

Extended Abstract

Paper/Poster Title	The impact of COVID-19 pandemic on household food security in the United Arab Emirates
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Abstract	200 words max
<p>The COVID-19 pandemic has exposed the vulnerability of the food systems of import-dependent economies to disruptions of global food supply chains. Several countries have imposed export restrictions for agri-food products following the outbreak of the COVID-19 pandemic, which might raise food insecurity in import-dependent economies such as the United Arab Emirates (UAE). The economic difficulties caused by the pandemic including pandemic-induced job losses and declining incomes might make (nutritious) food unaffordable, particularly for poorer households. In this study, we measured the prevalence and severity of food insecurity in the UAE during May 2021-June 2022 by applying the Food Insecurity Experience Scale (FIES), and assessed the impact of the COVID-19 pandemic and other demographic and socioeconomic characteristics on households' food insecurity levels by applying the bootstrap-truncated regression technique. The results of the estimations of the prevalence rates of household food insecurity showed that about 22% of the respondents experienced moderate or severe food insecurity during the past year whereas only 0.02% has experienced severe food insecurity during the same time period. The results also showed that the COVID-19 pandemic has adversely affected food security in the UAE, as a result of the disruptions in the physical and economic access to food.</p>	
Keywords	COVID-19; food security; import dependency; poverty; United Arab Emirates
JEL Code	Health, Education, and Welfare: Health I1, Welfare, Well-Being, and Poverty I3; Economic Development, Innovation, Technological Change, and Growth: Microeconomic Analyses of Economic Development O12; Agriculture: Agricultural Policy; Food Policy; Animal Welfare Policy Q18
Introduction	100 – 250 words
<p>The economic difficulties caused by the pandemic and the restrictive measures adopted by nations to slowdown the spread of the virus reduced households' economic and physical access to food (Fang et al., 2022). The pandemic-induced job losses and declining incomes might make (nutritious) food unaffordable, particularly for poorer households. Extremely, food may be unavailable in some areas as a result of the disruptions and breakdowns of logistics, marketing and trading systems, all raising food insecurity (FAO, 2020). Several countries have imposed export restrictions for agri-food products following the outbreak of the COVID-19 pandemic (Koppenberg et al., 2021), which might raise food insecurity in import-dependent economies like the United Arab Emirates (UAE).</p> <p>Studies reported that the COVID-19 pandemic has adversely affected food security, specifically the accessibility dimension (Béné et al., 2021; John-Henderson et al., 2022). There is, however, lack of studies examining the impact of the pandemic on food security in the GCC although food security might be severely impacted due to their high food import dependency and the COVID-19-induced global food supply chain disruptions. The objective of the study was to measure the prevalence and severity of food</p>	

insecurity in the UAE during May 2021-June 2022, and to assess the impact of the COVID-19 pandemic and other demographic and socioeconomic characteristics on households' food insecurity levels.

Methodology

100 – 250 words

Measuring food security has remained challenging due to the evolving nature of its operational concept and definition in relation to its multiple dimensions and components (Maxwell, 1996; Smith et al., 2017). Subsequently, the estimates of the prevalence and severity of food insecurity in the literature are inconsistent and inconclusive due to the lack of standardization of the food security indicators applied (Smith et al., 2017). To circumvent the limitations of food security measurement, FAO proposed the Food Insecurity Experience Scale (FIES) measure (FAO, 2016). The FIES is constructed using survey data from an 8-item questionnaire (Table 1). The questions reflect a respondent's experiences and behaviours when faced with lack of money or other resources to meet their basic food requirements. The prevalence and severity rates of food insecurity at respondent level are then derived from the dichotomous responses, by applying the logistic Rasch model (Nord, 2014). The model assumes that the log-odds of a household providing an affirmative response for a specific item is proportional to the difference between the level of severity of the household's food insecurity condition and the item's severity (Cafiero et al., 2018). Households are then assigned into the two food insecurity severity classes (*Moderate or severe food insecurity* and *Severe food insecurity*) following FAO's predefined global reference scales.

Table 1. The household version of the Food Insecurity Experience Scale Survey Module

No.	Short reference	Question wording
1	WORRIED	During the last 12 MONTHS, was there a time when you were worried that you or any household member would not have enough food to eat because of a lack of money or other resources?
2	HEALTHY	Still thinking about the last 12 MONTHS, was there a time when you or any household member were unable to eat healthy and nutritious food because of a lack of money or other resources?
3	FEWFOODS	Was there a time when you or any household member ate only a few kinds of foods because of a lack of money or other resources?
4	SKIPPED	Was there a time when you or any household member had to skip a meal because there was not enough money or other resources to get food?
5	ATELESS	Still thinking about the last 12 MONTHS, was there a time when you or any household member ate less than you thought you or any household member should because of a lack of money or other resources?
6	RANOUT	Was there a time when your household ran out of food because of a lack of money or other resources?
7	HUNGRY	Was there a time when you or any household member were hungry but did not eat because there was not enough money or other resources for food?
8	WHOLEDAY	During the last 12 MONTHS, was there a time when you or any household member went without eating for a whole day because of a lack of money or other resources?

