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Characteristics of COVID-19 Cases in Baghdad and Al-Rusafa, Iraq

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ABSTRACT

This study aims to identify the characteristics of COVID-19 cases associated with infection including socio-demographic background and the source of infection. We performed a descriptive cross-sectional study design including a total of 5959 suspected COVID-19 cases. People attending primary health care centers and general hospitals in Baghdad /Al-Rusafa DOH were included. An active survey for the tracing of the contacts of positive cases tracing was done from the beginning of the outbreak, and active surveillance and rapid tests were performed from 18/4/2020. Data was obtained from the surveillance unit at Baghdad/ Al-Rusafa DOH during the study period. Up to 29/5/2020, we identified 5959 suspected cases were 5959, 333 probable cases, and 1658 confirmed cases. Of the confirmed cases, 577 cases recovered and 64 died. Regarding age group, 40% of cases were between 41 and-60 years old. Males represented 57% of cases. All districts registered cases and the highest incidence rate (68 per 100,000 inhabitants) was in Al-Sadder city district. Like many countries around the world, Iraq has reported cases of COVID-19, and the number of cases was rising with increasing pace in Iraqi provinces including Baghdad. In the absence of a vaccine available and with little evidence of the effectiveness of therapeutic agents, a rapid, proactive, and comprehensive approach is essential in order to control imported cases, contain local transmission, and strengthen the national surveillance system.

Keywords: COVID-19, pandemic, Al-Rusafa/ Baghdad

Introduction

COVID-19 is an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first identified in December 2019 in Wuhan, the capital of China's Hubei province. It has since spread globally. The World Health Organization (WHO) declared the 2019–2020 coronavirus outbreak a Public Health Emergency of International Concern on 30 January 2020 [1] , and a pandemic on 11 March 2020[2] . Local transmission of the disease has been recorded in many countries across all six WHO regions. There is no available specific vaccine or medication. The WHO was notified of the spread of the virus in 2 countries in the EMRO region, the United Arab Emirates and Egypt, on 15 February 2020 [3].
On 19 February 2020, the Iranian ministry of health registered its first two COVID-19 cases in Qum city [4], resulting in the ongoing 2019- 2020 coronavirus spread in Middle East region [5]. The virus is primarily spread between people during close contact, often via small droplets

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produced by coughing, sneezing, or talking. These droplets are produced when breathing out, and they usually fall to the ground or onto surfaces rather than being infectious over long distances. People may also become infected by touching a contaminated surface and then their face. The virus can survive on surfaces for up to 72 hours [6] .It is most contagious during the first three days after the onset of symptoms, although spread may be possible before symptoms appear and in later stages. [7] Common symptoms include fever, cough, and shortness of breath. The time from exposure to onset of symptoms is typically around five days but may range from two to fourteen days. The majority of cases result in mild symptoms, some progress to viral pneumonia and multi-organ failure [16]. Suspect, probable, and confirmed cases definitions were based on standard criteria defined by the WHO [2,5]. By the end of our study on 29/5/2020, a total of 6,003,762 COVID-19 cases had been confirmed worldwide, for 367,183 deaths and 2,534,057 known recoveries [10]. In Iraq, the first case of COVID-19 was identified on 29/2/2020 by the Baghdad Al-Rusafa/ Directorate of health (DOH). Here we describe the dynamics and the epidemiological features of the epidemic in this region of Iraq following this initial case. We aim to identify the epidemiological characteristics of the disease including the source of infection, the highly susceptible groups, the age and sex distribution of cases, and the disease trend. In addition, our goal is also to determine the most important sign and symptoms of the disease and to evaluate the disease prognosis.

