RESEARCH PAPER

The Pandemic of COVID-19 in Eastern Mediterranean Region: Selected Outcome Parameters

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Abstract

Background: Despite the passage of eight months since the start of COVID-19 pandemic, it still represents a major public health problem at global, regional and national levels.

Objective: To present comparative outcome indicators and time trends for the pandemic among countries in the Eastern Mediterranean Region and to discuss possible determinants behind such trends.

Methods: We used data on all newly reported cases of COVID-19 infection from the start of the pandemic in each EMR country till the 5th of August, 2020. Three sources of data were used: the World Health Organization Websites and two private website reporting cases of world countries. Numbers were directly abstracted from these sources and Excel programme functions were used to make graphic presentations. Verification of numbers were made with data reported by health authorities in these studied countries.

Results: As on August 5,2020 countries of the Eastern Mediterranean Region varied substantially in scale of the incidence rate per million population (from highest of 38939.1 in Qatar to lowest of 54.2 in Syria), the case fatality (closed case fatality ratio) ranged from lowest of 0.2% in Qatar to the highest of 37.0% in Yemen. Cause-specific mortality rate ranged from 1.1 to 212.5 per million population in Jordan and Iran respectively. Testing policy was the main determinant of reported cases. Despite the decline in the scale of daily cases, none of the countries has reached a stage of clear exit (zero cases).

Conclusion: Most of the countries are experiencing a pattern of accelerated pandemic and are heading towards declining trend. Few are experiencing continued rise or resurgence and threats to re-emerge are impending. Reopening is a real challenge and careful scientific evidence based exit might be possible.

Keywords: COVID-19, SARS-CoV-2, Pandemic, Time trend. COVID-19 mortality

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Introduction

Despite the passage of long time since the start of COVID-19 pandemic in the countries of Eastern Mediterranean Region[1,2] the outlook of the pandemic at global level still not clear yet. The number of cases and resulting

fatalities are increasing and almost all countries are fighting the virus. A number of countries have shown some features of evident containment after rapid spread of infection like China, South Korea, Italy, Spain, France, Turkey, United Kingdom, Germany and most other European countries but resurgence cannot be excluded and actually is evident.[3,4] The United States, Russia, Brazil, India, Peru and Mexico and many others, are examples of countries experiencing severe wave of cases and deaths and occupying top ranks in reported cases.[3-5] Countries in the Eastern Mediterranean Region (EMR) are among many countries in which the pandemic started as modest daily cases but most of these countries experienced escalation with time. Some of them could succeed in suppressing the epidemic curve. Until now and after nearly six months of the start of case reporting in EMR countries, Iran has witnessed exponential increase very early in the course of the pandemic, some other countries are reporting substantial number of cases in recent weeks like Saudi Arabia, Qatar, Egypt, Oman, United Arab Emirates, Morocco and Iraq. The remaining countries showed modest time trend but some of them are potentially at risk of rapid increase of cases and consequently deaths resulting from coronavirus infection. EMR countries showed clear variation in the extent of risk of infection, case fatality and recoveries.[5] The reasons for these substantial variations across the world countries and within EMR are not clear. We propose that social behavior and population response could be one reason. Initial pool of infection and reluctance to take decisive counteraction as early as the start of the pandemic are additional reasons for the rapid escalation of the disease. Herd immunity and environmental conditions are other possible reasons. Also under-detection of mild cases could be an additional explanation at least for some of these countries. It is hoped that EMR countries will pass this pandemic without entering a phase in which the health care systems are severely overridden by cases similar to what happened in some Asian and European Countries.[6] However, the measures against the COVID-19 pandemic in the foreseeable future may need extensive reconsideration to encompass not only health aspects but also the consequences of the epidemic on population living and country economics.[7,8] A careful planning to COVID-19 exit is needed but this must be based on thorough analysis of the situation. In this article we took the initiative to monitor the dynamics of the pandemic in EMR countries and compile data on cases, deaths and recoveries from various sources including national reports, World Health Organization websites and private websites. This study was planned to document basic epidemiological features of COVID-19 in the early months of the pandemic. Specifically, it was intended to present comparative indicators including time trend for the pandemic outcomes among these countries and to discuss possible determinants behind such trends.