After estimating the prevalence of food insecurity, in the second stage, we applied a bootstrap-truncated regression to analyse the determinants of the prevalence and severity household food insecurity. The bootstrap-truncated regression for analysing the association between households'

degree of food insecurity and determinants of food insecurity including household characteristics can be given by:

$$Y_i = X_i' \beta + \varepsilon_i \quad (1)$$

where Y_i is the dependent variable measuring food insecurity (i.e. the *Food Insecurity Score*); X_i' refers to a vector of household's demographic, socioeconomic, and COVID-19-related characteristics, and ε_i is the error term (unobserved household heterogeneity).

Results

100 – 250 words

The frequency of household responses for the 8-item FIES questions are presented in Figure 1. About half of the respondents (51%) stated that they were worried about running out of food whereas about 48% of them were unable to eat healthy and nutritious food at some point during the past 12 months because of lack of money or other resources.

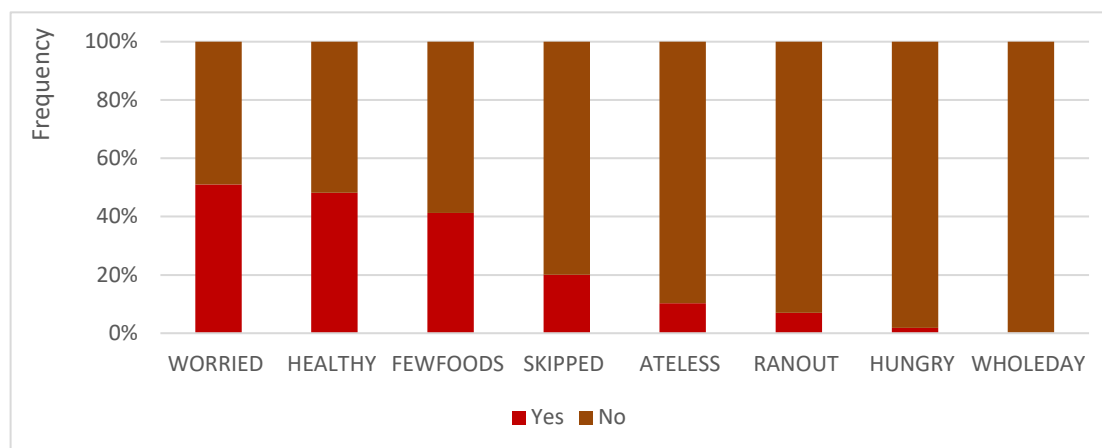


Figure 1. Frequency of responses for the Food Insecurity Experience Scale Survey Module (N=504).

The results of the estimations of the prevalence rates of household food insecurity (Table 2) show that about 22% of the respondents experienced moderate or severe food insecurity during the past year whereas almost no one (0.02%, only one household of the 504 respondents) has experienced severe food insecurity during the same time period (Table 2). In other words, about 22% of the respondents have raw scores of at least 4 (i.e. have eaten less than they thought should have) whereas almost none have spent a whole day without eating at some point during the past year because of lack of adequate resources to acquire food (i.e. raw scores of 7 or above). On the other hand, about 34% of the respondents were found to be food secure, i.e. respondents did not provide any affirmative response to the 8-item FIES questions.

Table 3 presents the truncated regression estimation results for the determinants of household-level food insecurity. Households living in Dubai (compared to other emirates), less educated, poorer, those with daily labour as their main source of livelihood and those with more elderlies are found to be food insecure (i.e. association). The COVID-19 pandemic has also shown to raise food insecurity through the disruption in physical access to food and job loss.

