

RESEARCH PAPER

## Epidemiological Features of COVID-19 Epidemic in Basrah Province-Southern Iraq-First Report

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### Abstract

**Background:** COVID- 19 expanded from an outbreak in China to a devastating pandemic across the world. So the aim of this study was to describe the epidemiology of COVID-19 in Basrah Province-Southern Iraq

**Methods:** Data were obtained from the Department of Public Health in Basrah and the daily communique of the Ministry of Health. Data on population were obtained from the Ministry of Planning. For all provinces the total number of cases and their fate in terms of being under treatment, cured or died was obtained. For cases in Basrah, data on age, sex, residence, fate, travel history and presence of co-morbidity for 152 cases.

**Results:** In Basrah, The mean age was 46 years (Median 45 years) and the range was 13-98 years. No difference in the risk of COVID-19 was related to sex. Geographical variation was inconclusive The time trend of the epidemic is modest in both new daily cases and in cumulative numbers. At one point in time (April 10) the incidence rate was 56.28 per million, which was at intermediate level among other provinces. The total cases used for Iraq was 1279. The highest numbers were reported in Baghdad, Najaf, Erbil, Basrah and Sulaymaniyah. The lowest incidence rate was in Salah Al-Din (0.61 per million) and the highest was in Najaf (170.16 per million). The case fatality ratio for closed cases and for all cases was variable among provinces.

**Conclusions:** COVID-19 in Basrah and Iraq is modest until today the 10th of April 2020

Keywords Covid19, Epidemiology, Basrah

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### Compliance with ethical standards

**Conflict of interest** The authors declare no conflict of interest

### Introduction

COVID-19 Virus caused unprecedented pandemic at global level. By the time we drafted this manuscript, the total number of reported cases exceeded two million cases with high toll of death.<sup>1</sup> The pandemic started in a single country China in late December 2019 in the city of Wuhan<sup>2</sup> and then rapidly crossed the international borders to involve almost all world countries. Iraq was not exceptional. At the time being, it is possible to identify at least three groups of countries. The first group experienced or is experiencing severe epidemic both in terms of incidence and in mortality. Examples of

this group of countries include China, Italy, Iran, Spain, France, Germany, Turkey, United Kingdom and United States of America. On April 9, the total cases in this group of countries accounted for more than 75% of total globally reported cases.<sup>1</sup> Less dramatic scale of cases was witnessed in Belgium, Switzerland, Netherland, and Brazil. Other countries are experiencing either less severe epidemics or very small number of cases. Countries which are south to equator are less affected in general. The responses to the pandemic among various countries were variable but all those countries with high incidence rates faced substantial difficulties to deal with the daily flow of cases.<sup>3</sup>

In Iraq the first case was reported on February 24th, 2020 and in Basrah on March 9th. While the number of new reported cases started to build up, the total number remains relatively low. The true reasons behind such a modest number of cases is not known. Other factors, which might have reduced the incidence are the active detection of cases which helped in reducing the pool of infection, the interruption of transmission through social distancing and personal protection and the closure of Iraqi borders with other countries particularly Iran; probably the main source of initial COVID-19 cases.

In this article, we attempt to present a profile on cases reported in Basrah and Iraq over the period from February 24 to April 10, 2020. The objectives of the study were to document the basic epidemiological features in terms of person, place and time, and make some sort of comparison among Iraqi governorates.

## Methods

The data used in this article were obtained from the official records of the epidemic unit at the Department of Public Health-Basrah province. Data for other governorates were obtained from the official records of the Ministry of Health.<sup>4</sup> Data collected in this study covered cases reported in the first seven weeks of the epidemic (from February 24 to April 10, 2020 inclusive). Additional sources were also viewed to verify the accuracy of numbers reported.<sup>1, 5, 6</sup> Data were analyzed using Statistical Package for Social Sciences-version 20. For all governorates only the total number of cases and their fate could be obtained. For Basrah's cases, data on age, sex, residence, fate, history of travel and presence of co-morbidity were obtained for 152 cases only. Data on population of Iraqi governorates were based on official document issued by the Iraqi Ministry of Planning.<sup>7</sup> The subject of this article was part of a research proposal approved by the Central Research Committee at the Directorate General for Health in Basrah. A case of COVID-19 denotes a person who presents to any designated health institutions with symptoms suggestive of COVID-19 and confirmed by clinical picture plus CT scan nasal or oral swab Polymerase Chain Reaction Test (PCR).

