

# Covid-19 and Food Security Challenges in the MENA Region

Dina Atef Mandour

# **COVID-19 AND FOOD SECURITY CHALLENGES IN THE MENA REGION**

Dina Atef Mandour<sup>1</sup>

**Working Paper No. 1506**

**November 2021**

**Send correspondence to:**

Dina Atef Mandour

Cairo University

[dinamandour@feps.edu.eg](mailto:dinamandour@feps.edu.eg)

---

<sup>1</sup> Assistant Professor, Faculty of Economic and Political Science, Cairo University.

First published in 2021 by  
The Economic Research Forum (ERF)  
21 Al-Sad Al-Aaly Street  
Dokki, Giza  
Egypt  
[www.erf.org.eg](http://www.erf.org.eg)

Copyright © The Economic Research Forum, 2021

All rights reserved. No part of this publication may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without permission in writing from the publisher.

The findings, interpretations and conclusions expressed in this publication are entirely those of the author(s) and should not be attributed to the Economic Research Forum, members of its Board of Trustees, or its donors.

## **Abstract**

Apart from being a health crisis in the first place, COVID-19 at its core is an economic as well as a food security potential crises. This paper assesses the link between the pandemic and food security status with special focus on the MENA region. It highlights the different channels through which the pandemic could impact the status of food security, with its different pillars including affordability, availability, and utilization. Globally as well as in the MENA region, COVID has mainly affected the affordability and utilization pillars of FS, and had negligible effects on the availability pillar, at least in the interim. To understand the link between food insecurity and the pandemic, the study employs two types of datasets and correspondingly two equations were estimated using two different indicators for measuring food security and two indicators to proxy the effect of the pandemic. The two approaches confirmed that the variability in food security status across all countries is significantly negatively related to the pandemic stringency on global and MENA region levels. The empirical assessment has drawn vivid attention to the relative importance of the role of institutional and demographic prerequisites, consecutively, needed to handle the pandemic in explaining the food insecurity variability across all countries, compared to the effect of the stringency of the pandemic as measured by the number of confirmed cases. Regression results have put the MENA region at a disadvantaged situation, compared to the rest of the world, regarding its coping capacity limitations as represented by the weak governance, high prevalence of corruption and fragile health systems in explaining countries' variability in food security levels. COVID has thus the potential of being the catalyst that would intensify the urgency to undertake radical reforms in food systems and to revisit several directly and indirectly related structural and institutional rigidities that have affected accessibility and utilization pillars in MENA region.

***JEL classification:*** H55, I12, I31, Q18

***Keywords:*** Food security, Food insecurity, Covid-19, Pandemic, Middle East and North Africa

## ملخص

بخلاف أن فيروس كورونا كوفيد 19 يعتبر أزمة صحية في المقام الأول، فهو يمثل في الأساس أزمة اقتصادية وكذلك أزمة أمن غذائي محتملة. تهدف هذه الورقة إلى تقييم العلاقة بين جائحة كوفيد 19 ووضع الأمن الغذائي مع تركيز خاص على منطقة الشرق الأوسط وشمال إفريقيا، وتسلط الدراسة الضوء على القنوات المختلفة التي يمكن للوباء من خلالها التأثير على وضع الأمن الغذائي بركائزه المختلفة بما في ذلك تكاليف الغذاء، وتوافره، واستخدامه. لقد أثرت الجائحة عالمياً وكذلك في منطقة الشرق الأوسط وشمال إفريقيا بالأساس على ركيزتي القدرة على تحمل تكاليف الغذاء واستخدامه مع تأثير طفيف على ركيزة توافر الغذاء، على الأقل مؤقتاً. ولفهم العلاقة بين انعدام الأمن الغذائي والجائحة، استخدمت الدراسة نوعين من قواعد البيانات وتم تقدير معادلتين في المقابل باستخدام مؤشرين مختلفين لقياس الأمن الغذائي ومؤشرين لتمثيل تأثير الجائحة. أكد النهجان أن التباين في حالة الأمن الغذائي في جميع الدول يرتبط ارتباطاً سلبياً بدرجة حدة الجائحة على المستوى العالمي وعلى مستوى منطقة الشرق الأوسط وشمال إفريقيا. لفت التقييم التجريبي الانتباه إلى أهمية دور المتطلبات المؤسسية والديموغرافية، على التوالي، اللازمة للتعامل مع الجائحة بشكل أكبر نسبياً من دور درجة حدة الجائحة مقاسه بعدد الاصابات المؤكدة في شرح تباين وضع الأمن الغذائي بين الدول. وأوضحت نتائج الانحدار اللوجيستي إلى أن منطقة الشرق الأوسط وشمال إفريقيا في وضع ضعيف نسبياً، مقارنة ببقية العالم، من حيث محدودية قدرتها على مواجهة الأزمة والتكيف معها نتيجة لضعف الحوكمة وانتشار الفساد وهشاشة الأنظمة الصحية والتي تفسر التباينات القطرية في مستويات الأمن الغذائي. وعليه فالجائحة قد تمثل المحرك الأساسي الذي يمكنه أن يسלט الضوء على الكثير من نقاط الضعف ويبرز الحاجة الملحة لتطبيق الإصلاحات الجذرية في النظم الغذائية وكذلك لإعادة النظر في العديد من أوجه الجمود الهيكلية والمؤسسية ذات الصلة المباشرة وغير المباشرة التي تؤثر على ركائز إتاحة الغذاء واستخدامه في المنطقة.

## **Introduction**

COVID-19 escalated from a public health emergency to a global pandemic on 11 March 2020, as declared by the World Health Organization (WHO). The pandemic has been described as “an extraordinary situation” where it represents a crisis of a unique nature that has affected all countries across the globe, regardless of their economic status (ITC, 2021). Analogously and within each country, most economic segments and actors were negatively affected, though with different intensities. The COVID-19 crisis is multidimensional; at the outset it is a health crisis, but at its core it is an economic and a food security (FS) potential crises, making it a triple shock (Erokhin and Gao, 2020; Mouloudj et. al., 2020). The impact of COVID-19 on FS is still unfolding, but as articulated by the United Nations (UN) in 2020, it could represent “an impending global food emergency of unknown, but likely very large proportions.”, (UN, 2020b).

The Food and Agriculture Organization (FAO) has declared that the FS of around 820 million people will be hard hit by the crisis, 62 and 31 percent of which are concentrated in Asia and Africa, respectively (Oraikat, 2020). The most substantial increase in the number of people suffering from acute hunger in 2020 is likely to be concentrated in the least developed countries (LDCs) of Sub Saharan Africa and the developing economies of the Middle East and North Africa (MENA) and Latin America (Erokhin and Gao, 2020). Some forecasts suggest the addition of 83 to 132 million people to the ranks of the undernourished in 2020 due to COVID-19 (FAO et al., 2020). Moreover, with the shrinkage of global trade that can reach a decline of 32 percent, food supply chains would be highly disrupted (Petetin, 2020). The pandemic has posed considerable challenges and risks in an array of areas and dimensions. Among such challenges is the momentum of the Sustainable Development Goals (SDGs), which is likely to stagnate and thereby cause many of the goals on top of the development agenda to recede. Furthermore, COVID-19 is highly expected to cancel out most of the previous and ongoing efforts and initiatives undertaken to improve the FS status in many countries (Kinsey et. al, 2020).

Combined with a sharp resource deviation towards the health sector and the significant drop in income it is highly expected to have inflated food insecurity (FI) rates across the globe, especially in countries with an initial alarming FI status. The MENA region is among the highly vulnerable regions in the world – together with Sub Saharan Africa and Latin America – subject to suffer from acute hunger amid the COVID-19 crisis (Erokhin and Gao, 2020). The MENA region has been strained by relative scarcity of natural resources, political conflicts, and macroeconomic instabilities which has put its pre-pandemic FI status on the edge. The pandemic is highly expected to further magnify the pre-existing weaknesses in several MENA countries, where the combination of weak institutions with disruptions to food supply chain and food aid will deepen the stringency of the crisis (FAO, 2020). The initial FI status in many countries in the region defines, to a great extent, the degree of vulnerability to such crises that could hinder them from an optimal response to the crisis (Mandour, 2017). The macroeconomic performance and FS management signal another source of their fragility in facing the COVID-19 crisis. Yet,

as much as COVID-19 could potentially result in alarming risks and threats to FS rates, the picture is not totally gloomy, as global food availability has so far been adequate and there have been no worrisome price hikes. Still, the pandemic is unfolding daily, and uncertainties haunt the whole picture of its consequential effects.

This paper aims to assess the link between COVID-19 and FS status with a special focus on MENA<sup>2</sup> countries in a trial to classify them according to the degree of risk to which they could be susceptible. The study aims to outline the main transmission channels through which the crisis could affect FS, particularly in the MENA region. Analyzing the various dimensions of FS including affordability, availability, and utilization is another goal of the study to highlight the challenges and strengths that the region could possibly encounter. Within this context, the paper highlights the specific nature of MENA countries regarding the impact of the crisis on FS status and the factors behind the variations of such an impact. Finally, the study intends to quantitatively assess the impact of the pandemic on FS across countries with a special emphasis on the relative situation of the MENA region.

The paper is structured as follows. Section one represents the conceptual framework of the study, elaborating the transmission mechanisms through which the pandemic can affect FS and providing a short literature review on the studies that analyzed the effect of the crisis on FS in developing countries. Section two portrays the status of food security in the MENA region to comprehend the status of FS before and during the COVID-19 crisis. Section two also outlines the various measures undertaken by MENA countries to mitigate the negative impacts of the pandemic. The quantitative analysis is undertaken in section three, where a cross-sectional regression is applied to empirically investigate the nature of the relationship between the pandemic and the status of FS with a special emphasis on the effect on MENA countries. Section four concludes and highlights the policy implications.

### **1. An overview of food security and the special nature of the COVID-19 crisis**

The effect on FS is largely defined by its initial status before the outbreak. After a decade of declining trends in the number of undernourished worldwide since 2005,<sup>3</sup> the figure started to take an upward shift since 2015, witnessing an escalation of three percentage points from 2014 to 2018 (Fan et. al, 2020). In 2019, around 821 million people (representing around ten percent of the world's population) were suffering from hunger, and another 690 million were undernourished (8.9 percent) adding up to 60 million since 2014 (GHI, 2020). In the same year, the number of people in acute FI reached its peak value since 2016 (Fan et. al, 2020). Hence, the status of FS was already experiencing a relapse before the onset of the pandemic in 2020. By the

---

<sup>2</sup> The paper follows the World Bank classification where the MENA countries include Jordan, Egypt, Syria, Qatar, Iran, Algeria, Bahrain, Djibouti, the West Bank and Gaza, Iraq, Israel, Libya, Kuwait, Lebanon, Malta, Morocco, Oman, Saudi Arabia, Tunisia, the United Arab Emirates, and Yemen.

<sup>3</sup> <https://ourworldindata.org/grapher/global-population-defined-as-undernourished>

end of 2020, and as a result of the ongoing repercussions of the pandemic, food supply had been restricted for an additional 260 million people. Moreover, the impact could be exacerbated by the effect of natural disasters, armed conflicts, and political unrest that – together with the COVID-19 shock – could lead to a twofold figure for food-insecure people worldwide (Ling Ma et. al., 2021).

As long as the pandemic and its aftermath are still unfolding, it is extremely difficult to arrive at a clear assessment of its impact on FS. At the outset, there seems to be a positive link between countries' ability to handle the pandemic according to their structural, demographic, economic, and institutional rigidities as expressed by the INFORM COVID-19 Risk Index<sup>4</sup> and FI as depicted in Figure 1. In fact, most studies found a significant adverse impact of COVID-19<sup>5</sup> on measures of FS with a high degree of country/macro, sector/commodity and household/micro level contingency (Mouloudj et. al., 2020). For example, Amare et. al. (2020) found that a 100 percent increase in the number of confirmed cases in Nigeria raised households' FI levels by two to three percentage points and resulted in the shrinkage of economic activities by one to three percentage points. On the other hand, relatively harsher negative impacts were indicated on households relying on non-farm businesses, those with school-aged children, and those living in remote and conflicted-affected zones. Elshahoryi et. al. (2020) concluded, through a cross-sectional analysis, that the pandemic had a negative effect on food supply and demand and weakened the purchasing power and capacity to produce and distribute food in Jordan. Such studies identified that the poor segments of the societies (including casual workers and the informal sector in general) are the most vulnerable groups subject to job losses.

On the demand side, the percentage of income spent on food is higher in poor segments, implying a more drastic effect on their FS levels. On the supply side, labor represents the major (if not the only) productive asset for the poor compared to the rich, making the lockdown effect likely to be substantial for the poor when compared to the rich (Swinnen and McDermott, 2020). Further, a number of studies indicated that the economic slowdown will be accompanied by a decline in income and rise in unemployment and poverty levels, all of which can affect the consumption habits of food products by shifting from the high-income elastic products to low-income elastic products (Schmidhuber et. al., 2020; Swinnen and McDermott, 2020; Workie et. al., 2020). Such an impact is likely to affect the accessibility and utilization pillars of FS arising mainly from income effects.

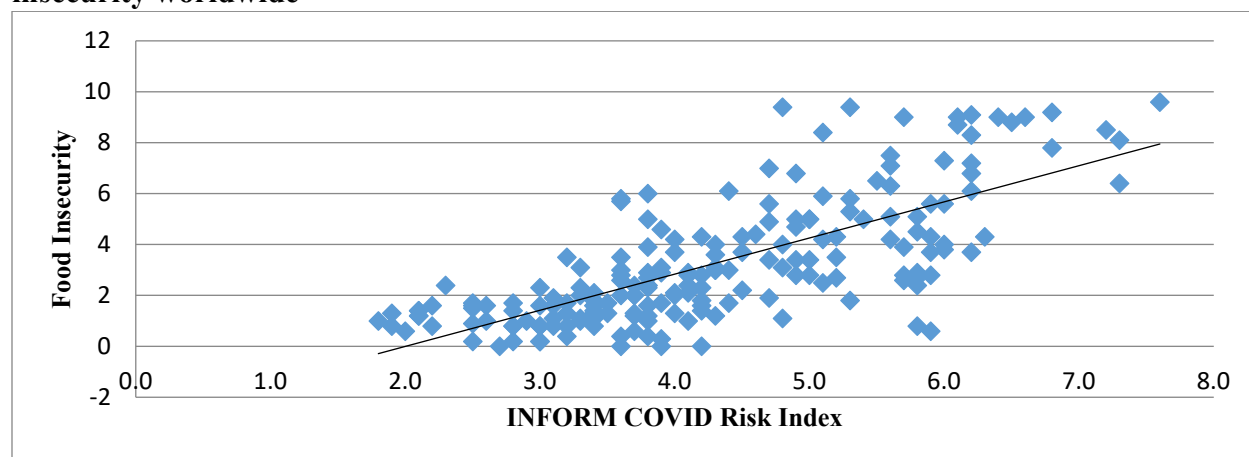
---

<sup>4</sup> More elaboration on the INFORM COVID-19 Risk Index is given in section three.

<sup>5</sup> The majority of the studies took the number of confirmed cases as a measure for the intensity of the crisis.



**Figure 1. COVID-19 Readiness Risk Index (INFORM COVID-19 Risk Index) and food insecurity worldwide**



Source: Adapted from Poljanšek et al. (2020); European Commission (2020).<sup>6</sup>

Likewise, the country-specific outcomes of the FS impacts of COVID-19 were constantly noted. For example, low-income countries with high food import dependency, high political instability, or those experiencing war or conflict and high agriculture contribution to GDP were perceived as more prone to be strongly hit by the crisis (Udmale et al., 2020). Erokhin and Gao (2020) also found a positive significant relationship between the number of registered COVID-19 cases and FI across 45 developing countries.

High-income countries depend more on intermediate inputs for their agricultural production processes and are hence more susceptible to a disruption in the input supplies. (Schmidhuber et al., 2020). On the other spectrum, a number of studies reached the conclusion that the majority of the developed world is found to be relatively resilient to food supply shocks (Mouloudj et al., 2020; Udmale et al., 2020). In contrast to low-income countries, upper-middle-income economies are deeply integrated into global capital and the technology intensive supply chains of value-added food products, enabling them to adapt to the crisis and contain the shock.

The COVID-19 pandemic affects all FS pillars, again with an uneven country-specific impact (Niles et al., 2020). Erokhin and Gao (2020) found that it affects the availability pillar in high income developing countries compared to low income ones where in the latter the effect is more evident on the accessibility (food inflation) pillar. As much as the impact of the pandemic is still unfolding, there is still controversy regarding who is impacted and in which direction. To arrive at a clear picture of how COVID-19 affects FS, the main transmission channels by which different aspects of FS are likely to be impacted are discussed below.