METHODS

Study design and population

We performed a descriptivecross-sectional study of a total of 5959 suspected COVID-19 cases in the Al-Rusafa portion of the city of Baghdad. Iraq. Baghdad city, the capital of Iraq, is divided by the Dijlah River, separating Al-Karkh and Al-Rusafa cities. Baghdad Al-Rusafa, where our study was conducted, is characterized by a high population density.In this study, we focused on people attending public health care centers and general hospitals in Baghdad/ Al-Rusafa DOH. These cases were recruited through active testing of the contacts of positive cases from the beginning of the outbreak, and through active surveillance using rapid tests from 18/4/2020 until the end of the study period. We note that this testing is still ongoing, even though the results of more recent testing are not reported here.

Laboratory testing:

Several samples were collected from suspected cases (nasal swab, pharyngeal swab, blood serum), and analyzed using the polymerase chain reaction (PCR) test for detecting genetic material from the virus SARS-CoV-2. If the result was negative, the patient was advised to remain isolated at home with follow-up to symptoms. If the result was positive, the patient was isolated in a specialized hospital and the examination was repeated after a week. If the follow-up test remained positive, the patient was directed to wait for another week. Conversely, in case of a negative follow-up test, the examination was repeated the next day and the patient discharged

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after two consecutive negative tests (Figure 1).