Table 2. Prevalence and severity of household food insecurity in the UAE

Items	Item severity		Infit		% affirmative response on non-extreme sample ^a	Severity of household food insecurity			% affirmative responses on complete sample ^b
	Mean	SE	Statistic	SE		Raw score	Severity	SE	
WORRIED	-2.92	0.16	0.81	0.07	77.34	0	-4.26	1.55	34.13
HEALTHY	-2.69	0.16	1.39	0.07	73.11	1	-3.34	1.22	18.85
FEWFOODS	-2.08	0.16	0.74	0.08	62.54	2	-2.06	1.11	14.29
SKIPPED	0.24	0.19	1.15	0.12	30.21	3	-0.74	1.19	11.31
ATELESS	1.54	0.21	0.98	0.12	15.41	4	0.65	1.15	11.90
RANOUT	2.14	0.23	0.96	0.14	10.27	5	1.94	1.14	6.75
HUNGRY	3.78	0.38	0.95	0.29	2.42	6	3.40	1.32	2.58
						7	4.45	1.55	0.20
Reliability									0.74
Reliability flat									0.79
Moderate or severe food insecurity prevalence rate									22.44%
Severe food insecurity prevalence rate									0.02%

^a Percentage of affirmative responses based on the non-zero raw score sample (N=331), i.e. excluding fully food secure respondents. ^b Percentage of affirmative responses based on the complete sample (N=504).

Table 3. Truncated regression estimation results for the determinants of household-level food insecurity

Food insecurity score	Coefficient	Bootstrap SE ^a	95% CI	
Region (Reference: Dubai)				
Sharjah	-0.103***	0.040	-0.181	-0.024
Abu Dhabi	-0.020	0.051	-0.120	0.080
Ajman	-0.164***	0.059	-0.279	-0.049
Others ^b	-0.068	0.061	-0.188	0.053
Main source of livelihood (Ref.: Private sector)				
Public sector employment	-0.112*	0.067	-0.244	0.020
Agriculture	-0.077	0.090	-0.253	0.100
Daily labor	0.187***	0.053	0.083	0.291
Own business	-0.072	0.048	-0.165	0.022
Expat	0.042	0.138	-0.229	0.313
Number of children (0 – 14 Years old)	-0.002	0.009	-0.021	0.016
Number of adults (15 – 59 Years old)	-0.011	0.009	-0.027	0.006
Number of elderlies (≥ 60 Years old)	0.041**	0.018	0.005	0.077
Age	-0.001	0.001	-0.003	0.002
Education	-0.079***	0.029	-0.135	-0.023
Food purchasing place	-0.002	0.033	-0.066	0.063
Income	-0.095***	0.030	-0.154	-0.035
Expenditure	0.014	0.015	-0.014	0.043
COVID-19-related variables				
Limited financial access	0.003	0.010	-0.016	0.022
Disruption in access to food outlets	0.017**	0.009	0.000	0.035
Job loss	0.081***	0.032	0.019	0.144
Risk of COVID-exposure	-0.012	0.009	-0.029	0.006
Food price increase	-0.013	0.010	-0.033	0.008
Exposed to unsafe food	0.005	0.010	-0.015	0.025
Increased domestic violence	-0.007	0.010	-0.027	0.012
Coping strategy to COVID-19-induced food insecurity				
Ate cheaper food	-0.042	0.043	-0.126	0.041
Ate less preferred food	0.045*	0.028	-0.009	0.099
Reduced diet diversity	-0.048***	0.015	-0.076	-0.019
Ate less nutritious food	0.035***	0.013	0.009	0.061
Spent saving	-0.015	0.028	-0.069	0.039
Borrowed food/money from friends/relatives	-0.010	0.035	-0.079	0.059
Sold assets	-0.013	0.037	-0.086	0.060
Constant	0.528***	0.202	0.132	0.923

<i>Error component and model fit</i>				
σ	0.168***	0.011	0.145	0.190
Log likelihood	241.890			
Wald chi ² (31)	305.940***			
Number of observations	331.000			

^a Estimation based on 1,000 replications. ^b Refers to the other three emirates: Ras Al Khaimah, Fujairah and Umm Al-Quwain.

Notes: ***, **, * Significant at critical levels of 1%, 5% and 10%, respectively.

Discussion and Conclusion

100 – 250 words

The results of the estimations of the prevalence rates of household food insecurity showed that about 22% of the respondents experienced moderate or severe food insecurity during the past year whereas only 0.02% has experienced severe food insecurity during the same time period. Our results also showed that the COVID-19 pandemic has adversely affected food security in the UAE, as a result of the disruptions in the physical and economic access to food, which is in line with the literature. A household's severity of food insecurity is associated with "temporary unemployment, episodes of ill health, or other recurring adverse events" as food insecurity is often a seasonal issue (Barrett 2010). Our results also showed that loss of job as a result of the pandemic is associated with increased household food insecurity. In line with our results, Béné et al. (2021) examined the impact of the pandemic on the four food security dimensions and concluded that the (economic and physical) accessibility dimension has been severely impaired globally compared to the other three dimensions whereas the availability dimension was found to be the least affected one.