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The geographical pattern of deaths in Basra Governorate: A comparative temporal study between 2012 and 2022

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Summary:
Death is a biological life phenomenon. As defined by the World Health Organization, it is the complete cessation of all aspects of life at any time after the occurrence of a live birth, meaning the cessation of vital functions after birth without the ability to live after fainting. Among the important matters that the geographer is interested in in the field of studying deaths are the causes. which leads to it; The main ones are related to the prevailing environmental conditions, as the repetition of some causes of recorded deaths leads to the formation of patterns of deaths that are caused by diseases or accidents.The causes of death may vary in populated societies with their degree of urbanization and the extent of their well-being and security. In developed countries, causes related to circulatory diseases, road accidents, and cancers are high, while parasitic and infectious diseases and malnutrition prevail in developing countries with low economic and social levels.This research aims to study deaths in Basra Governorate and their patterns according to their causes, whether pathological or due to accidents, based on registered cases for the (2012and 2022), and knowing their movement temporally and spatially. Keywords: Deaths, causes of death, geographical pattern, population, Basra Governorate

Introduction

Death is the negative element of the population growth equation; as it leads to a decrease in the population numbers, unlike (births and immigration), which represent the elements of population increase and demographic change. It is known that the natural population increase is through births, while their natural decrease is through deaths; that is, deaths continue as a natural phenomenon even if all advanced health means and proper nutrition are available or all epidemics, diseases and disasters are eliminated; because life is a characteristic inherent in living organisms and has certain limits, and a person must die after reaching a certain age.There is no doubt that the progress of health services and the continued discovery of drugs and treatments for diseases, along with the improvement of the standard of living of individuals, are among the most important factors influencing the reduction of the mortality rate. Death can be considered one of the most important factors that reflect the extent of progress of societies and their level of well-being and a measure of the development of their health services. We notice the reflection of this in the reduction of crude death rates in the world, which have currently stabilized between 10-15 per thousand (Al-Rashidi, 2009, 230).The importance of studying the mortality phenomenon is not limited to knowing its sizes and the change in this size over time or space; rather, analyzing the causes of death is of particular importance in explaining the patterns of mortality and its various trends, considering that knowing the causes allows for evaluating the possibilities of reducing some of them, which is reflected in reducing mortality rates in the geographical area.Hence, the importance of studying death and its causes in population communities, especially in the population community in Basra Governorate, which is currently suffering from a shortage of all services, the most important of which are health services; as (13,159) deaths were recorded according to 2022 statistics, higher than what they were according to 2012 data, with a total of (10,669) registered cases.Research problem: - The concept of the research problem is determined by the extent of the researcher's

interest and desire to investigate and discover the secrets and causes of the phenomenon being studied. There are many questions about deaths and their characteristics in the study area. The research problem can be formulated with the following questions: -

- What are the main causes of death in Basra Governorate during the years 2012 and 2022?
- What is the volume of deaths in the governorate and is there a difference between 2012 and 2022 in their volumes?
- Is there a spatial variation in the number of deaths between 2012 and 2022?
- Is there a difference in the gender and age composition of deaths between 2012 and 2022?

Research objective and hypothesis:

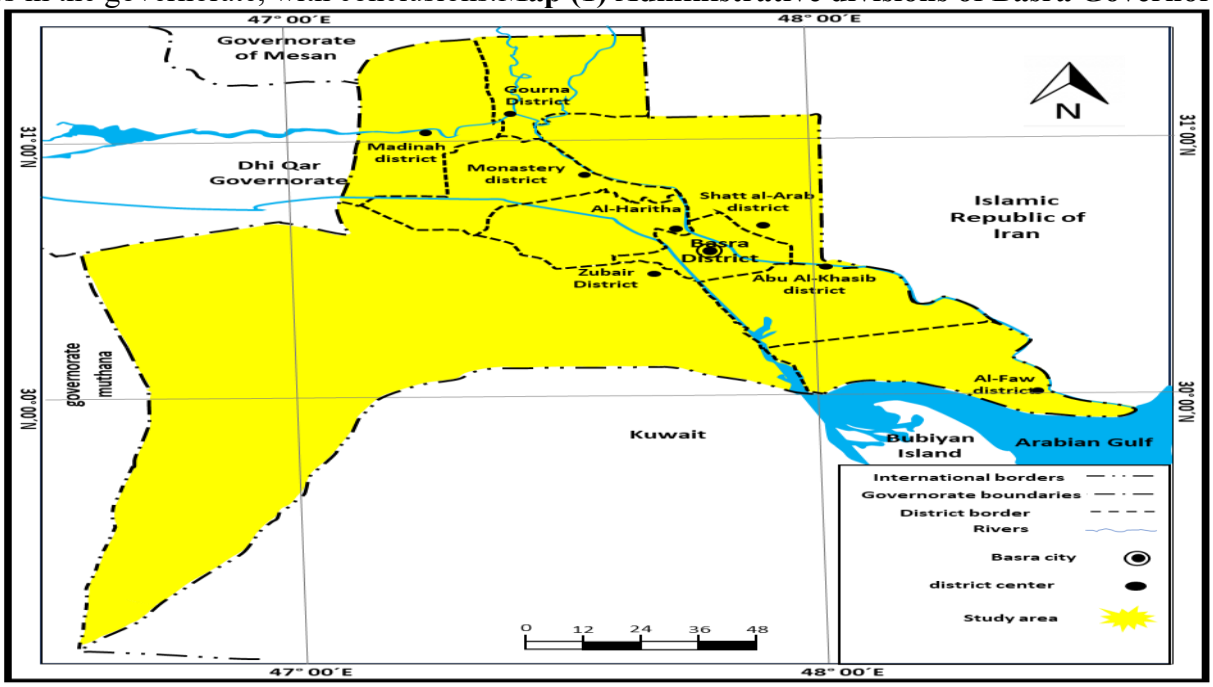
The research aims to study and analyze deaths and their causes in Basra Governorate during the years 2012-2022 and their spatial variation according to the districts, in addition to analyzing their qualitative and age composition. The study is based on several hypotheses, namely:

- Is there a difference between the volume of deaths according to their causes for the years 2012 and 2022?
- Does the spatial variation of deaths differ between the two mentioned years?
- Does the pattern of the gender and age composition of deaths differ between the two mentioned years?