The statistical analysis was restricted to epidemiological outcome measurement including three parameters:

**Incidence rate:** The number of reported cases per 1000000 population up to 10 April, 2020.

**Case fatality ratio for all cases:** Number of deaths among COVID-19 reported cases up to 10 April 2020 divided by all reported cases over the same period (as percentage).

**Case fatality ratio for closed cases.** The number of deaths among COVID-19 cases reported up to 10 April 2020 divided by summation of deaths and recoveries over the same time period (as percentage).

## Results

### Epidemiological features of COVID-19 in Basrah

The detailed epidemiological features were available for 152 patients only by the time we completed drafting this article. Some of these features are given below:

**Age and gender;** Age and sex distribution of COVID-19 cases in Basrah province is shown in (Table1). The median age was 45 years. No case was reported in children aged less than 10 years of age and the youngest patient was 13 years old. Cases were reported in all other age groups and both genders. The most frequently affected age groups were 30-34 and 45-49 years old. Both genders were equally affected with the risk of disease.

**Residence:** The majority of patients were from Basrah city centre (58.6%). However, all districts reported cases without exception. The geographical distribution of cases, however, cannot be quantified reasonably from such small number of cases.

**Travel history:** The great majority of cases (96.1%) had no history of travel, domestic or abroad during the few weeks preceding the onset of their disease.

**Co-morbidity.** About one fifth of the cases had co-morbidity (18.4%) as shown in Table 2. These included cardiovascular, diabetes and chronic obstructive pulmonary disease.

**Fate:** About 53.3% of cases are still under treatment in hospitals on April 10, 2020, while 36.8% have already been cured and

discharged from hospital. 15 patients (9.9%) died from COVID-19.

**Table 1:** Distribution of COVID-19 cases reported in Basrah over the period March 9 to April 10, 2020 inclusive, by age and sex

Characteristic	Number	Percentage
<b>Age (Years)</b>		
<5	0	0.0
5-9	0	0.0
10-14	6	3.9
15-19	3	2.0
20-24	8	5.3
25-29	10	6.6
30-34	16	10.5
35-39	12	7.9
40-44	13	8.6
45-49	22	14.5
50-54	14	9.2
55-59	12	7.9
60-64	8	5.3
65-69	10	6.6
70-74	12	7.9
75 and above	6	3.9
<b>Total</b>	<b>152</b>	<b>100.0</b>
<b>Sex</b>		
Male	77	50.7
Female	75	49.3
<b>Total</b>	<b>152</b>	<b>100.0</b>

### Fate of cases by selected variables

No death has occurred yet in patients aged less than 35 years as detailed in Table 3.

The case fatality ratio among all cases reported regardless of the termination of care in patients 35 years of age and older was very variable being highest (50.0%) among patients aged 70 years and above. The case fatality ratio among closed cases (cured or died) was higher and also variable in different age groups. It was 100.0% in patients aged 75 years and above and 85.7% among those aged 70-74 years. Gender-wise, no great variation was observed between males and females with respect to case fatality ratio.

Regarding fate by **residence**, it was variable as shown in Table 3, Presence of travel

history and co-morbidity carried significantly high risk of death. The case fatality ratio in patients with history of travel was 50%. In patients with co-morbidity, it was 90% (Table 3).