Method and Sources of data

The data used in this article covered the period from the onset of the pandemic in various countries in EMR to August 5, 2020. For the epidemic curves, the time period was extended to the 9th of August to complete the data for the last week. Data were obtained from sources containing the daily new cases of COVID-19 reported by various government agencies and Ministries of Health in the region supported by the World Health Organization Websites [3,4] and two private websites reporting cases for EMR and other world countries.[5,9] The use of multiple sources facilitated the cross checking and matching of numbers reported in different

sources. Consistency was almost complete among the sources used. Numbers of cases were fed into an Excel sheet and graphs were made using the Excel functions. A case of COVID -19 was defined according to specific criteria adopted by various countries in accordance with the World Health Organization definitions. In general a case denotes a person with a positive nasal or throat swab Polymerase Chain Reaction Test (PCR). The triggers for the test were clinical features suggestive of the disease, contact with cases, active case detection and history of travel to other affected countries. Data on population of each country were obtained from World meters for population.[10]

The statistical analysis covered:

a. Epidemiological outcome measurement including four parameters:

Incidence rate (IR): The number of reported cases per 1,000,000 populations up to 5August 2020.

Overall case fatality ratio (OCFR): The number of deaths among COVID-19 reported cases up to 5 August divided by all reported cases up to 5 August 2020.

Case fatality ratio for closed cases (Closed CFR): The number of deaths among COVID-19 cases reported up to 5August 2020 divided by summation of deaths and recoveries over the same time period.

Cause-specific mortality rate (CSMR): The number of deaths during a specified period of time per million population.

b. Comparative curves were prepared to display characteristics of COVID-19 epidemic curves in EMR Arab countries

To smooth the curves, we used weekly instead of daily reported cases. Twelve countries, in addition to Iraq, were compared. They were grouped arbitrarily into two groups based on the extent of weekly reported cases in each country. A high incidence countries included Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, UAE, Oman, Egypt and Morocco. A low incidence countries included Jordan, Lebanon, Tunisia and Palestine.

c. We attempted to explore the effects of certain variables on the incidence rate of COVID-19.

We hypothesized that incidence rate of COVID-19 infection is determined by a number of factors such as tourist activities, foreign short term workers, international air travel to countries with high infection transmission, the population structure and behavior, population density, the median age and the intensity of testing for infection practiced by each country. We got some data on a number of these hypothesized determinants where multiple regression analysis was carried out to identify predictors of incidence rate. The dependent variable was the incidence rate of COVID-19 as reported cases per million population as of August 5, 2020. The predictors for each country were population density per Km, median age, proportion of elderly over 65 years old, and the number of tests per million population. The sample countries for this analysis were the EMR 22 and 25 other countries. The latter were added to improve the efficiency statistical analysis and to broaden the coverage of countries in different contents. A systematic random sample was drawn from the list of countries covered in Corona World meters[3] during April 2020

Results

Pandemic outcomes in EMR

Selected epidemiological parameters on the situation of COVID-19 infection in the EMR countries after almost six months from the start of the pandemic are

shown in (Table-1). The extent of the incidence rate, the case fatality ratio and the cause specific mortality rate varied substantially among different countries. Compared with the average regional values of 2193.5 per Million population. Twelve countries (Afghanistan, Jordan, Egypt, Lebanon, Libya, Morocco, Pakistan, Somalia, Sudan, Syria, Tunisia and Yemen) have incidence rates below the regional average. The other ten countries all have incidence rates above the regional average. With respect to case fatality ratio, ten countries (Afghanistan, Egypt, Iran, Iraq, Lebanon Libya, Somalia, Sudan, Syria, Tunisia and Yemen) have ratios above the regional averages of 2.6% and 3.1% for overall and closed ratios. The regional cause-specific mortality rate was 57.7 per Million population. Eight countries exceeded the regional figure for the CSMR (Bahrain, Djibouti, Iran, Iraq, Kuwait, Oman, Qatar and Saudi Arabia).

Table 1. Estimated population, total cases, deaths and recoveries reported and selected epidemiological parameters for EMR countries of COVID-19 pandemic up to August 5, 2020.

