

Epidemiological Characteristics of confirmed COVID-19 cases in Iraq, three months situation analysis

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ABSTRACT

INTRODUCTION: COVID-19 is an emerging respiratory disease that was first reported in December 2019 in China and was then declared a public health emergency and subsequently a global pandemic. It is caused by a novel coronavirus that resembles the SARS CoV1 virus with some genetic differences.

OBJECTIVE: To show the clinical fate and epidemiology of the patients confirmed to have COVID-19 in Iraq for the three months from 24 February to 24 May 2020 and to compare our data to those of neighbour and other eastern Mediterranean countries.

METHODS: A cross sectional study was conducted to show the epidemiology of laboratory confirmed COVID-19 cases in Iraq from 24 February to 24 May 2020. All cases were diagnosed exclusively in governmental laboratories in Baghdad and other provinces by real time PCR. Incidence rate per 100,000 population, cure rate and case fatality rate were calculated and compared to that of other Eastern Mediterranean countries.

RESULTS: There were 4,469 laboratory confirmed COVID-19 cases by 24 May 2020 in Iraq which make an incidence of 11.13 per 100,000. Total recoveries were 2,738 (61%). Iraq was ranked the 12th among the EMRO countries in terms of confirmed COVID-19 cases. Males were 2,430 (54%) of the total cases, the highest case count was among the age group of 30-39 years (18.9 %), while the least percentage was among the 80 years and above age group (1%). Of the totally infected persons, 207 (4.6) were healthcare workers, and 187 (~ 90 %) of them were nurses and medical doctors.

CONCLUSION: after the first three months of pandemic of COVID-19, Iraq still in the middle rank among other Eastern Mediterranean countries in form of number of confirmed, cure and death rate. Baghdad, followed by Basra and Najaf have the highest rate of infection while Anbar and Ninawa are the least provinces affected.

Key words: COVID-19, Iraq, Epidemiology.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an emerging respiratory infectious disease. Reported initially as a cluster of pneumonia of unknown cause in Wuhan, China in late December 2019.^{1,2} Molecular analysis has shown that the culprit pathogen is a novel coronavirus, which was named initially 2019-nCoV.³ On 11 February 2020, the World Health Organization (WHO) officially named the virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the disease coronavirus disease 2019 (COVID-19).⁴ The virus is distinct from

both SARS-CoV and MERS-CoV, yet closely related.⁵ It has been suggested that COVID-19 may be less severe than SARS and MERS. But, it is more contagious.⁶ The WHO declared the outbreak a Public Health Emergency of International Concern on 30 January 2020 and a pandemic on March 11, 2020.²

With the rapid and wide transportation, the disease had been spread all over the world within few weeks. The United Arab Emirates was the first Eastern Mediterranean country to detect COVID-19 in late January 2020 followed by Egypt and Iran. Progressively over

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the next few weeks, all east Mediterranean countries have registered their first cases. In Iraq, the first case of COVID-19 was reported on 24th of February 2020.⁷

COVID-19 is a highly contagious disease and each infected person could infect others⁸ either directly through inhalation of respiratory droplets of an infected person or indirectly through fomites in the immediate environment around the infected person.⁹ Unlike SARS-CoV, transmission of COVID-19 occur during the prodromal period when those infected are mildly ill, and carry on usual activities, which contributes to the wide spread of infection.¹⁰ Although the infected droplets can be transmitted over a range of about one meter, WHO continues to recommend airborne precautions for circumstances and settings in which aerosol generating procedures and support treatment are performed, according to risk assessment.¹¹

In a cohort of 32,583 patients in China, median age of infected people was 56.7 years. Women were slightly more affected than men. Elderly over 80 years had a higher risk of having severe or critical cases compared to young adult less than 20 years.¹ In another study from china that recruited 44,672 patients about 80 % of cases were mild, 15 % severe, and 5 % critical with a case fatality 2.3 %.¹² The presenting common symptoms include fever, dry cough, dyspnoea, chest pain, fatigue and myalgia.⁵ Gastrointestinal symptoms are rarely reported.¹³ Development of pneumonia with CT changes is difficult to be assessed in all patients with COVID-19, however, in hospitalized patients all of them had pneumonia with abnormal findings on chest computed tomography.¹³

Older age, smoking and underlying non-communicable diseases (NCDs), such as diabetes, hypertension, cardiac disease, chronic lung disease and cancer, have been reported as risk factors for severe disease and death.¹⁴

Since the detection of the first case of COVID-19 in Iraq on 24 February 2020, The Public Health Directorate has published many situation reports about the epidemiology of COVID-19 in Iraq. These reports have included an updated data about the confirmed, cured, active and died patients with some other demographic characteristics. In this study we are presenting the clinical fate of the pa-

tients confirmed to have COVID-19 in Iraq for the three months from 24 February to 24 May 2020 showing some demographic features and comparing our data to that reported in Eastern Mediterranean countries.

