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Temporal Dimensions of Patients with Chronic Diseases (Hypertension - Asthma - Epilepsy) in Dhi Qar Governorate for the Period (2010 – 2022)

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Abstract

There are factors and causes of chronic diseases that are distributed throughout the year. There are diseases that increase in incidence in certain months of the year, or a season, as a result of the affected people being affected by the climatic or natural factors of this season. For example, in winter, low temperatures and staying indoors for long periods contribute to the spread of viruses that cause and increase colds and respiratory infections, in addition to asthma attacks and others. There are diseases that have a greater impact in the summer; due to the high temperatures, which makes people suffer from physical stress, which increases epileptic seizures as well as high blood pressure. The Search of chronic diseases (high blood pressure - asthma - epilepsy) is one of the important topics that need to be studied temporally; to know the extent of changes in infection rates, as we must know the temporal change of the disease, whether it is in the case of rising or falling.

Keywords: *Disease, Monthly Distribution, Chronic Diseases, High Blood Pressure, Asthma, Epilepsy.*

Introduction

The study of medical geography in developed countries has received the attention of researchers since the beginning of the twentieth century AD, and interest in it increased more after the end of World War II, but it did not receive attention from researchers in developing countries until the late twentieth century, and it still requires a lot of attention from scientific studies. The study of chronic diseases and their geographical distribution, demographic characteristics, and the impact of environmental factors on disease patterns and their spread, and the study of the relationship between the provision of health services, their quality, their spatial distribution, and the ease of delivering them to those in need, and the possibility of controlling the disease and limiting its spread, is one of the main areas of medical geography studies.

In order to cover the details of the study of the geographical (temporal) variation of chronic diseases in Dhi Qar Governorate for the period 2010 to 2022, the current research sought to address three types of chronic diseases, which have a significant negative impact in the research area because it is one of the neglected governorates compared to the rest of the cities of Iraq. It is clear that the incidence of high blood pressure is increasing; The number of patients and registrants with this disease has increased due to the harsh conditions experienced by the residents of Dhi Qar Governorate. Asthma, which is widespread in the research area, is affected by climatic factors that increase the incidence of this disease. Epilepsy, as it is one of the chronic

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diseases that has recorded a noticeable increase in Dhi Qar Governorate, due to the research area being exposed to many disasters that have swept this region, including absurd wars, as well as the Corona pandemic. Chronic diseases have an impact on the lives of patients and change them, as these diseases become part of their lives, forcing patients to change their lifestyle. Chronic diseases represent a global health problem, and Iraq in general, and the research area in particular, is one of the areas where diseases are widespread, and there is no family - apparently - except that there is a person infected with a chronic disease.

Research Problem: To shed light on the temporal dimensions of chronic diseases in Dhi Qar Governorate, the research problem can be formulated by asking: What is the extent of the temporal dimensions of chronic disease patients in Dhi Qar Governorate?

Research Hypothesis: In harmony with the goal and problem of the research, chronic diseases vary temporally in Dhi Qar Governorate between administrative units according to months and seasons.