**Table 2:** Distribution of COVID-19 cases reported in Basrah over the period March 9 to April 10, 2020 according to selected variables

Variable	Number	Percentage
<b>Residence</b>		
Basrah city	89	58.6
Abul-Khasib and Fao	20	13.2
Shatt Al-Arab	13	8.6
Zubair , Safwan and Um-Qasr	10	6.6
Al -Qurna	7	4.6
Al-Mdainah	7	4.6
Hartha and Dair	6	3.9
Presence of travel history		
No travel history	146	96.1
Presence of travel history	6	3.9
<b>Total</b>	<b>152</b>	<b>100.0</b>
<b>Presence of comorbidity</b>		
No comorbidity	124	81.6
Presence of comorbidity	28	18.4
<b>Total</b>	<b>152</b>	<b>100.0</b>
<b>Fate</b>		
Under treatment	81	53.3
Cured	56	36.8
Died	15	9.9
<b>Total</b>	<b>152</b>	<b>100.0</b>

### Time trend of reported COVID-19 cases in Basrah

The first case reported in Basrah was on March 9, 2020. Figure 1 illustrates the daily cases of COVID-19 over four and a half weeks (seven weeks since the start of the epidemic in Iraq). Few cases were reported every day. The epidemic actually started as sporadic before it takes the daily pattern but remained at a low scale. The distinct peak on March 27, 2020 was associated with an active surveillance campaign on contacts of a number of cases and accumulated cases due

to logistics of laboratory confirmation in Baghdad.

Figure 2 illustrates the cumulative number of cases as an indicator of the burden of disease on the health care system. Two features can be identified in this figure. First, the cumulative number of cases shows some sort of acceleration with time. Second, the non-exponential pattern which reflects the modest nature of the epidemic in Basrah.

### The state of the epidemic in Basrah within national context

Table 4 and Figures 3 and 4 show the extent of the COVID-19 cases and incidence rates for all Iraqi provinces. In term of absolute numbers Baghdad, Najaf, Erbil, Basrah and Sulaymaniyah come on the top of the list and account for 78.3% of reported cases. The numbers in other governorates are smaller particularly Nineva, Salah Al-Din, Anbar and Missan. When we calculated the incidence rates in each province, the pattern has changed. Relatively high incidence rates are seen in

Najaf occupied the first rank with incidence rate of 170.16 per million followed by Erbil, Karbala, Basrah and Sulaymaniyah.

With respect to case fatality ratio (Table 5), Basrah comes in the middle with a value of 9.4% for all cases and 17.4% for closed cases (cured and died). The case fatality ratio in both versions showed big variation among provinces but the validity of the numbers in some of them do not allow sound conclusions. For Iraq, the ratio for all cases was 5.5% and for closed cases (cured and died) it was 11.3%.

### Time trend of cases in Iraq

Figure 5 illustrates the daily cases reported for Iraq as a whole. The epidemic started on February 24 with small daily cases then the number started increasing with more cases reported in various provinces.

Table 3: Fate of COVID-19 cases by selected variables

Variable	Total cases	Cases cured	Deaths	Overall case fatality ratio (%)*	Case-fatality ratio for closed cases (%)**
<b>Age in years</b>					
<5	0	0	0	0	0
5-9	0	0	0	0	0
10-14	6	1	0	0.0	0.0
15-19	3	2	0	0.0	0.0
20-24	8	5	0	0.0	0.0
25-29	10	6	0	0.0	0.0
30-34	16	7	0	0.0	0.0
35-39	12	7	1	8.3	12.5
40-44	13	2	0	0.0	0.0
45-49	22	9	1	4.5	10.0
50-54	14	4	3	21.4	42.9
55-59	12	6	1	8.3	14.3
60-64	8	2	0	0.0	0.0
65-69	10	5	0	0.0	0.0
70-74	12	1	6	50.0	85.7
75 and above	6	0	3	50.0	100.0
<b>Gender</b>	152	56	15	9.9	26.8
Male	77	31	8	10.4	20.5
Female	75	25	7	9.3	21.9
<b>Residence</b>					
Basrah city	89	27	11	12.4	28.9
Abul-Khasib and Fao	20	12	1	5.0	7.7
Shatt Al-Arab	13	7	3	23.1	30.0
Zubair	10	1	0	0.0	0.0
Qurna	7	3	0	0.0	0.0
Mdainah	7	1	0	0.0	0.0
HarthaandDair	6	5	0	0.0	0.0
<b>Travel history***</b>					
Present	6	3	3	50.0	50.0
Absent	146	53	12	8.2	18.5
<b>Presence of comorbidity***</b>					
No comorbidity	124	55	5	4.0	8.3
Presence of comorbidity	28	1	10	35.7	90.9
<b>Total</b>	152	56	15	9.9	21.1

\*Overall case fatality ratio = No. of deaths/ total cases

\*\* Case fatality ratio for closed cases = No. of deaths/(Cured +Dead)

\*\*\* The observed difference in case fatality ratio was significant (P<0.05)

Table 4: Reported new cases of COVID-19 in Iraqi governorates over the period Feb 24 to April 10, 2020.

