Research article

Comorbidity and Risk Factors for COVID-19 Confirmed Patients in Wasit Province, IRAQ

[1.] Taqi M Taher, [2.] Firas T Sarray [3.] Saad A Farhan Al-Badri
[4.] Hasanain Fl Ghazi

ABSTRACT

Background: Coronavirus disease 2019 (COVID-19) is one of the updated challenges facing the whole world.
Objective: To identify the characteristics risk factors that present in humans to be more liable to get an infection than others.
Methods: A cross-sectional study was conducted for positively confirmed 35 patients with polymerase chain reaction in Wasit province at AL-Zahraa Teaching Hospital from the period of March 13th till April 20th. All of them full a questionnaire regarded by risk factors and other comorbidities. Data were analyzed by SPSS version 23 using frequency tables and percentage. For numerical data, the median, and interquartile range (IQR) were used. Differences between categorical groups were performed by fissure exact test.
Results: The median age of the patients was 43 years old and interquartile range (25-56 years). Majority of the patients were female (60%) and (51%) of them were from the same region (AL-ezza). The dominant blood group among patients was (O) (40%). About 11.4% of patients had a travel history especially to Islamic Republic of Iran, while (77.1%) had contact with positive cases. The highest percentage of comorbidities among patients was hypertension (40%), and the most presenting symptoms were cough and fever. About 51% of patients were with mild symptoms. Diabetes, coronary heart diseases, and chronic renal diseases were significantly related to disease severity (P-value=0.02, 0.001, 0.01 respectively).
Conclusion: Being a female, overweight or obese, and with blood group (O) are the major risk factors among patients. Comorbidities can play an important role in the severity of disease especially hypertension, diabetes, coronary heart diseases, and chronic renal diseases.
Keywords: COVID-19, risk factors, Comorbidity, Iraq.

[1]. Assistant Professor/ College of Medicine/ Wasit University
[2]. Internal Medicine Physician/ AL-Zahraa Teaching Hospital/ Wasit Health Directorate.
[3.] Assistant Professor/ College of Medicine/ Wasit University.
[4]. Associated Professor/ International Medical School/ Management and Science University.
Corresponding author:

Name: Taqi Mohammed Jwad Taher
E-mail: ttahir@uowasit.edu.iq

Received: 3 July 2020
Revised: 8 July 2020
Accepted: 14 July 2020
Published online: 20 July 2020
https://doi.org/10.47723/kcmj.v16isupplement.174

INTRODUCTION

Novel coronavirus (SARS-CoV-2) infection or COVID-19 disease considers as a major health concern that affecting 213 countries and areas worldwide starting from December 2019 [(1)]. On April 12, 2020, there were about 1,781,432 confirmed cases with 108,883 related deaths all over the world [(2)]. The disease started in China in December 2019 and identified by physicians as a series of pneumonia cases which is similar to severe acute respiratory syndrome (SARS) [(3)]. The disease began in Wuhan, then it is rapidly spread into different regions of China. Many factors were responsible for this rapid and widespread of the virus to different clusters like people susceptibility, various infection routes, and virus virulence [(4)]. It is reported that about 75,465 cases were confirmed in china until February 20, 2020 [(5)]. The World health organization (WHO) announced COVID-19 as a global pandemic on March 11, 2020 [(6)]. The United States ranks number one around the world with all 50 states reported different levels of infected cases and the CDC mentioned that the USA is in the acceleration phase of the pandemic [(7)].

In Iraq, the risk of the disease was raised due to borders with the neighbouring country, the Islamic Republic of Iran which becomes the eighth highest region with confirmed and dead cases reported (71,686 positive cases and 4,474 total death from

COVID-19). As of April 12, Iraq confirmed cases was 1,318 with 601 recovering and only 72 deaths [8]. Wasit is one of the Iraqi provinces that have close contact and sharing borders with the Islamic Republic of Iran which made the governorates authorities to start early measures for prevention and control that include school closure, movement restrictions, and increase population awareness.

According to previous studies, the most important risk factors were age, gender, and co-existing diseases. A review study found that older people were more liable to get the infection than younger age groups. The mortality among males was significantly higher compared to females with no approval of susceptibility to infection among two genders. The presence of pre-existing and any condition that weakens the immune system can be a risk factor for infection with COVID-19 [9].