<sup>6</sup> <https://drmkc.jrc.ec.europa.eu/inform-index/inform-covid-19>

*Is the crisis driven by the supply side or the demand side?*

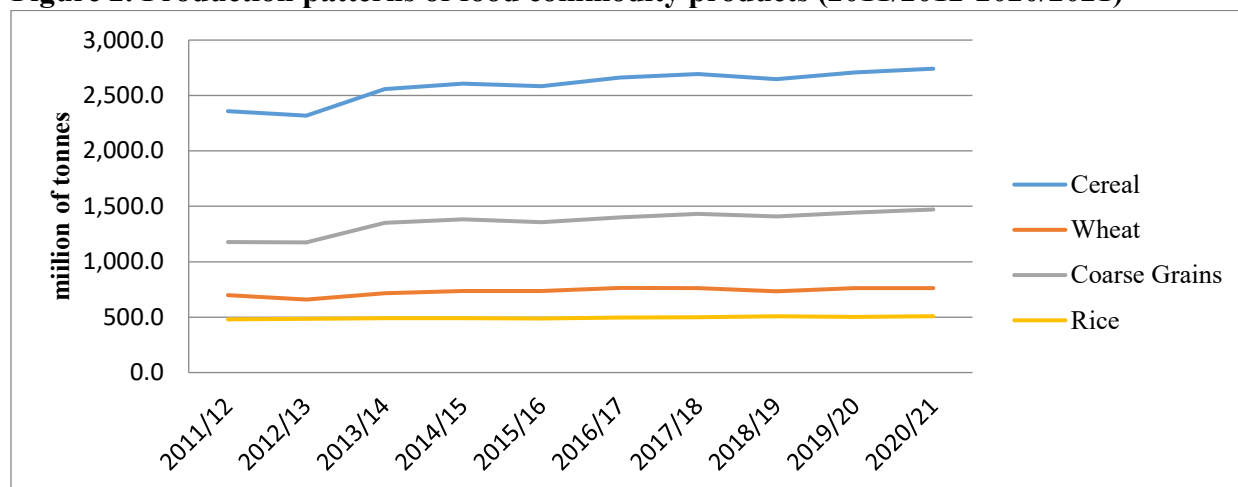
Despite the pessimistic forecast due to the aforementioned challenges, the Food and Agriculture Organization (FAO, 2020) stated that the production levels of the main food products, including wheat, coarse grains, cereals, and rice have remained relatively stable in 2020. The current global stock to utilization ratios are closer to their normal values, implying no significant bottlenecks in the supply of the global market for main food staples (see Figures 2 and 3). As FAO (2020) emphasized, there is an ample availability of cereals to meet global demand. FAO also forecasted a comfortable cereal stock-to-use ratio of 30.7 percent by the end of 2020.

So far, the crisis does not seem mainly supply side driven, especially when compared to the 2007/2008 crisis. Thus, it is perceived that the availability pillar will be the least affected during the pandemic, where the overall global picture of the food world market seems to be comforting, as depicted by the International Food Policy Research Institute (IFPRI, 2020). Figures 2 and 3 identify that the global production patterns of major food commodities have remained relatively stable with no disruption effect from COVID-19. Such a generalization needs to be treated cautiously as the impact differs from one product to the other, where cereals and grains are less affected compared to fruits and vegetables (Erokhin and Gao, 2020). However, the scene is changing gradually with the perpetuation of the pandemic, where recent FAO projections are retreating from former declarations, drawing some alarming signals within the availability pillar. FAO has amended its projections where the world cereal utilization in 2020/2021 is now expected to increase by 1.9 percent from 2019/2020, while worldwide cereal stocks are expected to decline but still with relatively comforting levels.<sup>7</sup> Nevertheless, such new shifts in expectations should be seriously considered as it is now declared that global hunger could double due to the food supply disruptions caused by the pandemic, especially in poor nations and Africa (Zurayk, 2020).

---

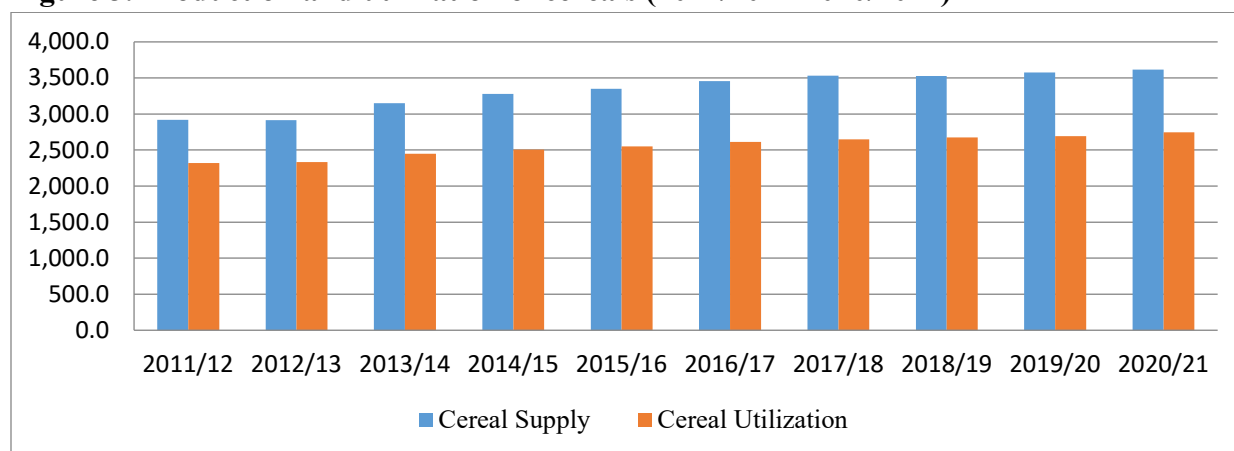
<sup>7</sup><http://www.fao.org/news/story/en/item/1334280/icode/#:~:text=3%20December%202020%2C%20Rome%20%2D%20Global,United%20Nations%20report%20released%20today.&text=The%20FAO%20Cereal%20Price%20Index,higher%20than%20in%20November%202019>

**Figure 2. Production patterns of food commodity products (2011/2012-2020/2021)**



Source: Adapted from FAO (2020).

**Figure 3. Production and utilization of cereals (2011/2012-2020/2021)**



Source: Adapted from FAO (2020).

*Is the crisis highly affected by supply chain bottlenecks?*

Most studies identified food supply chains to be the main vulnerable transmission channel prone to disruptions in this crisis. The effect of this channel differs according to the nature of product as identified by the IFPRI (2020a), from a low effect on basic staples such as rice, wheat, and maize to more significant effects on fruits and vegetables that have a more complex supply chain on the global level (since they are perishable). Moreover, the effect differs according to the type of product and whether it is a final product or an input; final products are disrupted in a faster manner than inputs, which react with a lag. In addition, the intensity of labor versus capital in the commodity production process is another factor where capital is less disrupted compared to labor, which is affected by the pandemic and the associated precautions like lockdowns and confinements. The technology status, logistical facilities, and level of economic development are all factors that result in a variation of the impact. Moreover, the disruptions are asymmetric in

terms of global versus domestic value chains, where global capital and technology intensive value chains are more resilient to the crisis when compared to domestic ones. The level of sophistication and diversification of risk for global value chains enable them to better address the challenges associated with interruptions in the downstream and upstream channels of production (Amjath-Babu, 2020; Swinnen and McDermott, 2020). Supply chains concentrated in labor-intensive segments represent a main pathway that affects FS. Global supply chains and those associated with high-income countries have been more resilient because trade is mostly undertaken by large enterprises in coordinated and capital-intensive supply chains that can mostly adjust to disruptions geographically and temporally. Within domestic value chains in developing countries, COVID-19 and lockdowns have mixed effects. Large scale companies are generally less labor intensive but rely more on hired labor (affected mainly by lockdowns), while small- and medium-sized enterprises (SMEs) are more labor intensive but use more family labor (not affected by lockdowns). These different labor structures have influenced how resilient domestic value chains have been in the face of health challenges and social distancing regulations (Swinnen and McDermott, 2020).

*Is the crisis price driven or income driven?*

The International Monetary Fund (IMF)<sup>8</sup> projected a 4.4 percent slowdown in the global economy in 2020 as a result of the pandemic. This economic slowdown and the consequently rising poverty and reduction of income levels, accompanied by the extreme increases in unemployment rates, can result in a disrupted world food market and a worsening FS status (Schmidhuber et al., 2020). While food consumption is generally inelastic with regard to income, large differences exist between high-income and low-income countries as well as high-income and low-income strata within countries. In low-income countries, or in poorer segments of high-income countries, income responsiveness is generally higher and aggregate food demand may contract. There are also considerable differences in income responsiveness across food items. The demand for food staples, such as grains, is generally less elastic than the demand for fruits and vegetables or meat and dairy products. Poorer consumers will try to maintain a stable calorie intake and, due to their smaller food budget, shift away from more expensive and more nutritious foods, such as fruits, vegetables, meat, and dairy products, to cheaper staples such as grains (Amjath-Babu et al., 2020). On the other hand, food demand in high-income countries is inelastic, safety nets are well-developed, and governments have been quick to cushion possible hardships (Schmidhuber et al., 2020).

Regarding prices, from the beginning of the crisis till March 2020, the FAO Cereal Price Index was declining by 1.9 percent compared to February 2020 and approaching almost the same level of March 2019 (Figure 5). Large global supplies, combined with generally favorable crop prospects and low world energy prices, kept international wheat prices under downward

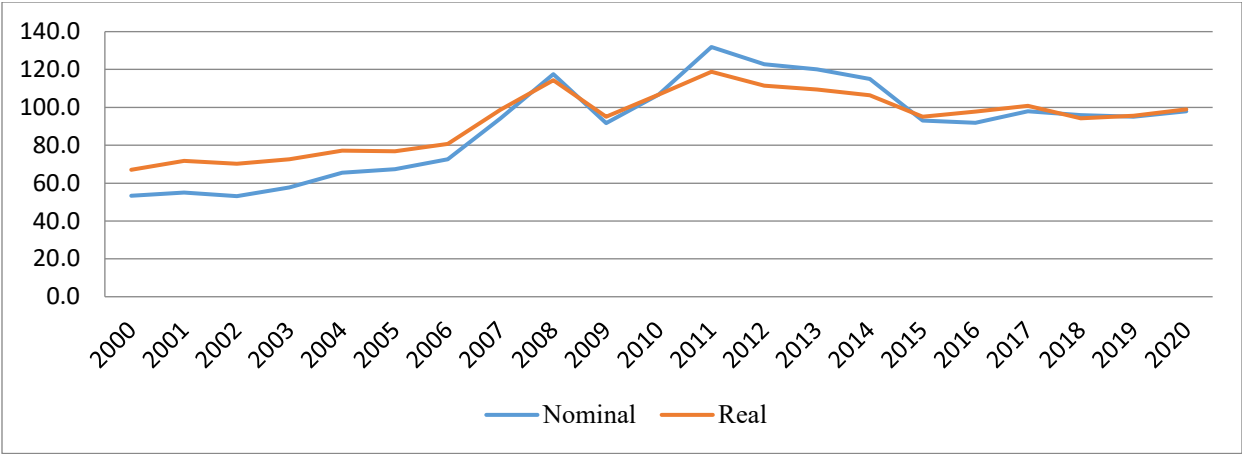
---

<sup>8</sup> <https://www.cnbc.com/2020/10/13/imf-world-economic-outlook-2020-amid-coronavirus-crisis.html>

pressure. The same trend applied on the FAO Food Price Index, which went down by 4.3 percent in March 2020 compared to February. The sharp decline in March was largely driven by COVID-19 pandemic-demand contractions. Nevertheless, since April 2020, there have been slight increases in the prices of the major food staples in the global market. As shown in Figures 4 and 5, the price trends of major food commodities have been slightly increasing, but with no comparison to the price surges in the 2007/2008 crisis. As depicted by FAO (2020), the rate of price increases over 2020 has been moderate, where the FAO Food Price Index recorded an increase of 2.9 points in 2020 compared to 2019, reaching a score of 97.9 points which is still below its 2011 peak of 131.9 points.<sup>9</sup> However, more recent price changes rendered the picture more worrisome, where world food prices trends are reversing. Global food commodity prices rose sharply in November 2020 to their highest level in six years, where the FAO Food Price Index increased by 3.9 percent compared to October 2020 and 6.5 percent from November 2019. The rise continued in December 2020 by an additional 2.2 percent, rendering the FAO Food Price Index to record a high of 107.5 points in December 2020, hence registering the sharpest increase since July 2012.

Despite such recent increases, food prices do not seem to be the major culprit underlying this crisis. The expected decline in incomes of the different social groups, and especially the informal sector and vulnerable poor segments of the society, represent a major risk on the demand side (Erokhin and Gao, 2020). However, the strong recessionary wave associated with the recent price hikes puts the accessibility pillar under jeopardy. Moreover, the relative availability of food staples and the greater exposure of labor-intensive food products, such as vegetables and dairy products, to adverse effects emanating from the pandemic would lead to a deterioration in diet quality (Schmidhuber et al., 2020).

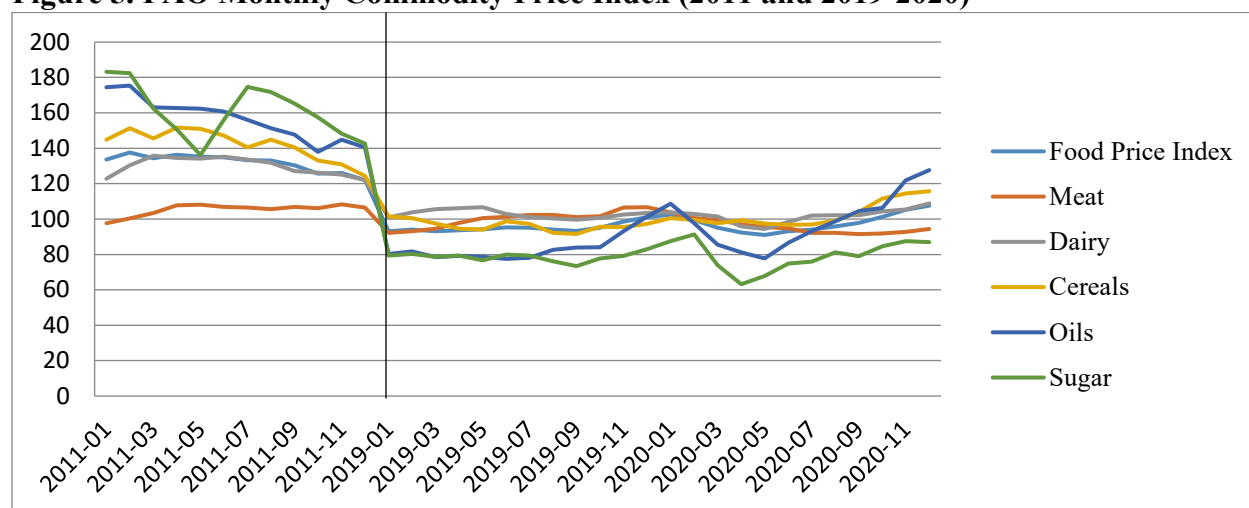
**Figure 4. Annual nominal and real FAO Food Price Index (2014-2016=100) from 2000 till 2020**



Source: Adapted from FAO. <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

<sup>9</sup> <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

**Figure 5. FAO Monthly Commodity Price Index (2011 and 2019-2020)**



Source: Adapted from FAO. <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

#### *Is the crisis different from the 2007/2008 crisis?*

There are many respects in which the COVID-19 crisis differs significantly from the 2007/2008 food crisis in terms of implications for FS. The 2007/2008 crisis was triggered by different reasons when compared to the COVID-19 crisis. The former was associated with high fuel prices and was mainly a food crisis where responses by governments escalated its depth while the latter is a byproduct of a health and, subsequently, an economic crisis where trade policies were also resorted to but still have not dominated the scene as a major response. The former was mainly supply driven, accompanied by wrong and egoistic government interventions, which led to the skyrocketing of prices of food staples in the world market (Pinstrup-Anderson, 2015). The pandemic crisis suffers from both supply and demand aspects, where demand plays a more significant role and problems associated with supply chains and logistics are at the core of crisis.

The 2007/2008 food price crisis showed that the panic about food availability and trade-restrictive policy responses can have detrimental effects, where such responses triggered almost 50 percent of the price surge. Even food importing countries at that time, being worried about the higher cost of food, lowered the import tariffs on food which supported demand but kept upward pressure on world prices. As a result, instead of containing price increases, these policy responses only drove world market prices higher (Glauber et al., 2020).