Governorate	Population	No. of Cases	Incidence rate per million
Baghdad	8 340 711	277	33.21
Najaf	1 510 338	257	170.16
Erbil	1 903 608	168	88.25
Basrah	2 985073	160	56.28
Sulaymaniyah	2 219 194	140	63.09
Karbala	1 250 806	79	63.16
ThiQar	2 150 338	44	20.46
Muthanna	835 797	35	41.88
Kirkuk	1 639 953	24	14.63
Diyala	1 680 328	18	10.71
Dahuk	1 326 562	15	11.31
Wasit	1 415 034	23	16.25
Babylon	2 119 403	11	5.19
Diwaniah	1 325 031	7	5.28
Nineva	3 828 197	5	1.31
Missan	1 141 966	4	3.50
Anbar	1 818 318	2	1.10
Salah Al-Din	1 637 232	1	0.61
Total	38 327 889	1279	33.37

### Time trend of cases in Iraq

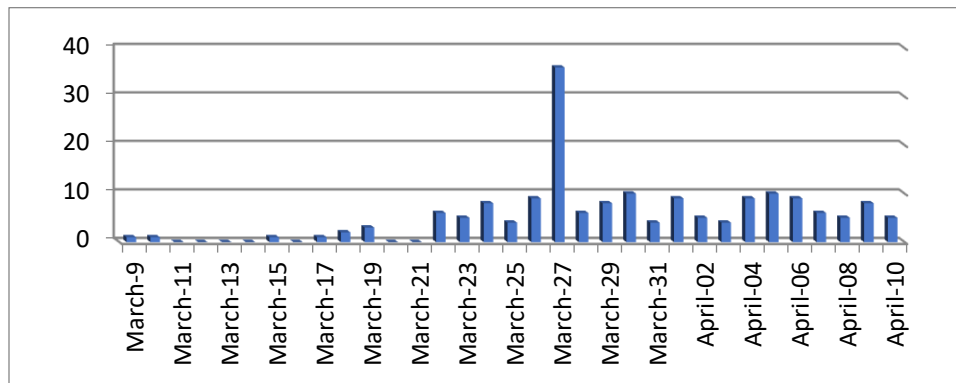
Figure 5 illustrates the daily cases reported for Iraq as a whole. The epidemic started on February 24 with small daily cases then the number started increasing with more cases reported in various provinces. The pattern shows ascending trend from the middle of March reaching a peak in the first week of April but then the number of cases started to decline.

Figure 6 shows the cumulative cases which exhibit clear increase with time but not as exponential in some countries. It does show leveling yet