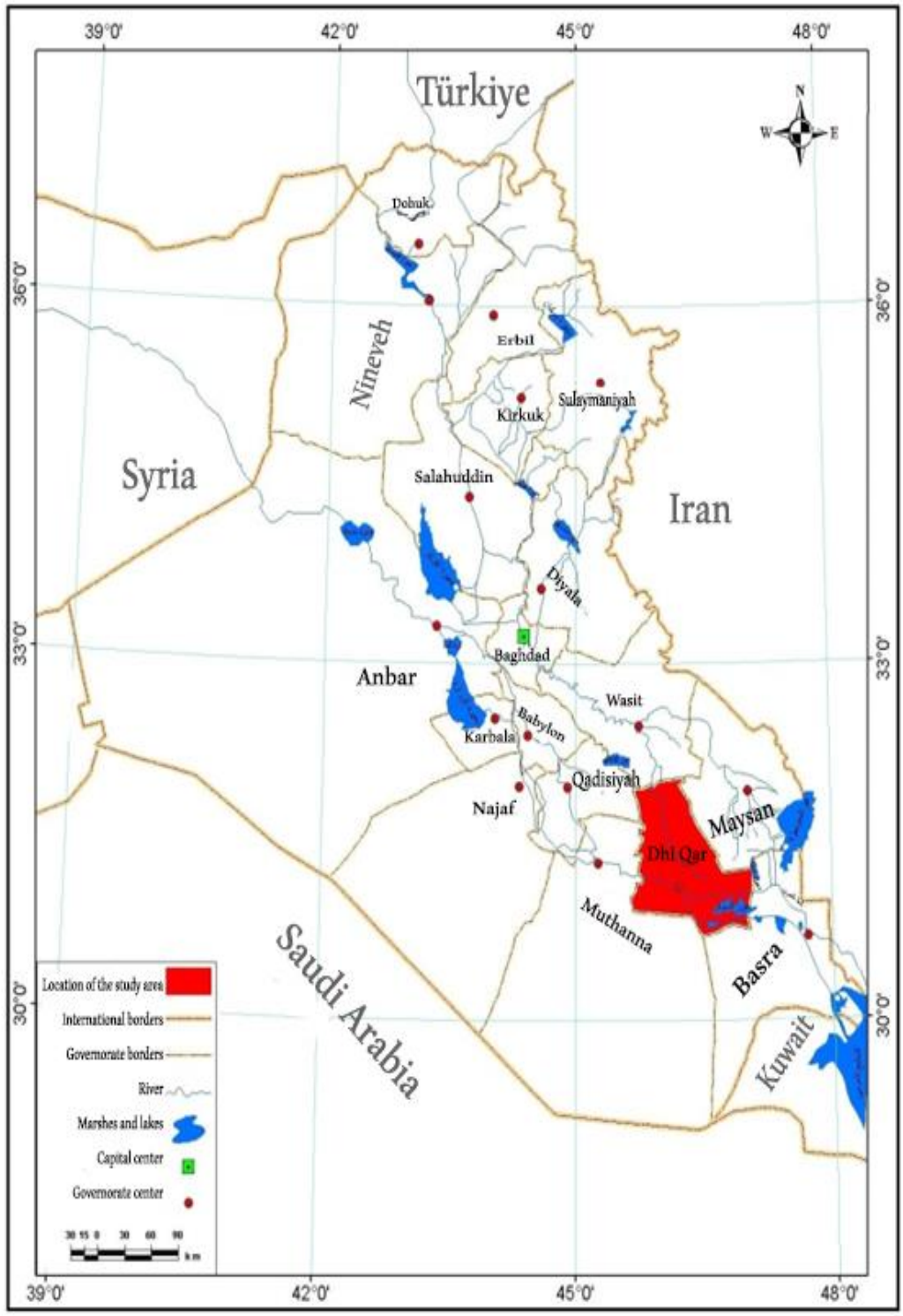
Research Objective: The research aims in its nature to highlight the important points in the research context. Therefore, the research aims to clarify the temporal variation in the incidence of chronic diseases in Dhi Qar Governorate.

Research Importance: Chronic diseases are among the leading causes of death worldwide - and they are among the most common and costly health problems. Among the important points in our research:

1- Determining the temporal dimensions of chronic diseases in Dhi Qar Governorate.

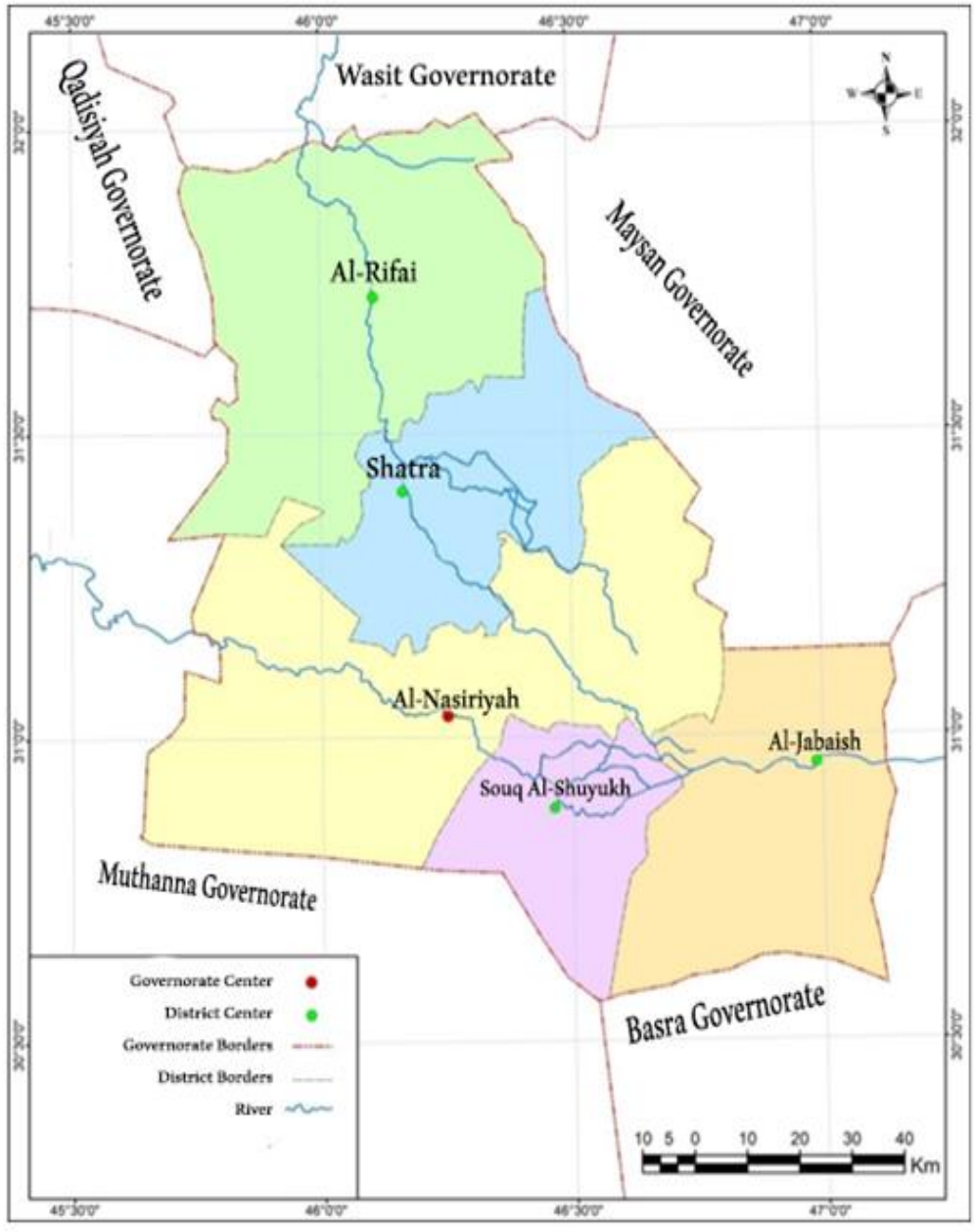
Research Methodology: The descriptive and analytical approach was adopted in describing the phenomena and factors related to the research topic, collecting information about the research area and community, and analyzing the available data, which was obtained from health departments and hospitals in all administrative units in the governorate, related to chronic diseases, as well as analyzing the data collected through the questionnaire form that was distributed to the research sample, stating this in tables, figures and maps, and applying some statistical methods, using the statistical analysis program (SPSS) statistical package for social sciences.