Likewise, part of the potential negative impacts of the pandemic on FS can be attributed to the opted rescue measures undertaken by main food exporters and importers to contain this adverse impact of the crisis. It does not seem that countries have learnt the lesson from the previous crisis; some countries followed the same suit, such as hoarding behavior in response to the pandemic, and opted for more trade restrictions in an effort to achieve food sufficiency to put FS aside. Some countries have started imposing export restrictions, which could disrupt the global markets even if imposed temporarily. Examples include Kazakhstan, which suspended the export

of several cereal products, oilseeds, and vegetables, and Vietnam, which stopped suspending the issuing of rice export licenses. Russia followed suit and announced that it will ban wheat exports. Kazakhstan is not a major wheat exporter (three percent of the global wheat exports) and hence its restrictions are not likely to affect the world market. However, Russia is a major wheat exporter and Vietnam is a major rice exporter, so their actions are likely to disrupt the world markets. The fear is that other countries will follow suit and apply the same measures, which can have substantial drastic effects on the world food market, and consequently on the FS status (Erokhin and Gao, 2020; Udmale et al., 2020).

Such binding restrictions amid COVID-19 triggered food supply shortages and affected around five percent of globally traded calories compared to 19 percent in the 2007-2008 crisis.<sup>10</sup> Though the five percent figure might incline a small effect, a retaliation effect might continue to take place, which could further deepen the crisis. It is currently expected that current export bans could last longer as the pandemic is still ongoing and major food exporters are still fighting the pandemic (Fan et al., 2020). Yet, it might be the case if the world food 2007/2008 crisis had not occurred; countries would have been in a much worse position facing the pandemic as now they are already prepared for availability and have a kind of emergency plan to partially contain the panic, based on their experience with the former food crisis.

## **2. Food security in MENA and the potential impact of the COVID-19 crisis**

### **2.1. Status of food security and COVID-19 in MENA**

Initial pre-COVID-19 FS prospects within the MENA region are not comforting. The MENA region holds the second rank after the Sub Saharan countries with the highest prevalence of undernourishment (Figure 6). Several countries in the region are highly vulnerable and their FS status has been worsening over time. The region as a whole is among the largest world food importers; on average, each country imports more than 50 percent of the calories it consumes. Utilization is the weakest FS pillar in the region, with around 52 million people suffering from obesity and other food related diseases such as diabetes (Karasapan, 2020). Moreover, the region includes two of the top ten countries in the world enduring the highest severity of food crises, amounting to 53 and 36 percent of the populations in Yemen and Syria, respectively (GRFC, 2020). Along with Yemen and Syria, Iraq, Libya, and Palestine experience one of the alarming conflict-related humanitarian emergencies (FAO, 2020). This makes conflict and instability main triggers of FI in the region (GRFC, 2020). According to the Global Hunger Index (GHI), Yemen and Syria reached extreme alarming scores (35-49.9),<sup>11</sup> followed by Iraq (17.1) and Egypt (11.9) having two-digit GHI scores and classified as a moderate yet still high degree of risk (see Table 2 in the annex).

---

<sup>10</sup> <https://www.ifpri.org/project/covid-19-food-trade-policy-tracker>

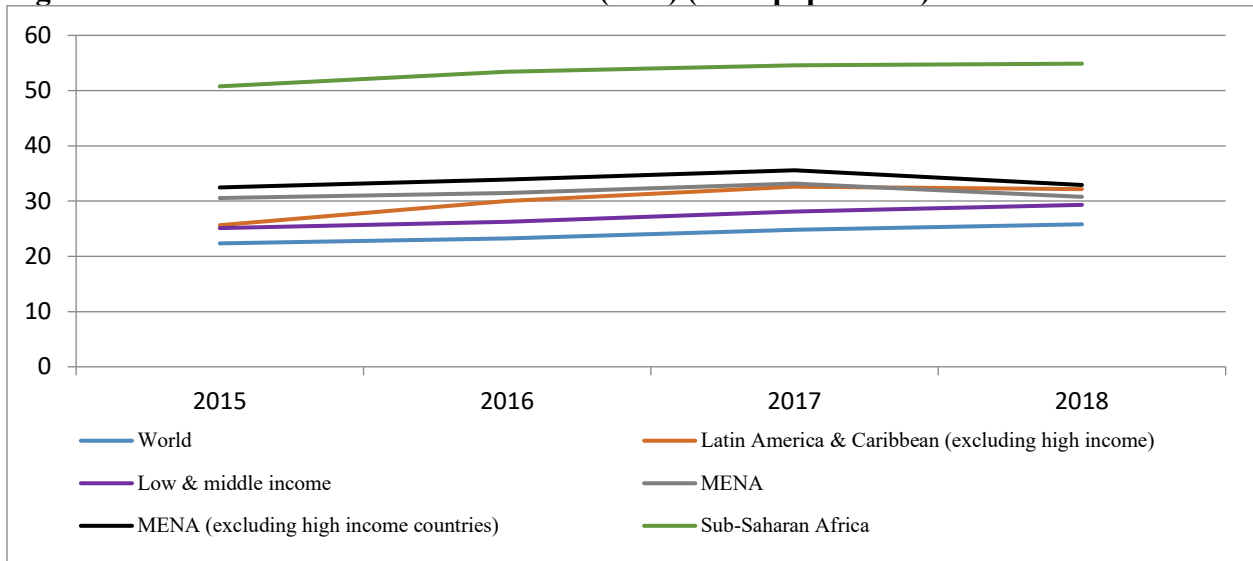
<sup>11</sup> <https://www.globalhungerindex.org/ranking.html>

In countries as Lebanon, Turkey, and Jordan, refugees face also severe degrees of FI (Figure 7). Gulf Cooperation Council (GCC) countries are home for a huge number of migrant workers, forming a considerable percentage of the population exceeding 80 percent in the United Arab Emirates (UAE), 70 percent in Qatar and Kuwait, and 30 percent in Bahrain, Saudi Arabia, and Oman (Woertz, 2020). This substantial category of the population faces several degrees of discrimination where they are not covered by subsidy schemes like normal citizens and are deprived from basic labor rights. Above all, the living conditions of the majority hamper them from attaining the minimum requirement for nutritious food (Woertz, 2020). All this puts their FI status at the edge. Both migrant workers and refugees, who are “the invisible martyrs of the food system,” according to Zurayk (2020), are subject to alarming FI levels. Furthermore, Lebanon has been facing severe political and macroeconomic crises where the soaring public debt is placing a strain on foreign currency reserves and leading to a reduced capacity for importing essential goods, including food. Moreover, it experienced a depreciation of the currency by more than 63 percent from October 2019 to February 2020, therefore eroding the purchasing power of the population and moving a large segment of the population to poor and near poor status (GRFC, 2020). The situation is also bad in other countries where nine and six percent of the population in Iraq and Libya, respectively, require food assistance (Karasapan, 2020; Ling Ma et al., 2021).

The relatively limited arable land in the region is also a main problem adding more complexity to the FS issue. Only 30 percent of the land in the MENA region is suitable for agriculture. Moreover, all MENA countries suffer from water stress ranging from high (40-80 percent) to extremely high (more than 80 percent) usage to supply ratios (Karasapan, 2020; World Resources Institute, 2013). Such water poverty puts FS under significant stress. Moreover, the policies adopted by most MENA governments have exacerbated the problem of FS, where generous cheap water was provided and, at the same time, food consumer subsidies, which promote unhealthy diets, have been a main policy tool (Karasapan, 2020; Woertz, 2020).

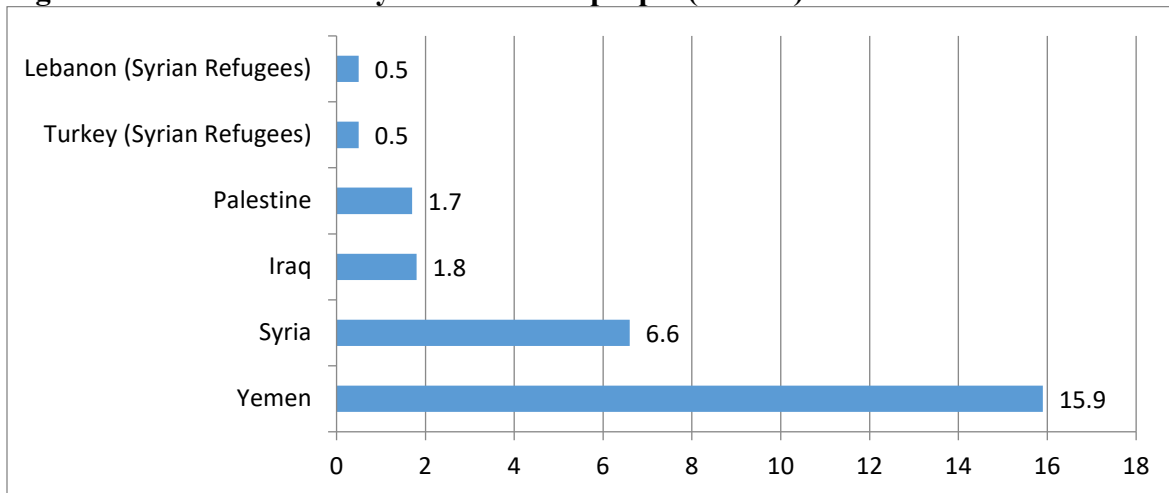


**Figure 6. Prevalence of Undernourishment (PoU) (% of population)**



Source: Adapted from WDI (2020).

**Figure 7. Number of acutely food insecure people (million)**

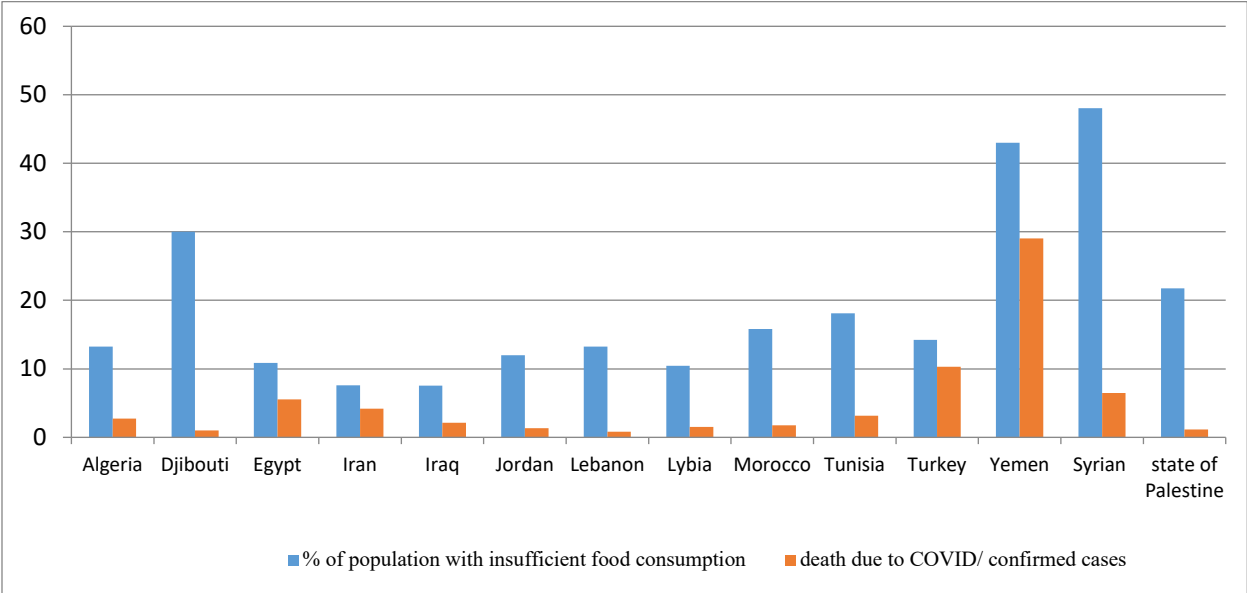


Source: GRFC (2020).

Referring to the Global Food security Index (GFSI) scores, (Table 1 in the annex), Syria and Yemen have remained on the tail of the list in the overall score as well as within each pillar. High-income countries in the region, GCC countries, and Israel score the highest in the affordability and utilization pillars (except for Bahrain) and relatively low in the availability dimension, where Israel, Egypt, Turkey, and Morocco come as best performers in this pillar in the region. On the global level, Tunisia, Algeria, and Yemen were among the ten most deteriorating countries whereas Kuwait and Qatar were among the top ten improving countries worldwide.

With the prolongation of the COVID-19 pandemic, FS is brought under extreme scrutiny in MENA. The number of people with insufficient food consumption increased in the short period between October 2020 and January 2021 in several MENA countries including Algeria, Egypt, Libya, Morocco, Tunisia, and Turkey (Table 1).

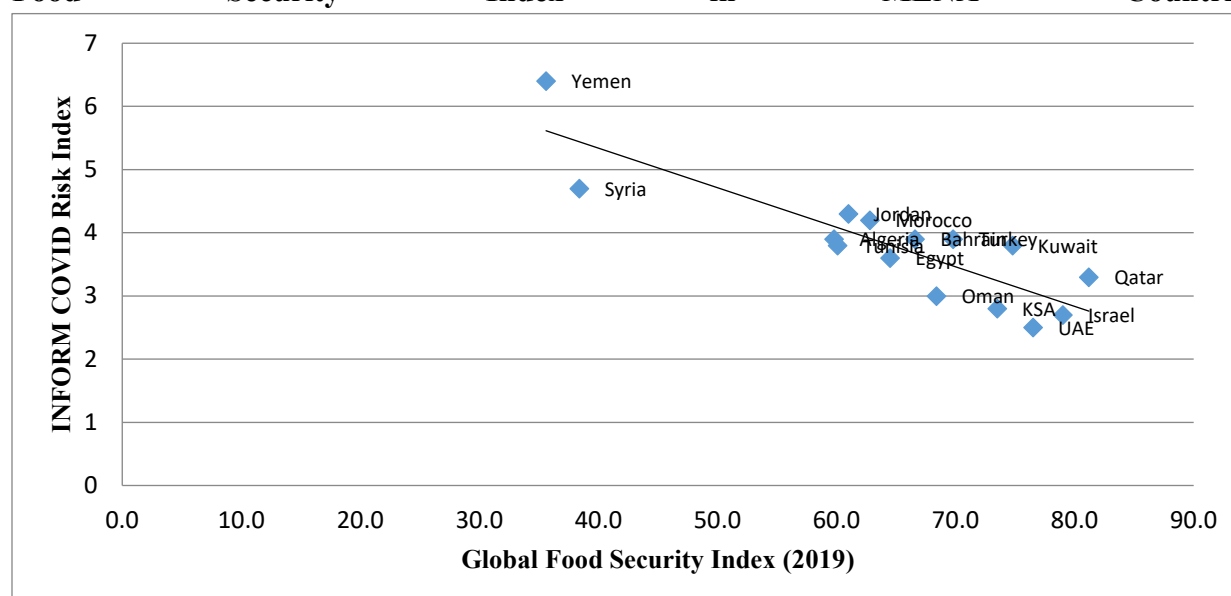
**Figure 8. Percentage of the population with insufficient food consumption and intensity of COVID-19 as of January 2021**



Source: Adapted and calculated from World Food Program (WFP) (2021).

On another note, the pandemic is highly expected to cause disruptions to food supply chains and food aid (FAO, 2020). It is worth noting that food aid is vital for some MENA countries where, for example, 50 percent of the population in Yemen and Syria depend on food aid (Karasapan, 2020). The highest fatality rates within confirmed COVID-19 cases occurred in Yemen, Turkey, Egypt, and Syria (Figure 8 and Table 2 in the annex). Similar to Figure 1, Figure 9 shows a negative relationship within the MENA region between countries’ ability to handle the pandemic according to their demographic, economic, and institutional rigidities as expressed by the INFORM COVID-19 Risk Index and food security as measured by the GFSI.

**Figure 9. COVID-19 Readiness Risk Index (INFORM COVID-19 Risk Index) and Global Food Security Index in MENA Countries**



Source: Adapted from Poljanšek et al. (2020); EIU (2020).

**Table 1. Food insecurity in MENA Region amid COVID-19 (excluding high income countries)<sup>12</sup>**

	People with insufficient food consumption (January 2021)	% of Population	People with insufficient food consumption (October 2020)
Algeria	↑5.6	13.3%	5.34
Djibouti	0.3	30.0%	0.38
Egypt	↑10.7	10.9%	10.64
Iran	6.2	7.6%	6.62
Iraq	2.9	7.6%	3.27
Jordan	1.2	12.0%	1.25
Lebanon	0.9	13.2%	0.94
Libya	↑0.7	10.4%	0.65
Morocco	↑5.7	15.8%	5.24
Tunisia	↑2.1	18.1%	1.81
Turkey	↑11.7	14.2%	10.91
Yemen	12.9	43.0%	13.01
Syria	9.8	48.0%	9.12
Palestine	1	21.7%	0.99

Source: extracted from WFP (2021)

<sup>12</sup> The table excludes GCC countries as well as Israel since they do not suffer from a significant undernourishment problem and thus are not covered by the World Hunger Map (WFP, 2021).