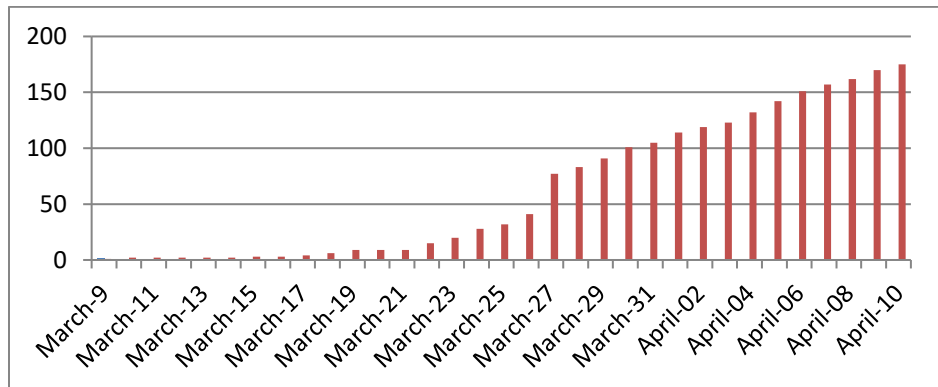
### Discussion

This study presents basic features on the COVID-19 epidemic in Basrah over the first seven weeks from February 24 when the first case was reported in Iraq to April 10, 2020 . The article was intended to document the salient features of the epidemic in Basrah within the national context and to document that the scale of this epidemic is modest for reasons which are not clear yet. The management of the epidemic was guided by the Ministry of Health guidelines issued by the National Task Force and also by local task force at the level of Basrah province. The guidance encompasses directives to the health care providers, the public and the other local agencies. The prime objective were to eliminate source of infection, interrupt transmission and protect the health care providers and the public. In addition, the highest possible quality of care is provided to confirmed cases of COVID-19 infection. Social distancing and other protective measures could have contributed to the low scale of the epidemic in Basrah and Iraq.

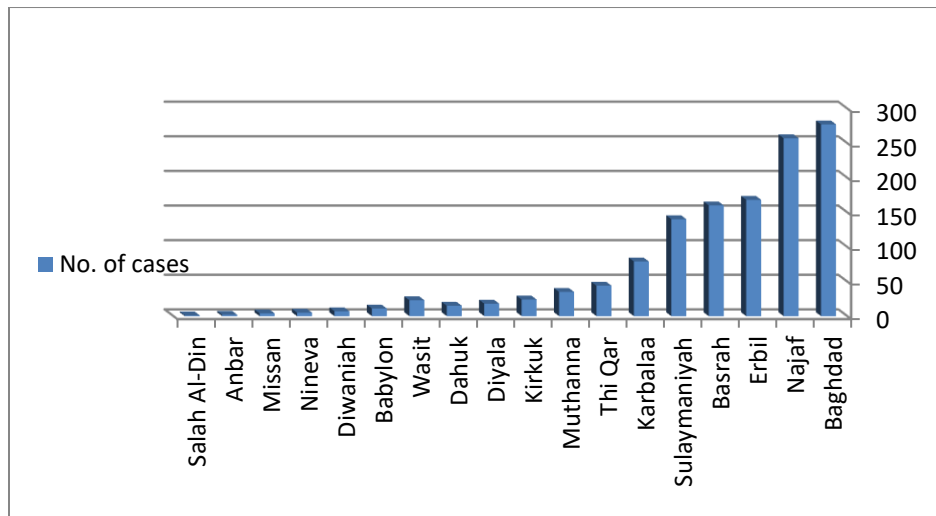
The epidemic in Basrah started a bit later (March 9), when the first case of COVID-19 infection was reported. This was followed by a series of small daily cases until this moment. The only exception was the reporting of 36 cases in one day (March 27, 2020), but this relatively high number was associated with active case detection in suspected residential areas. The low scale of the epidemic in Basrah and in Iraq as a whole is not unique but rather similar to almost all countries in the Eastern Mediterranean Region (EMRO) except Iran.<sup>1,5</sup>



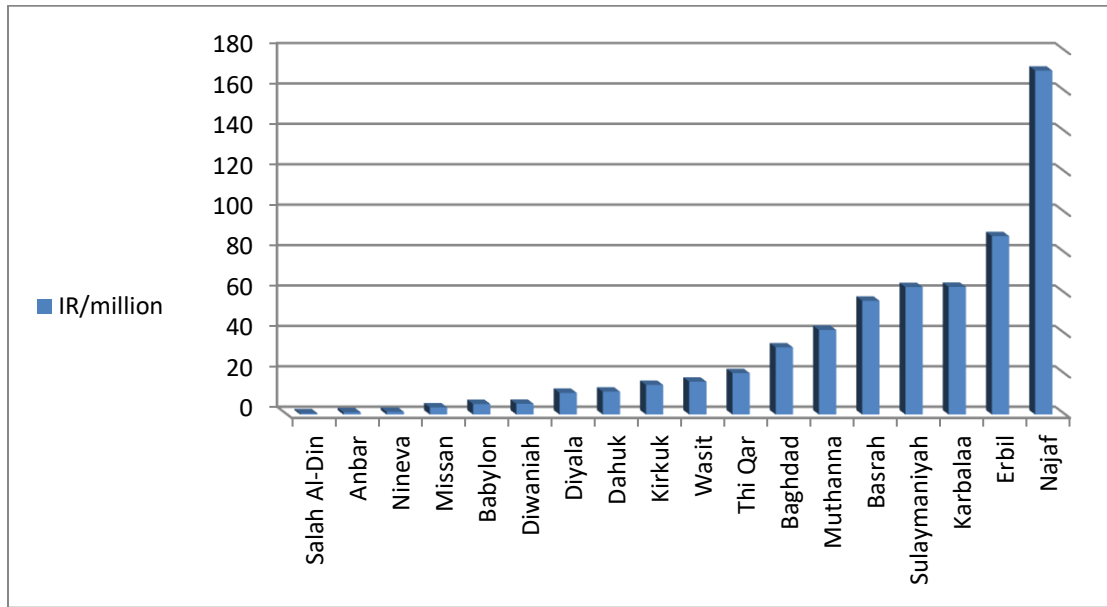
**Figure 1** Daily reported cases of COVID-19 infection in Basrah over the period from March 9 to April 10, 2020.