Spatial Boundaries of the Research: The spatial boundaries of the research area are represented by the administrative borders of Dhi Qar Governorate located in the southern part of Iraq. And the astronomical boundaries extending between latitudes (30.26º - 32.01º) north, and longitudes (45.39º - 47.10º) east. Note Map (1) and Map (2).



Map (1): Location of Dhi Qar Governorate in Iraq

Source: Republic of Iraq, Ministry of Water Resources, General Authority of Survey, Map Production Department, Administrative Map of Iraq, scale 1/1,000,000, Baghdad, 2022.



Map (2): Administrative units of Dhi Qar Governorate

Source: Republic of Iraq, Ministry of Water Resources, General Authority for Survey, Map Production Department, Digital Unit, Administrative Map of Dhi Qar Governorate, Scale 1/2,500,000, Baghdad, 2017.

Dhi Qar Governorate ranks twelfth among the governorates of Iraq in terms of area, as it

occupies an area of (12900) km2, divided into five districts. It is known that the population growth rates in Dhi Qar Governorate began to gradually increase after 2003, due to the increase in population density, and the population's great need for administrative units; for the purpose of severing their connection to the governorate departments.

Monthly Distribution of Registered Patients with Chronic Diseases:

Chronic diseases vary in their temporal behavior monthly; due to climate changes that directly affect those infected with these diseases, as monthly climate disturbances affect the spread of diseases, in terms of their impact on the immune system, as well as due to lack of exposure to sunlight, and also some nutritional behaviors that lead to chronic diseases, and there are many habits that people follow that increase the incidence, such as going to work early in the morning before sunrise, and returning home after sunset and darkness falls, as human skin exposure to sunlight is limited so that the skin's exposure to rays is somewhat limited. Which increases the incidence of diseases.

The clear disparity in Dhi Qar Governorate appears through the numbers of registered patients with chronic diseases throughout the months of the year, from the registered and the reviewers. From Table (1) and Figure (1), it is noted that the monthly rate of registered patients with high blood pressure, in the summer, recorded the highest rate in June, July and August at a rate of (64.63%), (67.48%), (62.68%) respectively. The seasonal value recorded its highest degrees in the months of April, May, June, July and August at a value of (115.47), (119.49), (136.69), (147.48), (136.98) respectively, which are values higher than 100, indicating an upward trend in the phenomenon in this season; as a result of the weather fluctuations and high temperatures in Dhi Qar Governorate, as well as the fatigue that workers are exposed to in this season of the year; Because they are exposed to sunlight, and the lack of the necessary needs and capabilities of economic, social and health requirements in Dhi Qar Governorate, which help reduce exposure to high blood pressure in these months of the year. While the seasonal value of the occurrence of the phenomenon in the remaining months of the year is less, it reached (71.70) in December, which is the lowest value, and the monthly rate of registered people with high blood pressure in this month reached (32.81%), while the monthly rates for the months of January, February and March were (38.45%), (36.61%), (38.03%) respectively, and a seasonal value of less than 100 was recorded, reaching (84.03), (72.26), (83.12) respectively, which indicates that these months have less stress, less temperature, and less exposure of people to sunlight. In addition, during these months, the apparent sun moves north of the equator, until stability occurs on the twenty-first of June. At this time, climatic disturbances occur, which makes Dhi Qar Governorate unstable, and atmospheric depressions increase; which increases the incidence of chronic diseases; as a result of low immunity. The months of September, October and November recorded a seasonal value of (83.26), (73.11), (76.42) respectively, and this value is almost close to the winter months, and the monthly rates for these months reached (39.37%), (33.45%), (36.13%) respectively.