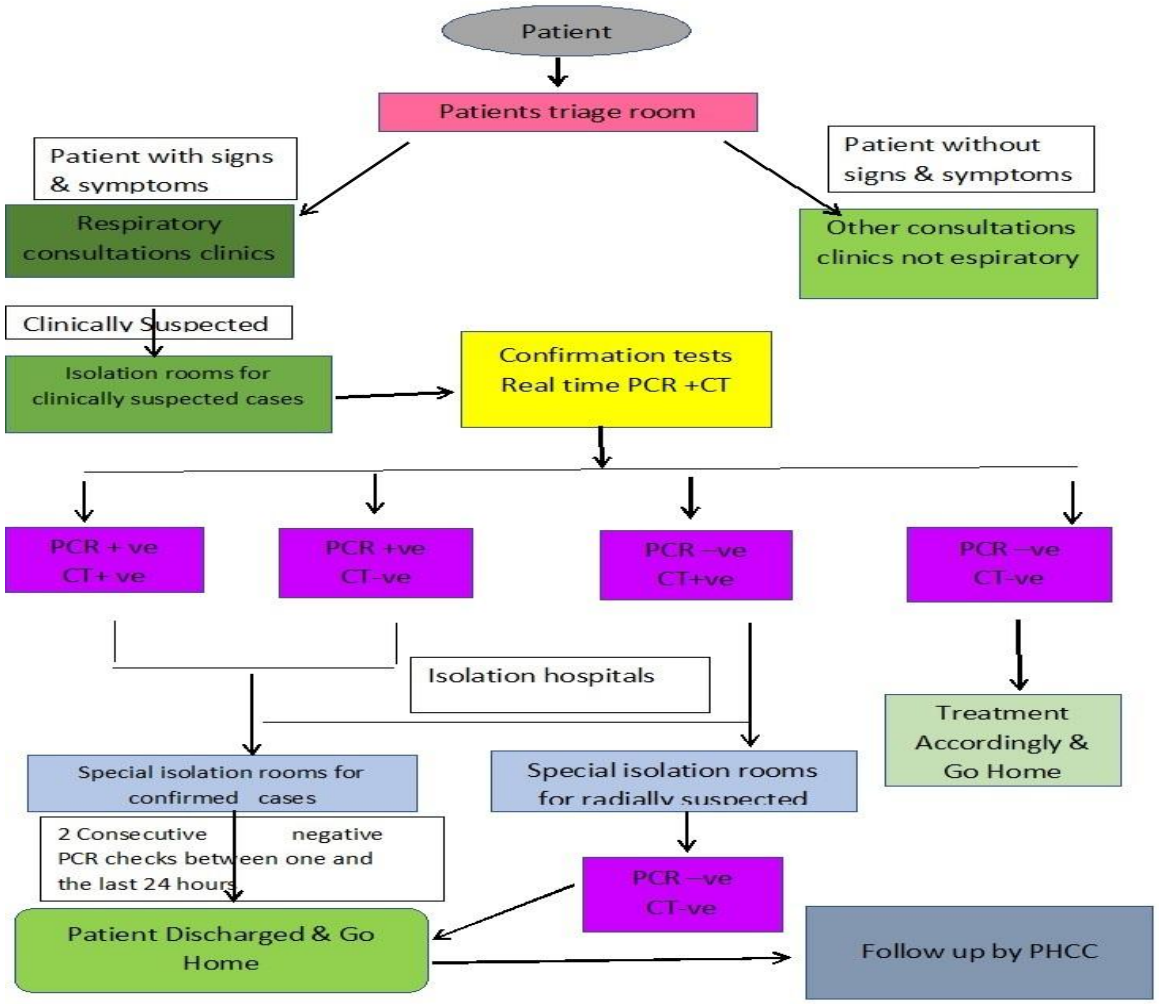

Figure 1. Flow chart for patients presenting at hospitals in Baghdad/Al-Rusafa, indicating the rules for patient triaging, testing, isolation, and return to home during the ongoing COVlD-19 pandemic.

Full household isolation was recommended for 15 days after discharge from the hospital and visitors are not to be received. From 18/4/2020, health teams from districts and primary health centers conducted active surveys in high-risk places using rapid tests. In the event of a positive result appearing, swabs were taken and sent to the central public health laboratory for confirmatory analysis.

Data collection and Management

Secondary surveillance data was obtained from the main Surveillance Unit at Baghdad/ Al-Rusafa DOH. For privacy and confidentiality purposes, the names of the patients have been

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deleted and only the case sequence number was retained. We took approval from main surveillance unit in Baghdad Rusafa DOH. Data was collected for the periodbetween 29/2/2020 and 29/5/2020. Microsoft Excel program was used for data entry for the analysis and presentation of data as frequency tables, bar charts, and pie charts. QGIS was also used to map the data.

RESULTS

Between the first diagnosis of COVID-19 on 29/2/2020 and 29/5/2020, we have recorded a total of 5959 suspected cases, 1658 confirmed cases. These results are based on 100% of the suspected cases being tested with the PCR test following a nasal swab, a pharyngeal swab, and a blood sample. The timeliness for these analyses was 96%. By the end of our study period, of the patients we identified as positive with COVID-19, 3.5% (58 cases) were dead, 27.8% (1094 active cases) were still in hospital, and 30.5% (506 cases) had recovered and been discharged. Following the first confirmed cases on 29/2/2020, cases gradually started to increase reaching their highest level on 6/4/2020. Cases then began to decline and reached their lowest level on 14/4/2020. The complete curfew was then lifted, and, following the implementation of a partial curfew on 18/4/2020, the total number of cases gradually increased from 185 cases on 14/4/2020 to 1658 cases on 29/5/2020 (Figure 2A, 2B).