METHODS

Setting and Design: This cross-sectional description was based of the national registry of the confirmed COVID-19 at the Ministry of Health in Iraq. Registry data are gathered, unified and analysed centrally at the Public Health Directorate in Baghdad in collaboration with sections of the communicable diseases in Health Directorates of all Iraqi provinces including Kurdistan region. The study covered the period of three months from 24 February to 24 May 2020.

Ethical consideration: The use of these data was approved by the Public Health Directorate, in accordance with the regulations of Ministry of Health in Iraq.

Definition of the cases: Confirmed cases of the COVID-19 that are used in this registry, hence this analysis, are those who were tested positive using a real time PCR on a sample of nasopharyngeal and oropharyngeal swap. The laboratory tests were done exclusively at governmental laboratories in Baghdad and health directorates in Iraq. Laboratory devices and kits used for the diagnosis of COVID-19 were of variable markers and versions. In the first few weeks of the pandemic, the Ministry of Health in Iraq has adopted a passive surveillance system where tests were performed on those with a clinical history suggestive of COVID-19, a history of travel to highly endemic countries, or a history of contact with a confirmed case of COVID-19. However, when the tests became available on a wide scale, many health directorates started an active surveillance to detect the cases in the community especially the communities that reported more confirmed cases.

Variables of the study and definitions: the following demographic variables were used for sake of this analysis; age distributed in eight groups each of a decade, gender, and address per provinces. Job description was reported only for the confirmed cases of COVID-19 from

healthcare workers.

Active case: Any patient who was confirmed COVID-19 and persistently shows positive results by real time PCR by 24 May 2020 is considered active case.

Cure case: A COVID-19 confirmed patient is considered cured when he/she turns negative on PCR in two consecutive samples 24 hours apart.

Cure rate: is the total number of cured cases divided by the total number of confirmed cases as recorded on 24 May 2020 multiplied by 100.

Age specific case fatality: Total number of deaths over the total number of confirmed cases within the same age group.

Death Case: For surveillance purposes, WHO defines a death for COVID-19 as a death resulting from a clinically compatible disease in a probable or confirmed case of COVID-19, unless there is a clear alternative cause of death not related to COVID-19 (for example, trauma). There should not be a period of complete recovery between illness and death.¹⁵

Incidence rate: total number of confirmed cases/ 100,000 population for each province. The total population of each province was tak-

en from the Department of Statistics / Ministry of Health.

Iraqi data was compared with the data of other Eastern Mediterranean countries.¹⁶

Statistical analysis: data were shown by tables and graphs using Microsoft Excel software 2019.

RESULTS

In the first three months of the pandemic in Iraq since the first case of COVID-19 registered, 4,469 confirmed cases were reported, 160 patients have died and 2,738 patients have cured. The incidence rate is 11.13 / 100,000 population. **Table 1** shows the confirmed, active, cure and dead patients distributed over the Iraqi provinces.

Table 2 shows the profile of Iraq compared to that of Eastern Mediterranean countries. **Figure 1** shows the map chart of the epidemiology of COVID-19 of Iraqi provinces and the neighbour countries. **Figure 2** shows the effect of complete and partial curfews on the number of the confirmed cases.

Of the totally confirmed cases during the studied period, 2,430 (54 %) were males and 2,039 (46 %) were female. 845 patient (18.9 %) were from age group 30-39 years, other demographic data are shown in the **table 3**. Confirmed and cured cases of COVID-19 age 10 years and below is shown in **figure 3**.

The number of health care workers get infected in the three months from 24 February to 24 May 2020. **Figure 4** shows the infected HCW according to their job description.