Study area: -

It is represented by spatial boundaries represented by Basra Governorate (Map 1), which is located in the southern part of Iraq and is bordered by Maysan and Dhi Qar Governorates to the north, the Iraqi-Iranian borders to the east, the Iraqi-Kuwaiti borders and the Arabian Gulf to the south, and Muthanna Governorate to the west, and between longitudes (46°40 - 48°30) east and latitudes (29°5 - 31°20) north, and Basra Governorate includes ten districts (Basra District, Abi Al-Khaseeb, Shatt Al-Arab, Al-Zubair, Al-Faw, Al-Hartha, Al-Deir, Al-Madinah, Al-Qurna) and Al-Sadiq District, which was recently established but was not included as a district in the study because its data were not administratively detailed in government departments (Ministry of Planning and Ministry of Health), so it is still considered a sub-district affiliated with the (Madinah) District; Therefore, it was not included in the study because its data is currently integrated. As for the time limits, they are represented by studying deaths recorded according to statistics (2012 and 2022).

Research Structure: The research relies on the analytical geographical approach and uses demographic statistical methods to analyze information and derive results. It relies on studies, books and official statistics issued by the health and planning departments in Basra Governorate. The research is divided into five sections: The first section is concerned with knowing the importance of studying the causes leading to deaths and classifying them and the number of deaths in the governorate. The second section studies the temporal change in deaths according to their causes for the years (2012-2022), while the third section represents the spatial variation in deaths according to their causes in the governorate, with conclusions.**Map (1) Administrative divisions of Basra Governorate**



Source: Republic of Iraq, Ministry of Planning, Department of Regional and Local Development, Basra Planning Directorate, Map of Administrative Units of Basra Governorate, 2023.

First - The importance of studying the causes of death and their international classification The World Health Organization has defined the causes of death that are mentioned in the medical death certificate with the aim of emphasizing the recording of all information related to death in the death certificate in a uniform manner without the need to mention the symptoms or method of death. Therefore, the causes of death that are suggested by proof in the medical certificate are defined as "diseases, medical conditions or injuries that resulted in death or that contributed to the events of death, and also include the circumstances of the accident or the means of violence that caused this injury" (Al-Othman, 2020, 274)Many studies have attempted to classify deaths based on determining their causes, so much so that this work has occupied many researchers and thinkers in population sciences and statistics since the seventeenth century to the present time; as the English scientist Graunt is considered the first to classify death rates according to their causes (Table 1), as attempts at classification continued by researchers until the World Health Organization took it upon itself to issue an international guide to classifying diseases (ICD), which is reviewed every ten years, as this classification appeared since the nineteenth century and has witnessed many revisions, the latest of which was the eleventh revision of the International Classification of Diseases at the World Health Assembly, which was adopted in May 2019 and officially entered into force in January 2022. (World Health Organization, 2024)Table (1) Stages of development of the numbers of the international classification of causes of death

Time	Organizing by	output
XVII century	English statistician John Graunt	Classify death rates by cause of death
18th century	Australian statistician Sauvages	Try to classify diseases in a systematic way Nosology Methodic
1853	William Farr - the first medical expert	Formation of an international list of causes of death
1893	Head of Statistical Services - Paris Jacques Bertillon	Bertillon classification
1920	League of Nations Organization	Management of the classification of causes of death
1946	World Health Organization	Became responsible for the revision and continuous publication of the classification Version 6 includes pathological causes
1975	World Health Organization	Issuance of ICD-9
1996	World Health Organization	Issuance of ICD-10
2007	World Health Organization	Last update

Source: Based on https://ar.wikipedia.org/wiki/

In Iraq, the recording of vital events began after the independence of the state in 1921, and then data on vital statistics began to be completed in the Central Statistical Organization since the issuance of the Statistics Law of 1972, where the registration of births and deaths became mandatory. It included all censuses and surveys for the periods from 1977 and the following questions about deaths, their characteristics and causes. The last of these was in 2013, when the poverty and maternal mortality map survey was implemented. It is the largest survey implemented in Iraq and the Middle East, as it was implemented on (311) thousand families, which included many questions about demographic characteristics, especially deaths. See (Hadi, 2017).Knowing the main causes of death is one of the priorities of the geographer in the field of mortality studies; as this is related to the environmental conditions surrounding the phenomenon, as these causes are formed by specific patterns of deaths due to diseases or accidents and their impact on the waste of human resources, as “the causes of death are a mirror that reflects the degree of civilization and progress of the nation and the extent of its well-being and security (Al-Bayati, 2009, 80), as it can be said that demographic well-being “is the enjoyment of the population of a long life span and a long average lifespan and a very good amount of vitality and a size that is proportional to the economic

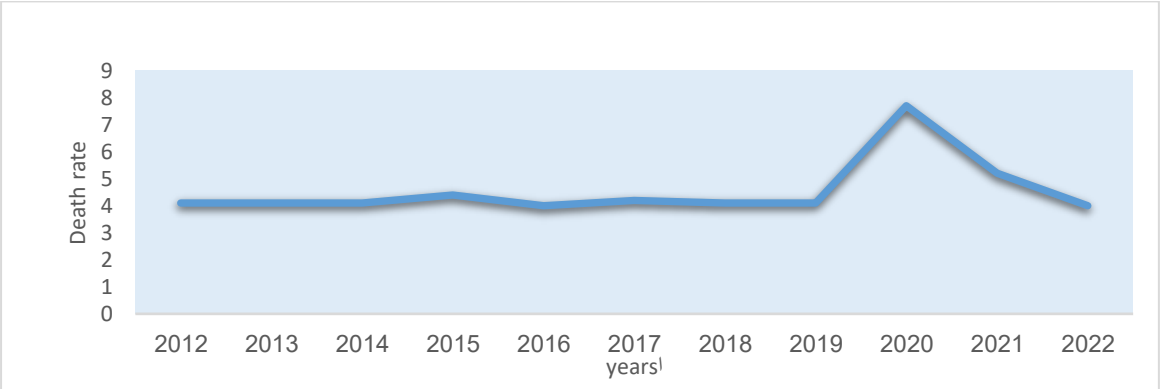
resources, which allows individuals to increase the number of years they are likely to live while adding their efforts to the general production, taking into account scientific and professional development and the rise in the economic level and various service aspects" (Al-Saad, 2021, 578). The length of life span and the average lifespan of a person, in addition to the number of inhabitants, is the correct standard for the vitality and production of the nation (Saleh, 2014, 4).Knowing the number of deaths and their quantitative distribution is of great importance in monitoring the movement of deaths in Basra Governorate towards an increase or a decrease, and this in turn provides a scope for evaluating the effectiveness of the health system; as knowing the number of deaths helps health authorities determine whether they are focusing on appropriate and effective health measures or not. (Al-Saad, 2019, 420)By following Table (2) and Figure (1), we notice that the movement of the annual crude death rate, which is a reflection of the number of deaths per thousand of the population, has remained at high levels for the period 2012-2022, with death rates that remained within the range of 4.0 per thousand and over the successive years from 2012-2019, respectively. However, it soon recorded very high rates off its path for the years 2020 and 2021, with rates of 7.7 per thousand and 5.2 per thousand, respectively. This certainly reflects the increase in deaths in these years, which constitute the period of the spread of the Covid-19 (Corona) epidemic, as we notice that deaths have returned to their previous level of 4.0 per thousand in 2022 after the dangerous impact of the epidemic and its mutations disappeared in subsequent years.**Table (2) Time development of the number of deaths in Basra Governorate for the period 2012 – 2022**

