#02/2023
ISSN 2299-1247

JHPOR | Journal of Health Policy & Outcomes Research

Readiness of the health system against COVID-19 and its impact on the economy and foreign trade in MENA

DOI:10.7365/JHPOR.2023.2.1

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Keywords:

Health system, health indicators, pandemic, COVID-19, vaccination, economic growth, foreign trade, MENA

How to cite this article?
Özsoy Ö., Gürler M., Readiness of the health system against COVID-19 and its impact on the economy and foreign trade in MENA J Health Policy Outcomes Res [Internet]. 2023[cited YYYY Mon DD];. Available from: http://jhpor.com/article/2332-readiness-of-the-health-system-against-covid-19-and-its-impact-on-the-economy-and-foreign-trade-in-mena

contributed: 2023-06-19
final review: 2023-06-28
published: 2023-07-14

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Abstract

Objectives
This study aims to investigate the readiness and resilience of the health system against COVID-19 and the impact of the pandemic on the economy and foreign trade in the Middle East and North Africa (MENA) region with Türkiye.

Methods
By descriptive analysis, the readiness and resilience of the health system and the impact of the pandemic on the economy and foreign trade in the MENA region with Türkiye were evaluated. The normality of the indicators was checked by Jarque-Bera (JB), Shapiro-Wilk (SW) and Kolmogorov-Smirnov (KS) tests. The countries were ranked by the min-max standardization method.

Results
As of the end of July 2021, the number of COVID-19-related cases was more than 12.4 million in MENA and 5.7 million in Türkiye and deaths were more than 212 thousand in MENA and 51 thousand in Türkiye.
After the analysis in order, it is found that Israel, Saudi Arabia, United Arab Emirates, Türkiye and Qatar as the most resilient countries and Yemen, Syria, Palestine, Iraq and Libya as the most vulnerable countries against the pandemic.

Conclusion
The pandemic has affected the life and the economies in the region negatively and the health system for some of them was not sufficient to fight it.

1. Introduction

The MENA region has contributed to the scientific and cultural development of humanity with its thousands of years of history. In addition to hosting a young and dynamic population, the countries of the region also have an important part of the world's energy resources and the potential to increase trade and investment links around the world. Low economic diversity, the imperative need to improve education and health systems and infrastructure, the fragile and unstable situation in some MENA countries, and geopolitical tensions in the region highlight the complexity and urgency of addressing these challenges sustainably.[1]

MENA Countries with rapidly growing economies linked to oil, tourism and the financial industry and Türkiye as an emerging market with strong industry, and service sectors such as tourism have got not only large populations but also have been guesting many expatriates from all over the world to work. The region with MENA countries and Türkiye has nearly 549 million population, more than 3.8 trillion dollars in Gross Domestic Product (GDP) in current price,[2] 6.96 thousand dollars in income per capita, 924 billion dollars in imports, 868 billion dollars in exports and a total of 1.79 trillion dollar goods trade volume [3] in 2020. Compared with the 1990 year values the growth rates seem as 78.1% for the population, 301.8% for GDP, 125.5% for income per capita, and 458% for export,[4] 547% for imports[4] and 500% for total trade value[4] in the region. Increasing activities in the economies and raising income per capita caused an increasing trend for well-being so that for the healthcare system in the countries. As people with access to good healthcare feel more productive and competitive increasing productivity in the workforce and working hours will lead to economic growth, and therefore to an increase in national income and income per capita in the region.[5,6] Accessing good health services in a country will lower the mortality rates, and promote a long-living population with a higher life expectancy and a healthy labour force.[7] OECD states a 38% decrease in global Foreign Direct Investment (FDI) in 2020 compared to 2019.[8] According to the UNCTAD data, FDI contracted by 35% for the world, 27.5% in the North African region and 15.2% in Türkiye while it increased by 11.3% in the Middle East, 11.3% in the MENA and 7.6% in the MENA and Türkiye total.[9] The MENA and Türkiye have 7.2% of global FDI.[9]

In recent years, the MENA countries have made significant improvements and developments in their health systems for the use of their citizens. The ongoing conflicts in the MENA countries such as Iraq, Libya, Syria and Yemen destructed the health status of populations. The conflicts have created new health challenges, which reversed the gains in the health system. Not only the health systems in the countries, which host the refugees, have faced capacity problems, but also the refugees and other displaced populations have already faced challenges in accessing and paying for health services.[10]

The new type of coronavirus, which emerged in Wuhan, China in the last days of 2019, has taken the whole world under its influence in a short time. The virus has not only become a global epidemic, but with both alarming levels of spread, the World Health Organization (WHO) declared it as a pandemic on March 11, 2020.[11] Like the 2015 outbreak of the Middle East respiratory syndrome coronavirus (MERS), the new pandemic COVID-19 has also affected the MENA region negatively.

COVID-19-related confirmed cases and deaths in some countries due to the pandemic have increased immediately with inadequate healthcare systems. The decrease in domestic and foreign demand and the destruction of the supply chains and value chains caused the countries to face shrinking GDP, foreign trade values, tax revenues and employment where individuals lost their jobs and incomes.[12] The increase in the demand for the health system for economic development and the pandemic has revealed the question of whether the system is adequate, effective and technological.

When examining domestic general government health expenditure per capita many of the MENA countries have lower expenditures than the world average.[13] While governments have made an average of $662 per capita health expenditure in the world with most recent year data (the latest data was for 2018), it was about $263 in the MENA region, with the inclusion of Türkiye in the account, the health expenditure per capita increases to 269 dollars.[2]

While MENA governments spend an average of 10% of their budgets on health expenditures (the ratio drops to 9.9 per cent including Türkiye), the share spent on education is about 12.7 per cent (the ratio drops to 12.6 per cent including Türkiye).[2, 14]

Since governments do not allocate a large share of the budget for health, out-of-pocket expenditures compensate for the remaining health expenditures. This causes people to either give up using healthcare services or decrease their purchasing power because they allocate their budgets to health expenditures. As governments have given low priority to health, citizens will not have equal access to healthcare and will have low-quality healthcare.[6]

Readiness of the health system, which simply means sufficient health infrastructure with new technology and a skilled health force in the MENA region, is very important to match the willingness to feel well-being and the increasing demand for healthcare especially due to the pandemic. The World Bank provides a range of technical assistance products, such as the universal coverage assessment tool (UNICO) and the universal coverage capacity assessment tool (UNICAT), to support the expansion of health coverage to the countries in the region.[6] Due to pandemic or noncommunicable diseases (NCDs), hospitals, which has higher bed number can guest ill people, but the availability and quality of primary care can also play an important role in a country.[15] While technology enables countries to be connected more than before, people's awareness and understanding of developments in health services increase expectations.[16]