## **2.2. Channels of transmission of COVID-19 impact on FS in MENA region**

The pandemic has been generating a set of disruptions that would be transmitted to FS within the region via various channels.

### *An economic downturn, rising poverty, limited arable land, and scarce water*

There are direct and indirect transmission channels by which the COVID-19 crisis is likely to affect FS in MENA countries. Among the direct channels is the slowdown of the world economy and its expected repercussions. According to the World Bank Group (2020), a downslide in the economies of the region is expected to reach 5.2 percent in 2020. Such projections are constantly revised, bringing up more pessimistic trends on the scene. According to World Bank (2021) projections, the MENA region's collective GDP is expected to contract further by 7.6 percentage points in 2021. At the country level, World Bank (2021) calculations registered the highest expected GDP losses in Lebanon, reaching a decline of 30 percent, followed by Yemen and Iraq with a descend of about 15 percent, then Kuwait, Oman, the UAE, and Tunisia with an average of nine percent. Algeria and Morocco follow by eight percent while Egypt holds the least downgrade in the region reaching 4.6 percent. The 2021 forecast for recovery is also dim, with the GDP of countries expected to remain below their pre-crisis level (World Bank, 2021).

The simultaneous prevalence of COVID-19 and decline of oil prices is expected to hurt countries unevenly, where World Bank (2021) projections revealed that conflict countries and oil exporters are the most severely affected countries (Yemen, Iraq, Libya, and Syria), followed by the GCC and oil importers. Oil importers are MENA countries suffering from large fiscal deficits and high cereal import dependency (e.g. Jordan and Lebanon) whereas the GCC countries are cushioned by a better fiscal position that enables them to absorb the increasing costs, albeit being fully dependent on wheat imports and facing simultaneously dwindling world oil prices for their major export goods (Larson et al., 2012). The declining oil prices have a negative potential impact on other variables including investment, remittances, and aid flows. For example, remittances were projected to drop by 20 percent in 2020. Further, in 2020, Foreign Direct Investment (FDI) to the GCC declined by 20.2 percent, whereas in non-GCC MENA countries it fell by 74 percent compared to 2019 (World Bank Group, 2020). This would indeed magnify the recessionary impact of the pandemic to an extreme level that would be transmitted to FS on the affordability and utilization pillars.

Moreover, according to the World Bank (2020) the agricultural output in MENA is likely to be negatively affected with a three percent reduction equivalent to manufacturing yet less severe than services (9.3 percent) (World Bank Group, 2020). The reduction in output is likely to imply a reduction in employment where most of the agriculture in MENA countries is dominated by small scale agricultural producers and the informal sector. In addition, the demand side is

negatively affected, where the purchasing power of the poor and vulnerable segments is expected to decline further, which will deepen the negative FS status.

Focusing on domestic production, prospects differ significantly among MENA countries. For example, drought has significantly affected Maghreb countries (Morocco, Algeria, and Tunisia). All three countries produce mostly rain-fed cereals. As a result of the drought, wheat production in Morocco was expected to be reduced by 50 percent of the country's average in 2020. Yet, all three countries have adequate cereal stocks. In other countries, such as Syria and Iraq, weather conditions remain favorable; however, agricultural production is disrupted by the domestic conflict they have been experiencing for a relatively long time. The prospects for grain availability in the coming months are relatively good in Egypt, the world's largest importer of wheat, providing enough grain to meet national demand for several months (FAO, 2020).

Anecdotal evidence suggests that COVID-19 has significantly negatively affected the status of FS in a number of MENA countries. For example, the World Bank Group (2020) shows that the Tunisian population suffered tremendously, with 18 percent of households consuming less food and the poorest quintile reducing its food consumption fivefold amid the crisis despite the availability of a number of social protection programs. The same is true in the case of Libya, yet in a more drastic manner, with 70 percent of households consuming less food compared to the situation before the crisis (Erokhin and Gao, 2020; World Bank Group, 2020). In Jordan, agriculture was one of the sectors most affected by the crisis due to lockdown measures which resulted in a shortage of labor. Yet, the most significant loss was incurred by the food services sector (namely hotels and restaurants), which is expected to suffer losses reaching over 90 percent (Raouf et al., 2020). Breisinger et al. (2020) found that the effect of the crisis on FS in Egypt is significant. The negative impact is channeled mainly through the economic downslide affecting the food services sector, which is likely to suffer significant losses exceeding 50 percent and indirectly affecting the food processing industry, yet with a less severe effect. However, the agriculture sector, as a component of the agri-food system, remained resilient with an expected significant increase in output (Breisinger et al., 2020).

Such disruptions have led to price increases in the MENA region which have negatively affected the accessibility pillar of FS. Since February 2020, the prices of main food categories in the region have been on the rise, including those for carbohydrates, dairy, fruits, meats, and vegetables. Yet, the price increases have been moderate, ranging five percent on average for the majority of food products – with an exception of food staples where price increases reached 20 percent and more since February 2020 in several countries including Djibouti, Egypt, Iran, Kuwait, Lebanon, Morocco, Qatar, Saudi Arabia, Syria, and Yemen (World Bank, 2021).

From another highly related perspective, poverty has been deeply rooted in the region with an estimated 20.3 percent in 2018, rising by 33 percent compared to 2015 (WDI, 2020). The general prospects for growth in the region remain dim, where the IMF has made its lowest forecasts for the region in 50 years (UNSDG, 2020), hence deepening the poverty aspect. The current crisis is estimated to increase the poor in the region by 14.3 million to reach 115 million people by the end of 2020 (UN, 2020a). The recent World Bank poverty projections due to COVID-19 are even gloomier; the rate of increase in poverty is expected to range from 15 percent to 100 percent as depicted in Table 3 in the annex (World Bank, 2021). In such a situation, it is expected that the COVID-19 crisis is likely to exacerbate the already existing and extremely vulnerable FS situation (FAO, 2020).

As discussed in section one, the effects of COVID-19 and the resulting downturn are highly uneven, with effects being substantial on the poor and vulnerable groups (including casual workers, informal sectors...etc.). Moreover, the effects of the crisis are uneven in their sectorial impact; some sectors have been harshly hit compared to others (including tourism and readymade garments industries). Such sectors are of extreme economic importance for several countries in the region, especially in terms of employment, implying that the negative impact is likely to be substantial in terms of loss of income, poverty, and hence FS (among such countries are Egypt, Morocco, Tunisia, and Lebanon) (World Bank, 2021; World Bank Group, 2020).

#### *Political instability and reluctant reforms*

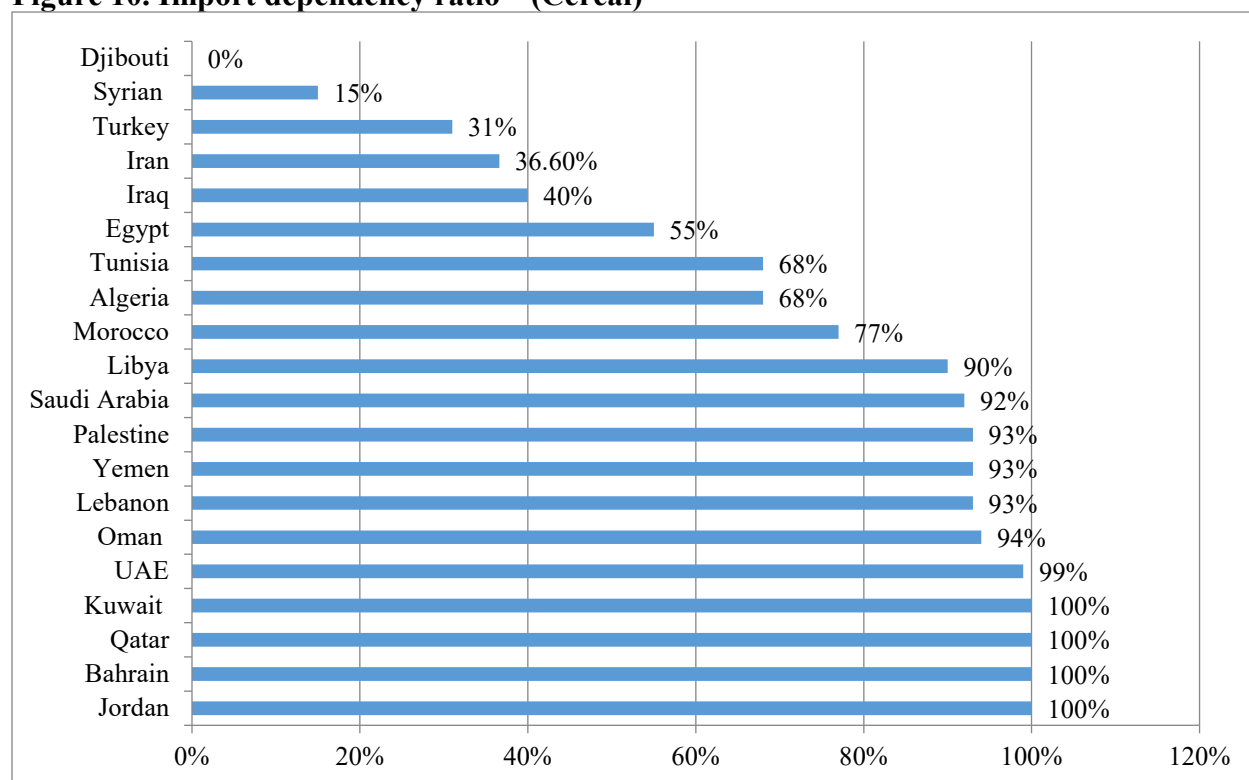
Among the three main pillars of FS, two (availability and affordability of food) were always among the slogans raised during the different uprisings that started in 2010 onwards, indicating the severity of the problem and its historical political and economic dimensions. Paradoxically, the existing regimes had food subsidy programs enacted before the uprisings. However, they were not capable of ensuring FS in reasonable terms. Political instability has a direct link to FI in various dimensions. For example, the encroachment of urbanization on agricultural land in Egypt intensified in the aftermath of Egypt's January 2011 revolution, making use of the weak subsequent governments, lack of security, and absence of rule of law. About 62,000 hectares of agricultural land were lost in the three years after the revolution, a two-third increase than the normal annual loss, thereby bringing up extreme pressures on FS (Mandour, 2017).

#### *International trade*

Trade is a vital channel through which COVID-19 can significantly affect FS. Being highly dependent on food imports exacerbates the FI status in the whole region. The region is the largest importer of cereals globally, where GCC countries (excluding Saudi Arabia) import 100 percent of their cereal needs, and countries such as Jordan, Oman, Palestine, Yemen, Saudi Arabia, Libya, and Lebanon import more than 90 percent of their grain needs (Figure 10). Such a high

import ratio makes these countries prone to any distortion in world food prices, currency volatilities, and food availability shocks (Mouloudj et al., 2020).

**Figure 10. Import dependency ratio<sup>13</sup> (Cereal)**

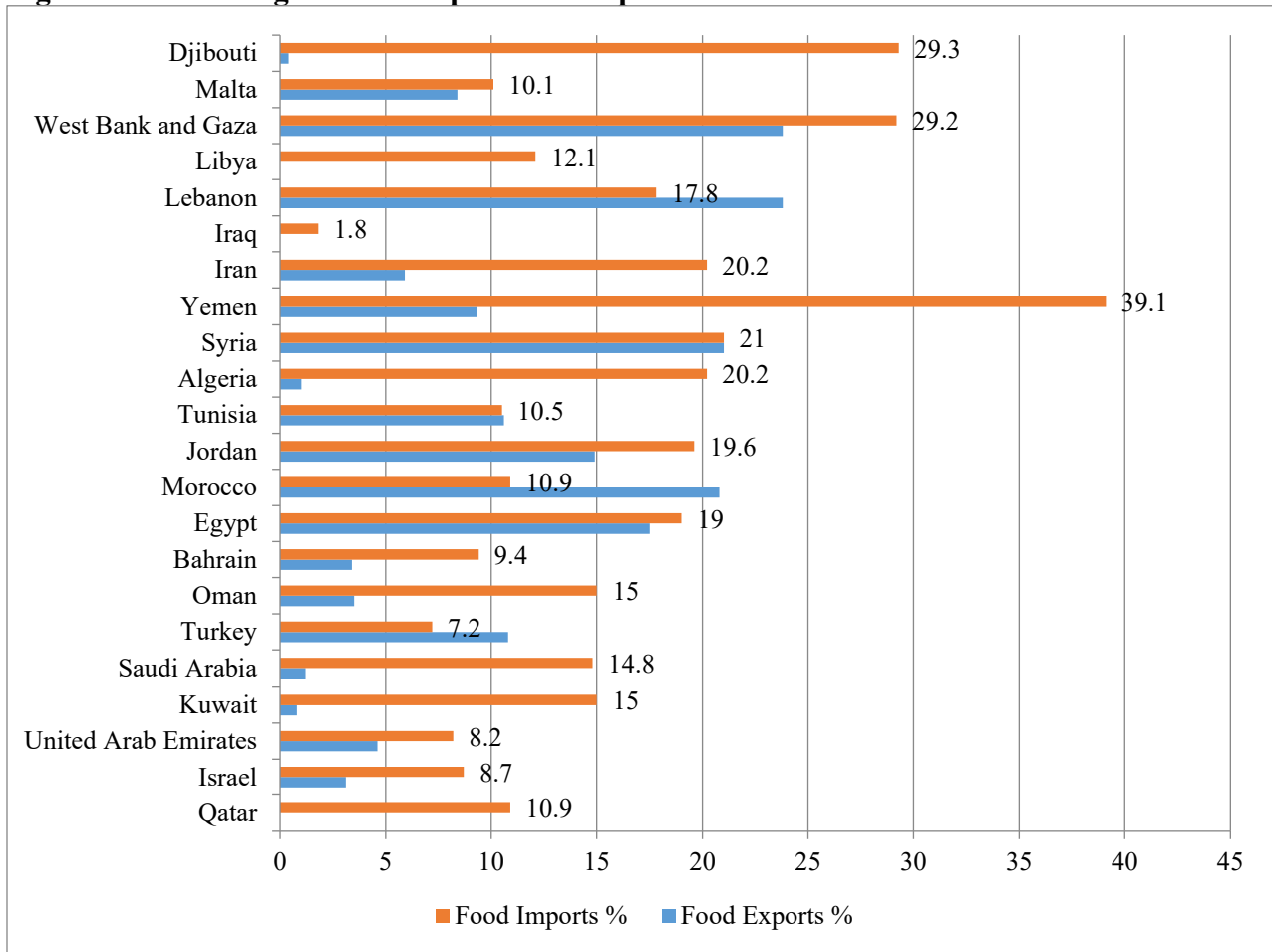


Sources: Adapted from WFP (2021), FAO (2020), and FAOSTAT (2020b).

A number of MENA countries depend highly on exporting a number of food products (Figure 11). Such products constitute a significant share in countries like Lebanon, Palestine, Syria, Morocco, Egypt, Jordan, and Turkey (WDI, 2020). Depending on food exports, among which are highly perishable ones, implies more vulnerable exposure to supply chain and logistics disruptions (FAO, 2020). Such countries are expected to face a further decline in their food exports following the recessionary impact of the crisis which is expected to lead to foreign demand contraction for their exports that are relatively highly price and income elastic.

<sup>13</sup> Percentage of a country's imported food for domestic supply versus its own food production for domestic supply; it is calculated as follows:  $IDR = \text{Imports} / (\text{local production} + \text{imports} - \text{exports}) * 100\%$  (WFP, 2021).

**Figure 11. Percentage of food imports and exports in 2019\***



\*As a percentage of total merchandise imports and exports, respectively

Source: WDI (2020); <http://wdi.worldbank.org/table/4.4#>

Countries in the region, mainly the GCC, depend heavily on exporting hydrocarbons and are likely to experience a decrease in the price of their major export commodities (mainly oil exports), which will in turn have a negative impact if the price of staple food commodities continue to increase (Erokhin and Gao, 2020). Woertz (2020) classified those countries to be the most vulnerable to COVID-19 induced trade disruptions as they are also poor in natural resources as well as agricultural potential. Although the scores of GCC countries within the FS utilization pillar are relatively high, as measured by GFSI (Table 1 in the annex), such countries hold the largest per capita shares worldwide of people suffering from diabetes and obesity (Woertz, 2020). It is worth mentioning that the GFSI has a major shortcoming in that respect as it does not cover a number of important malnutrition and health-related indices. Nevertheless, the food systems of the GCC countries have so far performed well during the COVID-19 crisis in terms of ensuring food availability. Their modern value chains are more resilient than the traditional and transitional ones that dominate developing countries (Woertz, 2020). In other MENA countries where the government plays a vital role in the procurement, storage, and



distribution of main food products like wheat, the impact of the crisis on FS has been contained (e.g. Egypt) (Larson et al., 2012).