Country	Population	Numbers and parameters as on August 5, 2020						CSMR/ 1000000
		Total cases	Total Deaths	Total Recovered	IR/ Million	Overall CFR	CFR for closed cases	
Afghanistan	38,751,038	36629	1294	25742	945.2	3.5	4.8	33.4
Bahrain	1,689,430	42132	154	39335	24938.6	0.4	0.4	91.2
Djibouti	988 000	5330	59	5057	5394.7	1.1	1.2	59.7
Egypt	101,945,728	94752	4912	45567	929.4	5.2	9.7	48.2
Iran	83,777,961	317483	17802	274932	3789.6	5.6	6.1	212.5
Iraq	40,039,919	137556	5094	98442	3435.5	3.7	4.9	127.2
Jordan	10,182,948	1231	11	1160	120.9	0.9	0.9	1.1
Kuwait	4,257,912	69425	468	60906	16304.9	0.7	0.8	109.9
Lebanon	6,831,433	5062	65	1837	741.0	1.3	3.4	9.5
Libya	6,852,594	4224	96	633	616.4	2.3	13.2	14.0
Morocco	36,823,190	27217	417	19629	739.1	1.5	2.1	11.3
Oman	5,080,263	80286	488	69803	15803.5	0.6	0.7	96.1
Pakistan	220,027,847	281136	6014	254286	1277.7	2.1	2.3	27.3
Palestine	5,077,406	16981	93	8128	3344.4	0.5	1.1	18.3
Qatar	2,871,278	111805	178	108530	38939.1	0.2	0.2	62.0
Saudi Arabia	34,705,096	282824	3020	245314	8149.4	1.1	1.2	87.0
Somalia	15,893,222	3220	93	1598	202.6	2.9	5.5	5.9
Sudan	43,641,982	11780	763	6194	269.9	6.5	11.0	17.5
Syria	17,414,481	944	48	296	54.2	5.1	14.0	2.8
Tunisia	11,793,963	1601	51	1233	135.7	3.2	4.0	4.3
UAE	9,866,529	61860	355	55680	6269.7	0.6	0.6	36.0
Yemen	29,825,964	1764	507	865	59.1	28.7	37.0	17.0
Total for EMR	727,350,184	1,595442	41982	1325176	2193.5	2.6	3.1	57.7

The numbers in this table were basically based on Reference No.4. Rates were calculated by authors.

Comparative time trends (Epidemic curves) among EMR Arab countries

In this section we attempt to understand the dynamics of the pandemic in selected Arab EMR countries. (Figures 1and 2) show that most of the Arab EMR countries have experienced slowly increasing weekly cases followed by escalation and then a recent decline. The rise in Iraq continued until now and no indication of curve flattening or decline is evident yet. Recent resurgence is also seen in Oman and Morocco.