Year	population	Number of deaths	Crude multiliterate
٢٠١٢	2,601,790	10669	٤,١
٢٠١٣	2,672,425	10998	٤,١
٢٠١٤	2,744,758	11372	٤,١
٢٠١٥	2,686,366	12047	٤,٤
٢٠١٦	2,894,591	11667	٤,٠
٢٠١٧	2,833,375	11934	٤,٢
٢٠١٨	2,908,491	11979	٤,١
٢٠١٩	2,985,075	12339	٤,١
٢٠٢٠	2,063,060	15958	٧,٧
٢٠٢١	3,142,450	16383	٥,٢
٢٠٢٢	3,223,159	13159	٤,٠

Source: Based on:

1- Republic of Iraq, Ministry of Planning, Department of Regional and Local Development, Basra Statistics Directorate, Population Estimates for the Years 2012-2022 (Unpublished).

2- 2- Republic of Iraq, Ministry of Health, Department of Health in Basra Governorate, Planning and Human Resources Department, Vital Statistics Division, Birth and Death Statistics for the Years 2012-2022 (Unpublished).**Figure (1) Crude death rate in Basra Governorate for the period (2012-2022)**



Source: Table (2)

Second - Temporal change in the pattern of deaths according to their causes between 2012-2022

The data in Table (3) and Figures (2, 3 and 4) indicate that there are clear changes in the number of deaths between 2012 and 2022, which appear as follows:

- The total number of deaths in 2012 was (10,669) deaths, at a rate of (4.00) deaths per 1000 people of the population, while the total number of deaths in 2022 was (13,159) deaths, at a rate of (4.30) deaths per 1000 people of the population.
- The percentage of change between the total number of deaths in the two mentioned years recorded a positive value of (23.3), which means that there is a relative increase in the total number of deaths.
- There is no statistical difference between the death rates per 1000 people between the two mentioned years, as indicated by the calculated chi-square value of 0.02, which was lower than the tabular value of 3.84 at a degree of freedom of 1 and a significance level of 0.05.
- According to the cause of death and during the two years of comparison, it is noted that diseases of the circulatory system were the highest among the causes of death, as they reached (3581) deaths in 2012, with a percentage of (33.6%) of the total deaths, and reached (4869) deaths in 2022, with a percentage of (37.0%) of the total deaths, while diseases of the musculoskeletal system were the lowest as a cause of death, as they recorded (4) deaths in 2012, with a very low percentage of (0.4%) of the total deaths, and recorded (19) deaths in 2022, with a percentage of (0.14%) of the total deaths, Figures (2) and (3).
- The rates of change varied between deaths according to their causes between 2012 and 2022, as deaths from infectious diseases, respiratory diseases, and diseases of the reproductive and urinary systems recorded negative rates of change of (-31.0) (-10.2) (-3.7) respectively, while deaths from other diseases recorded positive rates of change, the highest of which was for nervous system diseases, where it reached (+64), and the lowest was for accidents as a cause of death, which reached (+3.5), Figure (4).
- In 2012, circulatory system diseases ranked first as a cause of death, followed by certain conditions that arise in the postnatal period, followed by unspecified causes in third place, tumors in fourth place, then accidents, which ranked fifth, and in sixth place, diseases of the reproductive and urinary systems, followed by infectious diseases in seventh place, and in eighth place, congenital malformations, then diseases of the respiratory system, which ranked ninth, and in tenth place, endocrine diseases, followed by diseases of the nervous system in eleventh place, then diseases of the digestive system in twelfth place, and benign tumors and blood diseases in thirteenth place, and finally diseases of the nervous and skeletal systems in fourteenth place. In 2022, circulatory system diseases come first, followed by unspecified causes in second place, tumors in third place, certain conditions that arise in the postpartum period are the cause of death in fourth place, accidents are the cause of death in fifth place, diseases of the reproductive and urinary systems come in sixth place, congenital malformations are in seventh place, infectious diseases come in eighth place, respiratory system diseases come in ninth place, nervous system diseases come in tenth place, endocrine diseases come in eleventh place, and the novel coronavirus pandemic ranked twelfth as a cause of death in 2022, then diseases of the digestive system, where it comes in thirteenth place, and in fourteenth place came benign tumors and blood diseases as a cause of death, and diseases of the musculoskeletal system ranked fifteenth and last. When comparing the two mentioned years, we find that there is a relative difference in the order of causes of death.We can say that the pattern of deaths according to their causes for both mentioned years is similar to the global pattern of deaths, where diseases of the circulatory system top the list of deaths, and death rates from malignant tumors rise to occupy advanced ranks, and accidents constitute important causes of deaths.Table (3) Total deaths according to their causes and their change rates in Basra Governorate between 2012 and 2022