The health system varies from country to country in the region and the analysis of productivity across MENA countries strongly suggests that health systems evolve in response to a range of economic, social and institutional backgrounds.[17] Health systems in the region countries depend on many aspects, related to funding, inclusion, geographic factors or governance.[18] In MENA countries, UNICEF also supports efforts to strengthen health systems (HSS).[19] The weak capacity of the public in some MENA countries to provide comprehensive health services responsive to the needs of the population in the country has led to a significant increase in the activities and coverage of the private sector in the health sector.[20] As of the end of July 2021, the number of COVID-19-related cases was nearly 200 million, while the number of deaths exceeded 4.2 million in the world. By the way, the number of cases was more than 12.4 million in MENA and 5.7 million in Türkiye and the number of deaths was more than 212 thousand in MENA and 51 thousand in Türkiye. As the pandemic has spread rapidly around the world and new variants have begun to emerge, many countries with limited capacity in the health system and health workforce have faced challenges.[21]

Scientists have made research and developments and they have found different COVID-19 vaccinations in different countries until the end of 2020. Health staff administered more than 4.1 billion vaccine doses all around the world. [21]

2. Materials and Methods

2.1. Selection and Description of Participants

There are 20 countries in total in the country set, which is the subject of the study. Five of them (Algeria, Egypt "Arab Republic", Libya "State of", Kingdom of Morocco and Tunisia are North African countries. Fourteen of them (Bahrain Kingdom, Iran "Islamic Republic", Iraq, Israel, Hashemite Kingdom of Jordan, Kuwait, Lebanon, Sultanate of Oman, Palestine "State of", State of Qatar, the Kingdom of Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen Republic) are the Middle East region countries. In addition, the last country in the study is Türkiye, which is the neighbour of three countries in the Middle East region countries. Nineteen of twenty countries other than Israel are also members of the Organization of Islamic Cooperation (OIC).

The country set was analysed considering three indicators groups:

a. Health-related indicators;
   - health capacity indicators: hospital beds per 10,000 people for the 2019 year and the most recent year, medical doctors per 10,000 people for the 2019 year and the most recent year, nursing and midwifery personnel per 10,000 people for the 2019 year and the most recent year;
   - health status indicators: COVID-19-related total cases per million people for July 2021, COVID-19-related total deaths per million people for July 2021, the Case Fatality Rate (CFR) for COVID-19 for July 2021, people vaccinated per 100 hundred people against COVID-19 for July 2021, the reproduction rate of the pandemic for July 2021, total vaccinations per hundred people against COVID-19 for July 2021, people fully vaccinated per hundred population against the pandemic for July 2021, life expectancy at birth (years, for the 2019 year).

b. Health financing; current health expenditure, current health expenditure per capita, domestic general government health expenditure per capita, out-of-pocket expenditure per capita current health expenditure as a percentage of GDP, domestic general government health expenditure as a percentage of current health expenditure, domestic general government health expenditure as a percentage of general government expenditure for 2018 and most recent year.

c. Macroeconomic indicators of the countries; exports for the 2020 year, the percentage change in exports for the 2019-2020 years, imports for the 2020 year, the percentage change in imports for the 2019-2020 years, GDP for 2020, the GDP growth rate for the 2019-2020 years, GDP per capita for 2020, the population for 2020.

2.2. Technical Information

There was a lack of data for the domestic general government health expenditure as a percentage of general government expenditure for Palestine "State of", the GDP growth rate for the Syrian Arab Republic, and people fully vaccinated per hundred population for Libya "State of". Trade-related data was retrieved from the International Trade Centre (ITC/TradeMap).[3] GDP and population data were gathered from the World Bank[2] and International Monetary Fund.[22] COVID-19-related data for the cases, the deaths and the vaccination are from the Our World in Data.[21] The life expectancy at birth data was collected from the United Nations Development Programme (UNDP),[23] whereas the number of hospital beds, medical doctors and nursing and midwifery personnel data were from the World Health Organization (WHO)[24] and the World Bank.[2] The health financing data is retrieved from the World Bank,[2] the United Nations (UN),[25] and the Palestinian Central Bureau of Statistics (PCBS).[26]

2.3. Statistics

In the study, two different statistical software were used to get the descriptive statistics of the data and to evaluate and analyse the data. These are the 22nd version of the Statistical Package for Social Sciences Data (SPSS) software[27] and the 9th version of the EViews software.[28]

There are several statistical methods to evaluate whether our data are normally distributed or not. The Jarque-Bera test (which considers the shape of our data distribution, in particular, its lack of symmetry "skewness, S", and its tallness or flatness "kurtosis, K"), the Shapiro-Wilks test and the Kolmogorov-Smirnov test were used to analyse the normality of the data. For small-sized samples, which have less than 50 members the Shapiro–Wilk test is the more appropriate method. For large-sized samples, which have equal or more than fifty members both the Shapiro–Wilk test and Kolmogorov–Smirnov test can be used to check the normality.[29] If the data show a normal distribution, the parametric test should be applied, but if the data do not follow a specific distribution then the non-parametric "distribution-free" test should be applied. Common parametric statistics are, e.g. the Student's t-tests, one-way-ANOVA (analysis of variance) and common nonparametric statistics are, e.g. the Mann-Whitney-Wilcoxon (MWW) test or the Wilcoxon test, Kruskal-Wallis test.[27, 30]

Two hypotheses for testing normality, which were null and alternative hypotheses for our data, are as:

H0: The sample data are not statistically significantly different than a normal population (the variables for the country set are statistically distributed normally)

H1: The sample data are statistically significantly different than a normal population (the variables for the country set are not statistically distributed normally)

According to the normality test, if the p-value is greater than the predefined significance level, here it is a=0.05, the null hypothesis of normality of the data should not be rejected with 95% confidence. If the probability is greater than 0.05 it indicates that the data are normal and if the probability is smaller than 0.05 it indicates that the data are not normal.

In the study, the resilience of the countries against the pandemic was analysed by taking into account the health system capacities, health financing and macroeconomic performances of the countries. Indicators under the three dimensions were standardized with the min-max methodology. By taking the average of standardized values, the index score was calculated for each country. Then, the most resilient and most vulnerable countries against the pandemic were identified.

3. Results

After applying the normality tests, it is found that "hospital beds per ten thousand", "total cases per million people", "total deaths per million people", "life expectancy at birth", "nursing and midwifery personnel per ten thousand", "reproduction rate", "current health expenditure as a percentage of GDP", "domestic general government health expenditure as a percentage of current health expenditure", "domestic general government health expenditure as a percentage of general government expenditure", "export change" and "import change" indicators show normal distribution. The parametric tests can be applied to the data.

The "Case fatality rate", "medical doctors per ten thousand", "people vaccinated per hundred", "total vaccinations per hundred", "people fully vaccinated per hundred", "current health expenditure", "current health expenditure per capita", "domestic general government health expenditure per capita", "out-of-pocket expenditure per capita", "exports", "GDP", "GDP growth rate", "GDP per capita" "imports" and "population" indicators do not distribute normally. The non-parametric tests should be applied to the data.

Applying "the Pearson correlation test" to the normally distributed data for 19 countries excluding Palestine due to missing data, it is found that "GDP per capita" is positively related to "total cases per million people", "life expectancy at birth", "nursing and midwifery personnel" and "domestic general government health expenditure as a percentage of general government expenditure". The risk for COVID-19 is more with higher economic activity and mobility. It is also found that "current health expenditure as a percentage of GDP" is positively related to "total deaths per million" and "domestic general government health expenditure as a percentage of general government expenditure". Countries with high death rates spend more on well-being. "Reproduction rate" is already positively related to "import change", which means if the country is more open to international trade there is more risk to get COVID-19.