As the definite treatment and vaccine for this disease have not yet discovered, it is so important to identify risk factors to design suitable plans for the prevention of infection transmission for highly susceptible people. The current study aimed to identify the major risk factors and comorbidities identified among COVID-19 patients in Wasit province, Iraq.

METHODOLOGY

Study design and setting: This is a cross-sectional study done in Wasit province, one of the Iraqi governorates situated in the eastern border of Iraq with Iran with a total population of approximately 1,450,000. Data collection and analysis was continuous for about two months from 1st of March until the end of April.

Sample, Group definition: The sample involved in this study was all patients confirmed with COVID-19 infection by real-time reverse transcriptase-polymerase chain reaction test (RT-PCR) obtained from public health laboratory in the capital (Baghdad) using patients' nasal and pharyngeal swabs. All 35 Cases registered and admitted to AL-Zahraa Teaching Hospital for March 3rd (first diagnosed case in Wasit) until April 20th, 2020 were included in the study. There are no exclusion criteria for the sample collection.

The case definition for COVID-19 confirmed patients include all patients test positive by (RT-PCR) regardless of the presence of any sign and symptoms. The patients presenting sign and symptoms were classified according to the Chinese center for disease control and prevention into mild, moderate, severe, and critical [10]. This classification was the same as to that approved by the Ministry of Health in Iraq.

Ethical approval: An official approval was obtained from Wasit Health Directorate for data usage. All patients signed the consent form before starting the research.

Study Tool: (Questionnaire): A structured questionnaire previously prepared by two experts specialist in internal medicine and community health was used for data collection. The questionnaires consist of 3 parts mainly part A regarding demographic data such as age, gender, educational level, employment, place of living, and blood group. Part B was about risk factors such as smoking, travelling history, and contact with a positive case. Part C regarding symptoms of present illness and also past medical history like hypertension, diabetes, coronary heart diseases, chronic renal diseases, and others.

Statistical Methods: Data analysis was performed using SPSS version 23. Frequency and percentage were used to present categorical data, while numerical data were presented by a median, and interquartile range (IQR). Differences between categorical groups were performed by fissure exact test. Level of statistical significance considered as $P < 0.05$.

RESULT

The median age of patients was 43 years old (IQR 25-56 years). The minimum age was 2 years, while the maximum was 74 years old.

Table 1 shows the demographic distribution of patients. The females were higher than males in getting the infection with (60%) women. More than one third (34.3%) of patients never had any education including children. Near half (48.6%) of them were unemployed including retired and housewives. The majority of the patients were overweight (40%) and obese (37.1%). Majority of patients (51.4%) were living in Al-ezaa city. The dominant blood group among confirmed patients was type (O) which is found in (40%) of the patients.

Only four patients had travel history outside Iraq during the last two months, exactly to the Islamic Republic of Iran. Nearly three-quarters of patients (77.1%) had contact with positively diagnosed COVID-19 patients.

Table (1): Socio-demographic features and risk factors of COVID-19 patients

Variables	Categories	No.	%
Age groups	15 years and less	3	8.6
	16-30	10	28.6
	31-45	8	22.8
	46-60	9	25.7
	61 years and above	5	14.3
Gender	Male	14	40
	Female	21	60
Educational level	Illiterate/read write	12	34.3
	Primary	6	17.1
	Intermediate/secondary	6	17.1
	College/ diploma	11	31.4
Employment	Employed	9	25.7
	Student or child	9	25.7
	Unemployed	17	48.6
Weight categories (Body mass index kg/m^2**)**	Underweight	2	5.7
	Normal	6	17.1
	Overweight	14	40.0
	Obese	13	37.1
Place of living	Al- dujaelee	1	2.9
	Al-hay	1	2.9
	Al-mualmeen	1	2.9
	Al-zahraa	5	14.3
	Al_ezaa	18	51.4
	Al_houra	2	35.7
	Sheekh saad	3	8.6
	Al_sweera	4	11.4
Blood group categories	O	14	40.0
	A	6	17.1
	B	11	31.4
	AB	2	5.7
	missing	2	5.7
Currently smoking	No	31	88.6
	Yes	4	11.4
Had travel history	No	31	88.6
	Yes	4	11.4
Had contact with patient	No	8	22.9
	Yes	27	77.1

In table 2, about two-thirds of patients (68.7%) were having a history of chronic diseases. Hypertension was the most common pre-existing disease with (58.3%) followed by diabetes and coronary heart diseases with (12.5%) respectively. Only one female patient had a history of breast cancer.