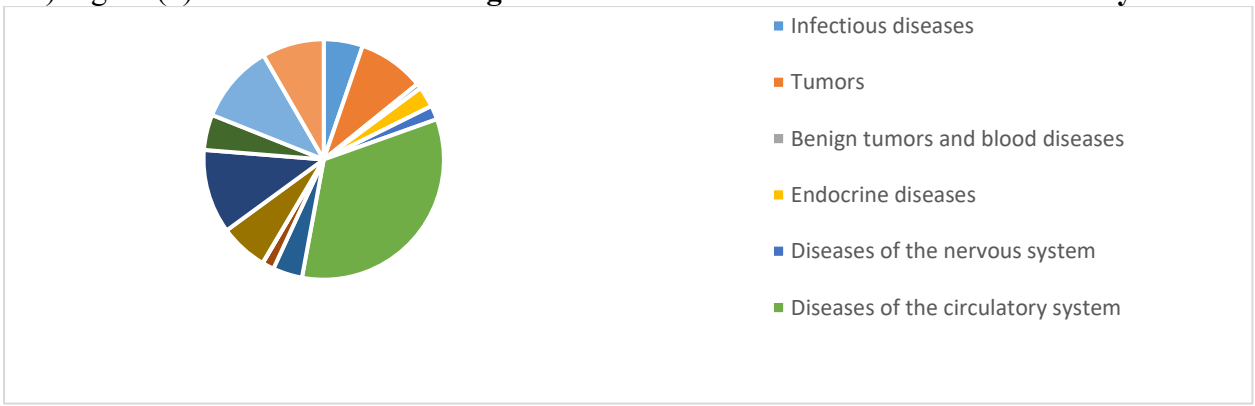
The reason	2012	%	2022	%	Rate of change
Infectious diseases	٥٧٠	٥,٣	٣٩٣	٣	٣١-
Tumors	٩٥٧	٩	١٣٦٠	١٠,٣	٤٢,١
Benign tumors and blood diseases	٧٧	٠,٧	١١٨	٠,٩	٥٣,٢
Endocrine diseases	٢٩٩	٢,٨	٣١٥	٢,٤	٥,٤

Diseases of the nervous system	٢٠٠	١,٩	٣٢٨	٢,٥	٦٤
Diseases of the circulatory system	٣٥٨١	٣٣,٦	٤٨٦٩	٣٧	٣٦
Diseases of the respiratory system	٤٣٢	٤	٣٨٨	٢,٩	١٠,٢-
Diseases of the digestive system	١٧٣	١,٦	٢٥٤	١,٩	٤٦,٨
Diseases of the musculoskeletal system	٤	٠,٠٤	١٩	٠,١	٣٧,٥
Diseases of the reproductive and urinary system	٦٩٥	٦,٥	٦٦٩	٥,١	٣,٧-
Certain conditions that arise in the postpartum period	١٢١٤	١١,٤	١٢٨٧	٩,٨	٦
Deformities	٤٣٥	٤,٨	٥٣٤	٤	٢٢,٨
Unspecified causes	١١٤٠	١٠,٧	١٤٠٧	١٠,٧	٢٣,٤
Accidents	٨٩٢	٨,٤	٩٢٣	٧	٣,٥
Corona	-	-	٣٠٩	٢,٣	-
Total	١٠٦٦٩		١٣١٥٩		٢٣,٣
Death rate per 1000 population	٤		٤,٣		

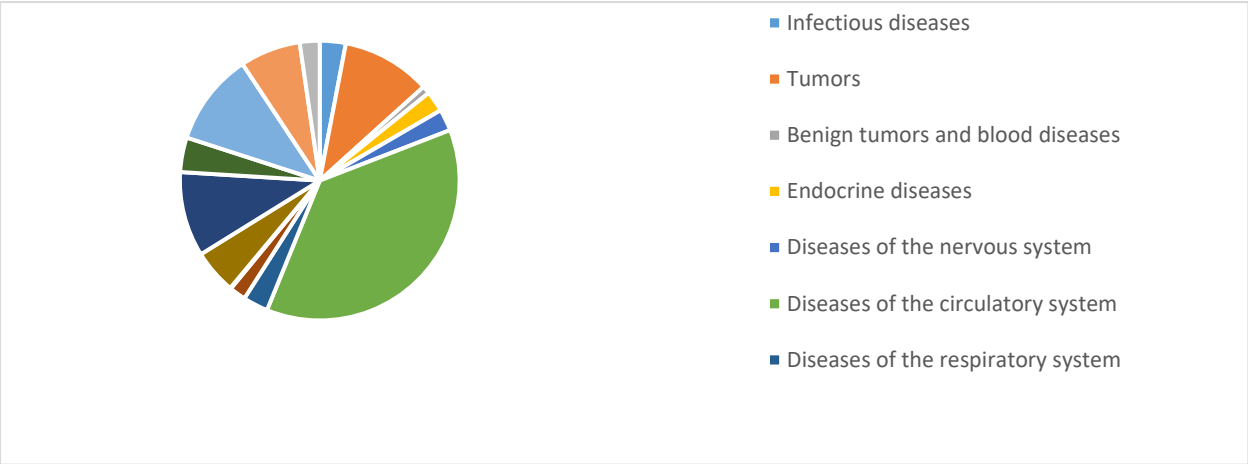
Source: Based on

1- Republic of Iraq, Ministry of Planning, Department of Regional and Local Development, Basra Statistics Directorate, Population Estimates for the Years 2012-2022 (Unpublished).

2- 2- Republic of Iraq, Ministry of Health, Department of Health in Basra Governorate, Planning and Human Resources Department, Vital Statistics Division, Birth and Death Statistics for the Years 2012-2022 (Unpublished).Figure (2) **Death rates according to their causes in Basra Governorate for the year 2012**