DISCUSSION

The first case of COV-

Table 1 | COVID-19 cases and indicators by province in Iraq, 24 February – 24 May 2020

Province	Confirmed	Active	Death	Cure	Cure rate %	Incidence rate/100,000
Baghdad	2,233	1,195	97	941	42 %	26.09
Basra	747	151	18	578	77 %	24.39
Najaf	318	13	6	299	94 %	20.52
Muthanna	117	18	4	95	81 %	13.64
Erbil	242	30	1	211	87 %	12.39
Kerbala	153	27	8	118	77 %	11.92
Sulaymaniya	215	38	4	173	80 %	9.44
Missan	52	5	2	45	87 %	4.44
Thi-Qar	96	20	4	72	75 %	4.35
Kirkuk	72	11	2	59	82 %	4.28
Wassit	59	17	3	39	66 %	4.06
Diyala	45	19	5	21	47 %	2.61
Babylon	49	5	5	39	80 %	2.25
Dahuk	26	7	0	19	73 %	1.91
Diwaniya	15	3	1	11	73 %	1.1
Sala-Aldin	13	4	0	9	69 %	0.77
Ninewa	12	6	0	6	50 %	0.31
Anbar	5	2	0	3	60 %	0.27
Total Iraq	4469	1571	160	2738	61 %	11.13

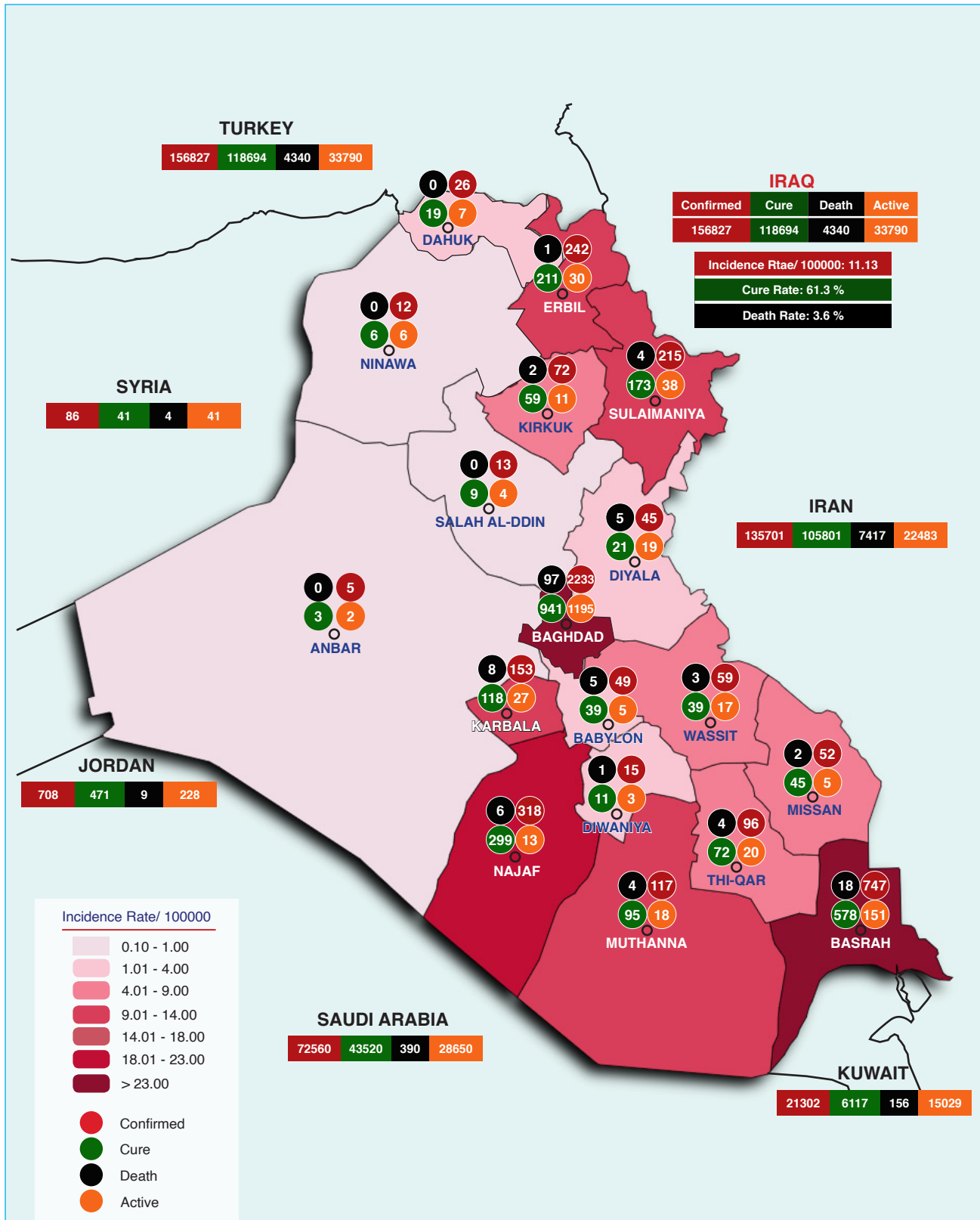


Figure 1 | Map chart shows confirmed, active, cure, and deaths of COVID-19 in Iraqi provinces up to 24 May 2020 (after 3 months from the first reported case) with a comparison with the registries of the neighbour countries.