### *Tourism*

One of the indirect transmission channels affecting FS is the slowing down of tourism in the MENA region. Tourism is a main activity in a large number of MENA countries, whether in terms of contribution to GDP or as a main direct and indirect employer. For example, tourism constitutes a major contributor to GDP and employment in several MENA countries, such as Egypt, Morocco, Tunisia, and Lebanon (FAO, 2020; Ghoneim, 2020). The slowing down of tourism could have severe repercussions on food supply chain associated with hotels and restaurants, which would have a negative impact on food suppliers. Moreover, the cutting down of salaries and employees in the tourism sector – being a large employment sector in MENA, especially for casual workers – could also have serious repercussions on the demand for food, which, again, is likely to disrupt the food supply value chain. According to some estimates, the losses of tourism can constitute two thirds of the total losses incurred by MENA countries due to the pandemic (OECD, 2020; World Bank Group, 2020).

Availability might not be radically affected in the region today, but with the continuation of the pandemic along with its drastic recessionary impacts and escalating disruptions in the global and local supply chains, the crisis could have considerable impacts on availability, accessibility, and (harshly) utilization in the very near future. Such potential shifts would have a dual effect on FS. The first effect arises from its negative impact on FS by shifting from healthy to less healthy food products, resulting in expanding FI in the region. The second effect arises from the negative impact on the food trade balance since MENA countries export the high elastic food products (e.g. fruits, vegetables) and import the lower elastic food product (e.g. wheat, and grains). Hence, the ability of governments to ensure FS is expected to be weakened. This is likely to affect the balance of payments of the majority of MENA countries, whether those highly dependent on exporting hydrocarbons, importing low elastic food staples, or those exporting high elastic food products. Conflict countries and LDCs are more vulnerable than other countries, but so are countries heavily depending on oil and/or food exports. This implies that the majority of MENA countries are highly vulnerable to the crisis. Table 4 in the annex illustrates the main sources of risk that countries in the MENA region could be exposed to due to the pandemic (FAO, 2020).

### **2.3. Policy responses in MENA countries**

Some of the measures taken to confront and mitigate the repercussions of COVID-19 on the food system were reactive and some were proactive. One of the reactive mitigating measures undertaken was the expansion of cash transfers and consumer subsidies. Such measures helped mitigating the expected potential price and income fluctuations in general and for food in specific (World Bank Group, 2020). The proactive measures included increasing the storage capacity. Similar to the global trend, the 2007/2008 food crisis and measures taken to mitigate its

impact were a main savior for MENA region, at least during the early phases of the pandemic. Several MENA governments have learnt to add to their capacity of storing main food staples since the 2007/2008 crisis. This resulted in increasing the share of the global stock of the main food staples in the region and significantly increasing the stock-to-use ratio (e.g. from negligible levels in the 1970s to more than 13 percent of global wheat stock by the end of the first decade in 2000s) (Larson et al., 2012). All this, accompanied by the favorable weather conditions for their major cereals and grains, has helped in relieving the stress on the availability pillar in the region.

Along the same orientation of putting self-sufficiency as a main target, a number of countries in the region adopted trade protectionist measures as a reactive measure, aiming to enhance food imports or restrict/ban some food exports (Table 5 in the annex). Yet, the severity of such measures, and especially the export bans, decreased over time.

Some MENA countries have allocated extra attention to food aspects amid the COVID-19 crisis, among which are Egypt (see Box 1 for measures adopted in Egypt) and Lebanon (special banking arrangements for importing food). The GCC countries have managed the crisis well so far, not through a reactive response policy, but rather a proactive one. They have focused mainly on managing the supply chains and international linkages in an effective manner. Following Woertz (2020) and FAO (2020), they have increased storage capacity, diversified their importing sources, relaxed import procedures (e.g. relaxing the condition of Arabic labels), and streamlined sanitation measures.

### **Box 1. Measures taken to shield domestic food markets in Egypt**

Egypt has ample food supplies to help shield its domestic market from the short-term global supply risks associated with the COVID-19 crisis. As of April 2020, Egypt has already imported substantial quantities to cover its needs for the year, particularly wheat. It has, over the years, doubled its modern grain silo capacity (from 1.5 million tonnes in 2014 to three million tonnes in 2019). This favorable supply environment is supported by several government measures taken to enhance food availability in the country for at least several months:

- The government imported significant quantities of basic staples, including wheat, yellow corn, soybeans, and legumes.
- Egypt's cultivated wheat area this season exceeded 3.4 million feddans (1.38 million hectares), and production is expected to be at least nine million tonnes, which is the same level as last year and the five-year average. Winter crops currently being harvested include barley, fava beans, alfalfa, potatoes, onions, and other vegetables. Sugar factories currently receive beet from farmers that will increase domestic sugar supplies.
- The Central Bank of Egypt (CBE) has expanded its EGP 100 billion industry stimulus initiative to include SMEs in fish, poultry, and livestock companies.
- About 29,000 families of community school students and teachers received unconditional cash transfers in nine governorates (Assiut, Aswan, Luxor, Giza, Fayoum, Matrouh, Qena, Bani Suweif, and Minia) redeemable for nutritious food items at local retail shops.

Sources: FAO (2020); WFP (2020b).

As a result of such mitigating measures as well as enhancing the production of strategic crops, to date, the impact of COVID-19 on FS has been largely contained (FAO, 2020). In addition, trading policies have developed over time to ensure the better diversification of main sourcing countries for import contracts and overcome price risk and vulnerability by adopting options and futures as hedging price risk tools (FAO, 2020). Focusing on specific cases associated with the COVID-19 crisis, a number of MENA countries have opted for additional policies. For example, the Lebanese government adopted a special arrangement allowing traders to use pegged exchange rates when purchasing grains from the world market as a mean to buffer the domestic market from the impact of the COVID-19 crisis and the financial problems Lebanon has been experiencing (FAO, 2020).

Resorting to intensifying the usage of digitalization within food supply systems is another type of response to the crisis that is not yet efficiently utilized in the region. Digitalization has proved to shield many sectors or even aid them to thrive during the crisis. COVID-19 has created a good opportunity to exploit such a method that would contribute to establishing resilient and sustainable food systems. For example, the utilization of technology in disseminating technical information to farmers as a mean of reaching a large number in remote areas while providing a regular follow up can have a significant positive impact on productivity. To the best of the author's knowledge, only some first steps for such orientation exist in Egypt, where several

initiatives for developing software applications for farmers are in progress (IFPRI, 2020b). The measures adopted by MENA countries helped to relax the availability constraint, despite the fact that it has not been the main concern whether on the global level (as depicted in section one) or on the regional level (as explained above). However, measures to tackle the accessibility pillar have been general and not food-focused when it comes to raising the affordability of the population (e.g. social safety net measures) whereas measures addressing the utilization pillar remained rather absent.

### **3. Empirical assessment of the relationship between the pandemic and food security**

Anecdotal evidence addressing the impact of the pandemic on FS has been quite extensive, yet empirical studies based on primary or secondary data have been relatively limited due to the recency of the issue and the bundle of uncertainties carried within. Studies varied from those depending on field surveys through interviews with households (Amare et al., 2020; Elshahoryi et al., 2020) and those using secondary data, whether on country (Erokhin and Gao, 2020) or household levels (Amare et al., 2020). Some studies followed a robust econometric analysis (Erokhin and Gao, 2020; Elshahoryi et al., 2020; Amare et al., 2020), while some followed a scenario-based exploratory approach (Umdale et al., 2020) and others diverted to a simple logical descriptive analysis (Mouloudj et al., 2020). Moreover, a set of IFPRI and World Bank studies employed a Social Accounting Matrix (SAM) multiplier and Computable General Equilibrium (CGE) models (Raouf et al., 2020; ElKadhi et al., 2020; Breisinger et al., 2020, World Bank Group, 2020) to assess the economy-wide impacts of the crisis.

This section addresses the nature of the link between the pandemic and FS through understanding the inter-country variability by applying a simple cross-sectional econometric analysis. In a trial to understand this relationship within the constraint of data limitations due to the novelty of the issue, two approaches were followed. The first tries to understand the link between various country-specific capacities in handling the pandemic on one side and its FS level on the other. The second relates the severity of the disease itself and the FI situation in each country. In the two approaches, the MENA situation is compared with the rest of the world.

#### *First approach*

The first approach aims to understand the link between COVID-19 country preparedness (rather than the intensity of COVID-19 occurrence per se, as in the majority of the reviewed studies) and FS levels in various countries. The composite GFSI<sup>14</sup> is taken as a proxy for FI. The lower its score, the higher the status of FI. The index covers a set of developing and developed economies amounting to 113 countries. The value of the index scores in 2019 represents the dependent variable that the model seeks to understand and the significance of the variables that explain

---

<sup>14</sup> This is a comprehensive FS index that has been published by the Economic Intelligence Unit (EIU) since 2012, which is a country-level food security measurement tool that addresses the issues of affordability, availability, and utilization (quality and safety) in 113 developed and developing countries.

inter-country variability. The index covers all MENA countries except for Iran, Djibouti, Palestine, Iraq, Libya, Lebanon, and Malta.

To measure the effect of the countries' variability regarding their degree of readiness for handling and dealing with the disease, the composite INFORM COVID-19 risk index, published by the European Commission, is used. It is an adapted version of the epidemic risk index, which provides scores for countries according to the degree of risk arising from a taxonomy of indicators capturing demographic, economic, socio-economic, and institutional rigidities such as: the level of awareness, population density, proportion of the population with an increased risk of severe COVID-19, economic vulnerability, and access to health care as well as governance, among others. These types of rigidities are lumped into three sub-indices, namely hazard and exposure, vulnerability, and lack of coping capacity. The index covers such sources of strains that existed before the pandemic outbreak in each country and that could highly limit effective national response to the crisis resulting in health and humanitarian hazards. The lower the score, the better the country in each of the three dimensions in handling the pandemic (Poljanšek et al., 2020). Since the vulnerability sub index includes FI within its measurements, it was excluded from the analysis to avoid potential endogeneity problems. The analysis thus includes the other two sub-indices: hazard and exposure and lack of coping capacity.

Yemen, Djibouti, Libya, Syria, Palestine, and Lebanon had the highest risk scores<sup>15</sup> within the MENA region for COVID-19 coping capacities, reflecting the institutional (governance and corruption) as well as health-related infrastructure deficiencies.<sup>16</sup> Bahrain, Yemen, Djibouti, Palestine, Oman, and Qatar had the worst scores compared to other MENA countries in the COVID-19 hazard and exposure index, which covers demographic aspects as well as sanitation and hygiene (Figure 12).<sup>17</sup> It is worth noting that Lebanon, Yemen, Palestine, and Djibouti have been classified as having a “high” COVID-19 risk regarding preparedness (grasping the three dimensions), whereas a “low” degree of risk characterized high-income countries in the region (Qatar, Saudi Arabia, UAE, Oman, and Israel) and all the rest lied in the “medium” range (Poljanšek et al, 2020).

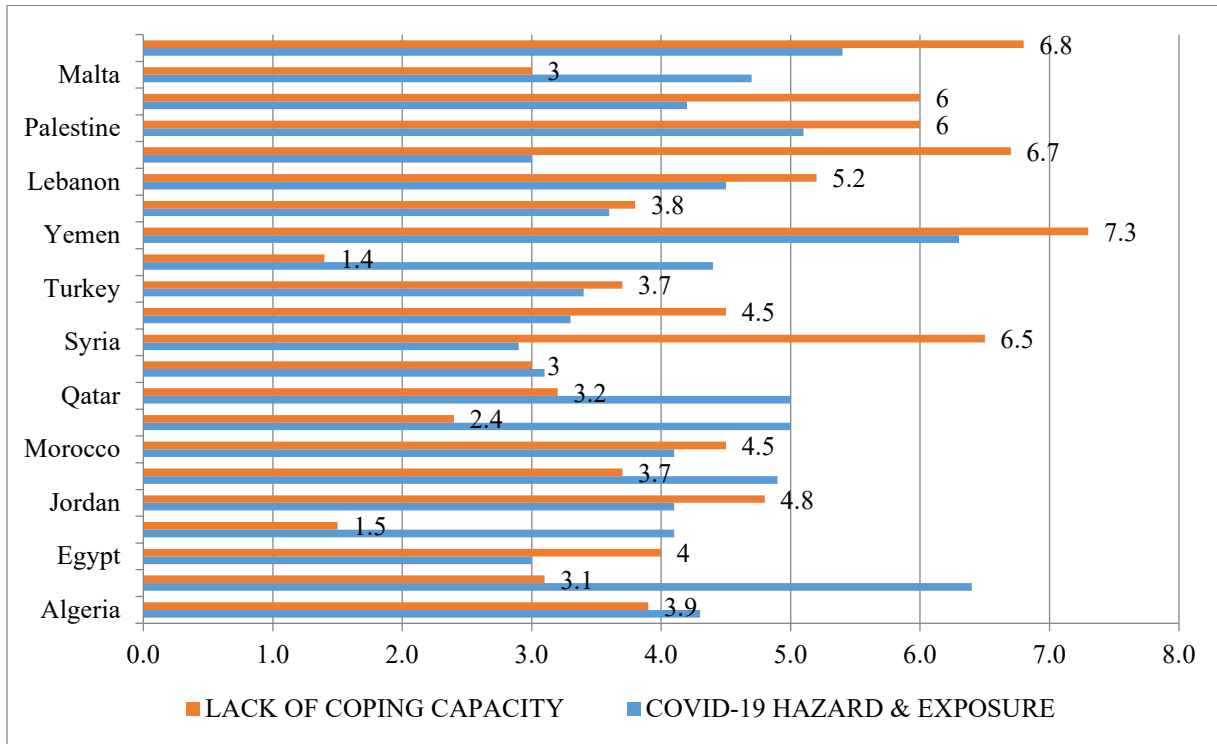
---

<sup>15</sup> High scores were assumed the ones exceeding five out of ten, with ten being the highest and thus the riskiest.

<sup>16</sup> This index includes the health system capacity specific to COVID-19, government effectiveness, corruption perception index, immunization coverage, health system capacity, per capita public and private expenditure on health care, and maternal mortality ratio.

<sup>17</sup> This index includes population density, urban population growth, population living in slums and household size in addition to availability of drinking water, sanitation, and hygiene (Poljanšek et al., 2020).

**Figure 12. COVID-19 hazard and exposure and lack of coping capacity risk indices in MENA countries**



Source: Poljanšek et al. (2020).

To incorporate the effect of country variability within the various pillars of FS, the estimated equation includes two measures for food affordability and two measures to control for each of the accessibility and availability pillars. The ratio of food imports to total exports was included to reflect the affordability dimension. This variable illustrates a country’s ability to purchase food from international markets using its export revenues, while also taking into account food availability and food accessibility on the international market (Breisinger et al., 2012). Food inflation rates were used to gauge for the accessibility dimension. GDP per capita was used to encompass a wider measure for the affordability dimension whereas the average dietary energy supply adequacy was included as a proxy to reflect food availability.

The data set for this model includes all countries simultaneously covered by the EIU (2020), GFSI, and the INFORM COVID-19 Index amounting to 112 countries. The regression equation includes two dummy interactive terms for examining the significance of the effect if the country belongs to the MENA region along with its corresponding level of COVID-19 readiness regarding exposure and lack of coping capacity risk measures. Values for all variables are taken for the year 2019, which is the latest year for which data are available and is suitable to use with the scores of the two sub-indices of the INFORM COVID-19 risk index as the latter reflects the country-specific demographic and institutional rigidities initially prevailing before the occurrence of the pandemic. Equation (1) takes the following form:

$$GFSI_i = \alpha_i + \beta_1 * HAZ_i + \beta_2 * COP_i + \beta_3 * GDPC_i + \beta_4 * DES_i + \beta_5 * FDINF_i + \beta_6 * RFDIMP_i + \beta_7(MENA_i * HAZ_i) + \beta_8(MENA_i * COP_i).....(1)$$

**Table 2. Definition of variables in equation (1) and their data sources**

Variable	Definition	Data Source
GFSI (dependent variable)	Global FS Index	EIU (2020) <sup>18</sup>
GDPC	GDP per capita at constant prices (=2015)	UNCTADSTAT (2020) <sup>19</sup>
HAZ	COVID-19 Hazard and Exposure Index	Poljanšek et al. (2020) <sup>20</sup>
COP	Lack of coping capacity	Poljanšek et al. (2020)
DES	Average dietary energy supply adequacy (percent) (3-year average)	FAOSTAT (2020a) <sup>21</sup>
FDINF	Food inflation	FAOSTAT (2020a) <sup>22</sup>
RFDIMP	Ratio of food imports to total exports	Calculated from UNCTADSTAT (2020)
MENAHAZ	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with its score in the hazard and exposure index	
MENACOP	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with its score in lack of the coping capacity index	

*Results:* A two-stage least-squares analysis was used to overcome endogeneity problems.<sup>23</sup> Results showed that both coefficients of COVID-19 related risk indices had highly significant estimates, with negative signs revealing that the higher the country’s risk of having weak demographic, health-related, and institutional factors in coping with the pandemic, the lower the score it gets for FS. This implies that the various existing structural rigidities in various countries that could limit their ability to handle the pandemic are negatively related to their FS level. As

<sup>18</sup> <https://foodsecurityindex.eiu.com/>

<sup>19</sup> [https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS\\_referer=&sCS\\_ChosenLang=en](https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_referer=&sCS_ChosenLang=en)

<sup>20</sup> <https://drmke.jrc.ec.europa.eu/inform-index/INFORM-Covid-19>

<sup>21</sup> <http://www.fao.org/faostat/en/#data/FS>

<sup>22</sup> <http://www.fao.org/faostat/en/#data>

<sup>23</sup> Instruments were tested and results rejected the null hypothesis of having weak instruments. Also, the model was tested for over-identification (using Sargan and Bassman tests) and the p values led to not to reject the null hypothesis of having a valid set of instruments and that the model is correctly specified.