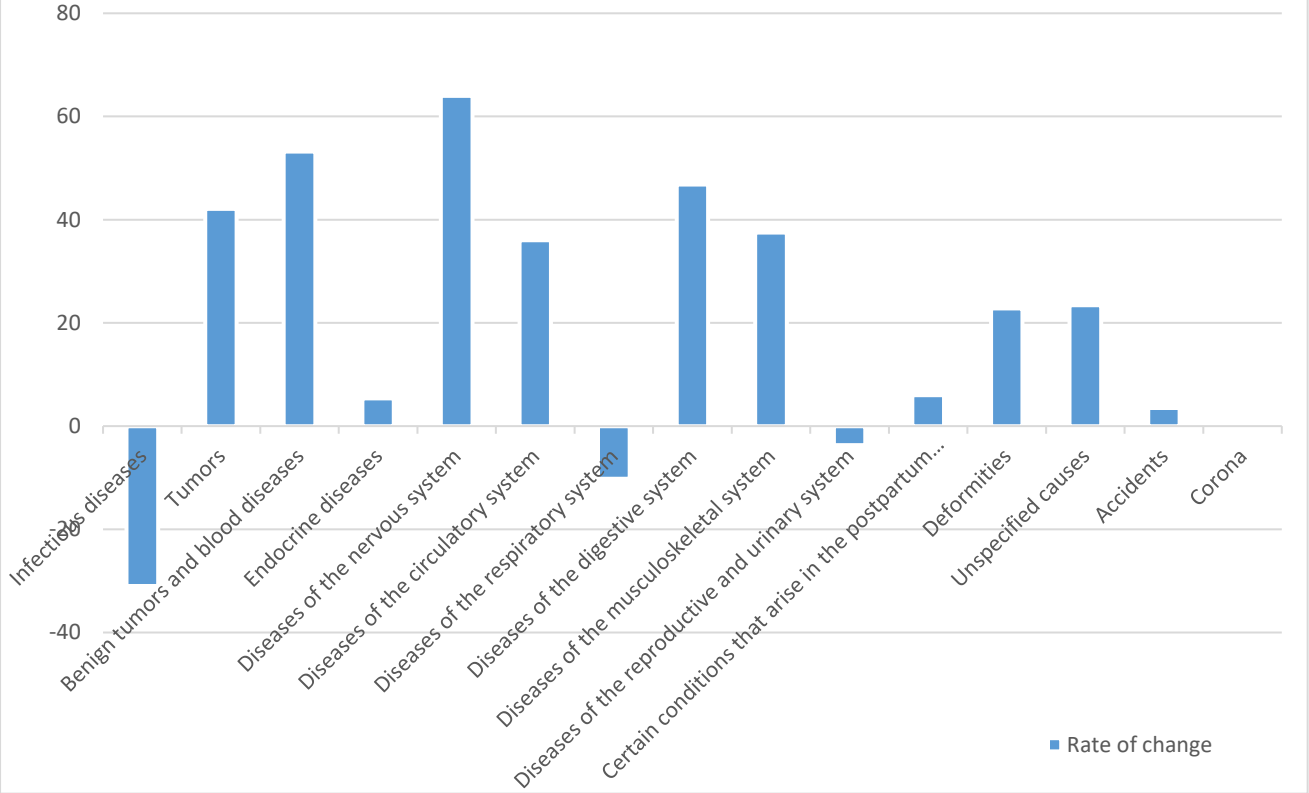


Source: Table (3)Figure (3)Death rates according to their causes in Basra Governorate for the year 2022



Source: Table (3)

Figure (4)Percentage change in total deaths according to their causes in Basra Governorate between 2012 and 2022



Source: Table (3)

Third - Spatial distribution of the pattern of deaths according to their causes in Basra Governorate in 2012 and 2022 The data in Table (4) and Map (2) show the spatial distribution of deaths in Basra Governorate and according to its administrative units (districts) for the years 2012 and 2022. Through them, we note: - There is a disparity in the total number of deaths recorded in the administrative units during the years 2012 and 2022, but it does not reflect a spatial pattern due to the difference in population size between the administrative units. - There is a clear disparity in death rates per 1000 people among the administrative units in Basra Governorate. In 2012, the city district had the highest death rate of 8.6 deaths per 1000 people, while the Al-Dair district recorded the lowest death rate of 2.6 deaths per 1000 people. In 2022, Basra district had the highest death rate of 6.9 deaths per 1000 people, while the lowest rate was recorded in Al-Hartha district of 0.94 deaths per 1000 people. - Statistically, there are no significant differences in the distribution of death rates among the administrative units in 2012, as indicated by the calculated chi-square value of 10.32, which was less than the tabular value of 15.51 at a degree of freedom of 8 and a significance level of 0.05. As for the year 2022, the calculated chi-square value was 11.6, which is less than the tabular value of 15.51 at a degree of freedom of 8 and a significance level of 0.05. - According to the causes of death, spatial variation in mortality values can be observed according to administrative units. In 2012, the highest total number of deaths was recorded due to diseases of the circulatory system in all districts of the

governorate, and the lowest total was due to diseases of the musculoskeletal system, and the same is the case in 2022.Table (4) Total deaths by administrative units for the years 2021 and 2022