Table 2: Presence of comorbidity among patients with COVID-19 in Wasit province, Iraq

Pre-existing chronic conditions	N	Percentage of the disease among patients having comorbidities (n=23)	Percentage of the disease among total patients with COVID-19(n=35)
Hypertension	14	58.3%	40%
Diabetes	3	12.5%	8.6%
Coronary heart diseases	3	12.5%	8.6%
Chronic renal diseases	2	8.3%	5.7%
Cancer	1	4.2%	2.9%
Hydrocephalus	1	4.2%	2.9%

Even that 8 patients never complained from any symptoms, the other patients mentioned the presence of one or more symptoms. The main presenting symptoms among patients were cough and fever. The cough was presented among 20 patients, while fever was presented among 19 patients. Only one patient presented with diarrhoea and vomiting as shown in figure 1.

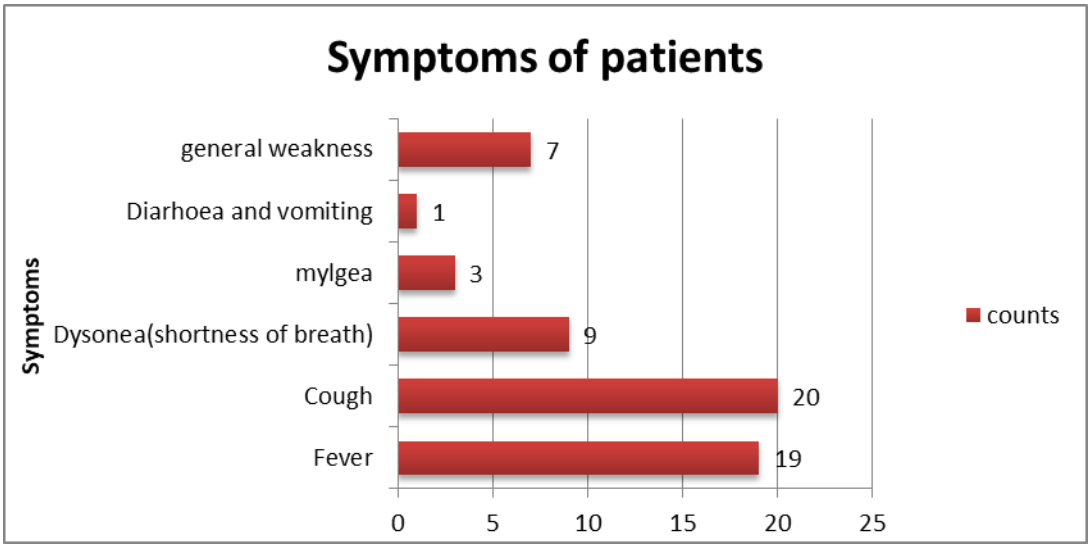

Figure 1: presenting symptoms among patients

The eight asymptomatic patients represented (22.86%) from all patients, other symptomatic patients were distributed to the following: Near half of the patients (51.43%) were with mild diseases, five patients(14.29%) moderate while only one patient (2.86%) with severe symptoms and (8.57%) were critical cases according to CDC China criteria. Two out of three critical cases passed away while all other patients were recovered and discharged from the hospital.

There was a statistically significant association between the severity of disease with diabetes, coronary heart diseases, and chronic renal diseases as shown in table 3.

Table 3: Association between pre-existing chronic diseases and severity of COVID-19.

Pre-existing diseases		Clinical disease severity		P-value
		Non-sever N(%)	Sever N(%)	
Hypertension	No	20(57.1%)	1(2.9%)	0.27
	Yes	11(31.4%)	3(8.6%)	
Diabetes	No	30(85.7%)	2(5.7%)	**0.02**
	Yes	1(2.9%)	2(5.7%)	
Coronary heart diseases	No	31(88.6%)	1(2.9%)	**0.001**
	Yes	0(0.0%)	3(8.6%)	
Chronic renal diseases	No	31(88.6%)	2(5.7%)	**0.01**
	Yes	0(0.0%)	2(5.7%)	
Cancer	No	31(88.6%)	3(8.6%)	0.11
	Yes	0(0.0%)	1(2.9%)	
Hydrocephaly	No	31(88.6%)	3(8.6%)	0.11
	Yes	0(0.0%)	1(2.9%)	

*fissure exact test was performed.