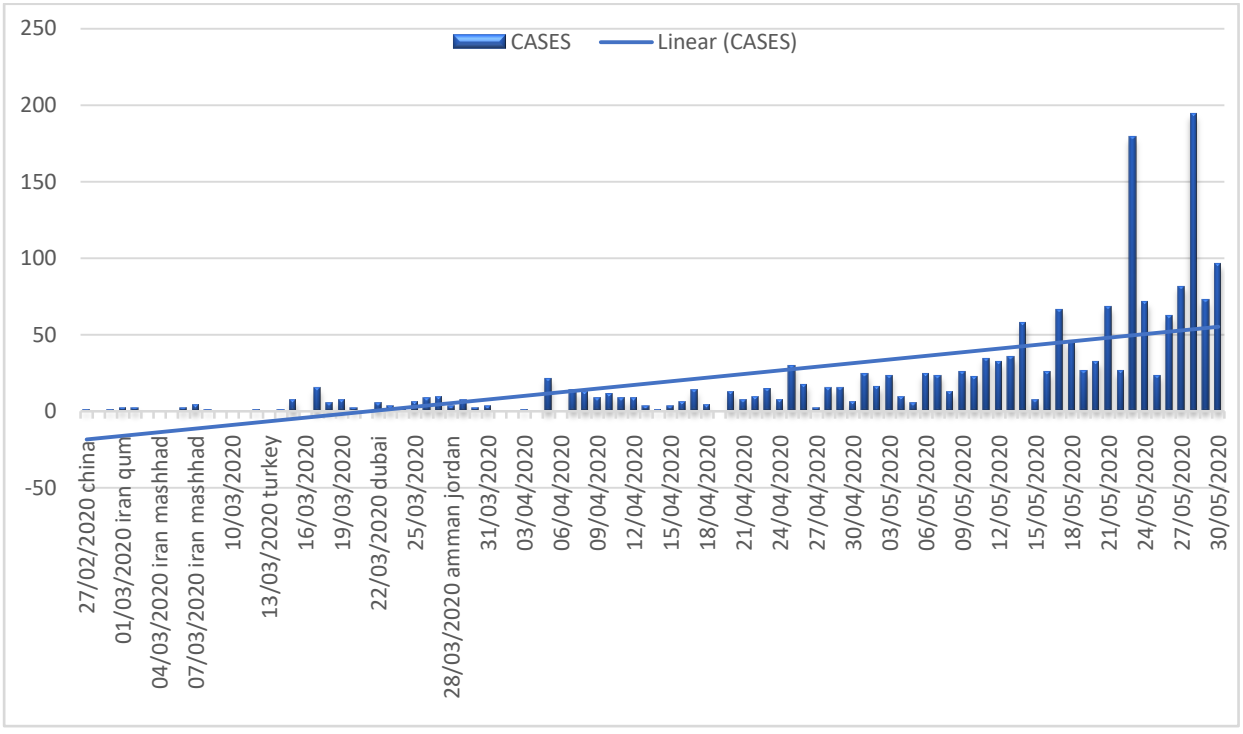

Figure 2-A. daily new confirmed cases of COVlD-19 in Baghdad/Al Rusafa from 29/2/2020 - 29/5/2020

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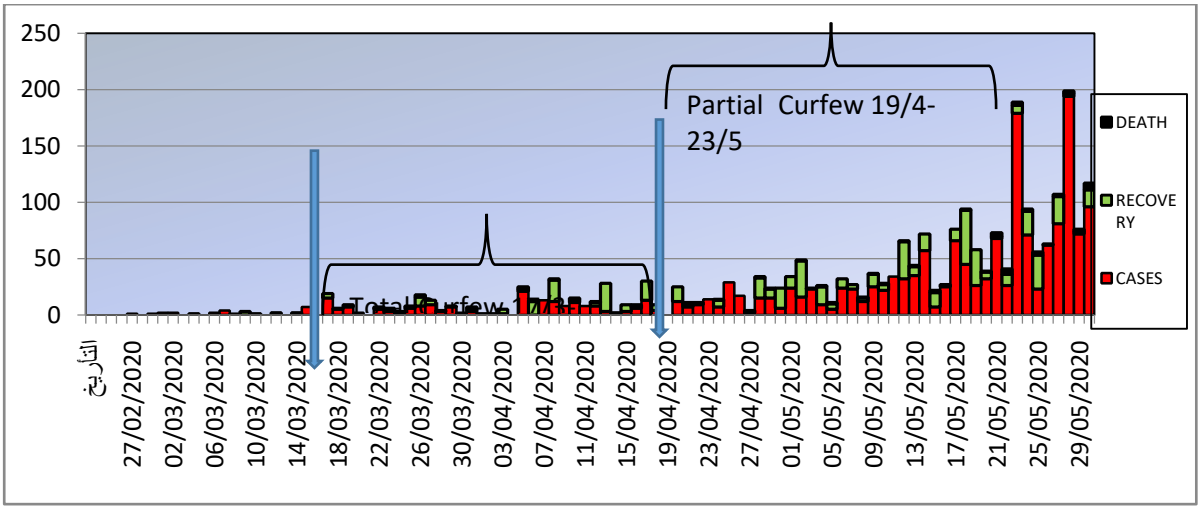