Table 2 | COVID-19 case summary statistics in EMRO region till 24 May 2020

COUNTRY	CONFIRMED	DEATH	CURE	ACTIVE
Iran	135,701	7,417	105,801	22,483
Saudi Arabia	725,60	390	43,520	28,650
Pakistan	54,601	1,133	17,198	36,270
Qatar	43,714	23	9,170	34,521
UAE	29,485	245	15,056	14,184
Kuwait	21,302	156	6,117	15,029
Egypt	17,265	764	4,807	11,694
Afghanistan	10,582	218	1,075	9,289
Bahrain	9,138	13	4,587	4,538
Oman	7,770	37	1,933	5,800
Morocco	7,433	199	4,703	2,531
Iraq	4,469	160	2,738	1,571
Sudan	3,628	146	424	3,058
Djibouti	2,270	10	1,064	1,196
Somalia	1,594	61	204	1,329
Lebanon	1,114	26	688	400
Tunisia	1,048	48	914	86
Jordan	708	9	471	228
Palestine	423	3	357	63
Yemen	222	42	10	170
Syria	86	4	41	41
Libya	75	3	39	33
TOTAL	425,188	11,107	220,917	193,164

visited Iran.⁸ This study will have a look at the epidemiology of COVID-19 in Iraq after 3 months since the first recorded case.

The total confirmed COVID-19 cases in Iraq till 24 May 2020 were 4,469 with an incidence rate of 11.13/100,000 population. Of those 160 patients (3.6%) have died, 2,738 (61%) have been cured, and 1,571 (36.4%) continue as active cases. Iraq is the 12th in the ranking of total reported cases and 13th in the number of active cases among East Mediterranean countries. This rank is located in the middle where Iran is on its top and Libya is in its bottom.¹⁶ (see table 2) Rate of death in Iraq rank it the ninth, but it is the third among Arabic Asian countries after Yemen and Syria; however, it is much better compared to the world average, 6.3 %. While the cure rate puts Iraq within the first

ID-19 in Iraq was reported in Najaf province on 24 February; the patient was a theology student from Iran. Four more cases were reported in Kirkuk province on 25 February; the patients were an Iraqi family who recently returned from Iran. Two days later on, Baghdad announced its first confirmed case who had also recently

quarter.

Cure rate and case fatality rate in Iraq are much better than the average rates of the worlds which are 42 and 6.3 % respectively.¹⁶ However, it is important to note that the countries recorded numbers are dependent on the