Applying "Spearman's rho test" to the not normally distributed data for 18 countries excluding Libya and Syria due to missing data, it is found that "GDP per capita" is positively related to "medical doctors per ten thousand", "people vaccinated per hundred", "total vaccinations per hundred", "people fully vaccinated per hundred", "current health expenditure per capita", "domestic general government health expenditure per capita", "out-of-pocket expenditure per capita", "exports" and is negatively related with "Case Fatality Rate (CFR, %)" and "population". It shows that high income enables higher health system capacity and vaccination. High income also decreases "the Case Fatality Rate".

The "Independent-Samples Median test" shows that the medians of fourteen indicators are the same across categories of "GDP per capita" in eighteen countries. The "Independent-Samples Kruskal-Wallis test" shows that the distributions of fourteen indicators are the same across categories of "GDP per capita" in eighteen countries since p-values are not statistically significant (not less than 0.05) and the null hypothesis will not be rejected.

After the analysis, it is found that Israel, Saudi Arabia, United Arab Emirates (UAE), Türkiye and Qatar are the most resilient countries in order and Yemen, Syria, Palestine, Iraq and Libya are the most vulnerable countries against the pandemic.

Health capacity and health personnel

Health system capacity, health workforce and COVID-19-related indicators are different from country to country in the region. It means that the pandemic has affected some countries in the region worse than others. The North Africa region has 9,504 "total cases per million people"; the Middle East region has 40,036; the MENA region has 26,724 in total; and the MENA and Türkiye together have 33,072. The world's average for "total cases per million people" is 25,385. The North African region has 266 "total deaths per million people"; the Middle East region has 609; the MENA region has 460 in total; and the MENA and Türkiye together have 483. The world's average for "total deaths per million people" is 541. The North African region has a 2.8 per hundred "Case Fatality Rate (CFR, %)"; the Middle East region has 1.5; the MENA region has 1.7 in total; the MENA and Türkiye together have 1.5. The world's average for the "Case Fatality Rate (CFR, %)" is 2.1. The North African region has a 1.30 "reproduction rate"; the Middle East region has 1.17; the MENA region has 1.20 in total; and the MENA and Türkiye together have 1.19. The world's average "reproduction rate" is 1.08.

The North African region has 75 years of "life expectancy at birth"; the Middle East region has 75.8; the MENA region has 75.4 in total; and the MENA and Türkiye together have 76.5. The world's average "life expectancy at birth" is

72.8 years. The North African region has 15.26 "hospital beds per ten thousand people"; the Middle East region has 15.07; the MENA region has 15.42 in total; and the MENA and Türkiye together have 17.16. The world's average for "hospital beds per ten thousand people" is 27.10.

The North African region has 10.37 "medical doctors per ten thousand people"; the Middle East region has 17.10; the MENA region has 13.23 in total; and the MENA and Türkiye together have 11.97. The world's average for "medical doctors per ten thousand people" is 15.66. The North African region has 17.15 "nursing and midwifery personnel per ten thousand people"; the Middle East region has 29.49; the MENA region has 25.43 in total; and the MENA and Türkiye together have 20.39. The world's average for "nursing and midwifery personnel per ten thousand people" is 38.16. The North African region has 18.06 "total vaccinations (doses) per hundred"; the Middle East region has 32.68; the MENA region has 20.06 in total; and the MENA and Türkiye together have 30.36. The world's average for the "total vaccinations (doses) per hundred" is 53.21. The North African region has 11.40 "people vaccinated per hundred"; the Middle East region has 20.01; the MENA region has 11.64 in total; and the MENA and Türkiye together have 17.34. The world's average for the "people vaccinated per hundred" is 28.56. The North African region has 6.7 "people fully vaccinated per hundred; the Middle East region has 11.8; the MENA region has 8.0 in total; and the MENA and Türkiye together have 11.70. The world's average for "people fully vaccinated per hundred" is 14.60.

It seems the Middle East region has not only better vaccination than the North African region but more health personnel as well. The North African region has more "hospital beds per thousand" than the Middle East region

Table 1. Health Capacity and Health Personnel Indicators in MENA Countries and Türkiye

Country	Hospital beds (per 10,000, 2019 and most recent year data) [A]	Total cases per million people (July 2021) [B]	Case fatality rate (CFR, %) [C]	Total deaths per million people (July 2021) [D]	Medical doctors (per 10,000, 2019 and most recent year data) [E]	Life expectancy at birth (years, 2019) [F]	Nursing and midwifery personnel (per 10,000, 2019 and most recent year data) [G]	People vaccinated (per 100) [H]	Reproduction rate [I]	Total vaccinations (per 100) [J]	People fully vaccinated (per 100) [K]
Algeria	19.00	3,909	2.5	97	17.19	76.9	15.48	7.80	1.08	9.45	1.7
Egypt	14.30	2,778	5.8	161	8.20	72.0	15.50	3.61	0.76	5.22	1.6
Libya	32.00	36,254	1.4	511	22.90	72.9	68.80	7.96	1.28	7.96	N/A
Morocco	10.00	16,893	1.6	265	6.70	76.7	8.50	36.93	1.68	64.36	27.4
Tunisia	21.80	49,884	3.3	1,666	13.00	76.7	38.90	14.38	0.92	22.54	8.2
Bahrain	17.20	158,197	0.5	813	22.60	77.3	45.40	65.13	0.95	135.48	62.0
Iran	16.20	46,087	2.3	1,079	15.40	76.7	21.30	9.22	1.15	12.11	2.9
Iraq	13.20	40,440	1.1	464	9.10	70.6	21.20	2.05	1.18	3.31	1.2
Israel	29.90	100,978	0.7	748	54.67	83.0	66.05	66.83	1.55	129.10	62.1
Jordan	14.00	75,537	1.3	983	23.00	74.5	33.20	29.30	1.25	51.11	21.8
Kuwait	19.30	93,157	0.6	543	25.30	75.5	67.20	34.00	0.79	55.62	21.6
Lebanon	27.30	82,248	1.4	1,158	31.20	78.9	37.40	16.31	1.42	28.52	12.2
Oman	14.80	57,936	1.3	747	21.00	77.9	44.00	30.37	0.50	36.96	6.6
Palestine	13.30	62,088	1.1	706	21.50	74.0	25.90	11.60	1.42	19.75	8.2
Qatar	12.30	78,526	0.3	209	25.00	80.2	73.20	71.28	1.16	131.22	59.9
Saudi Arabia	22.50	15,101	1.6	237	26.40	75.1	55.20	53.96	1.19	77.18	23.2
Syria	12.60	1,484	7.4	109	11.70	72.7	14.00	0.70	1.24	0.75	0.1
UAE	14.40	68,840	0.3	197	24.80	78.0	57.90	78.90	0.99	169.82	70.5
Yemen	0.10	237	19.5	46	1.70	66.1	6.30	1.00	1.32	1.04	0.0
Türkiye	28.10	67,905	0.9	609	18.07	77.7	30.03	48.63	1.58	86.88	32.4
North Africa	15.26	9,504	2.8	266	10.37	75.0	17.15	11.40	1.30	18.06	6.7
Middle East	15.07	40,036	1.5	609	17.10	75.8	29.49	20.01	1.17	32.68	11.8
MENA total	15.42	26,724	1.7	460	13.23	75.4	25.43	11.64	1.20	20.06	8.0
MENA & Türkiye	17.16	33,072	1.5	483	11.97	76.5	20.39	17.34	1.29	30.36	11.7
World	27.10	25,385	2.1	541	15.66	72.8	38.16	28.56	1.08	53.21	14.6

Source: [21], [2],[24], [31], [23]

total. After the analysis, it is found that UAE, Israel, Qatar, Saudi Arabia and Bahrain seem to have the best health capacity and personnel in order. On the other hand, Yemen seems to have the worst health capacity and personnel with Iraq, Syria, Iran and Palestine (Table 1).