DISCUSSION

Even that COVID-19 is considered as a pandemic disease worldwide, Iraq reported a relatively low incidence rate of disease. In Wasit province, there were only 35 cases until April 20th with only 2 death recorded. People who positively diagnosed as COVID-19 showed a different distribution among different age groups. Children were less likely to get the infection, while the majority of cases were belonging to the younger age groups (16-60) years old, with only 5 out of 35 patients were above 60 years old. The reason may be because the Iraqi population consisted of more than 58% of these age groups (15-65) years [11]. The median age of the infected patients was 43 years.

Other studies showed different values of age distribution among patients as was mentioned in a review study that median age of patients was 47-59 years with a very small percentage of children (2%) [12].

Different age distribution was mentioned in previous studies like in China, Wuhan found that the median age for patients was from 41 to 58 years old with no children and adolescents infected patients [13]. While Guan et al. (2020) found the IQR for age was (35-58) years and only 0.9% below 15 years old [14]. Even, in China, outside Wuhan the median age was 34 years (IQR=34-48 years), only (3%) of patients were under 15 years old and 3% above 65 years [15].

There are a lot of studies that found slightly similar results regarding age distribution among patients like in Zhejiang province among 62 patients with COVID-19 who all express human to human transmission of the disease [16].

Females have a higher percentage of infection compared to males. According to the history taken from infected women, it was obvious that the higher percentage of them were attending the same consolation where the super-spreader was present [17].

Men tend to be more exposed to get the virus in other studies as their jobs outside the home and being more socially active [12-16].

Males still reported higher mortality rates from the disease which was obvious in this study as the two deaths were males, maybe due to genetic, behavioural or biological factors related to females [9].

Obesity, in general, has an important role in disease pathogenesis especially diabetes and hypertension which is, in turn, lead to an increased risk for COVID-19. This study shows the high distribution of the disease among obese and overweight which may be explained by the presence of pre-existing chronic diseases.

According to previous studies, obesity was mentioned as a risk factor for disease severity. Obese patients are more difficult to intubate and obtaining a diagnostic image especially when a prone position is needed [18].

Kassir (2020) has explained the cause of increasing COVID-19 severity among obese patients due to the affinity of the virus to Angiotensin converted enzyme

inhibitors 2 (ACE2) receptors. The ACE2 expression is present at a higher level in adipose tissue [19].

Place of living was related to the disease with more than half of patients coming from one region (Ezaa) where most of the women attending the consolation and spread the infection to their families by family clusters pattern [20].

It was obvious that blood groups play an important role as a risk factor for infection. In this study, patients with blood group O were represented by 40%, followed by B group patients. This may be due to blood group distribution among the Iraqi population. It was found that group O was the most common blood group among Iraqis followed by A, B, and AB [21]. This result was in contrast to other non-peer-reviewed studies in China, that found blood group A were the most affected group by the virus with fewer percentages of patients among blood group type O [22-23].

Only 4 out of 35 patients had travel history outside Iraq during the last 2 months, exactly to the Islamic Republic of Iran where the disease was highly spread. This may be related to limit travelling and transportation during this period in population due to protests or school examinations. Even so, the majority picked the infection by contacting a positive case which may indicate the higher activity of the virus transmission within this region. In China, Guan et al. (2020) found that contact and travelling history among patients who living outside Wuhan were 72.3% and 31.3% respectively [14].

Although smoking is a major risk factor for many respiratory illnesses, this study shows only 4 out of 35 patients had smoking habits. This may be due to the social perspective about smoking, especially among females. Other studies also showing a low level of smoking among patients as in Zhou et al. (2020) study showed only 6% while in Zhang et al. (2020) study it was mentioned that only 3.4% of patients were current smokers [24-25].

Although smoking does not prove to be a risk factor for COVID-19, it may be considered as a risk for disease severity because smoking can suppress lung immune function and increase the risk of the acute respiratory syndrome(ARS) [26-27].