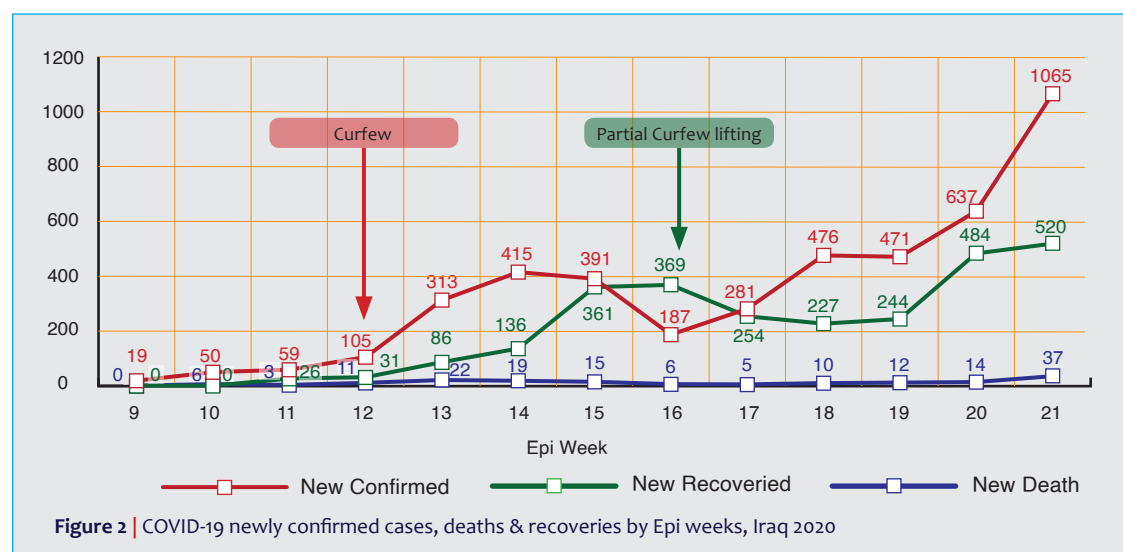
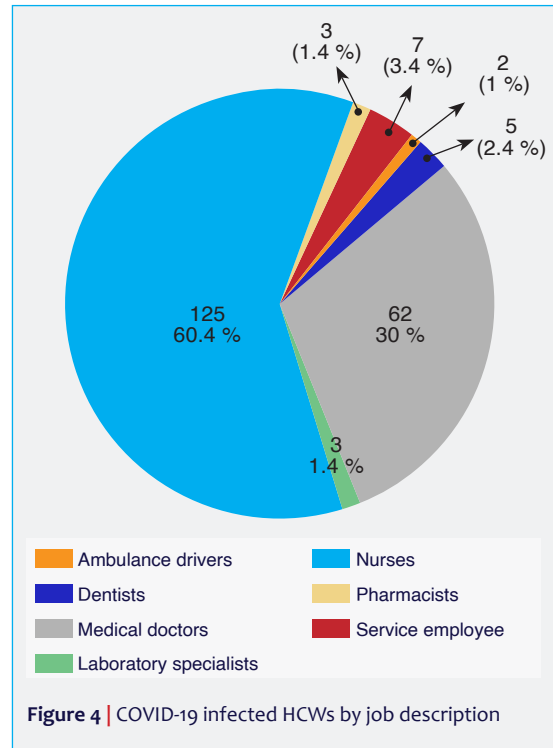


Table 3 | Epidemiological characteristics of COVID-19 cases in Iraq till 24 May 2020

Characteristic	Count	Percentage
Gender		
Male	2430	54
Female	2039	46
Age group (years)		
< 10	344*	7.7*
10-19	529	11.8
20-29	794	17.8
30-39	845	18.9
40-49	755	16.9
50-59	627	14.0
60-69	345	7.7
70-79	184	4.1
≥ 80	46	1.0
Travel history		
Yes	157	3.5
No	4299	96.2
Missing data	13	0.3

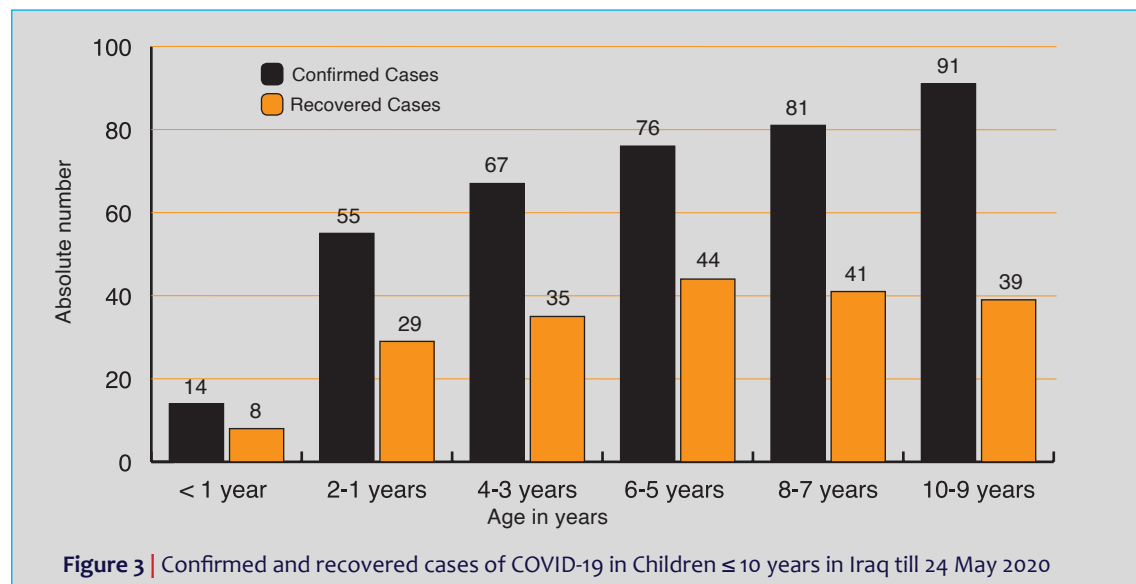
* This number and percent refers only to those below 10 years, In figure 3 and discussion section, 384 (8.6 %) refers to those aged 10 and below.