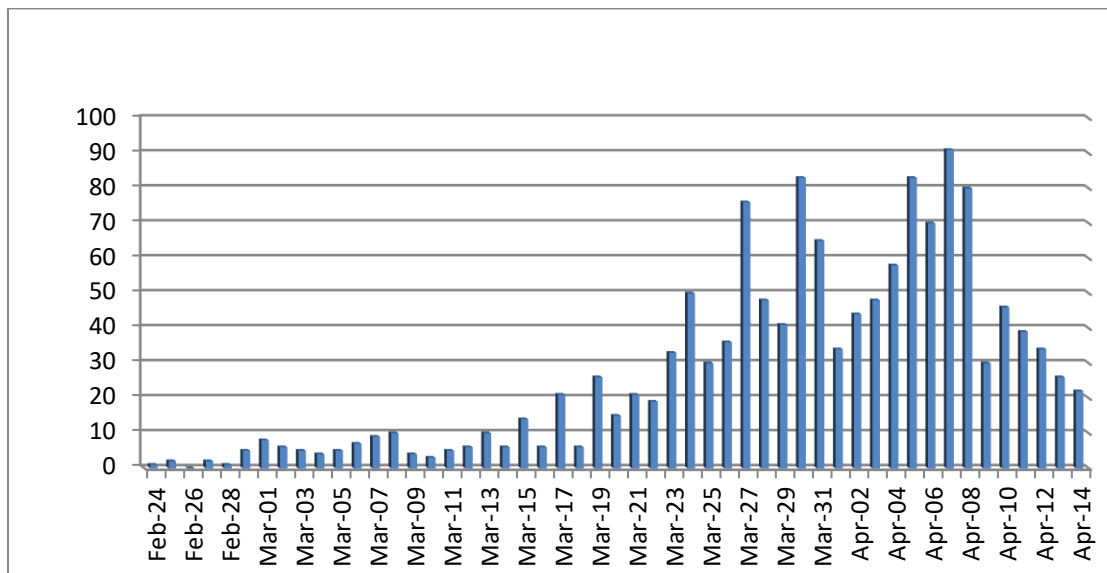
**Figure 2** Cumulative cases of COVID-19 infection in Basrah over the period from March 9 to April 10.



**Figure 3** Number of all reported cases of COVID-19 Virus In Iraq provinces over the period February 24 to April 10, 2020 inclusive.



**Figure 4** Incidence rate per million of reported cases of COVID-19 virus in Iraq provinces over the period February 24 to April 10, 2020 inclusive.