Bahrain has the highest value for "total cases per million people" with 158,197 and Yemen has the minimum value with 237. Tunisia has the highest value for "total deaths per million people" with 1,666 and Yemen has the minimum value with 46. Yemen has the highest value for "Case Fatality Rate (CFR)" with 19.5 and Qatar has the least value with 0.27. Morocco has the highest value for the "reproduction rate" at 1.68 and Oman has the minimum value at 0.50.

Libya has the highest number of "hospital beds per ten thousand" at 32 and Yemen has the minimum value at 0.10. Israel has the highest "life expectancy at birth" at 83 and Yemen has the least value at 66.10.

Analysing the health workforce it is found that Israel has the highest value for the "medical doctors per ten thousand" at 54.67 and Yemen has the minimum value at 1.70. Qatar has the highest value for the "nursing and midwifery personnel per ten thousand" at 73.20 and Yemen has the least value at 6.30.

Considering the vaccination indicators, UAE has the highest value for the "total vaccinations per hundred" with 169.82 and Syria has the minimum value with 0.75. UAE has the highest value for the "people vaccinated per hundred" with 78.90 and Syria has the minimum value at 0.70. UAE has the highest value for the "people fully vaccinated per hundred" of 70.50 and Syria has the least value at 0.05 (Table 2).

Table 2. Descriptive Statistics and Normality Tests for Health Capacity and Health Personnel Indicators in MENA Countries and Türkiye

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]
Mean	17.6	52,924.0	2.7	567.4	20.0	75.7	37.3	29.50	1.19	52.42	22.3
Std. Deviation	7.6	405,10.86	4.3	428.3	11.2	3.7	21.6	26.16	0.30	52.77	24.1
Maximum	32.00	158,197.40	19.47	1,665.68	54.67	83.00	73.20	78.90	1.68	169.82	70.50
Minimum	0.10	236.74	0.27	46.10	1.70	66.10	6.30	0.70	0.50	0.75	0.04
Skewness	0.08	0.63	3.14	0.82	1.21	-0.59	0.25	0.57	-0.35	0.87	0.9
Kurtosis	3.05	3.35	12.46	3.18	5.77	3.86	1.77	1.91	2.94	2.50	2.4
Type of skewness	right skewed	left skewed	right skewed	right skewed	right skewed	left skewed	right skewed	right skewed	left skewed	right skewed	right skewed
Type of kurtosis	leptokurtic	leptokurtic	leptokurtic	leptokurtic	leptokurtic	leptokurtic	platykurtic	platykurtic	platykurtic	platykurtic	platykurtic
Jarque–Bera (JB) test of normality											
Statistics	0.025	1.409	107.501	2.279	11.258	1.777	1.477	2.074	0.410	2.760	3.0
Significance value	0.987	0.494	0.000	0.320	0.004	0.411	0.478	0.354	0.815	0.252	0.2
Decision	not able to reject	not able to reject	reject	not able to reject	reject	not able to reject	not able to reject	not able to reject	not able to reject	not able to reject	not able to reject
Kolmogorov-Smirnov test for normality											
Statistics	0.144	0.113	0.323	0.160	0.183	0.160	0.120	0.193	0.1	0.2	0.20
Significance value	0.200	0.200	0.000	0.193	0.077	0.193	0.200	0.0498	0.2	0.1	0.06
Decision	Not able to reject	not able to reject	reject	not able to reject	not able to reject	not able to reject	not able to reject	reject	not able to reject	not able to reject	not able to reject
Shapiro-Wilk test for normality											
Statistics	0.94	0.94	0.54	0.92	0.89	0.96	0.94	0.89	0.98	0.86	0.82
Significance value	0.27	0.20	0.00	0.11	0.03	0.57	0.20	0.02	0.95	0.01	0.00
Decision	not able to reject	not able to reject	reject	not able to reject	reject	not able to reject	not able to reject	reject	not able to reject	reject	reject

Source: [21],[2],[24],[32],[23]

Health financing

Health financing is very important to fight the pandemic as the health system capacity in a country. If the government's support for health expenditure is not sufficient then citizens match the finance gap from their pocket.

The North African region has 34.4 billion USD in "current health expenditure"; the Middle East region has 173.8 billion USD; the MENA region has 208.3 billion USD in total; and the MENA and Türkiye together have 240.4 billion USD. The world's total "current health expenditure" is 8.4 trillion USD and it is nearly 10 per cent of the total world GDP. The North African region has 176.4 USD in "current health expenditure per capita"; the Middle East region has 700.8 USD; the MENA region has 520.9 USD in total; and the MENA and Türkiye together have 457.6 USD. The world's average for "current health expenditure per capita" is 1,111.1 USD. The North African region has 82.4 USD "out-of-pocket expenditure per capita"; the Middle East region has 166.7 USD; the MENA region has 129.6 USD in total; and the MENA and Türkiye together have 120 USD. The world's average for "out-of-pocket expenditure per capita" is 201 USD. The North African region has 83 USD "domestic general government health expenditure per capita"; the Middle East region has 404 USD; the MENA region has 293.9 USD in total; and the MENA and Türkiye together have 269 USD. The world's average for "domestic general government health expenditure per capita" is 661.7 USD.

The North African region has 5.58 per cent of "current health expenditure as a percentage of GDP"; the Middle East region has 6.53 per cent; the MENA region has 5.83 per cent in total; and the MENA and Türkiye together have 6.38 per cent. The world's average for "current health expenditure as a percentage of GDP" is 9.9 per cent. The North African region has 46.96 per cent of "domestic general government health expenditure as a percentage of current health expenditure"; the Middle East region has 57.70 per cent; the MENA region has 56.36 per cent in total; and the MENA and Türkiye together have 58.79 per cent. The world's average for "domestic general government health expenditure as a percentage of current health expenditure" is 59.54 per cent.

The North African region has 7.72 per cent of "domestic general government health expenditure as a percentage of general government expenditure"; the Middle East region has 10.52 per cent; the MENA region has 10.02 per cent in total; and the MENA and Türkiye together have 9.89 per cent. The world's average for "domestic general government health expenditure as a percentage of general government expenditure" is 15.5 per cent.

It seems the Middle East region has better health financing than the North African region. After the analysis, it is found that Israel, Saudi Arabia, Iran, Kuwait and UAE seem to have the best health financing in order. On the other hand, Yemen seems to have the worst health financing with Syria, Egypt, Morocco and Iraq (Table 3).