Figure 2-B. COVlD-19 daily new cases, recovered & death in Baghdad/Al Rusafa from 29/2/2020 to 29/5/2020

Before the imposition of the comprehensive curfew on 17/3/2020, 94% of the positive cases had a travel history to one of the neighboring countries with ongoing transmission according to the surveillance forms. After the imposition of the curfew and the closure of borders and airports, the cases of transmission of infection became local and 93% of the positive cases had no history of recent travel. The flight pattern between Iraq and Iran largely explains this result. We reviewed the flight schedule for Iraqi Airways [17] from Iran to Baghdad International Airport for the period from 1/2/2020 to 14/3/2020 and found36 airplanes that landed in Baghdad airport from different Iranian cities (including Qum city) before the curfew was fully implemented.

Age and sex distribution of cases in Baghdad/ Al-Rusafa:

The gender distribution of cases in our dataset was 57% male to 43% female. The highest percentage of cases occurred in the 41-50 and 51-60 years old age groups with 20% of cases in both age classes. The lowest percentage of cases occurred in the 0-10 and 71-80 age groups which respectively accounted for 5% and 6% of the overall number of cases. The rest of cases were distributed among the remaining age groups as follows: 11-20 year old had 8%; 21-30 year old had 16%; 31-40 year old had 18%; and 61-70 year old accounted for 7% of cases. The small number of infections among the elderly (more than 70 years) can be largely explained by the shape of the population pyramid for the population of Iraq. According to the annual statistical report of the Ministry of Health for the year 2019, we notice that the elderly (older than 70 years) make up the lowest percentage less than 5%of age groups among the population (n.d., pp. 24-25–26)

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Signs, Symptoms and length of stay in hospital associated with the COVID-19 cases in Baghdad Rusafa till 29/5/2020

Symptoms of cases registered were variable and included cough (56%), fever over 38°C (44%), general fatigue and sore throat (37%), headache (25%), runny nose (25%), and nausea and vomiting (18%). Other symptoms were less common, with lower respiratory system symptoms like difficulty in breathing, bronchial breathing, and wheezing each recorded in 12% of patients, and diarrhea – the least common symptom – being recorded in only 6% of cases. Length of stay in the hospital also varied widely (Figure 3A, 3B), ranging from 0 to 41 days with a mean (± standard deviation) stay of 18.35 days (±11.43 days).

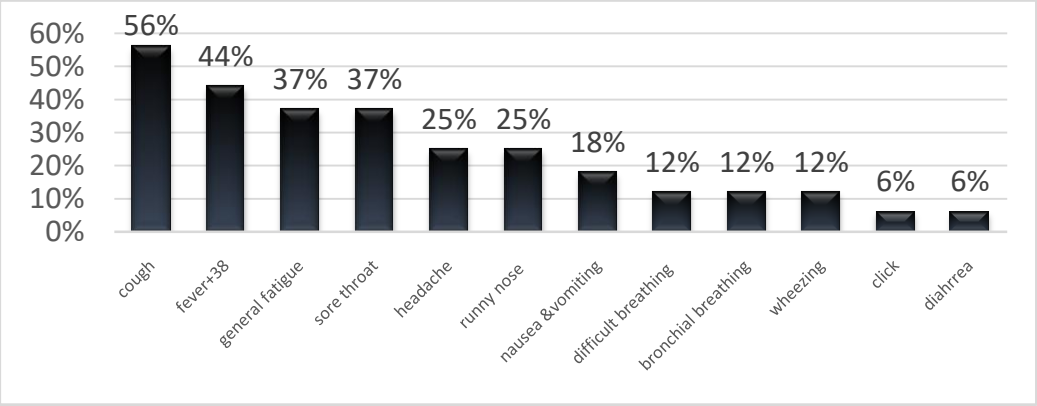

Figure 3. A: Signs & Symptoms for COVID-19 cases Baghdad-Rusafa DOH till 29/5/2020