Table 3 shows, the coefficient of the lack of coping capacity in confronting the pandemic had a higher magnitude compared to that of hazard and exposure. Looking at the details of the measures upon which each sub-index is built, institutional aspects like weak governance and high corruption, as well as health-related infrastructural deficiencies that limit the ability to cope with the pandemic, are all related to higher levels of FI with a higher degree compared to demographic variables like population density, urban population growth, or population living in slums. This adds up more complexity to the transmission mechanisms, previously discussed in section two, being not only limited to supply and demand pathways.

The significant coefficients for food inflation and GDP per capita (as measures for accessibility and affordability) as well as the food availability proxy and their corresponding signs (Table 3) are in line with the conceptual framework discussed in section one. Coefficients of the MENA dummy interactive terms showed significant estimates for both indices with much worse results regarding the lack of coping capacities associated with lower levels of FS compared to the rest of the world. This puts the region at a disadvantaged situation regarding its coping capacity limitations as represented by the weak governance, corruption, and fragile health systems compared to the rest of the world. The coefficient concerning the exposure and hazard index showed a counterintuitive positive link with FS, though with a negligible magnitude. Though it is difficult to interpret such a result, the negligible effect implies a highly weak relationship.



**Table 3. Results of regression estimation (1), FS, COVID-19 risk exposure, and lack of coping capacities**

<b>Variables</b>	<b>Definition</b>	<b>Estimates</b>
GDPC	GDP per capita at constant prices (=2015)	.0001161** (0.003)
HAZ	COVID-19 Hazard and Exposure Index	-2.524814*** (0.000)
COP	Lack of coping capacity	-2.869009*** (0.000)
DES	Average dietary energy supply adequacy (percent) (three-year average) OR Average value of food production (constant 2004-2006 I\$/cap) (three-year average)	.0854127 *** (0.000)
FDINF	Food inflation	-.3145633*** (0.000)
RFDIMP	Ratio of food imports to total exports	1.240247 (0.629)
MENAHAZ	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with the hazard and exposure index	2.973736*** (0.000)
MENACOP	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with the lack of coping capacity index	-3.369261*** (0.000)

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1

### *Second approach*

The second approach aims to investigate the link between the intensity of the pandemic after its outbreak in 2020 and FI through a cross-sectional analysis. In line with several studies, the severity of the pandemic is measured in terms of the number of confirmed cases in each country (Adame et al., 2020, Erokhin and Gao, 2020). While there is no agreement in the literature regarding the suitable measure for FI, the study adopted the same definition applied by Erokhin

and Gao (2020), where they expressed it by the number of people with poor or borderline food consumption as it was the only indicator reflecting FI amid the pandemic on a country level.<sup>24</sup>

Data concerning both measures were collected from the World Hunger Map<sup>25</sup> published by the WFP, as per the latest figures by the end of January 2021. The map registers the values of those variables, among others, on a daily basis covering 93 developing economies that experience food consumption insufficiency. This infers that it does not cover the high-income economies in the MENA region, which include GCC countries as well as Israel.

$$FI_i = \alpha_i + \beta_1 * COVNUM_i + \beta_2 * GDPC_i + \beta_3 * DES_i + \beta_4 * FDINF_i + \beta_5 * RFDIMP_i + \beta_6(MENA_i * COVNUM_i) \dots \dots \dots (2)$$

**Table 4. Definition of the new variables in equation (2) and their data sources**

Variable	Definition	Data Source
FI (dependent variable)	FI as measured by the number of people with insufficient food consumption per million in each country	World Hunger Map
COVNUM	Number of confirmed COVID-19 cases in each country	World Hunger Map

*Results:* Applying Ordinary Least Squares (OLS) on this cross-sectional data showed that the intensity of the pandemic had a significant positive coefficient, revealing that countries experiencing high numbers of confirmed COVID-19 cases also have high numbers of people with poor or borderline consumption (Table 5). This is in line with the arguments raised in section two and all expectations of international organizations; where the harsher the intensity of the disease, the higher the probability the country would fall in FI status. Though the data sets are different (here it is only limited to developing countries while the one used in equation (1) was with a wider scope covering a more non-homogenous set of countries), comparing the two COVID-19 related impacts revealed that the degree of link between FI on one side and the

<sup>24</sup> This measure is defined as: “People with insufficient food consumption” refer to those with “poor or borderline food consumption,” according to the Food Consumption Score; “Poor food consumption” typically refers to “households that are not consuming staples and vegetables every day and never or very seldom consume protein-rich food such as meat and dairy,” and “Borderline food consumption” typically refers to “households that are consuming staples and vegetables every day, accompanied by oil and pulses a few times a week.” (<https://hungermap.wfp.org/>).

<sup>25</sup> <https://hungermap.wfp.org/>

demographic, institutional, and health-related deficiencies on the other, exceeding by far that of the intensity of the disease.

As Table 5 reveals, GDP per capita at constant prices has a negative significant coefficient estimate emphasizing the same direction of linkage with FS in equation (1), where the higher the GDP, the less the FI level the country suffers from. Note that the magnitude of the coefficient is much higher than that in equation (1), denoting the importance of GDP per capita in explaining the inter-country differences in FS levels within the set of developing countries suffering from relatively high level of FI.

Unlike the results reached by Erokhin and Gao (2020), food inflation reflecting the accessibility dimension is insignificant, which can be explained by the usage of one-year cross-sectional data in this case, where price fluctuations are smoothed, whereas Erokhin and Gao (2020) applied monthly data. However, they still reached some counterintuitive results (negative relationship) regarding the link between inflation and FI, which they explained by governments' intrusion in setting food prices in many developing countries (Erokhin and Gao, 2020). The ratio of food imports to total exports variable remained insignificant as in the first equation estimation. Like the first approach, the MENA interactive coefficient is significant yet weak (P value less than 0.1). Having a negative value with a lower magnitude than that of the number of confirmed COVID-19 cases reflects a still positive relation with FI in the MENA region (the higher the number of cases, the higher the degree of FI), yet with a slightly lower magnitude compared to the rest of the world (Table 5). This implies that the COVID-19 intensity affects FI in MENA in negative terms when using the number of people with insufficient food consumption as an indicator, yet to a lesser degree than other developing countries covered by the dataset.

Although the study did not follow income country classification like Erokhin and Gao (2020), this result does not contradict theirs; they found FI in some MENA countries weakly (Turkey) or even negatively linked to the number of COVID-19 cases (Yemen, Iran, Jordan, and Libya). They found a weaker link for low-income countries in general (Erokhin and Gao, 2020). Moreover, the weaker link between the number of COVID-19 cases and the number of people suffering from insufficient food consumption for MENA countries might contrast with the intuitive expectations that many countries within the region suffer relatively more from the modest accessibility and utilization pillars of their FS systems. Yet, when taking into account that the data do not include developed countries, the interpretation is clear: MENA countries (excluding high-income countries) are in a relatively better position when compared to other countries included in this dataset, which mainly includes Sub Saharan and Latin American countries.

**Table 5. Results of regression estimation (2), FI and COVID-19 intensity (confirmed cases)**

Variables	Estimates	
COVID-19 Intensity (confirmed cases)	.000022*** (0.000)	Number of observations = 84 F( 6, 77) = 52.69
GDP per capita at constant prices (=2015)	-.0026219** (0.005)	Prob > F = 0.0000 R-squared = 0.8041
Average dietary energy supply adequacy (percent) (3-year average)	.0108127 (0.906)	Adj R-squared = 0.7889
Food inflation	-.0033838 (0.802)	Mean VIF   1.24 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ratio of food imports to total exports	-8.341193 (0.305)	Ho: Constant variance F(1 , 82) = 0.30
MENA COVID-19 Intensity (confirmed cases)	-.0000118** (0.042)	Prob > F = 0.5859

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1

### *Limitations*

In evaluating the study results, several limitations need to be taken into account. First, the cross-sectional nature of the study does not allow for causality to be inferred, nor was it feasible to assess changes over time, which was highly restricted by data insufficiency due to the novelty of the topic. Second, classifying countries according to their income level would have enriched the analysis, but this was restricted by data availability and would have resulted in lowering the number of observations. Third, estimations should not be taken as precise estimates in magnitude being based on cross-sectional data that ignore time dimension. Fourth, the World Hunger Map data, upon which the second equation is based, only covered countries already experiencing a high prevalence of undernourishment, which makes the analysis more restricted. Finally, the analysis treated MENA countries as one entity, though, as previously discussed, the impact of the pandemic on FS has very country-specific effects within the region that should be accounted for, an area that needs further research.

#### **4. Conclusion and policy implications**

Apart from the severity, the scope, and the vagueness of the pandemic progress, time plays a pivotal role in the assessment of its repercussions. During the course of writing this paper, information has changed and expanded on a daily basis, bringing up many challenges to encompass the various dimensions of the crisis. More importantly, this draws attention to the significance of timely proactive solutions and responses to contain the divergent consequences of the crisis. On a global and regional level, it was found that the pandemic is likely to affect the accessibility and utilization pillars of FS in a more significant manner than affecting the availability pillar. Its main channels are the disruption of local value chains and demand side. Its impact on the demand side arises from being income induced and not price driven.

MENA countries have been facing the COVID-19 pandemic with an already alarming FI situation for reasons that have been deeply rooted in a number of countries within the region. This deprives many countries from having full power to buffer the transmission of a multitude of adverse effects of the crisis on all FS pillars. COVID-19 has mainly affected the affordability and utilization pillars of FS, and had almost negligible effects on the availability pillar, at least in the interim. In this regard, the credit goes partially to the food crisis in 2007/2008, which triggered the increase in staples storage in most of the countries as a strategy that shielded many from a good fraction of the negative impacts of COVID-19 on FS. A considerable portion of the challenges facing MENA countries lies in the measures adopted to respond to the crisis, where governments all over the world (as well as in MENA region) have reacted, so far, in a general and traditional manner. Their interventions have mainly focused on relaxing the least problematic constraint, availability, and left aside tackling the accessibility and utilization pillars. Depending on reserves and stocks may be a major savior for many countries, but it is not a sustainable policy. With the unforeseen duration of the crisis and its drastic recessionary impacts that are getting gloomier daily, the availability pillar would also be harmed, and countries should be ready for that scenario.

Wrongfully putting food sufficiency rather than FS as a main goal, trade restrictions came as a first resort to a number of countries just as they did as a panic reaction during the crisis in 2007/2008, though to a much lesser degree. Several countries have imposed export restrictions or even bans on a list of food items, and some have relaxed import restrictions, but both served the availability pillar. Resorting to such trade restrictions, although proven that it injures more than cures throughout the experience in the 2007/2008 food crisis, might only offer a very transitory solution.

The MENA region is not a homogenous entity; the degree of exposure to food-related COVID risks differs considerably across countries in the region. GCC countries face a relative minimum degree of risk, where the countries secured their food supply through ensuring enormous reserves, facilitating imports by giving up restrictive import requirements, and minimizing the

risk by diversifying providers. Moreover, their relatively limited agricultural production and low agricultural exports lowered the probability of being subjected to supply risks to domestic production due to the pandemic. Further, their edge lies in having modernized, well-established, and capital-intensive value chains that significantly helped in mitigating the crisis impact. Realizing this fact, they responded by intensifying such chains and their international linkages. Although they have a very strong affordability pillar, they still need to address a descending utilization pillar having one of the highest diabetes and obesity worldwide with no sign of improvement. Migrant workers, who represent the majority of the population in some GCC countries, “the invisible martyrs of the food system,”<sup>26</sup> suffer from variable degrees of social and legal discrimination, which is another major jeopardy. In many cases, they are not covered by social security schemes in addition to enduring restricted labor rights. All such factors need extreme scrutiny and reform in order to empower the ability of a considerable segment of the population in general and in the face of the current crisis in particular.

Other countries in the region face a higher degree of risk due to the relatively high rates of food import dependency as well as the high food expenditure shares, which makes them more prone to shocks on the demand side. This includes Egypt, Algeria, Yemen, Iraq, Jordan, and Palestine. From this perspective, the risk is a bit minimized for Morocco and Tunisia having relatively lower food import dependency. Other factors – like conflict in Syria and Yemen, financial crises and political unrest in Lebanon, and instability in Iraq – magnify the risk. Institutional factors, such as corruption, deficient and weak demographic aspects, and the absence of efficient social security systems, in many cases undermine the ability of governments to provide the needed protection from the consequences of COVID-19, especially for the most vulnerable, marginalized, and poor strata.

MENA countries should make use of this crisis to tackle the structural imbalances affecting the accessibility and utilization pillars of FS. Woertz (2020) and other scholars emphasized that COVID-19 offers a good opportunity for MENA countries to shift their major focus from food availability to food accessibility and utilization. The former efforts in MENA countries have left those two dimensions of FS lagging. Measures to tackle the affordability and accessibility pillars have been general and not food focused. In this respect, the enhancement of social safety nets as a measure undertaken by all governments might have positive spillover effects on the accessibility pillar, but it remained short on targeting FS per se. Such an enhancement should not include civil society charity initiatives as a main resort if the aim is to at least maintain the level of FI. This channel will soon dry up if the pessimistic expectations of expanding economic downturn come into effect. Among the policy recommendations that can be implemented in this respect is nudging their population towards a healthy diet and nutrition prescriptions. This might be done through lowering subsidies directed to unhealthy food items and/or providing healthy relatively cheap substitutes. Given the fact that the pandemic pushed consumers to value the

---

<sup>26</sup> Zurayk (2020)

importance of consuming healthy food, reforming social safety nets should be tilted to focus on enhancing this kind of awareness. Moreover, MENA countries should devote extra efforts to fix their local supply chains and enhance their integration in global value chains when it comes to food products and inputs, while developing the accompanying risk management systems and overcoming logistical problems (FAO CFS HLPE, 2020; Mouloudj et al., 2020).

As identified by UNSDG (2020), the people who were already exposed to nutrition and dietary insufficiency before the COVID-19 crisis remained the ones most vulnerable after the crisis. Perhaps the general impact of the crisis and dealing with it as a health and economic crisis has left FS in the backseat. This is an issue that needs to be prudently addressed by MENA governments to avoid its potential negative consequences. Anecdotal evidence (e.g. Woertz, 2020; Ghoneim 2015; Mouloudj, 2020) for a large number of Arab countries indicates that MENA countries suffer from inefficiency in the domestic food markets, arising from anti-competitive behavior and fragmented supply chains. The measures undertaken by governments in the MENA region to contain COVID-19 effects did not focus on reforming such issues. COVID-19 has thus intensified the urgency to undertake radical reforms in food systems and to revisit many directly and indirectly related structural and institutional long-rooted rigidities across the region.

In order to understand the link between FI and the pandemic, the study employed two types of datasets and correspondingly two equations were estimated using two different FS indicators and two indicators to proxy the effect of the pandemic. The empirical assessment showed that COVID-19, whether expressed by its intensity, number of confirmed cases, or the degree of country preparedness, is significantly linked to the country variations regarding their FS levels. The higher the number of confirmed cases and the weaker the degree of country preparedness, the higher the country's FI level. However, as Zurayk (2020) constructively articulated, COVID-19 is, to a great extent, innocent from the charges thrown on it of being the exclusive cause of many of the adverse impacts on FS. The pandemic has been rather the magnifying loop that made the inadequacy, caveats, and fragility of the food systems worldwide and in MENA countries in particular clear and more tangible. Along the same lines, the empirical assessment in the study showed that as much as FI variability across all countries is explained by the variability of the intensity of the disease per se, it has drawn vivid attention to the importance of the efficient institutional and demographic prerequisites needed to handle the disease in this respect. More precisely, it revealed that the higher the country's risk of having weak demographic, health-related, and institutional factors in coping with the pandemic, the lower the score it gets for FS. Institutional aspects like weak governance and high prevalence of corruption, as well as health-related infrastructural deficiencies that limit the ability to cope with the pandemic came in first place in explaining country variability for having higher levels of FI. Demographic variables like population density, urban population growth, or population living in slums came in second place. Regression results have also put the MENA region at a disadvantaged situation compared

to the rest of the world regarding its coping capacity limitations as represented by weak governance, corruption, and fragile health systems in explaining the country variability in FS levels. Therefore, again, it is not the pandemic per se, but rather the structural, demographic, economic, and institutional deficiencies that attention should be devoted to in order to have a more sound level of FS, even if COVID-19 did not exist.