total number of testing conducted in each country and may not reflect the actual epidemiologic situation of COVID-19 burden. Globally, CFR is remarkably variable among different studies; it is around 2-3 % in overall patients,^{17,18} 11-15% in hospitalized patients^{13,19,20} and up 46 % among critically hospitalized patients.⁹

Table 1 shows the distribution of COVID-19 cases in Iraqi provinces, involvement of the provinces is diverse. Baghdad, Basra, and

Najaf have reported the highest incidence rate; 26.09, 24.39, and 20.52 cases/ 100,000 population respectively. All these provinces have shared the presence of an international airport; a state that makes the risk of importing infected cases higher. This notion is also applicable for Kurdistan region. While the incidence rate of COVID-19 in Erbil and Sulaymaniya, which have airports, are 12.39 and 9.44 per 100,000 population respectively, Dahuk, does



not have an airport, has an incidence rate of 1.9/ 100,000 population. The relation of risk of importing COVID-19 case with the presence of airports has been noted in China, India, and Africa.²¹

The total number of daily confirmed COVID-19 cases was increasing gradually as illustrated in **figure 2** till the 12th epiweek when complete curfew was implemented. Two weeks thereafter the number of confirmed cases started to decline coinciding with the maximum reported duration of action of the disease, which is 14 days.²² After changing the complete curfew to partial a second sharp rise in the confirmed cases has been noted.

In our study, males are slightly more affected by COVID-19 than females with a male:female ratio of 1.2:1. Many studies from Iran²³ and China^{24, 19} have shown similarly that males are more commonly affected than females. The more susceptibility to infection among men could be attributed to a more chance of men for contracting the infection because they relatively spend more time outside homes. Though some other opinions attributed this difference to the X chromosome and sex hormones, which have been reported to play role in innate and adaptive immunity²⁵ especially men are not only more infected than females but they are more serious and has a high mortality.^{23, 26}

Around 50 % of infected patients in this report are between age of 20-50 years (see **table 3**), then it progressively decreases with age reaching about 1 % in those over the age of 80 years. This is expected because adults are mainly involved in works outside homes exposing them to threat of having the infection. Besides that, people over the age of 65 years in Iraq comprises less than 5 % of the total Iraqi population.²⁷

In this report, 384 patients (8.6%) confirmed to have COVID-19 were aged 10 years and below. **Figure 3** shows that in this age group the recovered cases is usually more than the active cases, and the rate of confirmed cases is directly related to the age. Early reports from China has shown that infection of COVID-19 below age of 10 years is very rare; about 0.9%.²⁸ However, this low rate of infection of children does not necessarily reflect low susceptibility but due to less exposure in the first

days of the pandemic because children have fewer outdoor activities and undertake less international travel, making them less likely to contract the virus.²⁸ A systematic review showed that children have so far accounted for 1%-5% of diagnosed COVID-19 cases, they often have milder disease than adults and deaths have been extremely rare.²⁹

In Iraq, 207 health care workers (HCW) (4.6 %) have been infected with COVID-19 in the first three months (See **Figure 4**); nursing staff were 125 (60.4 %) and medical doctors were 62 (30%). COVID-19 is imposing a significant burden on HCW exposing them to a huge danger despite the availability of personal protective equipment. This is a worldwide problem, in Italy by 16 April 2020, 16,991 healthcare workers had tested positive for COVID-19. They represented about 10 % of the total infected people, of them 206 (1.2 %) have died.³⁰ Based on data from 30 countries, the international council of nursing has estimated that 90,000 healthcare workers have been infected on average of 6 % of all confirmed cases of COVID-19.³¹ High rate of involvement of HCW has raised a call to exercise more strict infection control programs and provision of effective personal protective equipment on a wide scale to protect the essential fighters of this dreadful enemy.

CONCLUSION

The review of Iraq data of COVID-19 pandemic has shown that it is in the middle rank compared to other countries of Eastern Mediterranean Region. Male are more affected than female and young adults are the highest age group to be involved.

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Abbreviations list: Case fatality rate (CFR), Coronavirus disease 2019 (COVID-19), Health care workers (HCW), Middle east respiratory syndrome corona virus (MERS-CoV), Noncommunicable diseases (NCDs), Polymerase chain reaction (PCR), Severe acute respiratory syndrome corona virus (SARS-CoV), Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), World Health Organization (WHO).

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