Month	Number of infected	persons Monthly	average Seasonal value
January	**1192**	**38.45**	**84.03**
February	**1025**	**36.61**	**72.26**
March	**1179**	**38.03**	**83.12**

April	**1638**	**54.60**	**115.47**
May	**1695**	**54.68**	**119.49**
June	**1939**	**64.63**	**136.69**
July	**2092**	**67.48**	**147.48**
August	**1943**	**62.68**	**136.98**
September	**1181**	**39.37**	**83.26**
October	**1037**	**33.45**	**73.11**
November	**1084**	**36.13**	**67.42**
December	**1017**	**32.81**	**71.70**
Total	**16722**	**Average**	**Average**
Annual Average	**1393.5**	**45.766**	**100**

Table (1): Monthly Rates of Patients Registered with High Blood Pressure in Dhi Qar Governorate for the Period (2010-2022))

Source: Republic of Iraq, Ministry of Health, Dhi Qar Health Department, for the period (2010-2022) unpublished data

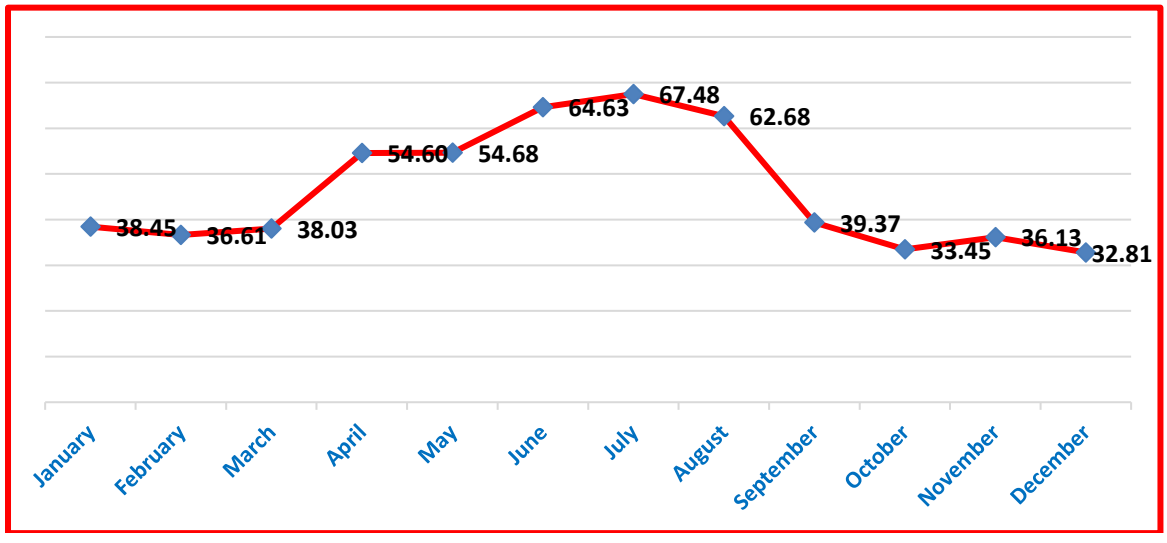


Figure (1): Monthly Rates of Patients Registered with High Blood Pressure in Dhi Qar Governorate for the Period (2010-2022)

Source: Data from Table (1)

As for the registered asthma patients in Dhi Qar Governorate, the months of October, November, December and January recorded the highest seasonal value of (107.68), (129.61), (152.82), (182.48) respectively, which is the highest seasonal value, with monthly rates of (5.39%), (6.70%), (7.65%), (9.13%) respectively, as shown in Table (2) and Figure (2).