Regarding symptoms, the common symptoms presented by the majority of patients were cough and fever, while gastrointestinal symptoms like vomiting and diarrhoea were the least. The same results were reported in other studies that give an idea about the differences of viral tropism from other coronavirus species, absence of fever doesn't mean the absence of COVID-19 [12,14-16].

The most common pre-existing chronic diseases among patients were hypertension(40%), diabetes and coronary heart diseases (8.6%), chronic renal diseases (5.7%), cancer (2.9%), and hydrocephaly (2.9%).

previous studies found that diabetes was the most common among COVID-19 patients followed by hypertension, and cardiovascular diseases [13] while Wei-jie Guan et al. (2020) found that hypertension was the highest comorbidity (16.9%), followed by diabetes (8.2%) among 1590 Chinese patients [28].

In the US population, the presence of comorbidities was found in more than 70% of severe cases. Diabetes mellitus is the commonest followed by chronic lung disease, and then cardiac disease [29].

Although diabetes and other comorbidities significantly related to the severity of the infection in this study and this may be due to its relation to older age groups and lower immunity, it is found that only (8.6%) of COVID-19 patients were diabetic. Our results were supported by previous research that gives the reason that sharing the same receptors between the virus and some types of drugs that are dipeptidyl peptidase-4 (DPP-4) inhibitors used commonly in diabetes treatment [12].

CONCLUSION

The clinical picture of COVID-19 in Wasit province was showing an increase in infection among younger age groups, female, overweighted, or obese with more infection rates among blood group type O. Being in contact with infected persons mainly increases the risk of infection. Diabetes, coronary heart diseases and chronic renal diseases were significantly associated with disease severity. More promotion and early detection are needed to tackle infected people as early as possible, especially those with contact with positive COVID-19 patients. More researches are needed especially in other Iraqi Provinces.

Acknowledgement: To all infected patients and all healthcare workers who represented the first line of defence against the disease.

Funding: No funding.

Conflict of interest: No conflict of interest was mentioned in this study.

