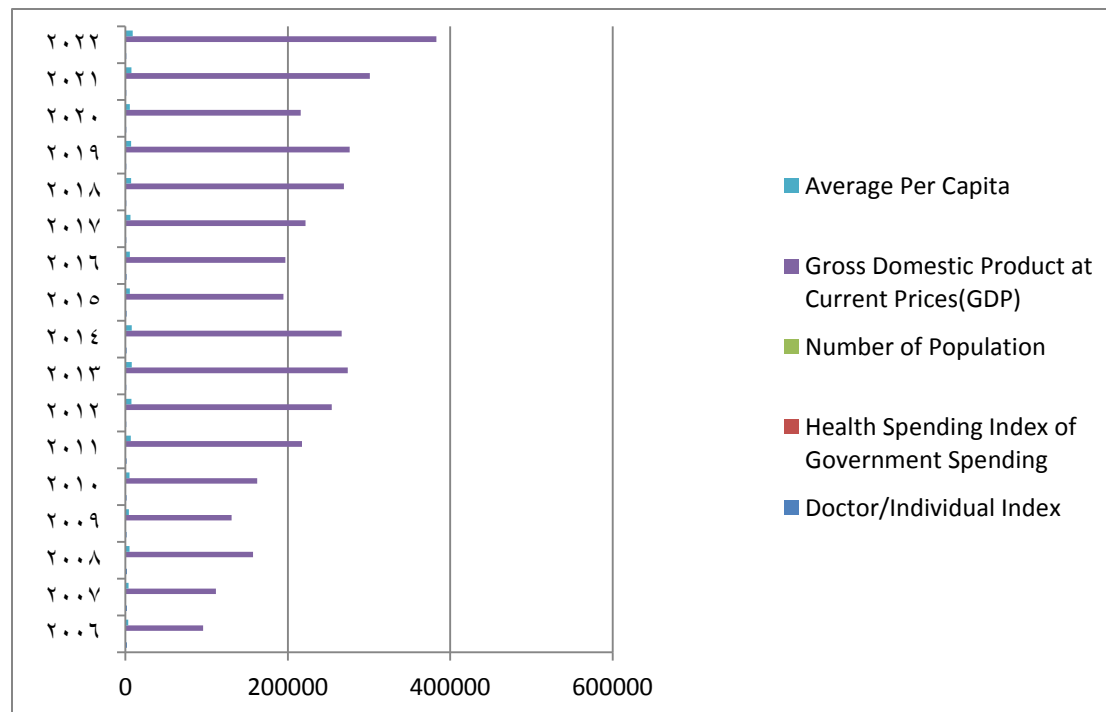
From Table (5), we note that the indicator of doctors per capita has witnessed an increase to (1855) in 2007 after it was (1744) in 2006. As for the percentage of government spending on health, it was stable between (2.83%) and (3.16%), which reflects stability in government funding priorities. This period witnessed a gradual increase in population growth. As for the gross domestic product (GDP) at current prices, it rose by more than 275% during this period, while the average per capita share of the GDP almost doubled from (3274.2) in 2006 to (3754.2) in 2007. This is due to the rise in global oil prices. It is known that the economy of the Iraqi country is a rentier economy, as it depends on oil revenues in its government expenditures, in addition to the state's interest in improving the standard of living of the citizen in terms of increasing employee salaries and expanding the social insurance system (Brihi 2011 29). Despite the improvement in sustainable development indicators, the health sector indicators did not improve at the same rate. The pace indicates a lack of a direct response between health spending and economic growth.

In 2008, the number of doctors per capita decreased from 1,649 to 1,183 in 2012. This period witnessed a rapid increase in population growth, while the percentage of government spending on health rose from 3.73% to 5.54%. This increase in spending rates is due to the security stability witnessed during this period, represented by the extension of security control throughout the country, in addition to raising wages for public sector workers, which led to improved health services and confronting increasing population pressures. Meanwhile, the period witnessed a sharp increase in the gross domestic product, which reached 254,225.5 in 2012, while 2009 witnessed a contraction due to the global financial and economic crisis, which in turn was reflected in a decline in the gross domestic product and consequently a decline in the average per capita share to 4,125.8, after it had reached 5,135.2 in 2008 (League of Arab States). 203.2011) Then we see that the average per capita share of the GDP has increased again, indicating an improvement in the standard of living despite the economic fluctuations. As for the year 2013, the index of doctors per capita continued to decline to (1180) in the year 2017, as this period witnessed a variation in population growth and health spending recorded a decline after 2013, while the GDP recorded a noticeable decline for the years 2014-2015, respectively. This is due to the shocks that the Iraqi economy was exposed to, such as the entry of the Takfiri terrorist gangs ISIS and the occupation of some governorates on the one hand, and the decline in oil prices and the decline in the country's exports on the other hand. As for the average per capita share, it was affected by the decline in the GDP, and thus this period indicates a decline in the marginal returns of health spending, as the continuation of spending did

not lead to significant improvements in public health indicators, which indicates that administrative efficiency and health policies play a crucial role in achieving optimal utilization of available resources.