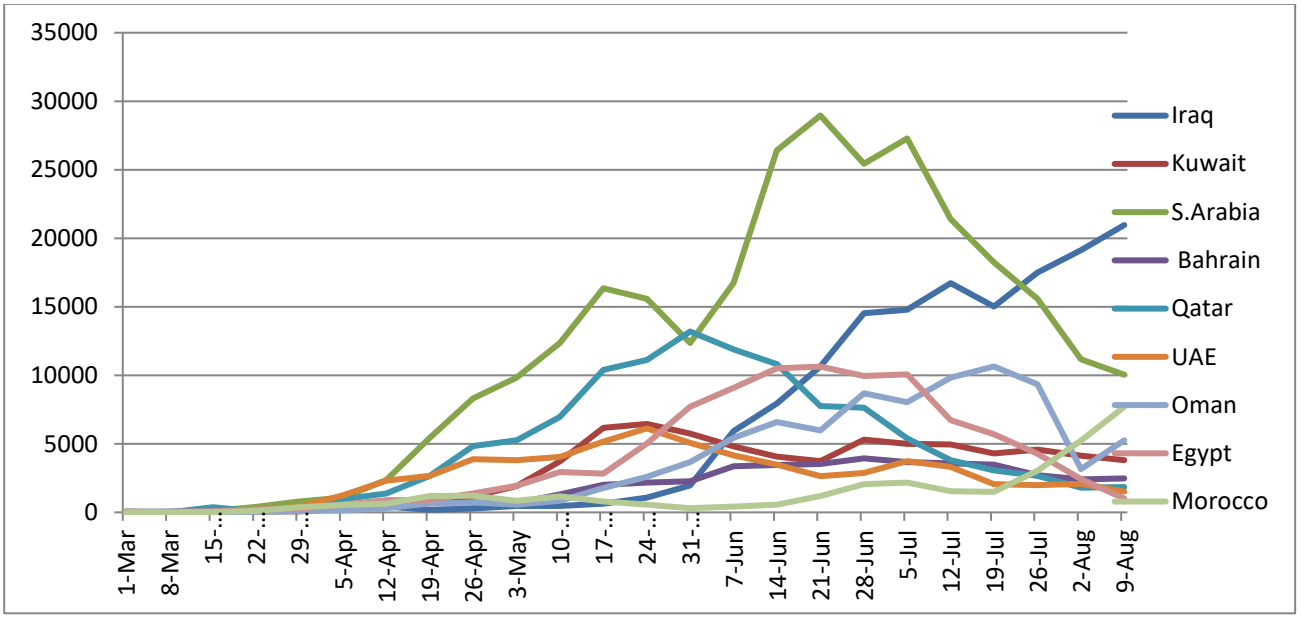

Fig 1. Weekly reported cases of COVID-19 infection in Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, UAE, Oman, Egypt and Morocco for the period from week ending March 1 to week ending 9 August, 2020.

(Figure-2), shows the epidemic curves for Lebanon, Jordan, Tunisia and Palestine. The four countries started with low scale weekly cases of COVID-19. Both Jordan and Tunisia are still suppressing the epidemic but a serious escalation took place in Lebanon and Palestine.

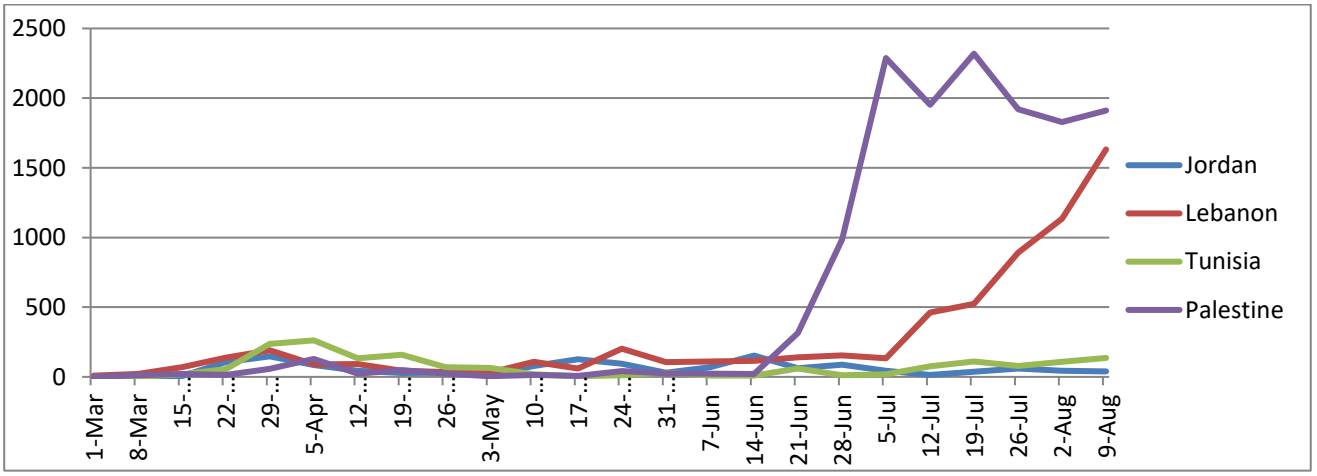

Fig 2. Weekly reported cases of COVID-19 infection in Jordan, Lebanon, Tunisia and Palestine for the period from week ending March 1 to week ending 9 August, 2020.

Determinants of the incidence rate

(Table-2), presents detailed data on incidence rates and four presumed determinants of the incidence rate.