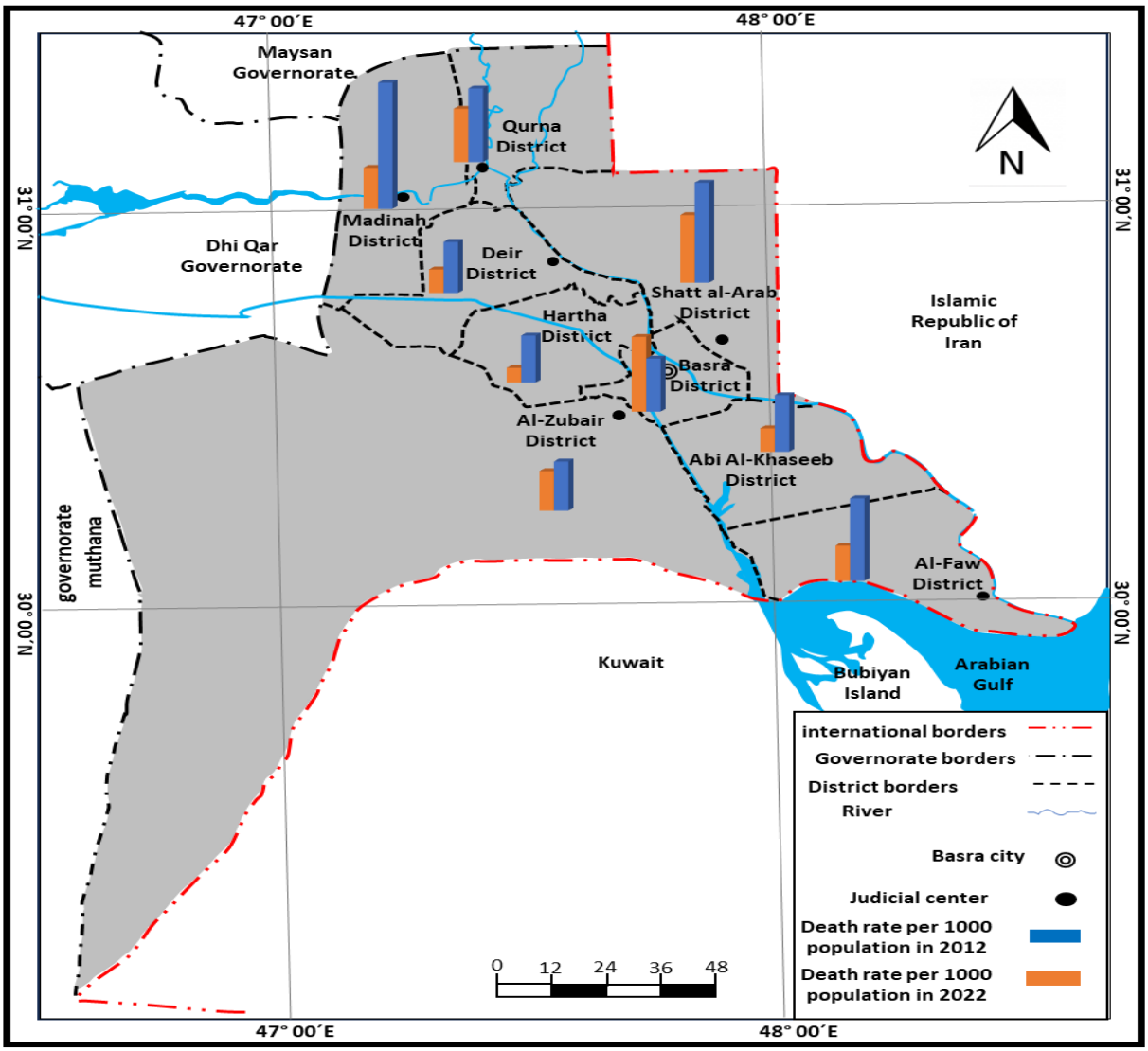
Administrative unit	Total deaths 2012	Death rate per 1000 population	Total deaths 2022	Death rate per 1000 population
Basra	٥٥٦١	٤,٩	٩٣١٠	٦,٩
Abi Al-Khaseeb	٨١٠	٤,١	٣٩٢	١,٧
Al-Zubair	١٦٣٦	٣,٦	١٥٤٠	٢,٩
Al-Faw	١٧٦	٤,٧	٩١	٢
Al-Qurna	٧٣٩	٥,٨	٨٠٥	٤,٢
Al-Madinah	٦١٨	٨,٦	٦٨٠	٢,٨
Shatt Al-Arab	٤٣٢	٣,٤	٤٣١	٢,٣
Al-Hartha *	٤٣٩	٣	١٦٢	٠,٩٤
Al-Deir **	٢٥٨	٢,٦	١٣٦	١,٢
Total	١٠٦٦٩		١٣١٥٩	

Source:

1- Republic of Iraq, Ministry of Planning, Department of Regional and Local Development, Basra Statistics Directorate, Population Estimates for the Years 2012-2022 (Unpublished).

2- Republic of Iraq, Ministry of Health, Department of Health in Basra Governorate, Planning and Human Resources Department, Vital Statistics Division, Birth and Death Statistics for the Years 2012-2022 (Unpublished).

Map (2) Geographical distribution of death rates in Basra Governorate according to 2012 and 2022 data



Source: Table (4)

Fourth: The gender and age structure of deaths in Basra Governorate according to data from 2012 and 2022

1- The qualitative composition:

- Both sexes are exposed to the disease, but there are diseases that are specific to one sex rather than the other, and this is attributed to differences in physiological composition, as well as environmental and social factors that affect the opportunities and possibilities of contact between pathogens and their hosts. (Al-Kaabi, 2022, 72)

In light of the data contained in Tables (5) (6), which show the qualitative composition of deaths according to their causes for the years 2012 and 2022, the following observations can be made:

-There is a similarity in the total number of deaths between males and females. In 2012, the death rate among males was 50.2% compared to 49.8% for females. In 2022, the death rate among males exceeded that of females, reaching 56% compared to 44%.

- Statistically, there are no significant differences between male and female deaths for the two mentioned years, as indicated by the calculated chi-square value of 0.08 for 2012 and 1.44 for 2022, which was less than the tabular value of 3.84 at a degree of freedom of 1 and a significance level of 0.05. - As for the causes of death, there is a difference between male and female deaths. In 2012, the percentage of male deaths resulting from infectious and parasitic diseases, tumors, diseases of the nervous, respiratory, digestive, reproductive and urinary systems, deformities, unspecified causes and accidents outperformed, while female deaths resulting from benign tumors, endocrine and circulatory glands, diseases of the musculoskeletal system and certain conditions that arise after birth. In 2022, the male mortality rate due to tumors, benign tumors, the nervous system, respiratory system, circulatory system, reproductive system, urinary system, certain conditions that arise after birth, deformities, unspecified causes, accidents, as well as deaths resulting from the Corona pandemic may be absent, while the female mortality rate due to infectious, parasitic, endocrine, musculoskeletal diseases outperformed. - Statistically, and by comparing the calculated values of the chi-square when compared to the tabular value of 3.84 at a degree of freedom of 1 and a significance level of 0.05, significant differences appeared between male and female deaths due to some diseases, some of which were fundamental, as is the case between deaths resulting from diseases of the musculoskeletal system and certain conditions that arise after birth, while no significant differences appeared between male and female deaths in most causes of death in 2012, and the same is the case in 2022, where no significant differences were recorded in most causes, with the exception of unspecified causes, accidents, and the Corona pandemic.**Table (5) The qualitative composition of deaths according to their causes in Basra Governorate for the year 2012**

Diseases	Male	%	Female	%	Total	Chi-square value	The difference
Infectious and parasitic diseases	٣٥٤	٦٢٪	٢١٦	٣٨%	٥٧٠	٥,٧٦	Moral
Tumors	٥٠١	٥٢٪	٤٥٦	٤٨%	٩٥٧	٠,١٦	Non-moral
Benign tumors with blood diseases	٣٥	٤٣٪	٤٢	٥٧٪	٧٧	١,٩٦	=
Endocrine diseases	١٣٩	٤٦٪	١٦٠	٥٤٪	٢٩٩	٠,٦٤	=
Diseases of the nervous system	١١٤	٥٧٪	٨٦	٤٣٪	٢٠٠	١,٩٦	=
= = Circulatory	١٧١٥	٤٨٪	١٨٦٦	٥٢٪	٣٥٨١	٠,١٦	=
= = Respiratory	٢٥٦	٥٩٪	١٧٦	٤١٪	٤٣٢	٣,٢٤	=
= = Digestive	٩٩	٥٧٪	٧٤	٤٣٪	١٧٣	١,٩٦	=
Musculoskeletal	١	٢٥٪	٣	٧٥٪	٤	٢٥	High moral
Reproductive and urinary	٣٨٣	٥٥٪	٣١٢	٤٥٪	٦٩٥	١	Non-moral