As we see in 2018, the index of doctors per capita continued to decline, despite the increase in the percentage of health spending to (7.04%) in 2022, which shows a strong government response to the requirements of the Covid pandemic and a noticeable increase in health funding, but it was not accompanied by noticeable improvements in the indicators of doctors, as the index of doctors per capita reached (938) in 2022 after it was (1855-1183-1180) for the years (2007-2012-2017). The ratios of these indicators are very high compared to the World Health Organization standard, which stipulates the presence of (1) doctor for every 434 patients. This indicates a significant shortage in the number of doctors, and thus causes great pressure on doctors due to the increase in the number of patients. As for the index of the percentage of government spending on health, it appeared to us in a fluctuating manner, as the percentage of the health spending index of government spending reached (2.83) in 2006, after which this percentage increased to (5.54) in 2012, and this increase continued. To reach (7.04) in 2022. During this period, it was noted that there was a clear development in the ratio of the health spending index to government spending during the years 2009-2010, as the ratios reached (7.48% - 8.20%). This is due to the large increase in the health budget compared to the increase in the gross domestic product. It becomes clear to us that the sharp increase in health spending was not sufficient to compensate for the shortage of health cadres, which indicates structural problems in medical recruitment and training. This can be explained by the time constraints on the response of medical supply. As for the gross domestic product, it witnessed a strong recovery after 2020. This is due to the increase in global demand for oil after its activity witnessed a significant improvement, while the average per capita share of the GDP jumped to (212,408.7) in 2022, reflecting a strong economic recovery phase. As we can see in the following figure:

Figure (1) Analysis of some indicators of the health sector and sustainable development in Iraq for the period (2006-2022)



Source: Researcher's work based on data from Table (5)

Conclusions

1-Human health development indicators revealed discrepancies in performance compared to international standards. Some indicators, such as the population per doctor ratio, exceeded standard levels, placing significant pressure on doctors and negatively impacting the quality of health services provided to individuals. Conversely:

2-The need to improve the efficiency of health spending: Instead of simply increasing the budget, focus should be on policies that enhance medical recruitment, training, and the provision of an infrastructure capable of absorbing available funding.

3-Health spending levels have witnessed significant fluctuations due to the country's general instability and the absence of well-thought-out plans for managing public facilities. This fluctuation has impacted the relative importance of health spending compared to total public spending and GDP. Furthermore, the growth rate has fluctuated between negative and positive values without a clear correlation with GDP growth, leading to a decline in allocations to the health sector. This decline has negatively impacted health worker productivity.

4- Develop sustainable public health strategies that ensure the long-term stability of health services, especially during times of crisis such as the pandemic.

Recommendations

1- Efforts should be made to reform and develop the health system in Iraq to ensure the provision of free medical services to the most needy groups, particularly those with limited income and chronic diseases, with a focus on strengthening preventive care services. At the same time, it is advisable to reduce the waste of financial and human resources by adopting a model of shared spending between the state and beneficiaries of health services, which contributes to directing resources toward optimal use when needed. This new approach also requires the provision of acceptable-quality health services at competitive prices, achieving the desired balance between economic efficiency and the principles of health equity.

2- Administrative positions in the health sector are often assigned exclusively to doctors, even though they lack academic qualifications or specialized training in management, such as a diploma in hospital management or an MBA. Accordingly, there is a need to establish a training center affiliated with the Ministry of Health that organizes intensive courses in health care management, lasting three to six months, and awards participants accredited certificates. These courses should be considered a prerequisite for assuming leadership positions such as managing hospitals, departments, or health sectors, thus enhancing management efficiency and improving the quality of health services provided.

3- No real and sustainable progress in the level of health services can be achieved without a significant increase in government spending allocated to the health sector, so that it is at least 10% of the total public spending in the annual budget. Iraq is in urgent need to raise the proportion of its health allocations from the current level of about 5% to at least 10%, in line with the recommendations of the World Health Organization. This increase in financing will enable the health system to bring about a qualitative shift in the quality of the services provided and ensure their long-term sustainability.

4- Instead of focusing on increasing the volume of health spending only, this health spending should be directed towards enhancing its sustainability by investing in developing health infrastructure, such as establishing hospitals and medical centers, as well as supporting employment and training policies for medical personnel, which contributes to meeting the needs of growing population growth.

5- Developing an integrated strategy for health and sustainable development that links the sectors of health, education, environment, and economy.

6- Rehabilitation and renewal of health infrastructure in cities and countryside, especially in areas affected by the conflict. By increasing the number of primary health centers and expanding primary health care services to relieve pressure on hospitals. And promote the use of health technology.