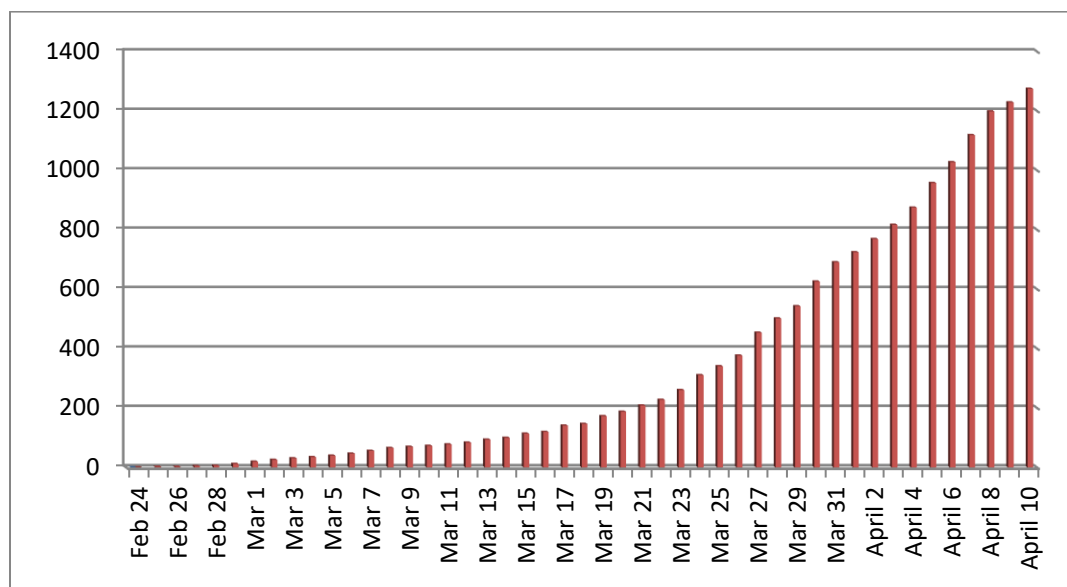


**Figure 5** Daily reported cases of COVID-19 infection in Iraq over the period from February 24 to April 10, 2020



**Table 5:** Estimated population, reported new cases of COVID-19 and case fatality ratio by province in Iraq (Data covered the period from February 21 to April 10, 2020 inclusive)

Governorate	Population	Total cases	Cured	Died	CFR for all cases (%)	CFR for closed cases (%)
Baghdad	8 340 711	277	120	24	8.7	16.7
Najaf	1 510 338	257	122	5	1.9	3.9
Erbil	1 903 608	168	29	0	0.0	0.0
Basrah	2 985 073	160	71	15	9.4	17.4
Sulaymaniyah	2 219 194	140	93	3	2.1	3.1
Karbala	1 250 806	79	48	6	7.6	11.1
ThiQar	2 150 338	44	4	2	4.5	33.3
Muthanna	835 797	35	10	1	2.9	9.1
Kirkuk	1 639 953	24	10	1	4.2	9.1
Diyala	1 680 328	18	8	3	16.7	27.3
Dahuk	1 326 562	15	15	0	0.0	0.0
Wasit	1 415 034	23	9	2	8.7	18.2
Babylon	2 119 403	11	3	5	45.5	62.5
Diwaniah	1 325 031	7	6	1	14.3	14.3
Nineva	3 828 197	5	1	0	0.0	0.0
Missan	1 141 966	4	2	2	50.0	100.0
Anbar	1 818 318	2	1	0	0.0	0.0
Salah Al-Din	1 637 232	1	0	0	0.0	0.0
<b>Total</b>	<b>38 327 889</b>	<b>1279</b>	<b>552</b>	<b>70</b>	<b>5.5</b>	<b>11.3</b>



**Figure 6** Cumulative cases of COVID- 19 infection cases in Iraq over the period from February 24 to April 10, 2020

The scale of the epidemic is quite different from the situation in neighboring Iran and Turkey, and most of the Western European countries, where high incidence and mortality reported.<sup>1,3,5,6</sup>

With respect to patients' characteristics, they were almost equally distributed by gender with a median age of 45 years and no case was reported in children less than 10 years. These results tend to agree with the prevailing view that COVID-19 represents a low risk or mild disease in children. These features were similar to what was initially reported on COVID-19 cases in Singapore<sup>8</sup> and China.<sup>2,9</sup> Within the province of Basrah, the cases were distributed in a sporadic manner. No specific district or location could be identified with high number of cases. The initial small number of cases could be traced to have visited countries with COVID epidemic but most of the cases were either contacts to initial cases or they were solo cases at the time and place.