Certain conditions arising after birth	٢١٩	٪١٨	٩٩٥	٪٨٢	١٢١٤	٤٠,٩	High moral
Deformities	٢٤٥	٪٥٦	١٩٠	٪٤٤	٤٣٥	١,٤٤	Non-moral
Unspecified causes	٦٨١	٪٦٠	٤٥٩	٪٤٠	١١٤٠	٤	Moral
Accidents	٦١٠	٪٦٨	٢٨٢	٪٣٢	٨٩٢	١٢,٩	Moral
total	٥٣٥٢	٪٥٠,٢٠	٥٣١٧	٪٤٩,٨٠	١٠٦٦٩	-	-
					Chi-square value		3.84
					The degree of free		1
					Significance level		0.05

Source: Based on the Republic of Iraq, Ministry of Health, Health Department in Basra Governorate, Planning and Human Resources Department, Vital Statistics Division, Statistics and Deaths according to 2012 data (unpublished).**Table (6) The qualitative composition of deaths according to their causes in Basra Governorate for the year 2022**

Diseases	Male	%	Female	%	Total	Chi-square value	The difference
Infectious and parasitic diseases	١٨٨	٪٤٨	٢٠٥	٪٥٢	٣٩٣	٠,١٦	Non-moral
Tumors	٧١٢	٪٥٢	٦٤٨	٪٤٨	١٣٦٠	٠,١٦	=
Benign tumors with blood diseases	٦٦	٪٥٦	٥٢	٪٤٤	١١٨	١,٤٤	=
Endocrine diseases	١٤٧	٪٤٧	١٦٨	٪٥٣	٣١٥	١,٩٦	=
Diseases of the nervous system	١٨٥	٪٥٨	١٣٤	٪٤٢	٣١٩	٢,٥٦	=
= = Circulatory	٢٥٤٩	٪٥٢	٢٣٢٠	٪٤٨	٤٨٦٨	٠,١٦	=
= = Respiratory	٢٠٩	٪٥٤	١٧٩	٪٤٦	٣٨٨	٠,٦٤	=
= = Digestive	١٣٥	٪٥٣	١١٩	٪٤٧	٢٥٤	١,٩٦	=
Musculoskeletal	٨	٪٤٢	١١	٪٥٨	١٩	٢,٥٦	=
Reproductive and urinary	٣٤١	٪٥١	٣٢٨	٪٤٩	٦٦٩	٠,٠٤	=
Certain conditions arising after birth	٧٤٦	٪٥٨	٥٤١	٪٤٢	١٢٨٧	٢,٥٦	=
Deformities	٢٧٦	٪٥٢	٢٥٣	٪٤٨	٥٢٩	٠,١٦	=
Unspecified causes	٩٠١	٪٦٤	٥٠٦	٪٣٦	١٤٠٧	٧,٨٤	=
Accidents	٧٣٣	٪٧٩	١٩٠	٪٢١	٩٢٣	٣٣,٦٤	Moral
Total	١٧٢	٪٥٦	١٣٧	٪٤٤	٣٠٩	١,٤٤	High moral
					Chi-square value		3.84
					The degree of free		1
					Significance level		0.05

Source:

Based on the Republic of Iraq, Ministry of Health, Basra Governorate Health Department, Planning and Human Resources Department, Vital Statistics Division, Statistics and Deaths according to 2022 data (unpublished).

2- Age structure:

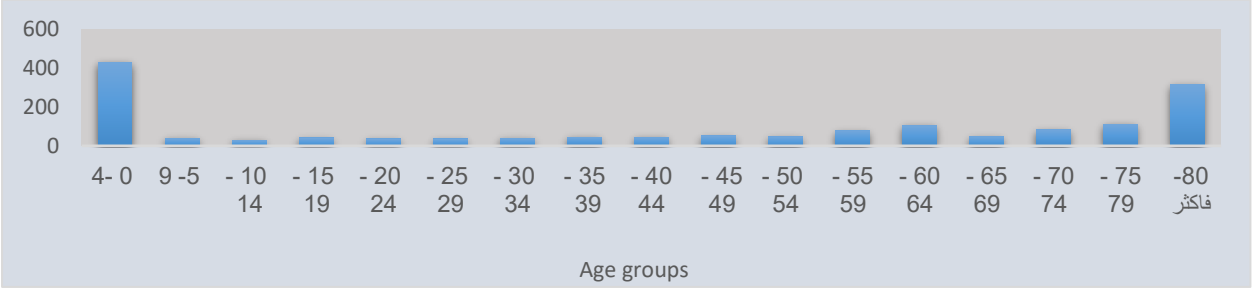
The data in Table (7) and Figures (5) and (6) showed that there is a similarity in the pattern of deaths according to age groups between 2012 and 2022, as they were concentrated at high rates in the categories (0-4) and (80 and over). In 2012, the number of deaths among young people under the age of five was 2703, constituting 25.3% of the total number of deaths in the governorate, with a high concentration rate of 430.4. The same is the case in 2022, where the number of deaths within this category was 2511, constituting 19% of the total number of deaths in the governorate, with a high concentration rate of 320.0. After that, the number of deaths began to decline among the young and adult age groups, reaching its lowest within the age group (10-14) for both years, where the total number of deaths was 184 and 228, respectively, for the years 2012 and 2022. By 1.7% for both years and with a low concentration rate of 29.3 and 29.0 respectively, and with age, the number of deaths within the age group 80 and over increased to reach 1979 by 18.5% and a high concentration rate of 315.3 for the year 2012 and 2335 by 17.7% and a high concentration rate of 301.7 for the year 2022. The disparity in the number between the age groups of the population is attributed to factors related to the health and immune status of each age group, as young people under the age of five and the elderly are more susceptible to diseases and have less immunity to confront them, which leads to high mortality rates among them.**Table (7) Age structure of deaths in Basra Governorate for the years 2012 and 2022**