Saudi Arabia has the highest value for "current health expenditure" with 50.03 billion USD and Syria has the minimum value with 1.18 billion USD. Israel has the highest value for "current health expenditure per capita" with 3,324 USD and Syria has the least value with 69.8 USD. Israel has the highest value for "out-of-pocket expenditure per capita" with 702.5 USD and Syria has the least value with 37.5 USD. Israel has the highest value for "domestic general government health expenditure per capita" with 2,150.5 USD and Yemen has the minimum value with 7.45 USD

Palestine has the highest value for "current health expenditure as a percentage of GDP" at 9.7 per cent and Qatar has the minimum value at 2.49 per cent. Kuwait has the highest value for "domestic general government health expenditure as a percentage of current health expenditure" at 88.04 per cent and Yemen has the minimum value at 10.18 per cent. Iran has the highest value for "domestic general government health expenditure as a percentage of general government expenditure" at 21.81 per cent and Yemen has the least value at 2.23 per cent (Table 4).

Macroeconomic indicators

The pandemic has also affected the economies, international supply chains, and value chains. The economies have contracted 4 per cent in the Middle East, 1.7 per cent in the North African region (3.66 per cent in the MENA) and 3.3 per cent globally on average, whereas the Turkish economy has a growth rate of 1.76 per cent. The imports have decreased by 8.04 per cent globally and 21.07 per cent in North Africa, 28.02 per cent in the Middle East (26.50 per cent in the MENA) on average. In addition, Türkiye's import value increased by 4.36 per cent in 2020. The global exports have contracted by 7.8 per cent and 30.5 per cent in North Africa, 31.8 per cent in the Middle East (31.7 per cent in the MENA) on average and 6.2 per cent in Türkiye in 2020. The shrinking economies have started to recover after vaccinations and the governments have loosed closures and lockdowns. Countries have established alternative supply chains and foreign trade volume started to increase towards the pre-pandemic level in 2021.

Table 3. Health Financing Indicators in MENA Countries and Türkiye

Country	Current health expenditure (billion US$) [L]	Current health expenditure per capita (current US$) [M]	Domestic general government health expenditure per capita (current US$) [N]	Out-of-pocket expenditure per capita (current US$) [O]	Current health expenditure (% of GDP) [P]	Domestic general government health expenditure (% of current health expenditure) [Q]	Domestic general government health expenditure (% of general government expenditure) [R]
Algeria	10.80	255.9	168.4	83.5	6.22	65.83	10.73
Egypt, Arab Rep.	12.36	125.5	36.1	78.2	4.95	28.73	4.72
Libya	2.07	309.9	196.1	113.6	6.05	63.29	6.42
Morocco	6.30	174.8	70.2	82.1	5.31	40.19	7.17
Tunisia	2.91	251.5	144.3	97.8	7.29	57.37	13.63
Bahrain	1.56	994.2	584.9	298.3	4.13	58.83	7.21
Iran, Islamic Rep.	39.61	484.3	222.4	173.5	8.66	45.93	21.81
Iraq	9.20	239.4	115.2	122.9	4.11	48.13	6.19
Israel	29.52	3,323.7	2,150.5	702.5	7.52	64.70	12.06
Jordan	3.29	330.1	162.4	101.3	7.79	49.18	12.40
Kuwait	7.08	1,711.2	1,506.6	185.1	5.00	88.04	8.91
Lebanon	4.71	686.5	343.4	228.0	8.35	50.02	13.27
Oman	3.28	678.2	594.5	40.6	4.13	87.66	7.98
Palestine, State of	1.57	308.1	139.6	119.2	9.7	45.30	N/A
Qatar	4.77	1,716.3	1,281.5	163.7	2.49	74.67	6.29
Saudi Arabia	50.03	1,484.6	927.0	213.3	6.36	62.44	10.86
Syrian Arab Republic	1.18	69.8	31.6	37.5	3.57	45.29	4.47
UAE	17.50	1,817.3	937.4	230.7	4.23	51.58	7.25
Yemen, Rep.	2.09	73.2	7.5	59.2	4.23	10.18	2.23
Türkiye	32.10	389.9	301.7	68.2	4.1	77.4	9.3
North Africa	34.44	176.4	83.0	82.4	5.58	46.96	7.72
Middle East	173.83	700.8	404.4	166.7	6.53	57.70	10.52
Middle East & North Africa	208.27	520.9	293.9	129.6	5.83	56.36	10.02
MENA & Türkiye	240.37	457.6	269.0	120.0	6.38	58.79	9.89
World	8,435.86	1,111.1	661.7	201.0	9.86	59.54	15.5

Source: [2], [26], [27]

Table 4. Descriptive Statistics and Normality Tests for Health Financing Indicators in MENA Countries and Türkiye							
	[L]	[M]	[N]	[O]	[P]	[Q]	[R]
Mean	12.10	771.22	496.07	159.97	5.71	55.74	9.10
Std. Deviation	14.31	839.2	583.2	146.1	1.96	18.8	4.399
Maximum	50,03	3.323,65	2.150,54	702,52	9,70	88,04	21,81
Minimum	1,18	69,83	7,45	37,49	2,49	10,18	2,23
Skewness	1.47	1.63	1.51	2.70	0.43	-0.30	1.14
Kurtosis	3.95	5.21	4.44	10.67	2.16	3.31	4.75
Type of skewness	right skewed	right skewed	right skewed	right skewed	right skewed	left skewed	right skewed
Type of kurtosis	leptokurtic	leptokurtic	leptokurtic	leptokurtic	platykurtic	leptokurtic	leptokurtic
Jarque–Bera (JB) test of normality							
Statistics	7.998	12.954	9.324	73.25	1.21	0.38	6.504
Significance value	0.018	0.002	0.009	0.00	0.55	0.83	0.039
Decision	reject	reject	reject	reject	not able to reject	not able to reject	reject
Kolmogorov-Smirnov test for normality							
Statistics	0.243	0.240	0.253	0.214	0.175	0.139	0.137
Significance value	0.003	0.004	0.002	0.017	0.111	0.200	0.200
Decision	reject	reject	reject	reject	not able to reject	not able to reject	not able to reject
Shapiro-Wilk test for normality							
Statistics	0.752	0.773	0.783	0.683	0.942	0.964	0.916
Significance value	0.000	0.000	0.000	0.000	0.265	0.627	0.096
Decision	reject	reject	reject	reject	not able to reject	not able to reject	not able to reject

Source: [2], [26], [27]

The North African region has a 685.8 billion USD "GDP"; the Middle East region has 2,455.7 billion USD; the MENA region has 3,141.5 billion USD in total; and the MENA and Türkiye together have 3,861.6 billion USD. The world's total "GDP" is 84.7 trillion USD and the MENA region with 19 countries has nearly 3.7 per cent of the total global GDP. The North African region has 3,398 USD "GDP per capita"; the Middle East region has 10,970 USD; the MENA region has 6,670 USD in total; and the MENA and Türkiye together have 7,537 USD. The world's average "GDP per capita" is 10,926 USD. The North African region has a 201.8 million "population"; the Middle East region has 261.3 million; the MENA region has 463 million in total; and the MENA and Türkiye together have 547.4 million. The world's total "population" is 7.75 billion and the MENA region with 19 countries has nearly 6 per cent of the total world population. The North African region's GDP has contracted by 1.70 per cent in 2020; the Middle East region has contacted 4 per cent; the MENA region has contracted by 3.66 per cent in total; and the MENA and Türkiye together have contracted by 2.23 per cent. The world's GDP has contracted by 3.6 per cent in total.