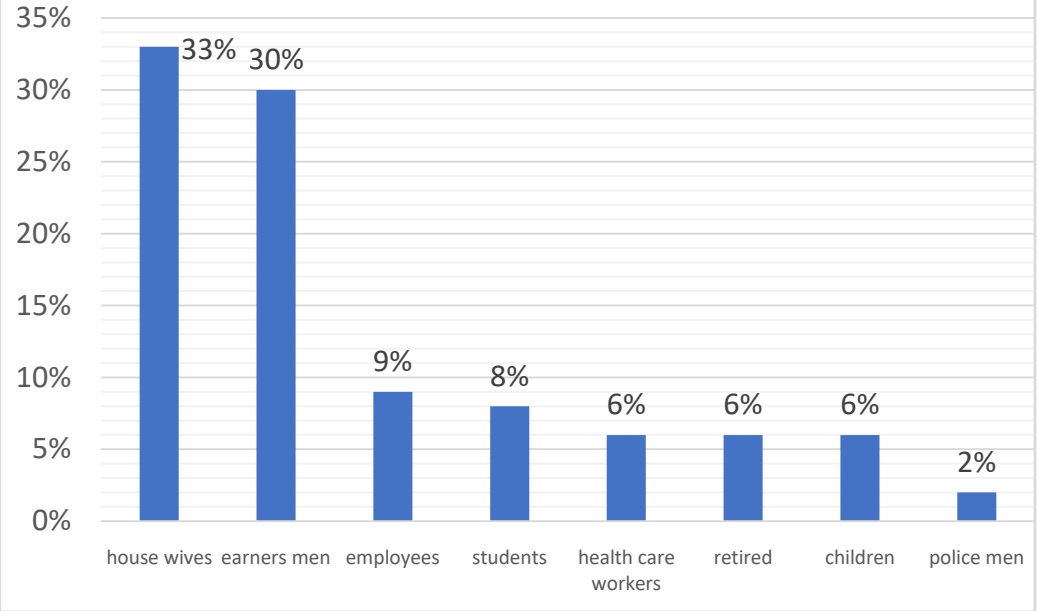

Figure 3. B: Job description for COVID-19 cases Baghdad /AL-Rusafa DOH till 29/5/2020

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Spatial variation in infection rates

We found that the infection rates varied within Baghdad-Al Rusafa (Figure 4). In particular, the poorest and more densely populated areas and neighborhoods had higher incidence rates (e.g Al Sadder City, Al-Baladiat 1). The majority of the residents in these districts work as salaried workers and earners men and have to go out for daily work. In the meantime, women manage home affairs and usually shop for groceries and vegetables on a daily basis because of the limited income that impedes the purchase of daily needs on a weekly or bi-monthly basis. Women are thus more likely to visit markets and attend crowded gatherings where social rapprochement is more common and can favor the spread of COVID-19. This theory is also supported in our dataset by 33% of the cases being housewives and 30% of cases being earner men. The importance of trade-related contacts in the spread of COVID-19 in our study area is also highlighted by the relatively high incidence in the district of Al-Jedida, one of the most important commercial neighborhoods in Baghdad. Details on incidence by district can be found in Table 1.