Age groups	2012			2022		
	Number of deaths	%	Concentration ratio	Number of deaths	%	Concentration ratio
0-4	٢٧٠٣	٪٢٥,٣٠	٤٣٠	2511	٪١٩	٣٢٠
5-9	٢٤٣	٪٢,٣٠	٣٨,٧	255	٪٢,٠٠	٣٣
10-14	١٨٤	٪١,٧٠	٢٩,٣	228	٪١,٧٠	٢٩
15-19	٢٥٤	٪٢,٣٠	٤٠,٤	342	٪٢,٦٠	٤٤,٢
20-24	٢٢٨	٪٢,١٠	٣٦,٣	332	٪٢,٥٠	٤٢,٩
25-29	٢٢٦	٪٢,١٠	٣٦	260	٪٢,٠٠	٣٣,٦
30-34	٢٤٢	٪٢,٣٠	٣٨,٥	267	٪٢,٠٠	٣٤,٥
35-39	٢٨٣	٪٢,٦٠	٤٥	287	٪٢,٢٠	٣٧
40-44	٢٧٤	٪٢,٥٠	٤٣,٦	384	٪٢,٩٠	٤٩,٦
45-49	٣٢٧	٪٣,٠٠	٥٢	499	٪٣,٨٠	٦٤,٥
50-54	٢٩٧	٪٢,٨٠	٤٧,٣	629	٪٤,٨٠	٨١,٣
55-59	٤٩٤	٪٤,٦٠	٧٨,٦	743	٪٥,٦٠	٩٦
60-64	٦٥٧	٪٦,١٠	١٠٥	680	٪٥,١٠	٨٧,٩
65-69	٣٠١	٪٢,٨٠	٤٧,٩	1128	٪٨,٦٠	١٤٦
70-74	٥٢٩	٪٥,٠٠	٨٤,٢	1191	٪٩,٠٠	١٥٤
75-79	٧٠١	٪٦,٥٠	١١٢	1089	٪٨,٢٠	١٤١
80 +	١٩٧٩	٪١٨,٥٠	٣١٥	٢٣٣٤	٪١٧,٧٠	٣٠٢
Total	١٠٦٦٩	٪١٠٠		١٣١٥٦	٪١٠٠	

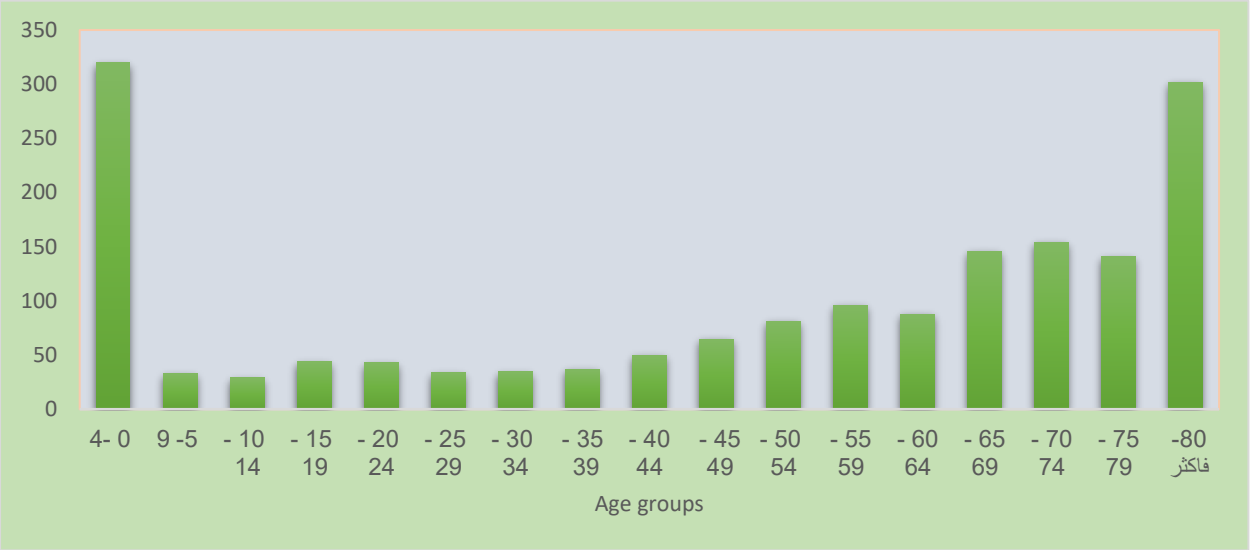
Source:

Based on the Republic of Iraq, Ministry of Health, Basra Governorate Health Department, Planning and Human Resources Department, Vital Statistics Division, Statistics and Deaths for the years 2012-2022 (unpublished).

Figure (5)Death concentration rate in age groups of the population in Basra Governorate for the year 2012



*Source: Table (7)*Figure (6)Death concentration rates in age groups of the population in Basra Governorate for the year 2022



Source: Table (7)

Conclusions: -

1 - The crude death rates of the population in Basra Governorate remained within the limits of 4.0 per thousand according to the recorded deaths for the limited years 2012-2022, with the exception of the mutations that occurred during the spread of the Corona virus (Covid-19) epidemic for the years 2020 and 2021, as they formed two high peaks in the death path line in the governorate, which soon returned to its rate after the cause and its danger disappeared. It is worth noting here that the Corona virus is one of the diseases common to humans and animals, as some of its types are transmitted from certain animals that are reservoirs of the cause, such as birds and some types of mammals, and it is also transmitted from an infected person to a healthy person (Al-Kaabi, 2020, 52).

2 - The study showed that deaths in Basra Governorate are linked to a number of pathological causes and that they were subject to relative quantitative variation between the comparison years 2012 and 2022 and that the percentage of change was positive for deaths in most causes except for infectious diseases and diseases of the respiratory, urinary and reproductive systems, where the percentage of change between the two years was negative, suggesting a decrease in the number of deaths resulting from them. At the level of place, there is a relative variation between the districts and for both years. It is noted that the death rates calculated per 1000 people of the population varied according to their causes.

3 - The study showed significant differences between male and female deaths due to some diseases, as some of them recorded a significant difference when compared to the tabular value of 3.84 at a degree of freedom of 1 and a significance level of 0.05, such as diseases of the musculoskeletal system and cases that arise after birth and did not appear for other reasons according to the 2012 data, and the same is the case in 2022, as no significant differences were recorded in most causes, with the exception of unspecified causes, accidents, and the Corona pandemic.

4 - The study tracked the pattern of infections and deaths according to age groups, as this variation was linked to a number of factors related to the health and immune status of each age group; Young people under the age of five and the elderly are more susceptible to diseases and have less immunity to confront them, which leads to higher mortality rates among them.

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