Month	Number of infected	persons Monthly	average Seasonal value
January	283	38.45	182.48
February	136	4.86	87.69
March	147	4.74	94.79
April	134	4.47	86.41
May	104	3.35	67.06
June	89	2.97	57.39
July	157	5.06	101.24
August	122	3.94	78.67
September	84	2.80	54.16
October	167	5.39	107.68
November	201	6.70	129.61
December	237	7.65	152.82
Total	16722	Average	Average
Annual Average	155.083	5.87	100

Table (2): Monthly Rates of Patients Registered with Asthma in Dhi Qar Governorate for the Period (2010-2022)

Source: Republic of Iraq, Ministry of Health, Dhi Qar Health Department, for the period (2010-2022) unpublished data

This is due to climate fluctuations and their impact on asthmatics, in addition to the month of July, during which dust waves are generally more common in Dhi Qar Governorate, as its southern and southwestern parts in particular are exposed to the phenomenon of moving sand dunes, and these dunes are a source of dust storms through wind-blown dust in the Batha area, as well as the western parts of Al-Rifai district, Al-Fajr district, and the southern parts of Suq Al-Shuyukh district. The monthly average for July was (5.06%), and the seasonal value was (101.24), which is also a large value. The remaining months recorded varying seasonal values, as they reached (87.69), (94.79), (86.41), (67.06), (57.39) respectively in the months of February, March, April, May, and June, which are values that indicate that the phenomenon is taking a downward trend. As for the months of August and September, the seasonal value reached (78.67) and (54.16) respectively.

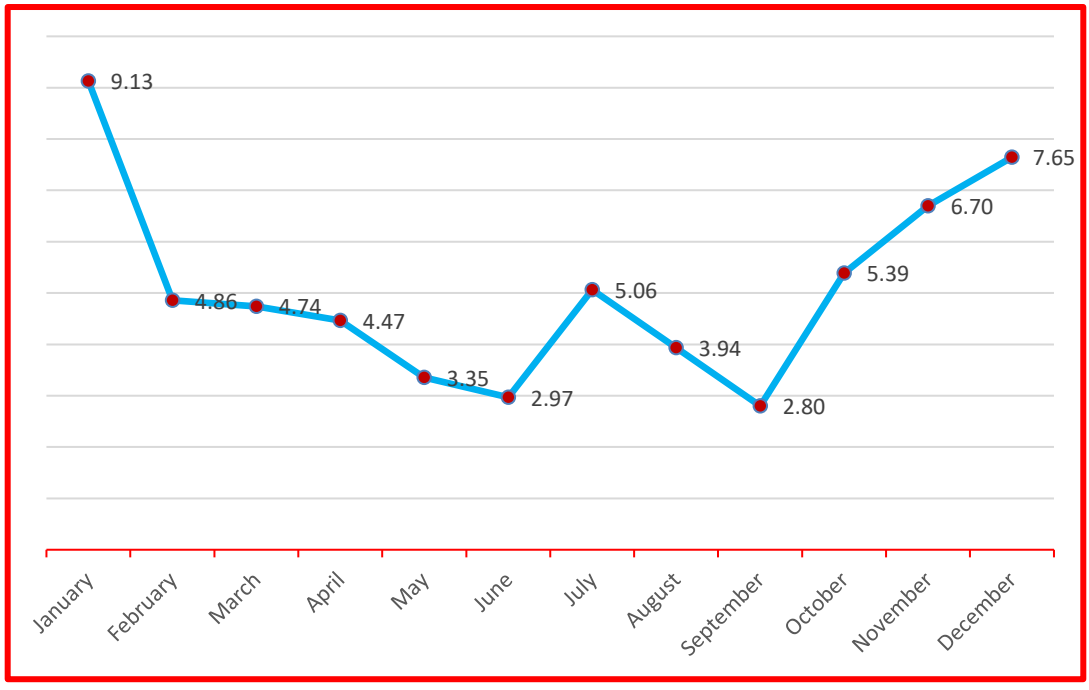


Figure (2): Monthly Rates of Patients Registered with Asthma in Dhi Qar Governorate for the Period (2010-2022)

Source: Data from Table (2)

As for those afflicted with epilepsy in Dhi Qar Governorate, through Table (3) and Figure (3), a clear variation is noted in Dhi Qar Governorate through the monthly rates of registered people afflicted with epilepsy. The seasonal value for the first three months, January, February and March, reached high seasonal values that exceeded 100, indicating an upward trend in the phenomenon. It recorded (125.26), (111.34), 114.43) respectively, with a monthly rate of (2.61%), (2.57%), (2.39%) respectively. The reason for this is attributed to malnutrition and the weather conditions that Dhi Qar Governorate is exposed to. In addition, the months of June, July and August reached the seasonal value (120.62) (129.90), (136.08) respectively. In these three months, people with epilepsy are frequently exposed to work pressures and exposure to sunlight. This increases the chances of developing epilepsy. In April and May, the seasonal value for these two months was (88.14), (92.78) respectively, which is a value with a declining trend compared to other months, with a monthly rate of (1.90%), (1.94%) respectively. The seasonal value for the months of September, October, November and December was (80.41), (72.68), (63.40), (64.95) respectively, with monthly rates of (1.73%), (1.52%), (1.37%), (1.35%) respectively, indicating a decline in the incidence of epilepsy in these months, and the reason is attributed to the moderate temperatures in these months, and the fact that the infected are not exposed to physical and psychological stress.