The North African region has 97.8 billion USD in "exports"; the Middle East region has 600.5 billion USD; the MENA region has 698.3 billion USD in total; and the MENA and Türkiye together have 868 billion USD. The world's total "exports" is 17.1 trillion USD and the MENA region with 19 countries has nearly 4.1 per cent of total global exports. The North African region has 164.9 billion USD "imports"; the Middle East region has 539.6 billion USD; the MENA region has 704.5 billion USD in total; and the MENA and Türkiye together have 924 billion USD. The world's total "imports" is 17.5 trillion USD and the MENA region with 19 countries has nearly 4.0 per cent of total global imports. The North African region has a 67.1 billion USD trade deficit; the Middle East region has a 60.92 billion USD trade surplus value; and the MENA region has a 6.17 billion USD trade deficit value in total.

The North African region's exports have contracted by 30.5 per cent, the Middle East region's exports have contracted by 37.25 per cent, the MENA region's exports have contracted by 36.4 per cent in total, the MENA and Türkiye's exports have contracted by 32.11 per cent. The global exports have contracted by 7.80 per cent on average. The North African region's imports have contracted by 21.1 per cent, the Middle East region's imports have contracted by 28.0 per cent, the MENA region's imports have contracted by 26.5 per cent in total, the MENA and Türkiye's imports have contracted by 20.9 per cent. The global imports have contracted by 8.04 per cent on average.

It seems the Middle East region has better macroeconomic indicators than the North Africa region. After the analysis, it is found that Türkiye, Saudi Arabia, UAE, Israel and Egypt seem to have the best macroeconomic indicators in order. On the other hand, Palestine seems to have the worst macroeconomic indicators with Libya, Lebanon, Bahrain and Syria (Table 5).

Türkiye has the highest value for "GDP" with 720.1 billion USD and Palestine has the minimum value of 15.6 billion USD. Qatar has the highest value for "GDP per capita" with 50,805 USD and Yemen has the minimum value of 814 USD. Egypt's GDP has the highest growth rate at 3.57 per cent and Libya's GDP has contracted with the maximum value at 31.3 per cent. Egypt has the highest "population" with 102.3 million people and Bahrain has the minimum population with 1.7 million people.

Saudi Arabia has the highest value for "exports" at 176.5 billion USD and Palestine has the minimum value at 153 million USD. Türkiye has the highest value for "imports" at 219.5 billion USD and Palestine has the minimum value at 924 million USD. Syria has the maximum export growth at 12.2 per cent and Palestine's exports have contracted with a maximum value of 86.1 per cent. Türkiye has the maximum import growth at 4.4 per cent and Palestine's imports have contracted with a maximum value of 86 per cent (Table 6).

Table 5. Basic macroeconomic indicators

Country	Exports (2020, billion USD)	Change in exports (2019-2020, %)	GDP (2020, billion USD)	GDP growth rate (2020, %)	GDP per capita (USD)	Imports (2020, billion USD)	Change in imports (2019-2020, %)	Population (2020, million)
Algeria	20.9	-42.05	145.2	-5.48	3,310	33.1	-21.6	43.9
Egypt	26.8	-12.46	363.1	3.57	3,548	60.3	-23.4	102.3
Libya, State of	8.4	-71.40	25.4	-31.30	3,699	10.8	-30.3	6.9
Morocco	27.7	-6.38	112.9	-7.12	3,009	44.5	-12.8	36.9
Tunisia	14.0	-6.43	39.2	-8.60	3,320	16.3	-24.6	11.8
Bahrain	7.9	-44.10	38.5	-5.81	23,443	8.8	-52.4	1.7
Iran, Islamic Republic of	11.8	-61.70	191.7	1.66	2,283	22.2	-36.9	84.0
Iraq	63.3	-30.64	167.2	-10.37	4,157	33.2	-35.0	40.2
Israel	49.8	-14.86	402.0	-2.44	43,611	70.2	-8.3	9.2
Jordan	8.0	-4.31	43.7	-1.55	4,283	17.0	-11.9	10.2
Kuwait	42.8	-33.63	136.2	0.00	32,373	21.5	-35.9	4.3
Lebanon	3.8	2.04	33.4	-20.30	4,891	11.4	-41.0	6.8
Oman	31.8	-24.07	76.3	0.00	15,343	17.7	-44.0	5.1
Palestine, State of	0.2	-86.14	15.6	-11.00	3,240	0.9	-86.0	4.8
Qatar	51.5	-29.38	146.4	-3.67	50,805	25.8	-11.5	2.9
Saudi Arabia	176.5	-29.90	700.1	-4.11	20,110	131.3	-9.0	34.8
Syrian Arab Republic	0.8	12.21	60.0	N/A	2,810	4.1	-33.9	17.5
UAE	151.2	-52.13	421.1	-5.90	43,103	166.3	-37.9	9.9
Yemen	1.2	-21.68	23.5	-5.00	824	9.1	-11.0	29.8
Türkiye	169.7	-6.20	720.1	1.76	8,538	219.5	4.4	84.3
North Africa total	97.8	-30.46	685.8	-1.70	3,398	164.9	-21.1	201.8
Middle East total	600.5	-37.25	2,455.7	-4.00	10,970	539.6	-28.0	261.3
MENA total	698.3	-36.38	3,141.5	-3.66	6,670	704.5	-26.5	463.0
MENA & Türkiye Aggregation	868.0	-32.11	3,861.6	-2.23	7,537	924.0	-20.9	547.4
World	17,142.1	-7.80	84,705.4	-3.59	10,926	17,469.3	-8.0	7,752.8

Source: [2], [23], [3]

Table 6. Descriptive statistics and normality tests for basic macroeconomic indicators