DISCUSSION

The role of the curfew in curbing the spread of COVID-19

Our study finds that the total curfew implemented at the beginning of the COVID-19 outbreak, between 17/3 and 18/4/2020, was effective at keeping the number of cases under the control of the health care system and within the institutions' capacity. The relatively limited number of cases (185) observed by 14/4/2020 helped ensure that all cases received treatment and allowed to quarantine those in contact within hospitals designated for isolation in a way that prevents further spread of the virus within the society. However, after the total curfew was removed and replaced by a partial curfew on 18/4/2020, cases increased approximately 9 times during the following 40-day period. Lockdowns have been shown to be similarly effective at curbing the spread of COVID-19 around the world. China also experienced significantly decreased growth rates and increased doubling times of cases most likely due to Chinese lockdown measures. A more stringent confinement of people in high risk areas seems to have a potential to slow down the spread of COVID-19(2020) .Another study from India suggests that implementing a strict lockdown for a period of at least 21 days may reduce the transmission of COVID-19, but that extending the lockdown for up to 42 days is required to significantly reduce the transmission of COVID-19 (2020).

In addition to the curfew, a diagnostic testing strategy that increases the maximum detection rate of asymptomatic infected individuals (followed by contact tracing and self-isolation of the detected cases) would greatly reduce the burden of the pandemic, particularly if also combined with a face mask use strategy. The effect of the curfew was limited by the existence of an economic crisis in Iraq at the same time. It was difficult for people with little daily income to abide by the total curfew , which caused pressure on the government to allow partial movement.

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Another possible approach could have been to provide small amounts of money for each family: a sum on the order of $200 per month would have been sufficient to meet the daily needs, and would have allowed a stricter curfew to remain in place longer.

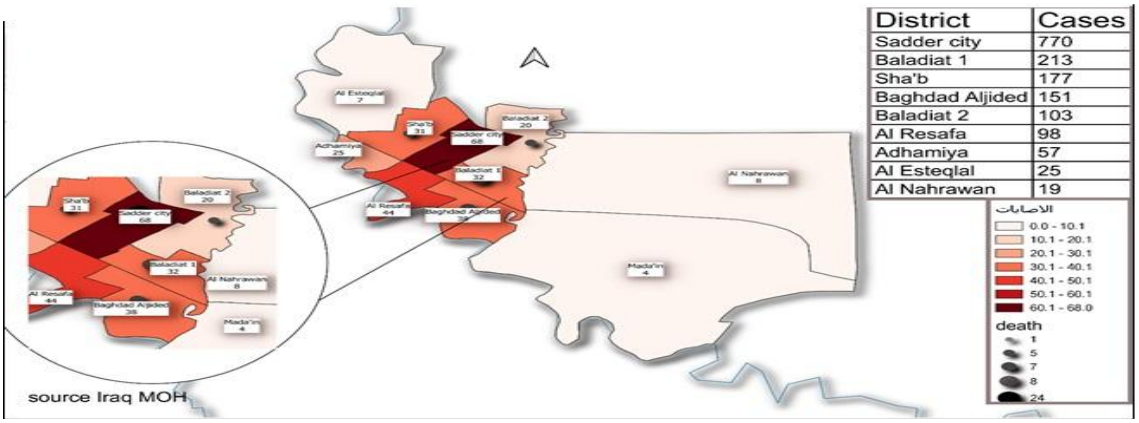

Figure 4: Map of COVlD-19 cases in Baghdad Al-Rusafa. Darker shades of red indicate areas with higher number of cases.

Table 1: Incidence rates per 100,000 and Population according to health districts in Baghdad] Al Rusafa DOH tilI 29/5/2020

District	POPULATION	Location	Region type	Incidence rate
Sadder city	#######	East of canal	Urban	68.1
Baghdad aljedida	394,059	West of canal	Urban	38.3
Baladiat 1	670,224	East of canal	Urban	31.7
Baladiat 2	515,409	East of canal	Urban	19.9
Shaab	576,960	East of canal	Urban	30.6
Risafa	224,870	West of canal	Urban	43.5
Nahrawan	229,734	East of canal	Rural	8.2
Madaen	315,130	West of canal	Rural	3.8
Adhamya	231,503	West of canal	Urban	24.6
Istiqlal	374,957	East of canal	Rural	6.6
Total population	#######			35.4