The importance of the affordability pillar was also illustrated in the empirical part of the study where GDP per capita as a measure of affordability in both models has proved to significantly explain country variability regarding FS levels. The significant coefficients for food inflation as well as the food availability proxy and their corresponding signs within the broader set of countries, encompassing developing as well as developed countries, are in line with the conceptual framework showing their importance in understanding country FS variability. However, both pillars were insignificant in explaining the FS variability across developing countries already suffering from poor or borderline levels of insufficient food consumption. Within the latter set of countries, FI in the MENA region was also negatively related to the intensity of the disease (number of confirmed cases) yet to a lower degree compared to the Sub Saharan and Latin American countries covered by the dataset. This is in line with results of other studies like Erokhin and Gao (2020), which found FI in some MENA countries to be weakly (Turkey) or even negatively linked to the number of COVID-19 cases (Yemen, Iran, Jordan, and Libya).

Preferential trade agreements signed by MENA countries need to address FS. So far, the existing trade agreements signed by MENA countries among themselves (e.g. PAFTA, Agadir) or with their major trading partners (e.g. EU Association Agreements) have suffered from a protectionist attitude when it comes to agriculture (World Bank, 2020). Revisiting the agreements needs to be considered with the aim of targeting FS and lessening the protectionist attitude and promoting engagement in secure and safe value chains.

An important point is data availability and transparency. In order to hold a better understanding of the repercussions of the pandemic and thus offer rigorous analysis and constructive policy implications, more data transparency is needed. Within the region, several countries stopped declaring COVID-19 testing data and fatality rates. For example, as the World Bank (2021) noted, Algeria stopped reporting such figures when its positive rates reached extreme limits, while Syria did not report testing data at all (World Bank, 2021). In this respect, the GCC countries are the best performers. This alone indicates that the MENA region faces a transparency challenge. Transparent dissemination of information in general regarding testing, the number of confirmed COVID-19 cases, food prices, and the food situation, will strengthen government management over the food market during such abnormal circumstances and lessen the degree of panic that usually results in unfavorable outcomes.



From another angle, COVID-19 has shifted the whole world to a new norm where digitalization became at the core of personal and business livelihoods. FS still lags in this regard. Except for some early signals in Egypt, agriculture is not monitored by any digital application in the majority of MENA. Introducing information technology-based applications in farming – for example, whether in terms of enhancing the awareness of small-scale farmers or for collecting and analyzing data – is among the reforms that should be seriously considered in the region. The effects of such an orientation are highly expected to be translated into improved productivity as well as intensified supply chains and better logistics. The use of information technology has opened a new set of businesses in the food industry through the use of applications for food delivery that could potentially and partially offset the job losses due to the lockdowns and confinement. In addition, the pandemic entailed a positive element with the improvement of many aspects of food safety, provided that this would prevail after the crisis. The hope thus lies in the pandemic itself to trigger the long-lasting neglected reforms within food systems and across the indirectly related channels in the same manner by which the 2007/2008 food crisis unintentionally cushioned the major repercussions of COVID-19 today.

## References

- Amare, Mulubrhan, Kibrom A. Abay, Luca Tiberti, and Jordan Chamberlin (2020). Impacts of COVID-19 on Food Security: Panel Data Evidence from Nigeria, August 2020; PEP Partnership for Economic Policy, <https://www.ifpri.org/publication/impacts-covid-19-food-security-panel-data-evidence-nigeria>
- Amjath-Babu, T. S., Timothy J. Krupnik, Shakuntala H. Thilsted, and Andrew J. McDonald (2020). Key Indicators for Monitoring Food system Disruptions caused by the COVID-19 Pandemic: Insights from Bangladesh towards Effective Response, *Food Security* (2020) 12:761–768, <https://doi.org/10.1007/s12571-020-01083-2>
- Barrett, Christopher (2010). *Measuring Food Security*, *Science* 327, 825 (2010); DOI: 10.1126/science.1182768; [https://www.researchgate.net/publication/41424901\\_Measuring\\_Food\\_Security](https://www.researchgate.net/publication/41424901_Measuring_Food_Security)
- Breisinger, Clemens, Mariam Raouf, Manfred Wiebelt, Ahmed Kamaly, and Mouchera Karara (2020). Impact of COVID-19 on the Egyptian Economy: Economic Sectors, Jobs, and Households, IFPRI, Middle East and North Africa; <https://www.ifpri.org/publication/impact-covid-19-egyptian-economy-economic-sectors-jobs-and-households>
- Breisinger, Clemens, Olivier Ecker, Jean-Francois Maystadt, Jean-Francois Trinh Tan, Perrihan Al-Riffai, Khalida Bouzar, Abdelkarim SMA, and Mohamed Abdelgadir (2014). *How to Build Resilience to Conflict*, The Role of Food Security, Food Policy Report; <https://www.ifpri.org/publication/how-build-resilience-conflict-role-food-security>
- Breisinger, Clemens, Jean-Francois Maystadt, and Jean-Francois Trinh Tan (2012). *Does Food Security Matter for Transition in Arab Countries?*, IFPRI Discussion Paper 01196, Development Strategy and Governance Division, July 2012; [https://www.researchgate.net/profile/Clemens\\_Breisinger/publication/254416880\\_Does\\_Food\\_Security\\_Matter\\_for\\_Transition\\_in\\_Arab\\_Countries/links/55b8bf8008ae092e965a3d78.pdf](https://www.researchgate.net/profile/Clemens_Breisinger/publication/254416880_Does_Food_Security_Matter_for_Transition_in_Arab_Countries/links/55b8bf8008ae092e965a3d78.pdf)
- Brinkman, Henk-Jan, Saskia de Pee, Issa Sanogo, Ludovic Subran, and Martin W. Bloem (2010). *High Food Prices and the Global Financial Crisis Have Reduced Access to Nutritious Food and Worsened Nutritional Status and Health*, the *Journal of Nutrition*, November 25, 2009; doi:10.3945/jn.109.110767, [https://www.researchgate.net/profile/Issa\\_Sanogo/publication/40033218\\_High\\_Food\\_Prices\\_and\\_the\\_Global\\_Financial\\_Crisis\\_Have\\_Reduced\\_Access\\_to\\_Nutritious\\_Food\\_and\\_Worsened\\_Nutritional\\_Status\\_and\\_Health/links/5f56ea208ae1d9803960460.pdf](https://www.researchgate.net/profile/Issa_Sanogo/publication/40033218_High_Food_Prices_and_the_Global_Financial_Crisis_Have_Reduced_Access_to_Nutritious_Food_and_Worsened_Nutritional_Status_and_Health/links/5f56ea208ae1d9803960460.pdf)
- Economist Intelligence Unit EIU (2020). *Global Food Security Index*, <http://foodsecurityindex.eiu.com/>
- ElKadhi, Zouhair, Dalia Elsabbagh, Aymen Frija, Thouraya Lakoud, Manfred Wiebelt, and Clemens Breisinger (2020). The Impact of COVID-19 on Tunisia's Economy, Agri-food System, and Households, IFPRI, Middle East and North Africa; <https://www.ifpri.org/publication/impact-covid-19-tunisia-economy-agri-food-system-and-households>

- Elsahoryi, Nour, Hiba Al-Sayyed, Mohanad Odeh, Andrea McGrattan, and Fwziah Hammad (2020). Effect of Covid-19 on Food Security: A cross-sectional survey, 2020 European Society for Clinical Nutrition and Metabolism. Published by Elsevier; <https://doi.org/10.1016/j.clnesp.2020.09.026>; <https://www.sciencedirect.com/science/article/abs/pii/S2405457720302138>
- Erokhin, Vasilii and Tianming Gao (2020). Impacts of COVID-19 on Trade and Economic Aspects of Food Security: Evidence from 45 Developing Countries, *Int. J. Environ. Res. Public Health* 2020, 17, 5775; doi:10.3390/ijerph17165775; <https://www.mdpi.com/1660-4601/17/16/5775>
- European Commission (2020). INFORM COVID-19 Risk Index; <https://drmkc.jrc.ec.europa.eu/inform-index/inform-covid-19>
- Fan, Shenggen, Wei Si, and Yumei Zhang (2020). How to Prevent a Global Food and Nutrition Security crisis under COVID-19? <https://www.emerald.com/insight/content/doi/10.1108/CAER-04-2020-0065/full/pdf?title=how-to-prevent-a-global-food-and-nutrition-security-crisis-under-covid-19>
- FAO Committee on World Food Security High Level Panel of Experts (FAO CFS HLPE) (2020). *Impacts of COVID-19 on Food Security and Nutrition: developing effective policy responses to address the hunger and malnutrition pandemic* <http://www.fao.org/3/cb1000en/cb1000en.pdf>
- FAO (2020). *COVID-19 and the Impact on Food Security in the Near East and North Africa: How to respond?* Cairo; <https://doi.org/10.4060/ca8430en>
- FAO, IFAD, UNICEF, WFP and WHO (2020). *The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets*. Rome, FAO. <https://doi.org/10.4060/ca9692en>
- FAOSTAT (2020a). Suite of Food Security Indicators, <http://www.fao.org/faostat/en/#data/FS>
- FAOSTAT (2020b). Data on Islamic Republic of Iran, [http://faostat.fao.org/static/syb/syb\\_102.pdf](http://faostat.fao.org/static/syb/syb_102.pdf)
- GRFC (2020). Global Report on Food Crises, Joint analysis for Better Decisions; [https://docs.wfp.org/api/documents/WFP-0000114546/download/?\\_ga=2.70676240.1644043769.1612853053-1731074169.1572183068](https://docs.wfp.org/api/documents/WFP-0000114546/download/?_ga=2.70676240.1644043769.1612853053-1731074169.1572183068)
- Ghoneim, Ahmed Farouk (2020). “Exploring the Potential Impact of COVID-19 on Trade in the Arab Region,” op-ed for Arab Development Portal, <https://arabdevelopmentportal.com/blog/exploring-potential-impact-covid-19-trade-arab-region>
- Ghoneim, Ahmed Farouk (2015). “The Political Economy of Food Price Policy in Egypt”, in Per Pinstrup-Anderson (editor), *Food Price Policy in an Era of Market Instability*, Oxford University Press.

- Glauber, Joseph, David Laborde, Will Martin, and Rob Vos (2020). COVID-19: Trade restrictions are worst possible response to safeguard FS, IFPRI Blog: Issue Post, MARCH 27, 2020; <https://www.ifpri.org/publication/covid-19-trade-restrictions-are-worst-possible-response-safeguard-food-security>
- Global Hunger Index (GHI) (2020). One Decade to Zero Hunger, Linking Health and Sustainable Food Systems, <https://www.globalhungerindex.org/>.
- IFPRI (2020a). *Cash transfers as an effective tool for social protection and shock response in Egypt*, Symposium Policy Note 23 USAID and IFPRI, <https://www.ifpri.org/publication/symposium-policy-note-3-cash-transfers-effective-tool-social-protection-and-shock>
- IFPRI (2020b). *Digitalization of agricultural services and policy analysis in Egypt*, Symposium Policy Note 2, USAID and IFPRI, <https://www.ifpri.org/publication/symposium-policy-note-2-digitalization-agricultural-services-and-policy-analysis-egypt>
- IFPRI (2016). *Global Nutrition Report: From Promise to Impact Ending Malnutrition by 2030*; <http://www.ifpri.org/publication/global-nutrition-report-2016-promise-impact-ending-malnutrition-2030>
- International Trade Center ITC (2021). Market Access Map, COVID-19 Temporary Trade Measures, <https://www.macmap.org/Covid19>
- Karasapan, Omer (2020). Striving for Water and Food Security, *The Cairo Review of Global Affairs*, <https://www.thecaireview.com/essays/striving-for-water-and-food-security/>
- Kinsey, Eliza W., Dirk Kinsey and Andrew G. Rundle (2020). *COVID-19 and Food Insecurity: an Uneven Patchwork of Responses*, *J Urban Health* (2020) 97:332–335, <https://doi.org/10.1007/s11524-020-00455-5>, Published online June 2020, The New York Academy of Medicine 2020.
- Larson, Donald F., Julian Lampietti, Christophe Gouel, Carlo Cafiero, and John Roberts (2012). Food Security and Storage in the Middle East and North Africa, The World Bank Development Research Group Agriculture and Rural Development Team April 2012, Policy Research Working Paper 6031; [https://www.researchgate.net/publication/254072586\\_Food\\_Security\\_and\\_Storage\\_in\\_the\\_Middle\\_East\\_and\\_North\\_Africa](https://www.researchgate.net/publication/254072586_Food_Security_and_Storage_in_the_Middle_East_and_North_Africa)
- Ling Ma, Nyuk, Wanxi Peng, Chin Phong Soon, Muhamad Fairus Noor Hassim, Suzana Misbah, Zaidah Rahmat, Wilson Thau Lym Yong, and Christian Sonne (2021). Covid-19 Pandemic in the Lens of Food Safety and Security, *Environmental Research* [Volume 193](https://www.sciencedirect.com/science/article/pii/S0013935120313025), February 2021, 110405, <https://www.sciencedirect.com/science/article/pii/S0013935120313025>
- Mandour Dina (2017). Food Insecurity and Political Unrest in Egypt: The Inter-Linkages, Paper presented at the conference Crisis and Conflict in the Agrarian World: An Evolving Dialectic, March 1-3, 2017, Sciences Po, Paris, France.

- Mouloudj, Kamel, Ahmed Chemseddine Bouarar, and Hamid Fecht (2020). “The Impact of Covid-19 Pandemic on Food Security”, *Les Cahiers du Cread*, Vol. 36 – no. 03 - 2020 159, [https://www.researchgate.net/publication/343047126\\_The\\_Impact\\_Of\\_Covid-19\\_Pandemic\\_On\\_Food\\_Security](https://www.researchgate.net/publication/343047126_The_Impact_Of_Covid-19_Pandemic_On_Food_Security)
- Napoli, Marion (2011). *Towards a Food Insecurity Multidimensional Index (FIMI)*, Master in Human Development and FS, Roma TRE Universita Tegli Studi; <http://www.fao.org/fileadmin/templates/ERP/uni/FIMI.pdf>
- Niles, Meredith T., Farryl Bertmann, Emily H. Belarmino, Thomas Wentworth, Erin Biehl, MSPH, Roni Neff (2020). *The Early Food Insecurity Impacts of COVID-19*, May 2020, <https://www.medrxiv.org/content/10.1101/2020.05.09.20096412v1.full.pdf>
- OECD (2020). COVID-19 Crisis Response in MENA countries, <https://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-mena-countries-4b366396/>
- Omidvar Nasrin, Davod Ahmadi, Kate Sinclair, and Hugo Melgar-Quiñonez (2019). Food Security in selected Middle East and North Africa (MENA) countries: An inter-country comparison, *FS* (2019) 11:531–540, <https://doi.org/10.1007/s12571-019-00935-w>, [https://ideas.repec.org/a/spr/ssefpa/v11y2019i3d10.1007\\_s12571-019-00935-w.html](https://ideas.repec.org/a/spr/ssefpa/v11y2019i3d10.1007_s12571-019-00935-w.html)
- Oraikat, Samir (2020). *Coronavirus and Food Security (in Arabic)*, Series of Papers Institute of National Planning, Cairo, May 2020, <http://repository.inp.edu.eg/bitstream/handle/123456789/4850/6.pdf?sequence=1&isAllowed=y>
- Petetin, Ludivine (2020). *The COVID-19 Crisis: An Opportunity to Integrate Food Democracy into Post-Pandemic Food Systems*, Downloaded from <https://www.cambridge.org/core>. IP address: 196.155.13.63, on 22 Jul 2020 at 17:07:06, subject to the Cambridge Core terms of use, available at <https://www.cambridge.org/core/terms>. <https://doi.org/10.1017/err.2020.40>
- Pinstrup-Anderson, Per (2015). “An Overview”, in Per Pinstrup-Anderson (editor), *Food Price Policy in an Era of Market Instability*, Oxford University Press.
- Poljanšek, K, Vernaccini, L, and Marin Ferrer (2020). *INFORM COVID-19 Risk Index*, European Commission, Joint Research Centre (JRC), <https://op.europa.eu/en/publication-detail/-/publication/be4524bf-a9f7-11ea-bb7a-01aa75ed71a1/language-en>
- Raouf, Mariam, Dalia Elsabbagh, and Manfred Wiebelt (2020). Impact of COVID-19 on the Jordanian Economy Economic sectors, Food Systems, and Households, Regional Program Policy Note 09, November 2020; <https://ebrary.ifpri.org/utills/getfile/collection/p15738coll2/id/134132/filename/134343.pdf>
- Schmidhuber, Josef, Jonathan Pound, and Bing Qiao (2020). COVID-19: Channels of Transmission to Food and Agriculture Trade and Market Division Economic and Social Development Department, Food and Agriculture Organization of the United Nations Rome, <http://www.fao.org/3/ca8430en/CA8430EN.pdf>