Month	Number of infected	persons Monthly	average Seasonal value
January	81	2.61	125.26
February	72	2.57	111.34
March	74	2.39	114.43
April	57	1.90	88.14
May	60	1.94	92.78
June	78	2.60	120.62
July	84	2.71	129.90
August	88	2.84	136.08
September	52	1.73	80.41
October	47	1.52	72.68
November	41	1.37	63.40
December	42	1.35	64.95
Total	16722	Average	Average
Annual Average	64.66	2.127	100

Table (3): Monthly Rates of Patients Registered with Epilepsy in Dhi Qar Governorate for the Period (2010-2022)

Source: Republic of Iraq, Ministry of Health, Dhi Qar Health Department, for the period (2010-2022) unpublished data

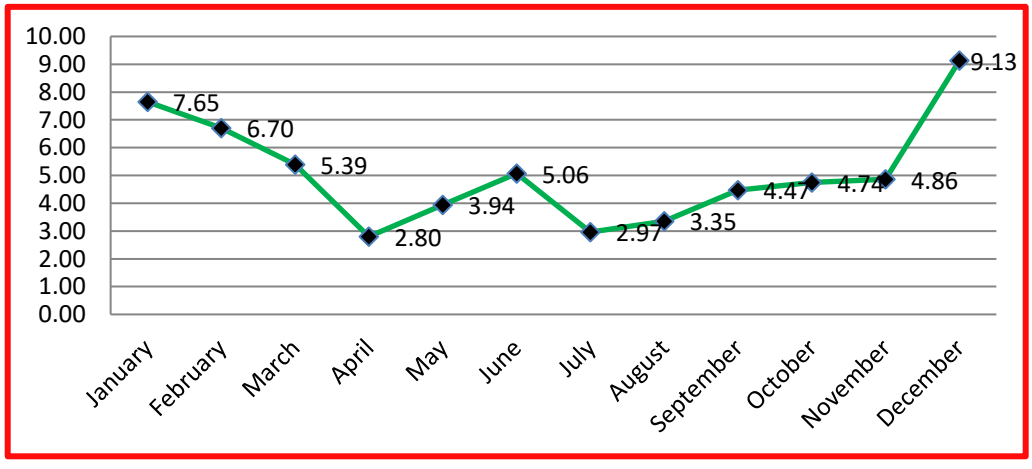


Figure (3): Monthly Rates of Patients Registered with Epilepsy in Dhi Qar Governorate for the Period (2010-2022)

Source: Data from Table (3)

Monthly Distribution of Patients with Chronic Diseases

There is a variation in the monthly rates of patients with chronic diseases throughout the months of the year. From Table (4) and Figure (4), it is noted that the seasonal value of patients with high blood pressure in the months of March, April, May, June, July, and August, June and July

came at the highest value, as it recorded (117.36), (110.25), (107.40), (133.50), (136.24), (130.70) respectively. These are high values that indicate an upward trend in the phenomenon. Monthly rates were recorded at (64.97%), (63.07%), (59.45%), (76.37%), (75.42%), and (72.35%) respectively. The reason for this is attributed to the weather fluctuations in these months, in addition to the high temperatures, as well as the fatigue that affects workers in these months. Due to their exposure to sunlight, and the lack of the necessary needs and capabilities of economic, social and health requirements in Dhi Qar Governorate, which help reduce exposure to high blood pressure in these months of the year. As for the other months of the year, we find that the seasonal value of the occurrence of the phenomenon is less, and it reached in January and February (92.59), (76.92) respectively, and the monthly rate of those infected with high blood pressure in these two months reached (51.26%) and (47.14%) respectively, while the monthly rates for the months of September, October, November and December were recorded (49.40%), (38.48%), (42.30%), (36.10%) respectively, and the seasonal value for these months was recorded less than 100, reaching (86.36), (69.52), (73.95), (65.21) respectively, which indicates that these months indicate a decline in the trend of the phenomenon; Due to the low temperatures, people are not exposed to sunlight.

Month	Number of infected	persons Monthly	average Seasonal value
January	1589	51.26	92.59
February	1320	47.14	76.92
March	2014	64.97	117.36
April	1892	63.07	110.25
May	1843	59.45	107.40
June	2291	76.37	133.50
July	2338	75.42	136.24
August	2243	72.35	130.70
September	1482	49.40	86.36
October	1193	38.48	69.52
November	1269	42.30	73.95
December	1119	36.10	65.21
Total	20593	Average	Average
Annual Average	1716.083	56.36	100

Table (4): Monthly Rates of Patients with High Blood Pressure in Dhi Qar Governorate for the Period (2010-2022)

Source: Republic of Iraq, Ministry of Health, Dhi Qar Health Department, for the period *(2010-2022)*

unpublished data.