Table 2. Incidence rates and case fatality ratios and four presumed determinants of incidence rate for the EMR 22 countries and other 25 countries as to August 5, 2020*

Country	IR/Million	Density	Median age	% of elderly	Tests / Million
Afghanistan	945.2	60	18	3	2,530
Bahrain	24938.6	2,239	32	2	568,990
Djibouti	5394.7	43	27	5	63,652
Egypt	929.4	103	25	5	1,316
Iran	3789.6	52	32	6	34,328
Iraq	3435.5	93	21	3	31,810
Jordan	120.9	115	24	4	68,416
Kuwait	16304.9	240	37	3	131,623
Lebanon	741.0	667	30	7	61,706
Libya	616.4	4	29	4	11,486
Morocco	739.1	83	30	7	43,436
Oman	15803.5	16	31	2	60,369
Pakistan	1277.7	287	23	4	10,386
Palestine	3344.4	847	21	3	42,001
Qatar	38939.1	248	32	1	198,009
S. Arabia	8149.4	16	32	3	123,785
Somalia	202.6	25	17	3	0
Sudan	269.9	25	20	4	9
Syria	54.2	95	26	5	0
Tunisia	135.7	76	33	8	9,551
UAE	6269.7	118	33	1	611,978
Yemen	59.1	55	20	3	4
Brazil	15,717	25	33	9	63,287
India	1947	464	28	6	21,742
Chile	20349	26	35	12	106,855
China	59	153	58	11	62814
Netherlands	3,704	508	43	19	79,121
S. Africa	9,888	49	28	5	57,248
Indonesia	816	151	30	6	6940
Romania	3704	84	43	18	79,121
Japan	433	347	48	28	9312
Austria	2,611	109	43	19	113,621
Denmark	2,716	137	42	20	339,412
Bolivia	8,582	11	26	7	18,335
Moldova	7,533	123	38	11	31759
Finland	1,399	18	43	22	84,864
Guatemala	3,505	167	23	5	11,193
Guinea	644	53	18	3	1,094
Thailand	48	137	40	12	10,730
Bulgaria	2069	64	45	21	48,162
Nepal	933	203	35	6	28,829
Estonia	1652	31	42	20	101,657
Venezuela	1187	32	30	7	57,714
Ethiopia	272	115	19	4	5457
Albania	2565	105	36	14	15996
Latvia	702	30	44	20	120,276
Cyprus	1118	131	37	14	198,291

*** Tests per million population was obtained for August 16, 2020 for technical reason**

(Table-3), shows the results of a step-wise multiple regression analysis carried out to predict incidence rate using data in (Table-1). Tests per million was the main significant (P =

0.002) and independent predictor of incidence rate of COVID-19 infection in EMR countries and in All countries listed in (Table-2). The average number of tests per million population could explain just under one fifth (Adjusted R^2 = 0.17) of the variability in the reported incidence rates of COVID -19.

Table 3. Results of stepwise multiple regression to predict incidence rate of COVID-19 cases

Explanatory variables	BETA	T	Significance
Significant variables:			
Tests/Million population	0.026	3.249	0.002
Non-significant variables			
- Population density/Km^2	0.150	0.968	0.338
-Median age of the population	-0.060	0.432	0.668
- % of elderly (65+ years of age)	-0.238	1.820	0.076

Discussion

The COVID-19 infection started in China late December 2019 and then rapidly spread to almost all countries in the World. [1,11] The pandemic have imposed severe threat to the life and wellbeing of the population in terms of morbidity, mortality, social life and economic consequences in many countries. In some countries the situation represents a real challenge to the health care system.[6] In the EMR countries, great variations do exist in incidence and fatality rates, and hence in policy to respond to the pandemic.[12,13] Despite that the scale of the pandemic in the Arab state members of EMR started modest in general terms but threats of escalation were witnessed in some countries. As of August 5, the incidence rate of COVID-19 varies widely in Arab countries. Qatar experienced the highest incidence rate so far. Bahrain, Kuwait, Saudi Arabia, Oman, United Arab Emirates, Iran, Iraq and Djibouti have relatively high rates but less than Qatar. All the remaining countries have lower incidence rates. This variation in incidence rate is not unique to EMR Arab countries but rather it is a phenomenon prevailing in all regions in Asia and Europe in particular.[14] Among the determinants of reported incidence rate are the scale of testing for COVID-19 reported by each country. Definitely this is not the only determinant and future research need to explore in-depth analysis for additional determinants and protective factors. The same variation does exist in case fatality ratio for all cases and for closed cases as shown in (Table-1). Some countries like Yemen, Sudan, Iran, Tunisia, Egypt, Syria, Somalia, Afghanistan and Iraq experienced relatively high CFR. Bahrain, Djibouti, Qatar and Palestine experienced very low case fatality ratios. Most of the EMR Arab countries have case-fatality ratios higher than those initially reported in China.[15] The variation in the CFR should reflect at least two things. First, the severity of detected cases. Second, the effectiveness of the health care system in managing the epidemic situations and severe and critical cases. Countries with high active case detection activities are expected to have lower proportion of severe and critical cases and less fatal outcomes. This is evident in Gulf countries which exhibit higher rates of testing and case detection and lower case fatality ratios. Despite all these indicators, exit from COVID-19 pandemic in EMR countries is not easily anticipated yet. Most EMR countries did not pass a definite peak of the pandemic. Even the countries which showed some decline after