Sources and References

First: Arabic Books

1- Ayoub Anwar Hamad Samaka, Environment and Sustainable Development, Analysis of the Relationship between Environment and Sustainable Development with Special Reference to Erbil Governorate, Al-Tafsir Publishing and Advertising, First Edition, 2006.

2- World Health Organization Report, Health and Sustainable Development, Geneva, 2001

3- Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 1992

4- League of Arab States, Arab Monetary Fund, Unified Arab Economic Report, 2011

5- Hanan Abdul-Ridha Taher, Efficiency of Health Development Services in the Urban Center of Warka District, 2021. Al-Qadisiyah Journal of Humanities, Volume 25, Issue 4, 2022.

6- Khalaf Hussein Ali Al-Dulaimi, Planning Community Services and the Environment: Foundations of Technical Standards, Safa Publishing and Distribution House, Amman, 2009.

7- Rizqi Nour El Jouda, Kalash Maryam, The Role of Health Expenditures in Achieving Sustainable Health Development in Algeria for the period 2000-2018 Compared to Tunisia and Morocco, An Analytical Study, Algerian Journal of Public Finance, Volume 10, Issue 2, 2020

8- Suad Kazem Khadir Al-Mousawi, Sustainable Human Development in Iraq and Health Spending: Reality, Challenges, and Solutions, Unpublished Research, Analytical Economic Study, University of Maysan, College of Administration and Economics, 2007

- 9- Samir Ahmad Abu Al-Ayoun, Health Culture, First Edition, Al-Masarra Publishing and Distribution House, Amman, Jordan, 2013
- 10-Salah Othman Abdul Saleh Al-Ani, Analysis of Spatial Variation of Human Development Indicators in Anbar Governorate, PhD Thesis, University of Anbar, College of Education for Humanities, 2016.
- 11- Abbas Hajoul Kitan, Spatial Analysis of Health Services in Dhi Qar Governorate, Master's Thesis Submitted to Ibn Rushd College of Education, University of Baghdad, 2003.
- 12-Othman Muhammad Ghunaim, Majida Abu Zant, Sustainable Development: Its Philosophy, Planning Methods, and Measurement Tools, Second Edition, Safaa Publishing and Distribution House, Amman, 2014
- 13-Faris Barihi, Knowledge Economy: Opportunities and Challenges, Journal of the Baghdad College of Economic Sciences, Issue 27, 2011.
- 14-Kazem Al-Shabib, Obstacles to Health Development, Al-Okaz Newspaper, Issue 2202, Thursday, June 28, 2007
- 15-Kamel Mahna, Primary Health Care: Reality and Solutions, First National Conference, Gathering of Civil Society Organizations in Lebanon, UNESCO Palace, December 1999
- 16-Lamia Hamayzia, Abboud Zarqin, Sustainable Health Development And its Impact on Human Resources: A Comparative Study of Algeria, Tunisia, and Morocco, Economic Visions Magazine, University of Martyr Hama Lakhdar El Oued, Issue 9, December 2015
- 17-The World Commission on Environment and Development, Our Common Future, translated by Muhammad Kamil Arif, World of Knowledge Series, Issue 142, National Council for Culture, Arts, and Literature, Kuwait, 1989
- 18-Mai Shabib Al-Shammari, Ali Hamza Jiyad, Sustainability within the Framework of Development - A Future Vision for Sustainable Development in Iraq, Issue 57, 2020.
- 19-Muqaddam Al-Shaibani, The Reality of the Health Sector in Iraq and Ways to Advance It (Preliminary Reading), Al-Bayan Center for Planning and Studies, 2014
- 20-Munim Ahmed Khadir, Burhan Shiaa Marai Hassan Measuring and Analyzing the Impact of Health Services on Human Development Indicators in Iraq for the Period (2005-2015), Tikrit Journal of Administrative and Economic Sciences, Volume 2, Issue 38, 2017
- 21-Nawzad Abdul Rahman Al-Hiti, Sustainable Development: Framework and Applications: The United Arab Emirates as a Model, Abu Dhabi, Emirates Center for Strategic Studies and Research, 2009
- 22-Ministry of Planning and Development Cooperation, Central Statistical Organization, National Development Plan 2013-2017, Baghdad, 2017.

Second: Foreign sources

- 1- Geis, D. and Kutzmark, T. Developing Sustainable Communities - The Future is Now, Center of Excellence for Sustainable Development, website, 1997
- 2- Kozlowski, J. and Hill, G. Towards Planning for Sustainable Development: A Guide for the Ultimate Environmental Threshold (UET) Method, Ashgat Publications, Sydney, 1998

Third: Websites

- 1- [https:// www.m.alsharq.net.sa](https://www.m.alsharq.net.sa)