	Exports (2020, billion USD)	Change in exports (2019-2020, %)	GDP (2020, billion USD)	GDP growth rate (2020, %)	GDP per capita (USD)	Imports (2020, billion USD)	Change in imports (2019-2020, %)	Population (2020, million)
Mean	43.4	-28.2	193.1	-6.1	13,835.0	46.2	-28.2	27.4
Std. Deviation	56.0	25.6	216.3	8.2	16,164.0	59.0	20.0	30.4
Variance	3,136.07	654.74	46,804.28	67.87	261,275,205.05	3,475.91	401.93	924.20
Maximum	176,51	12,21	720,10	3,57	50.805,46	219,51	4,36	102,33
Minimum	0,15	-86,14	15,56	-31,30	824,12	0,92	-86,04	1,70
Skewness	1.58	-0.61	1.43	-1.70	1.21	1.87	-1.00	1.33
Kurtosis	4.07	2.72	3.90	5.92	2.98	5.41	4.58	3.55
Type of skewness	right skewed	left skewed	right skewed	left skewed	right skewed	right skewed	left skewed	right skewed
Type of kurtosis	leptokurtic	platykurtic	leptokurtic	leptokurtic	mesokurtic	leptokurtic	leptokurtic	leptokurtic
Jarque–Bera (JB) test of normality								
Statistics	9.241	1.307	7.471	15.909	4.905	16.501	5.419	6.118
Significance value	0.010	0.520	0.024	0.000	0.086	0.000	0.067	0.047
Decision	reject	not able to reject	reject	reject	not able to reject	reject	not able to reject	reject
Kolmogorov-Smirnov test for normality								
Statistics	0.243	0.115	0.253	0.193	0.310	0.287	0.128	0.246
Significance value	0.003	0.200	0.002	0.060	0.000	0.000	0.200	0.003
Decision	reject	not able to reject	reject	not able to reject	reject	reject	not able to reject	reject
Shapiro-Wilk test for normality								
Statistics	0.720	0.959	0.768	0.832	0.741	0.704	0.919	0.778443
Significance value	0.000	0.529	0.000	0.003	0.000	0.000	0.097	0.000419
Decision	reject	not able to reject	reject	reject	reject	reject	not able to reject	reject

Source: [2], [23], [3]

4. Discussion

COVID-19 has affected many countries negatively. After the WHO declared COVID-19 as a pandemic on March 11, 2020,[11] many countries, international organizations and international institutions have responded against the pandemic. Because of countries' inadequacy in the provision of preventive and treatment services in their fight against the pandemic, the unequal access to vaccination by every country, and the shrinkage of GDP, GDP per capita, foreign trade and FDI in the economies, international organizations have also supported countries. A global partnership has come into the scene to fight the pandemic. The World Bank committed COVID-19 response financing committed 4.8 billion USD for the MENA region during the April 2020-June 2021 period.[9]

With new variants, COVID-19 goes on spreading all around the world and the pandemic is still affecting many countries since they have limited capacity in the health system and health workforce. Türkiye and the MENA region together have difficulties in the fight against the pandemic. The economies are also struggling in the region with contracted GDP, GDP per capita and foreign trade values.[27] Although vaccination has started, it is still a problem due to the inequality among countries in the region.[32,33,34] Vaccination rates seem as the best accelerator for a faster recovery for some countries than others. The higher and more widespread the vaccination rate in countries, the less time there is for variants to mutate, as COVID-19 eases restrictions, allowing people to return to work and normal life, and fueling the economy as the spread of COVID-19 becomes more difficult.[35]

As of the end of July 2021, COVID-19 has affected nearly 200 hundred million people and more than 4.2 million people have died due to the pandemic. In the MENA region, cases were 12.4 million and deaths were 212 thousand.[21] Emerging new variants forced many countries with their limited health system and health workforce. Diversification in the economies has caused inequality in to access the vaccine to fight the pandemic. Health staff administered more than 4.1 billion vaccine doses in the world and there are 1.14 billion fully vaccinated people all around the world. In the MENA region, there are 36.8 million fully vaccinated people.[21]

It seems the Middle East region has not only better vaccination than the North African region but more health personnel as well. The North African region has more the number of "hospital beds per thousand" than the Middle East region total.

After the analysis, it is found that Israel, Saudi Arabia, UAE, Türkiye and Qatar are the most resilient countries in order and Yemen, Syria, Palestine, Iraq and Libya are the most vulnerable countries against the pandemic.

After the analysis, it is found that UAE, Israel, Qatar, Saudi Arabia and Bahrain seem to have the best health capacity and personnel in order. On the other hand, Yemen seems to have the worst health capacity and personnel with Iraq, Syria, Iran and Palestine.

The Middle East region has better health financing than the North African region. After the analysis, it is found that Israel, Saudi Arabia, Iran, Kuwait and UAE seem to have the best health financing in order. On the other hand, Yemen seems to have the worst health financing with Syria, Egypt, Morocco and Iraq. Governments in the MENA region made an unprecedented institutional and political effort to support households and businesses throughout the pandemic.[32] COVID-19 would exacerbate pre-existing weaknesses in the health systems of the MENA region and countries should consider implementing health finance reforms to improve sustainability and equity. They should already strengthen health information systems to provide a proactive response and should improve service delivery flexibility to minimize service disruptions.[36]

The Middle East region has better macroeconomic indicators than the North Africa region. After the analysis, it is found that Türkiye, Saudi Arabia, UAE, Israel and Egypt seem to have the best macroeconomic indicators in order. On the other hand, Palestine seems to have the worst macroeconomic indicators with Libya, Lebanon, Bahrain and Syria.

Higher economic activity with higher income per capita brings a dilemma to the MENA region to fight the pandemic. Economic activity results in mobility domestically and internationally which may cause the transmission of COVID-19, especially with the new variants. The development of the countries in the region varies so that income inequality and different level of health system capacity with health workforce among the countries end up with failure to access the vaccine and medical treatment.

The question of when will the countries in the MENA region recover economically from the global pandemic based on a return to pre-pandemic levels of GDP growth, GDP per capita, FDI, and foreign trade still stands as crucial in mind.

Research Highlights

- For the first time, the MENA countries and Türkiye were analysed together for the health system capacity, health financing and macroeconomic indicator to fight against COVID-19.
- The resilience of the countries against the

COVID-19 pandemic in the region countries was analysed for the first time.

- It seems the Middle East region has not only better vaccination than the North African region but more health personnel as well. The North African region has more "hospital beds per thousand" than the Middle East region total.
- After the analysis, it is found that Israel, Saudi Arabia, UAE, Turkey and Qatar are the most resilient countries in order and Yemen, Syria, Palestine, Iraq and Libya are the most vulnerable countries against the pandemic.
- After the analysis, it is found that UAE, Israel, Qatar, Saudi Arabia and Bahrain seem to have the best health capacity and personnel in order. On the other hand, Yemen seems to have the worst health capacity and personnel with Iraq, Syria, Iran and Palestine.

Study limitations

There were missing data for the domestic general government health expenditure as a percentage of general government expenditure for Palestine "State of", the GDP growth rate for the Syrian Arab Republic, and people fully vaccinated per hundred population for Libya "State of". The health finance data was for 2018 years for most of the countries in the study. The total and average values for North Africa, the Middle East, the MENA, the MENA and Türkiye were calculated.

All authors declare that there are no conflicts of interest. All authors declare that this research did not receive any funding for the research.