peaking are now experiencing resurgence The implication of such epidemiological situation is that EMR countries might be in a rather difficult situation to manage exit from COVID-19 pandemic within the short future. To attempt reopening is a real challenge and needs intensive discussion among various parties about the means, indicators and preparedness to unexpected developments and the risk of second wave of infection.[16] A strategy of four specific public health principles (Monitoring infection status at population level, community acceptance and engagement in any easing or restrictive measures, public health capacity and measures and health system capacity) proposed by Rawaf et al [7] is worth using as a base for reopening towns and cities. Failure to recognize that may lead to unexpected flare up of the pandemic in short time after apparent relief.[13]

Limitation of the Study

The study could have been much better if it secured contributions from other participant co-authors from other EMR countries in this study. This imposed some limitation on the direct use of available data in different countries and the use of other expertise. The fast moving numbers of the pandemic made authors in a hurry to prepare and close the manuscripts. At the time of its publication, some of the findings might become inconsistent with the prevailing situation. This does not undermine the value of continuing research given the nature of pandemics and rapid changes with the passage of time. The data used in this article were carefully checked across various sources to ensure consistency.

Conclusions

Most of the EMR countries have experienced a pattern of accelerated pandemic and peaks. Most are heading towards decline. Only few experience some definite decline in the scale of reported cases but threats to re-emerge are impending. Reopening is surrounded with real challenges and careful scientific evidence based exit might be possible.

References

1. Sohrabi C, Alsafi Z, O, Neilla N, Khan M, Kerwan A, Al-Jabir A. et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International Journal of Surgery 2020; 76: 71-76.
2. WHO. Coronavirus disease 2019 (COVID-19) Weekly situation report, World Health Organization, Eastern Mediterranean Region Issue 1, 5 March 2020. Available from: http://www.emro.who.int/images/stories/coronavirus/covid-sitrep-issue1.pdf?ua=1&ua=1 Accessed on August 1, 2020
3. WHO. WHO Coronavirus Disease (COVID-19) Dashboard. Available from: https://covid19.who.int/table Accessed daily from February 21 to August 9.
4. WHO, Regional Office for the Eastern Mediterranean: COVID-19 daily updates. Available from: http://twitter.com/whoemro/status/1311714137009983488?s=24 Accessed daily from March 21 to October 5, 2020.
5. Corona World meters. A website displaying figures on COVID-19 Infection at global level on daily basis. World Health Organization. Available from: https://www.worldometers.info/coronavirus/ Accessed: Daily from February 21 to August 10, 2020.
6. Robert Schuman Foundation. Managing COVID-19: A journey through Europe. April 11, 2020. Available from https://www.robert-schuman.eu/en/doc/ divers/Covid-

19_Through_Europe.pdf Accessed on October 3, 2020.