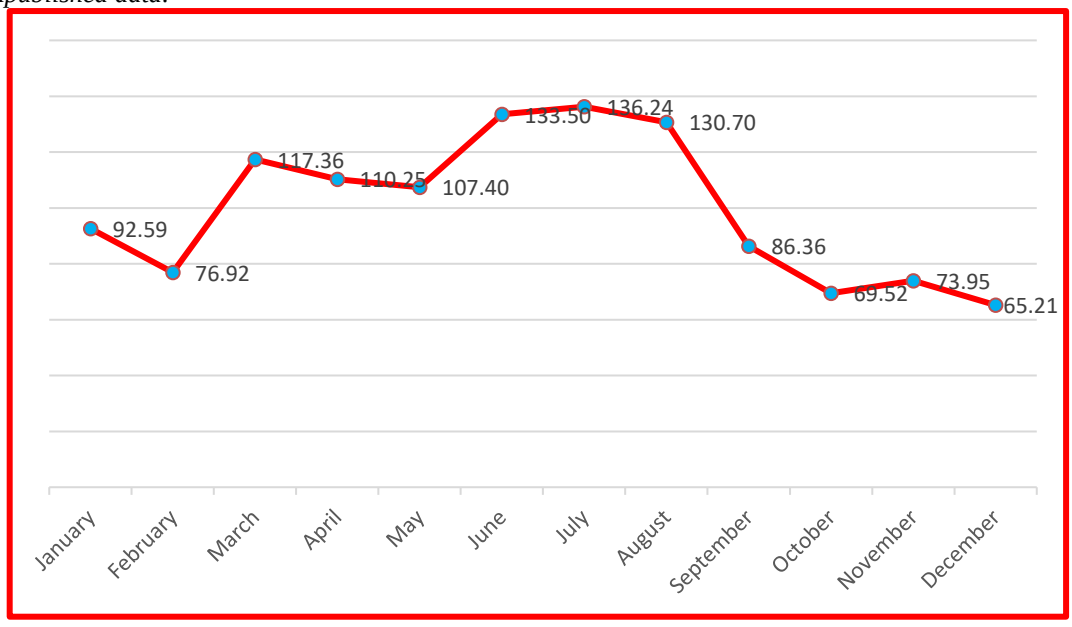


Figure (4): Monthly Rates of Patients with High Blood Pressure in Dhi Qar Governorate for the Period (2010-2022)

Source: Data from Table (4)

As for the patients with asthma in Dhi Qar Governorate, it is noted from Table (5) and Figure (5) that the months of January, July, November and December recorded the highest seasonal value of (169.35), (100.55), (125.25), (124.81) respectively, which is a value that indicates an increase in the trend of the phenomenon, with monthly rates of (12.39%), (7.35%), (9.47%), (9.13%) respectively; As Dhi Qar Governorate is exposed to climate fluctuations that have an impact on people with chronic diseases, including asthma, in addition to the month of July, when dust waves are frequent in Dhi Qar Governorate, Dhi Qar Governorate in general, and its southern and southwestern parts in particular, are exposed to the phenomenon of moving sand dunes, and these dunes are a source of dust storms through wind-blown dust in the Batha area, as well as the western parts of Al-Rifai District, Al-Fajr District, and the southern parts of Suq Al-Shuyukh District. While the remaining months recorded varying seasonal values, they reached in the months of February, March, April, May, and June (98.79), (87.76), (81.59), (94.38), (69.24) respectively, with monthly rates of (8%), (6.42%), (6.17%), (6.90%), (5.23%) respectively, which indicates that the phenomenon is taking a downward trend. Also, the months of August, September and October recorded seasonal values of (81.15), (71.89), (95.26) respectively, with monthly rates of (5.94%), (5.43%), (6.97%) respectively.

Month	Number of infected	persons Monthly	average Seasonal value
January	384	12.39	169.35
February	224	8	98.79

March	**199**	**6.42**	**87.76**
April	**185**	**6.17**	**81.59**
May	**214**	**6.90**	**94.38**
June	**157**	**5.23**	**69.24**
July	**288**	**7.35**	**100.55**
August	**184**	**5.94**	**81.15**
September	**163**	**5.43**	**71.89**
October	**216**	**6.97**	**95.26**
November	**284**	**9.47**	**125.25**
December	**283**	**9.13**	**124.81**
Total	**2721**	**Average**	**Average**
Annual Average	**226.75**	**7.45**	**100**

Table (5): Monthly Rates of Patients with Asthma in Dhi Qar Governorate for the Period (2010-2022)

Source: Republic of Iraq, Ministry of Health, Dhi Qar Health Department, for the period (2010-2022) unpublished data