When the epidemic pattern across all provinces in Iraq was examined, a great variation in the incidence rates were reported. The highest incidence rates were in Najaf, Erbil, Sulaymaniyah, Karbala and Basrah. Baghdad with the highest number of cases, the incidence rate was relatively low given the fact that Baghdad is the most populated province in Iraq, with more than 8 million inhabitants.

There seems some sort of a link between the relatively high risk of infection and the presence of airports. The provinces with highest reported cases (Baghdad, Erbil, Basrah, Sulaymaniyah and Najaf) have

airports that remained operating for some time after the start of the epidemic in Iraq.

Although the pattern of the COVID epidemic in Basrah and Iraq is generally of low scale, as shown in this study and the results of another modeling study<sup>10</sup> it is unlikely to be eliminated from the country in few weeks. Elimination, by itself, is very possible, However, the inconvenience caused by social distancing might lead to public disobey and hence difficulties in maintaining a low scale of transmission of infection for more additional weeks of restrictions. Whether the high temperature in summer is a strong factor in abating the virus is yet to be seen.

## Conclusions

The epidemic of COVID-19 in Basrah and Iraq is moderate in severity until today (April 10, 2020). Large variation did exist among Iraqi provinces in the risk of infection and fatality. Provinces with air travel facilities seemed at higher risk of COVID-19 Virus infection. Epidemic control measures are going well but the transmission of infection among the population may take further few weeks to subside. It is highly recommended that the active cases detection is upgraded to facilitate and accelerate the complete control of the epidemic in Basrah and the rest of Iraq.

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## الخصائص الوبائية لوباء كوفيد 19 فى البصرة-جنوب العراق

### الخلاصة

**الخلفية:** ظهر وباء فايروس كورونا فى الصين فى كانون الاول 2019 ثم انتشر بسرعة ليتحول الى جائحة اجتاحت العالم تهدف الدراسة الى تقديم وصف دقيق وواقعى لوباء فايروس كورونا فى البصرة فى اطار وطنى.

**طرائق البحث:** اعتمد البحث الحالى على البيانات اليومية التى تصدر عن وزارة الصحة ودائرة صحة البصرة والتى تتضمن الاعداد اليومية المؤكدة لاصابات كورونا. كما تم الحصول على البيانات التفصيلية عن المرضى فى محافظة البصرة بما فى ذلك العمر والجنس وتاريخ التشخيص ومحل السكن وتاريخ السفر والاصابة بأمراض اخرى وكذلك مصير المريض ( اكتسب الشفاء أو ما زال تحت العلاج أو توفى). ولتسهيل حساب النسب والمؤشرات الوبائية تم الاستفادة من البيانات السكانية لدى وزارة التخطيط العراقية لعام 2019. تم تجميع البيانات الخاصة بالبصرة على برنامج احصائى (الحزمة الاحصائية للعلوم الاجتماعية) كما استفيد من برنامج اكسل لرسم الاشكل التوضيحية.

**النتائج:** تم استخدام البيانات التفصيلية ل 152 مريضا من محافظة البصرة و 1279 اصابة على مستوى العراق. كان معدل العمر للمرضى 46 سنة تقريبا وتراوحت الاعمار بين 13 -98 سنة ولم تسجل اصابة بين الأطفال دون العاشرة من العمر. ولم تظهر البيانات تمايزا فى احتمال الاصابة بين الذكور والاناث. بالنسبة لمنطقة السكن فمن الصعب الوصول الى استنتاج محدد فى الوقت الحالى الا ان الحالات المبكرة كانت اكثر انتشارا فى مركز المحافظة وأفضية ابو الخصيب وشط العرب و الزبير. على مستوى العراق تمثل البصرة إحدى المحافظات التى تصدرت المشهد سواء فى عدد الاصابات او فى نسبة حدوثها اضافة الى بغداد واربيل والنجف والسليمانية، **الاستنتاجات:** ما زال الوباء فى البصرة وفى عموم العراق يمثل نمطا معتدلا متباطئا مع فوارق واضحة بين المحافظات

الكلمات المفتاحية : الوبائية ، كوفيد 19 ، البصرة