REFRENCES

1) World Health Organization. Coronavirus disease (COVID-19) Pandemic, 2020 [online]. Retrieved on April 12, 2020 from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019
2) Worldometer . COVID-19 Coronavirus Pandemic, 2020[online]. Retrieved on April 12, 2020 from: https://www.worldometers.info/coronavirus/
3) Brüssow H. The Novel Coronavirus - A Snapshot of Current Knowledge. Microb Biotechnol. 2020 May;13(3):607-612. doi: 10.1111/1751-7915.13557. Epub 2020 Mar 6.
4) Guan W-jie, Chen R-chang, Zhong N-shan. Strategies for the prevention and management of coronavirus disease 2019. Eur Respir J 2020; in press (https://doi.org/10.1183/13993003.00597-2020).
5) World Health Organization. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19), 2020[online]. Retrieved on April 12, 2020 from: https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf.
6) Cucinotta D& Vanelli M. WHO Declares COVID-19 a Pandemic. 2020;91(1):157-160. Published 2020 Mar 19. doi: 10.23750/abm.v91i1.9397
7) Centers for Disease Control and Prevention. Coronavirus Disease 2019 (COVID-19), 2020[online]. Retrieved on April 12, 2020 from: https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/summary.html
8) Worldometer. Reported Cases and Deaths by Country, Territory, or Conveyance, 2020[online]. Retrieved on April 12, 2020 from: https://www.worldometers.info/coronavirus/#countries.
9) Racheal D'Souza & Arit Banerjee. An Insight into Coronavirus: A Global Pandemic of the 21st Century. International Journal of Science and Research (IJSR). April 2020; 9(4):100- 105. DOI: 10.21275/SR20402061244
10) General Office of National Health Committee. Office of State Administration of Traditional Chinese Medicine. Notice on the issuance of a program for the diagnosis and treatment of novel coronavirus (2019-nCoV) infected pneumonia (trial sixth edition) (2020-02-19)
11) countrymeters. Iraq population[online]. Retrieved at April 20, 2020 from: https://countrymeters.info/en/Iraq
12) Hussain A, Bhowmik B, Cristina N, do Vale Moreira. COVID-19 and Diabetes: Knowledge in Progress, Diabetes Research and Clinical Practice (2020), doi: https://doi.org/10.1016/j.diabres.2020.108142
13) Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020;395:497-506.
14) Guan WJ Ni ZY Hu Y et al. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med. 2020; (published online Feb 28). DOI:10.1056/NEJMoa2002032
15) Chang D, Lin M, Wei L, et al. Epidemiologic and Clinical Characteristics of Novel Coronavirus Infections Involving 13 Patients Outside Wuhan, China. JAMA. 2020;323(11):1092–1093. doi:10.1001/jama.2020.1623
16) Wei Xu I, Xin Wu X, Gao Jiang X, et al. Clinical findings in a group of patients infected with the 2019 novel coronavirus (SARS-Cov-2) outside of Wuhan, China: retrospective case series. BMJ 2020; 368 doi: https://doi.org/10.1136/bmj.m606 (Published 19 February 2020)Cite this as: BMJ 2020;368:m606
17) McGraw E. What is a super spreader? An infectious disease expert explains. January 31, 2020 12.15am AEDT. From: https://theconversation.com/what-is-a-super-spreader-an-infectious-disease-expert-explains-130756
18) World Obesity. Coronavirus (COVID-19) & Obesity. 23 March 2020[online]. Retrieved from: https://www.worldobesity.org/news/statement-coronavirus-covid-19-obesity
19) Kassir R. Risk of COVID- 19 for patients with obesity. Obesity Reviews. 2020;1– 2. https://onlinelibrary.wiley.com/doi/10.1111/obr.13034. First published:13 April 2020 https://doi.org/10.1111/obr.13034
20) Edwards E. Family clusters: A common pattern for how the coronavirus spreads. Retrieved from: https://www.nbcnews.com/health/health-news/family-clusters-common-pattern-how-coronavirus-spreads-n1150646. March 6, 2020.
21) Saleh M S & Abood A S. ABO and Rh (D) Blood Groups' Distribution and Gene Frequencies in North Baghdad Population–Iraq. August 2016International Journal of Scientific and Engineering Research 7(8):581-584
22) Zhao J, Yang Y, Huang HP, et al. Relationship Between the ABO Blood Group and the COVID-19 Susceptibility. Med RxIV. Doi: https://doi.org/10.1101/2020.03.11.20031096.
23) Zietz M, Tatonetti NP. Testing the Association Between Blood Type and COVID-19 Infection, Intubation, and Death. Med RxIV. Doi: https://doi.org/10.1101/2020.04.08.20058073.
24) Zhou F, Yu T, Du R, et al. Clinical Course and Risk Factors for Mortality of Adult Inpatients

with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020. doi:10.1016/S0140-6736(20)30566-3

25) Zhang JJ, Dong X, Cao YY, et al. Clinical characteristics of ١٤٠patients infected by SARS-CoV-2 in Wuhan, China. Allergy. 2020. doi:10.1111/all.14238

26) Stanton A. Glantz, . Reduce your risk of serious lung disease caused by corona virus by quitting smoking and vaping. University of California San Francisco, Center for Tobacco Control Research and Education. April 20, 2020. Retrieved from: https://tobacco.ucsf.edu/reduce-your-risk-serious-lung-disease-caused-corona-virus-quitting-smoking-and-vaping.

27) DelViscio J, Roane K R. Investigating The Potential Danger to Those Who Use Tobacco Products or e-cigarettes Calls for a look at the Lungs. on April 8, 2020. Scientific American. At: https://www.scientificamerican.com/article/are-smokers-or-vapers-more-at-risk-for-covid-19-heres-what-we-know/

28) Wei-jie Guan1, Wen-hua Liang,Yi Zhao, Heng-rui Liang, Zi-sheng Chen,Yi-min Li ..et al. Comorbidity and its impact on 1590 patients with Covid-19 in China: A Nationwide Analysis. European Respiratory Journal 2020; DOI: 10.1183/13993003.00547-202

29) Chow N et al. Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions among Patients with Coronavirus Disease 2019 — United States, February 12–March 28, 2020. MMWR Morb Mortal Wkly Rep 2020 Apr 3; 69:382. Retrieved from: (https://doi.org/10.15585/mmwr.mm6913e2)