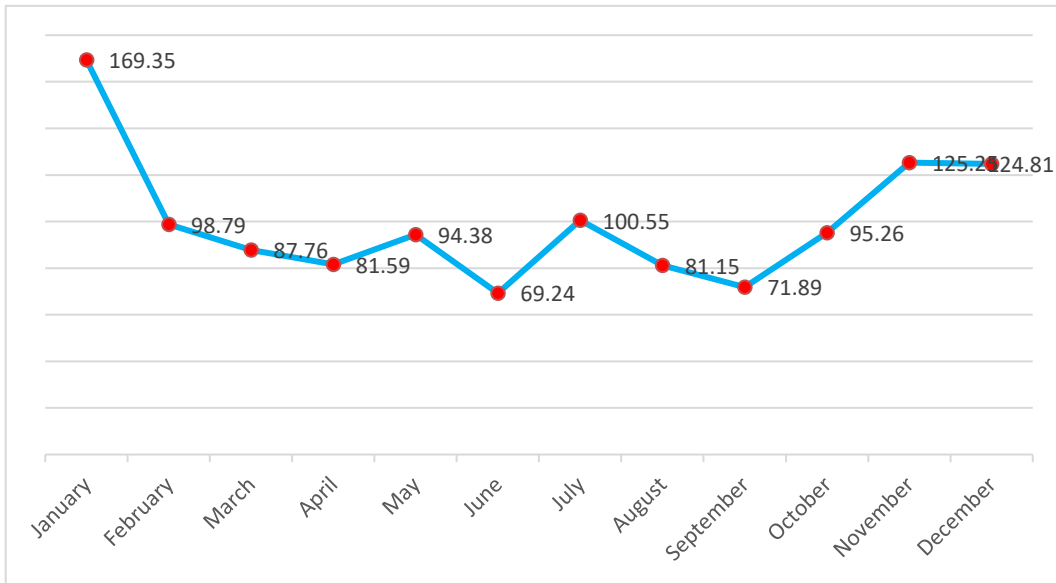


Figure (5): Monthly Rates of Patients with Asthma in Dhi Qar Governorate for the Period (2010-2022)

Source: Data From Table (5)

As for those afflicted with epilepsy in Dhi Qar Governorate, through Table (6) and Figure (6), a clear variation is noted in Dhi Qar Governorate through the monthly rates of patients afflicted with epilepsy, as they reached for the months of January, March, June, July, August and September (4.90%), (5.26%), (5.73%), (5.39%), (4.48%), (4.57%) respectively, and with high

seasonal values exceeding 100 indicating an upward trend in the phenomenon, as these months recorded (117.07), (125.55), (132.33), (128.63), (107.06), (105.52) respectively.

Month	Number of infected	persons Monthly	average Seasonal value
January	152	4.90	117.07
February	112	4	86.26
March	163	5.26	125.55
April	99	3.30	76.25
May	121	3.90	93.20
June	172	5.73	132.48
July	167	5.39	128.63
August	139	4.48	107.06
September	137	4.57	105.52
October	98	3.16	75.48
November	105	3.50	80.87
December	93	3	71.63
Total	1558	المعدل	المعدل
Annual Average	129.833	3.26	100

Table (6): Monthly Rates of Patients with Epilepsy in Dhi Qar Governorate for the Period (2010-2022)

Source: Republic of Iraq, Ministry of Health, Dhi Qar Health Department, for the period (2010-2022) unpublished data

Figure (6): Monthly Rates of Patients with Epilepsy in Dhi Qar Governorate for the Period (2010-2022)

Source: Data from Table (5)

The reason for this is attributed to malnutrition and the weather conditions that Dhi Qar

Governorate is exposed to during these months, in addition to the pressures that affected people are exposed to due to work and exposure to sunlight. This increases the chances of developing epilepsy. As for the months of February, April, May, October and November, the seasonal values for these months were (86.26), (76.25), (93.20), (72.48), (80.87), (71.63) respectively, which are values that indicate a downward trend in the phenomenon. The reason is attributed to the moderate temperatures in these months and the exposure of affected people to physical and psychological pressures, at a monthly rate of (4%), (3.30%), (3.90%), (3.16%), (3.50%), (3%) respectively.

Conclusions

1. Due to climate changes, chronic diseases vary in their temporal behavior monthly.

2. The monthly incidence rate of chronic diseases recorded the highest rate in June, July and August at (64.63%), (67.48%), (62.68%) respectively.

3. The seasonal value recorded its highest degrees in the months of April, May, June, July and August at (115.47), (119.49), (136.69), (147.48), (136.98) respectively.

Suggestions

1. Providing medical supplies in all health centers on an ongoing basis.

2. Paying attention to patients with chronic diseases in the months of June, July and August; due to their exposure to severe stress.

3. Distributing hospitals and health centers fairly in all districts and sub-districts of Dhi Qar Governorate to benefit all residents of the governorate.

4. Focus on the health aspect and health awareness through health seminars and workshops.

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