- Swinnen, Johan and John McDermott (2020). COVID-19 and Global Food Security, IFPRI, Middle East and North Africa; <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/133762/filename/133971.pdf>
- Udmale, Parmeshwar, Indrajit Pal, Sylvia Szabo, Malay Pramanik, and Andy Large (2020). Global Food Security in the context of COVID-19: A scenario-based exploratory analysis, *Progress in Disaster Science* 7 (2020) 100120, Published by Elsevier; <https://www.sciencedirect.com/science/article/pii/S2590061720300570>
- United Nations UN (2020a). *The Impact of COVID-19 on the Arab Region, An Opportunity to Build Back Better*, Policy Brief; [https://www.un.org/sites/un2.un.org/files/sg\\_policy\\_brief\\_covid-19\\_and\\_arab\\_states\\_english\\_version\\_july\\_2020.pdf](https://www.un.org/sites/un2.un.org/files/sg_policy_brief_covid-19_and_arab_states_english_version_july_2020.pdf), July 2020.
- United Nations UN (2020b). *The Impact of COVID-19 on Food Security and Nutrition*, Policy Brief; [https://namibia.un.org/sites/default/files/2020-06/sg\\_policy\\_brief\\_on\\_covid\\_impact\\_on\\_food\\_security.pdf](https://namibia.un.org/sites/default/files/2020-06/sg_policy_brief_on_covid_impact_on_food_security.pdf), June 2020.
- United Nations Sustainable Development Group UNSDG (2020). The Impact of COVID-19 on the Arab Region An Opportunity to Build Back Better, Policy Brief, JULY 2020, <https://unsdg.un.org/resources/policy-brief-impact-covid-19-arab-region-opportunity-build-back-better>
- WDI (2020). World Development Indicators; <https://databank.worldbank.org/source/world-development-indicators>;
- Woertz, Eckart (2020). Wither the Self-sufficiency Illusion? Food Security in Arab Gulf States and the impact of COVID-19, *FS* (2020) 12:757–760; <https://link.springer.com/article/10.1007/s12571-020-01081-4>
- Workie, Endashaw, Joby MAckolil, Joam Nykia, and Sendhil Ramadas (2020). “Deciphering the Impact of COVID-19 Pandemic on Food Security, Agriculture, and Livelihoods: A Review of the Evidence from Developing countries”, *Current Research in Environmental Sustainability*, Volume 2, December 2020, 100014, <https://www.sciencedirect.com/science/article/pii/S266604902030027X?via%3Dihub>
- World Food Program WFP (2021). World Hunger Map, HungerMap Live; <https://hungermap.wfp.org/>
- World Food Program WFP (2020a). *Economic and Food Security Implications of the COVID-19 Outbreak: The cost of the attempt to contain a highly contagious disease*, Vulnerability analysis and Mapping Service VAM; [https://fscluster.org/sites/default/files/documents/wfp-economic\\_and\\_food\\_security\\_implications\\_of\\_the\\_covid-19\\_outbreak.pdf](https://fscluster.org/sites/default/files/documents/wfp-economic_and_food_security_implications_of_the_covid-19_outbreak.pdf)
- World Food Program WFP (2020b). WFP Egypt Country Brief, May 2020; <https://reliefweb.int/report/egypt/wfp-egypt-country-brief-may-2020>
- World Bank (2021). MENA Crisis Tracker, 2/2/2021, <http://documents1.worldbank.org/curated/en/280131589922657376/pdf/MENA-Crisis-Tracker-February-2-2021.pdf>

- World Bank Group (2020). Trading together: Reviving Middle East and North Africa Regional Integration in the Post-Covid Era, World Bank Middle East and North Africa Region, MENA Economic Update October, 2020; <https://openknowledge.worldbank.org/handle/10986/34516>
- World Resources Institute (2013). Water Stress by Country, December 2013, <https://www.wri.org/data/water-stress-country>
- Zurayk, R. (2020). Pandemic and Food Security: A View from the Global South. *Journal of Agriculture, Food Systems, and Community Development*, 9 (3), 17-21. <https://doi.org/10.5304/jafscd.2020.093.014>; <https://www.foodsystemsjournal.org/index.php/fsj/article/view/803>

## Annex

**Table 1. GFSI scores in MENA countries in 2019**

Overall	Affordability		Availability		Quality and Safety						
	Score / 100	Δ	Score / 100	Δ	Score / 100	Δ					
Qatar (13)*	81.2	+2.9	Qatar	98.9	0.0	Israel	73.6	+1.2	Qatar	84.1	-0.1
Israel (18)	79.0	+0.5	UAE	89.8	+0.2	Egypt	70.2	+0.3	Israel	83.8	-0.1
UAE (21)	76.5	+1.0	Kuwait	88.1	-0.2	Turkey	64.8	-1.5	UAE	78.5	+4.4
Kuwait (27)	74.8	+3.2	Saudi Arabia	86.3	-0.1	Morocco	64.2	+0.7	Kuwait	75.9	0.0
Saudi Arabia (30)	73.5	-0.2	Israel	83.0	0.0	Qatar	64.0	+6.6	Oman	74.4	+0.1
Turkey (41)	69.8	-0.6	Bahrain	81.9	-0.4	UAE	63.7	+0.5	Saudi Arabia	73.5	+0.1
Oman (46)	68.4	+0.5	Oman	77.8	+0.1	Kuwait	62.3	+7.4	Turkey	71.1	0.0
Bahrain (50)	66.6	+1.5	Turkey	74.7	+0.1	Saudi Arabia	61.8	-0.4	Egypt	65.9	0.0
Egypt (55)	64.5	0.0	Jordan	70.5	-0.1	Tunisia	58.0	-3.7	Tunisia	62.2	+0.3
Morocco (59)	62.8	+0.8	Algeria	66.9	+0.1	Oman	57.6	+0.8	Morocco	61.9	+0.5
Jordan (64)	61.0	+0.8	Morocco	61.5	+0.9	Bahrain	56.3	+3.7	Bahrain	56.9	+0.3
Tunisia (69)	60.1	-1.3	Tunisia	61.5	+0.6	Algeria	55.8	-0.3	Jordan	54.2	0.0
Algeria (70)	59.8	-0.8	Egypt	57.6	-0.4	Jordan	54.8	+2.0	Algeria	53.0	-4.6
Syria (107)	38.4	+1.3	Yemen	45.5	0.0	Syria	38.9	+2.8	Syria	46.4	0.0
Yemen (111)	35.6	-0.7	Syria	34.6	+0.1	Yemen	28.6	-1.2	Yemen	30.2	-0.9

\*the parentheses denote the world rank in 2019 across 113 countries covered by the index. Source: EIU (2020); <https://foodsecurityindex.eiu.com/>



**Table 2. MENA countries grouped by GDP per capita, political stability, food insecurity and COVID-19 intensity**

		GDP per Capita (constant 2015) 2019	Political stability and absence of violence/terrorism (index) 2018	Global Hunger Index (2020)	Food Insecurity (2018/2019)		COVID cases	
					PoMSFI (%)	PoU (%)	Number of confirmed cases (till January 2021)	death/cases %
Low Income	Yemen	716.9098	-3				2,118	29.0
	Syria	1194.212	-2.74				13,557	6.5
Lower Middle Income	Algeria	4119.43	-0.79	9	17.6	2.8	105,369	2.7
	Djibouti	3183.33	-0.13				5,918	1
	Egypt	3837.485	-1.16	11.9	34.2 (+)	4.7	161,143	5.5
	Morocco	3224.816	-0.33	8.9		4.3	465,769	1.7
	Tunisia	3938.674	-0.9	5.7	20 (+)	2.5	195,314	3.2
	Palestine	3182.421	-1.74				155,006	1.2
Upper Middle Income	Iran	4887.369	-1.31	7.9	39.7	4.7	136,7032	4.2
	Iraq	4748.228	-2.56	17.1		23.7	612,870	2.1
	Jordan	4064.575	-0.38	8.8			319,519	1.3
	Lebanon	7174.747	-1.64	8.9		5.7	276,587	0.8
	Libya	4630.108	-2.44			35.9 (+)	112,540	1.5
	Turkey	11853.45	-1.33	<5		2.5	242,328	10.3

**Table 2. MENA countries grouped by GDP per capita, political stability, food insecurity and COVID-19 intensity (*continued*)**

		<b>GDP per Capita (constant 2015) 2019</b>	<b>Political stability and absence of violence/terrorism (index) 2018</b>	<b>Global Hunger Index (2020)</b>	<b>Food Insecurity (2018/2019)</b>		<b>COVID cases</b>	
					<b>PoMSFI (%)</b>	<b>PoU (%)</b>	<b>Number of confirmed cases (till January 2021)</b>	<b>death/cases %</b>
High Income	Bahrain	21177.83	-0.84				107,329	
	Israel	40580.39	-0.93		12.2	2.5	685,583	0.74
	Kuwait	27623.48	0.11	<5	12.3	2.5	170,036	0.56
	Oman	13844.36	0.65	12.2		7.8	135,041	1.13
	Qatar	60013.32	0.68				153,690	0.16
	Saudi Arabia	19753.31	-0.52	7.5		4.8	369,961	1.72
	UAE	39042.16	0.74			3.1	323,402	0.28

Sources: <https://unctadstat.unctad.org/wds/>, FAO et al. (2020), FAOSTAT (2020a), WFP (2021), WDI (2020) <https://databank.worldbank.org/source/world-development-indicators>, <https://www.worldometers.info/coronavirus/#countries>, the (+) denotes an increasing % since 2016

**Table 3. Percentage of changes in poverty rates due to COVID-19 crisis GDP losses**

	Poverty rate (\$3.2 in 2011 PPP) (2021)	
Algeria	26.4	42.12
Egypt	15.8	12.43
Iran	20.79	17.12
Iraq	49.17	46.58
Jordan	19.14	27.02
Lebanon	100.98	–
Morocco	28.38	27.31
Tunisia	30.3	37.63

Projections in the first column are based on a common elasticity for the eight MENA countries at each poverty threshold, while the second column uses varying poverty-to-GDP elasticities across countries as well as across poverty thresholds (World Bank, 2021). Source: World Bank (2021).

**Table 4. Vulnerability of MENA countries to food-related COVID-19 induced disruptions**

	<b>Supply Related Shocks</b>	<b>Demand Related Shocks</b>
Kuwait (intermediate low risk)* UAE (low risk) Saudi Arabia (intermediate low risk) Oman (intermediate low risk) Qatar (low risk) Bahrain (low risk)	With relatively limited domestic agricultural production and limited agricultural exports, GCC countries have limited and low to intermediate low exposure to COVID-19-associated supply risks to domestic production. GCC countries shield their food supply through reserves and trade, at least in the interim. Their edge lies in the modernized, well-established value chains that helped in mitigating the crisis impact to a great extent	With a high food import dependency but a low share of food expenditure in total expenditures, GCC countries are exposed to a relatively low to intermediate low risk of exposure to demand risks. The relatively high per capita income of these countries may shield the population from potential demand shocks. Food subsidies are also an important “automatic stabilizer.” Still, migrant workers are under extreme risk being not covered with social security schemes and face severe social and legal discrimination.
Tunisia (intermediate low risk) Algeria (high risk) Libya, Morocco (intermediate low risk)	The degree of exposure to supply risks varies considerably among the Maghreb countries. Algeria and Tunisia are exposed to low risk with minimal exposure to risk from consumption of intermediate inputs and fixed capital and low agricultural exports. Although both Tunisia and Morocco have high shares of food exports of high-value products such as fruits, vegetables, olive oil and dates, Morocco faces an intermediate high degree of exposure to risk because of its more labor-intensive production and risk associated with the availability of intermediate inputs.	Similar to the exposure to supply shocks, the degree of exposure to demand risks varies among the Maghreb countries. Algeria faces a high degree of exposure to demand risk because of its relatively high share of food expenditure and relative higher dependence on food imports. Morocco and Tunisia are exposed to intermediate low risk with relatively lower food import dependency.
Iraq (high risk) Lebanon Jordan (intermediate high risk) Palestine (high risk), Syria	Jordan, Syria, and Palestine are subject to a high degree of exposure while Iraq and Lebanon face a low to intermediate low degree of exposure. Yet with new projections for 2021 of harsh economic contraction, Lebanon might still be at high risk. As a conflict-affected country, Syria faces a high degree of exposure to supply risk. Iraq, with limited agricultural exports, faces a low degree of exposure.	Iraq, Jordan, and Palestine face an intermediate high to high risk of exposure to demand risk because of a high share of imports. Syria’s exposure is exacerbated by the crisis, while Lebanon is exposed to risk because of a relatively high share of food imports and its financial crisis.

**Table 4. Vulnerability of MENA countries to food-related COVID-19 induced disruptions (*continued*)**

	<b>Supply Related Shocks</b>	<b>Demand Related Shocks</b>
Djibouti (high risk) Yemen (high risk)	Djibouti faces a high degree of risk exposure to COVID-19 supply shocks. Yemen is exposed to intermediate low risk due its low share of agricultural exports.	Both are exposed to a high risk of demand shocks. This may be due to the inability of the governments of these countries to provide sufficient social protection to shield the poor from the consequences of COVID-19.
Egypt (high risk)	Egypt successfully secured the availability of food through imports, domestic production, and food reserves of major staples. In addition, the onset of the crisis coincided with the winter season harvest with a good harvest of wheat expected. Egypt faces a minimal level of exposure to supply risk. Egypt is also gradually introducing digitalization in farm production, though at early steps.	With high food import dependency, a relatively high share of food expenditure, particularly for those of low income and with high rural and urban poverty, Egypt faces a high degree of exposure to demand shocks. The government has taken a host of measures to mitigate the adverse effect of the crisis on households and on the business, banking and financial sectors.

\* Between parenthesis () is the possible extent of COVID-19 food-related shock exposure as suggested Schmidhuber et al., (2020) based on a set of indicators as share of intermediate inputs, consumption of fixed capital per agricultural worker, gross output per agricultural worker, share of agricultural exports, overall exposure to supply shocks, share of food expenditure per capita, share of agricultural exports, and overall exposure to demand shocks. Source: FAO (2020) with minor amendments.

**Table 5. Food trade related adopted measures in response to COVID-19 in MENA countries (as of end of January 2021)**

Country	Type of Measure	Affected Products	Effect on Trade	Affected Partner	Status	Start Date	End Date
Algeria	Export prohibition	Food products, medicines, and medical supply products	Restrictive	All countries	Active	3/22/2020	Unknown
Egypt	Export prohibition	Beans, peas, and lentils	Restrictive	All countries	Active	3/31/2020	12/31/2020
Egypt	Prohibitions/restrictions of imports for SPS reasons	Garlic, carrots and green ginger	Restrictive	China	Active	2/9/2020	Unknown
Iraq	Additional import duties	Agricultural products and gypsum	Restrictive	All countries	Active	4/2/2020	4/1/2022
Jordan	Prohibitions/restrictions of imports for SPS reasons	Animal and plant-based products	Restrictive	China	Active	2/2/2020	Unknown
Jordan	Export prohibition	Food products	Restrictive	All countries	Terminated	4/6/2020	4/22/2020
Kuwait	Export prohibition	Foodstuffs, medicines, medical supplies, and equipment	Restrictive	All countries	Active	3/12/2020	Unknown
Morocco	Tariff reduction	Wheat, lentils, chickpeas, beans, and dried beans	Liberalizing	All countries	Active	4/1/2020	12/31/2020
Oman	Export prohibition	Onions, garlic, flour, and wheat	Restrictive	All countries	Active	4/2/2020	Unknown
Saudi Arabia	Duties on imports are postponed	All imports	Liberalizing	All countries	Terminated	3/31/2020	6/30/2020
Syrian Arab Republic	Export prohibition	Food commodities, sterilization, and cleaning materials	Restrictive	All countries	Terminated	4/5/2020	5/4/2020
Turkey	Licensing or permit requirements to export	Lemons	Restrictive	All countries	Terminated	4/7/2020	8/7/2020

Source: ITC (2021), <https://www.macmap.org/Covi>