Comparison with other parts of Iraq and the rest of the Middle East

The departmentBaghdad Rusafa ranked first in the departments with the highest registration of cases of COVID-19, followed by the Karkh Health Department, the third and fourth sequences,

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the Basra Health Department and the Medical City, the fifth and sixth sequences, the Najaf Health Department and Erbil. The rest of the governorates recorded only dozens of cases, with some such as Anbar (5 cases) recording extremely low number of cases. It is worth noting here that all the governorates that have recorded high casualties contain airports, which attract both leisure and commercial traffic. The travel ban between Iraq and the rest of the neighboring countries can be considered as arriving late after the first cases were recorded in the region, as multiple Middle Eastern countries had including Egypt, the United Arab Emirates and Iran [3-5] had notified the WHO of cases before a travel ban was enacted. For instance, travel between Iraq and Iran continued intensively between 19/2/2020 and 17/3/2020 until Iraq decided to stop allowing flights with the rest of the affected countries. At that point on 17/3/2020, the Islamic Republic of Iran ranked first in the EMRO region for number of cases of COVID-19 and COVID-19 related deaths.

Improving detection and reporting of cases

At the beginning of the outbreak in the area covered by the Baghdad/ Al-Rusafa DOH, the monitoring mechanism for cases was limitedto people attending public health care centers and general hospitals. Later (from 18/4/2020), surveillance based on the use of rapid tests in the community was also performed, and we note that this testing is still ongoing. There are still multiple avenues that would increase the detection of COVID-19 cases in our study area. A weekly field survey with rapid tests could be conducted for all employees of government institutions according to the geographical area of the health center. The development of mobile Covid-19 test units that allow testers to scan individuals without the risk of exposure to the virus would make surveillance more effective. These units could be similar to the mobile COVID-19 united deployed in Israel ("Getting tested for Covid-19 inside Israel's mobile booths - CNN Video," n.d.) or to the testing booths that South Korea developed and used earlier this year (2020). In addition, establishing car inspection centers in all sectors to examine people and children and take nose and throat swabs inside the car has proven useful, since drive-through (DT) testing was first implemented in South Korea. DT centers allow to streamline the process of COVID-19 testing, from registration, examination, specimen collection, and instructions, while maintaining high levels of protection for healthcare workers (2020). The entire service takes about 10 minutes for one test without the patient ever leaving his or her car. It shows good results, and has been implemented in the UAE where several DT centers have been set up across the country, in order to augment the testing that takes place at government healthcare facilities(n.d.).

Conclusion

Like many countries around the world, Iraq has reported gradually increasing numbers of COVID-19 cases across all Iraqi provinces including Baghdad, especially in areas of high density population and low economic state, where people may be less committed to preventive health

instructions. In the absence of a vaccine, strengthening the national surveillance system, increasing the number of PCR and rapid tests to detect infected cases, and focusing on community awareness to convince the population to abide by preventive health regulations are essential aspects in order to control transmission of disease.

Further improvements to the COVID-19 situation in Iraq could also be gained by implementing social distancing measures to mitigate the impact of the epidemic and to delay the epidemic peak. Such measures include:

1. the immediate isolation of symptomatic persons suspected or confirmed to be infected with COVID-19 and compulsory sick leave for the employers in public and private sectors.
2. social distancing measures at workplaces, such as teleworking, the suspension of meetings, or the cancellation of non-essential travel.
3. decreasing and regulating school hours to ensure social distancing and decrease crowded classroom by assigning one day for physical interaction and more days for E-learning.
4. Ensuring the public is aware of the seriousness of COVID-19. A high degree of population understanding solidarity and discipline is required to apply strict personal hygiene, coughing etiquette, self-monitoring and community engagement and acceptance of stringent social distancing measures.
5. Implementing regional lockdown rather than total lockdown to decrease community transmission.
6. Providing new testing method to maximize service delivery outletslike testing booth and drive-through screening centers.

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Funding: Self
Ethical Clearance: Al-Karkh University of Science

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