7. Rawaf S, Yamamoto HQ, Rawaf D. Unlocking towns and cities: COVID-19 exit strategy. East Mediterr Health J. 2020 26(5):499-502.
8. Angulo FJ, Finelli L, Swerdlow SL. Reopening Society and the Need for Real-Time Assessment of COVID-19 at the Community Level. JAMA. 2020; 323(22): 2247-2248. doi:10.1001/jama. 2020.7872
9. https://www. sehhty.com/ Accessed: Daily from March 24 to August 10, 2020.
10. Worldometer (www.Worldometers.info). Elaboration of data by United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2019 Revision. (Medium-fertility variant). Available from :https://www.worldometers.info/population/ Accessed on April 18, 2020.
11. Guan W, Ni Z, Hu Y, Liang W, Ou C, He J, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. New England Journal of Medicine 2020 Feb 28. doi:10.1056/NEJMoa2002032.[Epub ahead of print].
12. WHO. COVID-19 Strategic preparedness and response plans, Country Preparedness and Response Status for COVID-19 as of 16 April. World Health Organization, Geneva. Available fromttps://www.who.int/publications/m/item/updated-country-preparedness-and-response-status-for-covid-19-as-of-16-april-2020 Accessed on May 15, 2020.
13. WHO. COVID-19 Strategic preparedness and response plans, Country Preparedness and Response Status for COVID-19 as of 7 May 2020. World Health Organization, Geneva. Available from https://www.google.com/search?q=who.+covid-19+strategic+preparedness+and+ response+plans%2C+country+preparedness+and+response+status+for+covid-19&oq = & aqs = chrome.0.69i59l8.4625054j0j7&sourceid=chrome & ie=UTF-8 Accessed on May 15, 2020
14. WHO. Coronavirus disease (COVID-19) - Situation Report-112. World Health Organization, Geneva, May 9, 2020. Available from: https://www.who.int/docs/default-source/coronavirus / situation-reports/20200511-covid-19-sitrep-2.pdf?sfvrsn=813f2669_2 Accessed on May 14, 2020.
15. The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)-China, 2020. China CDC Weekly. 2020; 2(8):113-122 Available from https://cdn.onb.it /2020/03/COVID-19.pdf.pdf Accessed on May 15, 2020.
16. Wise J. Covid-19: Risk of second wave is very real, say Researchers. BMJ 2020; 369:m2294 doi: 10.1136/bmj.m2294 (Published 9 June 2020).

جائحة COVID-19 في إقليم شرق المتوسط: نتائج مختارة

الخلفية: رغم مرور ما يقارب الثمانية أشهر ما زالت جائحة كوفيد-19 تشكل مشكلة صحية كبرى على المستوى العالمي والاقليمي والوطني.

الهدف: لتقديم عرض مقارن للنمط الزماني والمخرجات الوبائية في دول اقليم شرق المتوسط وتحديد بعض محددات هذا النمط.

الطرائق: استخدمت البيانات المتاحة عن الجائحة لغاية الخامس من آب 2020، وقد اعتمد مصدران اساسيان للبيانات هما موقع بمنظمة الصحة الدولية وموقعين اخرين خاصين وفي كليهما تدون بيانات لجميع الدول تقريبا. دونت البيانات من تلك المواقع مباشرة بمتابعة يومية منذ بدء الجائحة وتم الاستفادة من برنامج اكسل لخزن البيانات وتهيئة الجداول والاشكال. وتم تدقيق تلك البيانات بكل ما يترشح عن الجهات الصحية لكل بلد.

النتائج: أظهرت النتائج تباينا كبيرا في المعايير الوبائية للجائحة بين دول أقليم شرق المتوسط في نسب الاصابة من 38939،1 في قطر الى 54،2 في سوريا) ونسب الهلاك (من .،2% في قطر الى37 % في اليمن 37) ونسبة الوفيات قياسا للسكان (من 1،1 الى 212،5 لكل مليون نسمة في الاردن وايران على التوالي). وكان المحدد الرئيسي للإصابات في هذه الدول هو عدد الفحوصات التي تجريها كل دولة وبالرغم من تباطؤ المنحنى الوبائي لمعظم الدول الا ان السيطرة الكاملة على الجائحة ما زالت بعيدة، بل ان عدد من دول الأقليم ما زالت تشهدا تصاعدا في الوباء.

الاستنتاج: معظم دول الاقليم ما تزال تشهد نسبا عالية في الاصابات وبعضها يعاني من تصاعد في الاعداد اليومية وهناك الكثير قد شهد انحدارا في النمط الزماني الا ان الجميع لم يشهد بعد السيطرة الكاملة على الجائحة.

الكلمات المفتاحية: كوفيد-19، سارس-كوف-2، جائحة، نمط زماني, وفيات كوفيد-19