References

1. OECD. 2016. Active with MENA. https://www.oecd.org/mena/Active_with_MENA_EN.pdf (accessed August 19, 2021)
2. The World Bank. 2021. What We Do/Data. https://data,worldbank,org/ (accessed August 18, 2021)
3. International Trade Centre (ITC). 2021. International trade statistics 2001-2020. https://www.trademap.org/ (accessed August 18, 2021)
4. Trade Organization (WTO). 2021. Documents, data and resources/ WTO Data Portal. https://data.wto.org/ (accessed August 18, 2021)
5. Özsoy Ö., and M. Gürler. 2020. The Analysis of Health Expenditure as a Determinant of Economic Growth in 37 High-Income Countries. Acta Scientific Nutritional Health (ASNH) 4/9: 19-33. https://www.actascientific.com/ASNH/pdf/ASNH-04-0747.pdf (accessed August 18, 2021)
6. The World Bank. 2013. Fairness and Accountability: Engaging in Health Systems in the Middle East and North Africa. https://openknowledge.worldbank.org/bitstream/handle/10986/16109/MENA%20HNP%20Strategy%20Eng,pdf?sequence=1&isAllowed=y (accessed August 18, 2021)
7. Gürler M., and Ö. Özsoy. 2019. Exploring the relationship between life expectancy at birth and economic growth in 56 developing countries. Journal of Global Health Reports. 3:e2019001. doi:10,29392/joghr,3,e2019001
8. OECD. 2021. Foreign direct investment in figures. https://www.oecd.org/investment/FDI-in-Figures-April-2021.pdf (accessed September 5, 2021)
9. UNCTAD. 2021. World Investment Report 2021. https://unctad.org/system/files/official-document/wir2021_en.pdf (accessed September 5, 2021)
10. USAID. 2018. Health Trends in the Middle East and North Africa. https://www.hfgproject.org/health-trends-in-the-middle-east-and-north-africa/ (accessed August 19, 2021)
11. World Health Organization (WHO). 2020. WHO Timeline-COVID-19. https://www,who,int/news-room/detail/27-04-2020-who-timeline---covid-19 (accessed August 18, 2021)
12. Gürler M., and Ö. Özsoy. 2021. The Health System Infrastructure and Economic Effects of COVID-19 in OECD Countries, the Policy Responses of Nations and International Organizations against Pandemic. Diversity& Equality in Health and Care. 18/4: 278-295. https://diversityhealthcare.imedpub.com/the-health-system-infrastructure-and-economic-effects-of-covid19-in-oecd-countries-the-policy-responses-of-nations-and-internation.php?aid=36658 (accessed August 18, 2021)
13. Asbu, E.Z., M.D. Masri, and A. Kaissi. 2017. Health status and health systems financing in the MENA region: roadmap to universal health coverage. Global Health Research and Policy. 2/25. DOI 10.1186/s41256-017-0044-9
14. Türkiye Republic Ministry of Treasury and Finance. 2021. Merkezi Yönetim Bütçe İstatistikleri. https://muhasebat.hmb.gov.tr/merkezi-yonetim-butce-istatistikleri (accessed August 18, 2021)
15. OECD. 2014. Geographic Variations in Health Care: What do we know and what can be done to improve health system performance? OECD Health Policy Studies. https://www.oecd.org/els/health-systems/

FOCUS-on-Geographic-Variations-in-Health-Care.pdf (accessed August 19, 2021)

16. Deloitte. 2016. 2016 Global Health Care Outlook: Battling costs while improving care. https://www2,deloitte,com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-2016-health-care-outlook,pdf (accessed August 19, 2021)
17. Dhaoui I. 2019a. Achieving Sustainable Development Goals in MENA countries: an Analytical and Econometric Approach. hal-02075484f. https://hal.archives-ouvertes.fr/hal-02075484/document (accessed August 19, 2021)
18. Dhaoui I. 2019b. Healthcare system efficiency in MENA countries. Economic Research Forum (ERF) Policy Portal. https://theforum.erf.org.eg/2019/10/14/healthcare-system-efficiency-mena-countries/ (accessed August 19, 2021)
19. UNICEF. 2021. Middle East and North Africa, Health. https://www.unicef.org/mena/health (accessed August 19, 2021)
20. WHO. 2021a. Alliance for Health Policy and Systems Research, Identification of Priority Research Questions Related to Health Financing, Human Resources for Health, and the Role of the Non-State Sector in Low- and Middle-Income Countries of the MENA Region. https://www.who.int/alliance-hpsr/projects/middleeast-polforum/en/ (accessed August 19, 2021)
21. Our World in Data. 2021. Statistic and Research/Coronavirus Pandemic (COVID-19). https://ourworldindata.org/coronavirus (accessed August 29, 2021)
22. IMF. 2021. IMF DataMapper. World Economic Outlook April 2021. https://www.imf.org/external/datamapper/datasets/WEO (accessed August 29, 2021)
23. UNDP. 2021. Human Development Reports/Life expectancy at birth (years). http://hdr.undp.org/en/indicators/69206# (accessed August 29, 2021)
24. WHO. 2021b. The Global Health Observatory. https://www.who.int/data/gho/data/indicators (accessed August 29, 2021)
25. UN. 2021. UNDATA- a world of information. https://data.un.org/_Docs/SYB/CSV/SYB63_325_202009_Expenditure%20on%20Health.csv (accessed August 29, 2021)
26. Palestinian Central Bureau of Statistics (PCBS). 2021. Home/Percentage Distribution of Current Expenditure on Health in Palestine by Financing Agents, 2000-2019. https://www.pcbs.gov.ps/statisticsIndicatorsTables.aspx?lang=en&table_id=869 (accessed August 29, 2021)
27. IBM. 2021a. IBM SPSS Statistics. https://www.ibm.com/products/spss-statistics (Accessed August 29, 2021)
28. EViews. 2021. Innovative Solutions for econometric analysis, forecasting & simulation. https://www.eviews.com/home.html (accessed August 29, 2021)
29. Mishra, P., C. M. Pandey, U. Singh, A. Gupta, C. Sahu, and A. Keshri. 2019. Descriptive statistics and normality tests for statistical data. Annals of cardiac anaesthesia. 22/1: 67–72. https://doi.org/10.4103/aca.ACA_157_18 (accessed October 28, 2021)
30. Minitab. 2015. Choosing Between a Nonparametric Test and a Parametric Test. https://blog.minitab.com/en/adventures-in-statistics-2/choosing-between-a-nonparametric-test-and-a-parametric-test (accessed August 29, 2021)
31. WHO. 2021c. Regional Office for the East Mediterranean/Eastern Mediterranean Health Observatory. https://rho.emro.who.int/Indicator/TermID/70 (accessed August 29, 2021)
32. OECD. 2020. OECD Policy Responses to Coronavirus (COVID-19)/ COVID-19 crisis response in MENA countries. https://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-mena-countries-4b366396/ (accessed August 31, 2021)
33. Dabrowski M., and M. Domínguez-Jiménez. 2021. The socio-economic consequences of COVID-19 in the Middle East and North Africa. https://www.bruegel.org/2021/06/the-socio-economic-consequences-of-covid-19-in-the-middle-east-and-north-africa/ (accessed August 31, 2021)
34. Younis N.K., M. Rahm, F. Bitar, and M. Arabi. 2019. COVID-19 in the MENA Region: Facts and Findings. J Infect Dev Ctries. 15: 342-349. DOI: 10.3855/jidc.14005
35. Koop, A. 2021. When Will Your Country Recover from the Pandemic? Visual Capitalist. https://www.visualcapitalist.com/when-will-your-country-recover-from-the-pandemic/ (accessed September 5, 2021)
36. Duran D. and R. Menon. 2021. A year after patient zero: Essential health services and systems in MENA. The World Bank Blogs. https://blogs.worldbank.org/arabvoices/year-after-patient-zero-essential-health-services-and-systems-mena (accessed August 31, 2021)