

## Letter to the Editor

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## Factors Contributing to the Containment of the COVID-19 in Kurdistan Region of Iraq

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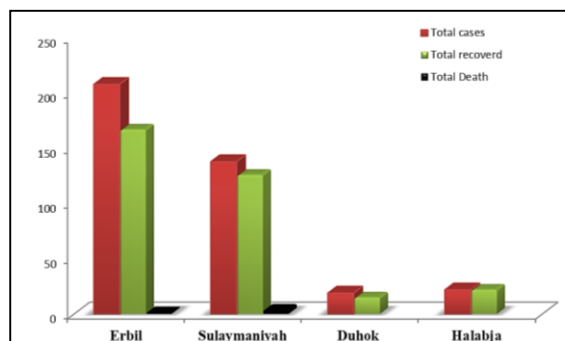
A highly contagious coronavirus disease 2019 (COVID-19) is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which was first identified in Wuhan, China in December 2019<sup>(1)</sup>. The virus primarily affects the respiratory system of human beings and results in the symptoms of headache, fever, dry cough, sore throat, shortness of breath and fatigue with abnormal chest computed tomography (CT) scan. In some cases, nasal sputum discharge and diarrhea have been also reported<sup>(2-4)</sup>. Up to the 26<sup>th</sup> of April 2020, more than three million laboratory confirmed cases of COVID-19 have been recorded worldwide with more than 220,000 confirmed deaths<sup>(5)</sup>.

In the Kurdistan region of Iraq, the first case of laboratory confirmed COVID-19 was recorded in March 1<sup>st</sup>, 2020 in Sulaymaniyah province<sup>(6-8)</sup>. Figure 1 shows the number of mortality and morbidity cases in the four different cities of Kurdistan region of Iraq; By May 2<sup>nd</sup>, 2020, the number of COVID-19 cases rose to 387 people, with 5 deaths, and 330 recovered patients in Kurdistan region<sup>(9)</sup>.

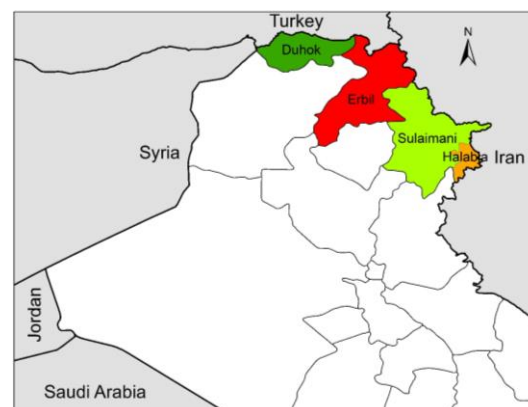
Considering the geographical location of the Kurdistan region of Iraq to the highly infected COVID-19 neighboring countries of Iran and Turkey (figure 2) and also the reproduction number (R0) of the disease, it was expected that the disease will spread faster and would infect a greater number of people in the region<sup>(10)</sup>. In Iran and Turkey, the mortality to the morbidity number were 6091/95646 and 3258/122392 respectively up to May 2<sup>nd</sup>, 2020<sup>(11)</sup>. In addition, COVID-19 is highly contagious and having the reproduction number (R0) of 3.28, meaning every single infected person will infect about 3.28 others, on average<sup>(10)</sup>.

Although the Kurdistan regional government may have played an important role in controlling the

spread of the disease by applying early travel restriction, shutting down airports, schools and other public places and imposing a curfew to enforce social distancing. It is also expected that low rate of morbidity and mortality in the region could relate to the immunity of the resident of the region against the disease. Particularly, the majority (>75%) of the confirmed COVID-19 cases in Kurdistan region of Iraq were asymptomatic<sup>(8)</sup>. In addition, all the five recorded deaths had underlying health conditions, and only two of



**Figure 1:** Number of mortality and morbidity cases in the four different cities of Kurdistan region of Iraq



**Figure 2:** Location of the Kurdistan Region of Iraq to its highly infected COVID-19 neighboring countries of Iran and Turkey

them were hospitalized COVID-19 patient, the rest were confirmed to have died of COVID-19 base on post-mortem examination of the corpses.

There are three hypotheses that proposed to explain low morbidity and mortality rate of the COVID-19 in the Kurdistan region of Iraq: first, the local strain of the SARS-CoV2 may be different, second, the Bacillus Calmette-Guérin (BCG) vaccination may have contributed in the immunity of the people<sup>(8)</sup>. Lastly, the residents of the region may have already passed through herd immunity of COVID-19 before or during the outbreak.

So far, three variant of the SARS-COV-2 have been recognized worldwide named A, B, and C clusters<sup>(12)</sup>. Type A is an ancestral SARS-COV-2 and both type A and type C are found mainly in Europe, United States, and Australia. Type B, however, is the most common type in East Asia<sup>(12)</sup>. Although the genome data of the SARS-COV2 of Kurdistan region is not available yet, it is unlikely the strain to be different at least from the neighboring countries of Iran and Turkey. Especially, majority of the positive cases of COVID-19 in Sulaymaniyah city were those people who visited or had a contact with those who visited Iran. The protective role of the BCG vaccination against COVID-19 and reducing mortality rate of the patient has already been proposed<sup>(8, 13)</sup>. However, according to BCG World Atlas (<http://www.bcgatlas.org/>), Kurdistan region of Iraq, Iran and Turkey are among the countries that they have BCG vaccination policy since childhood<sup>(14)</sup>. Therefore, it is unlikely that BCG vaccination protects the residents of the Kurdistan of Iraq against COVID-19, but do not protect the residents of Iran or Turkey. Lastly, the low morbidity and mortality rate of COVID-19 in the region is associated with having unidentified non-specific immunity by the population against the virus. We hypothesize that herd immunity may have provided key protection against SARS-CoV-2. Perhaps, SARS-CoV-2 might have already spread undetected in this region. It was known to local

residents of Kurdistan Region of Iraq that there was a severe form of “seasonal flu”-like disease in December, 2019 and January, 2020. Several people were hospitalized and some may have died from the disease without confirming the causative agent. Lack of advanced diagnostic techniques and symptoms similarity of COVID-19 with common flu might have resulted in the misidentification of the disease in the Kurdistan Region of Iraq. Moreover, the CT scan of the infected people showed a very severe and different form of the infection comparing to the seasonal flu (verbal communication with a local physician). Furthermore, a similar claim in France, although not scientifically backed, reported that the first case of COVID-19 dated back to mid or late of December, 2019<sup>(15)</sup>.

To sum up, the mortality and morbidity of COVID-19 are lower in Kurdistan region of Iraq compared to the neighboring and other countries around the world. Thus, we believe that undiagnosed outbreak of COVID-19 previously may have happened before declaring the pandemic. This resulted in silent herd immunity against the disease in the population of Kurdistan and this can be considered as a key protection mean against the disease in the region.

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#### AUTHOR CONTRIBUTION

All the authors met the standards of authorship based on the recommendations of the International Committee of Medical Journal Editors.

#### CONFLICT OF INTEREST

None declared.

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