Impacts of COVID-19 Pandemic on Household Food Security and Access to Social Protection Programs in the Philippines: Findings From a Telephone Rapid Nutrition Assessment Survey

Imelda Angeles-Agdeppa, PhD[1], Charina A. Javier, MDE[1], Charmaine A. Duante, MSPH[1], and Ma. Lynell V. Maniego[1]

Abstract

This study assessed the status and factors that affected the food security of Filipino households and their access to social protection programs and coping mechanisms during the coronavirus disease 2019 (COVID-19) pandemic in the Philippines. A rapid nutrition assessment survey through telephone interview was conducted on November 3 to December 3, 2020, among households covered in the 2019 Expanded National Nutrition Survey (ENNS) to compare the status of household food security before and during the pandemic. A total of 9 provinces and highly urbanized areas were selected as study sites based on risk to COVID-19 infection categorized as low, medium, and high. A total of 5717 households with contact numbers participated in the study. Results showed that almost two-thirds (62.1%) of the households experienced moderate to severe food insecurity when strict community quarantines started. The increase in the proportion of moderate to severe food insecurity was higher in the low- and medium-risk areas of COVID-19 infection than in high-risk areas (*P* < .05). The poorest households were 1.7 times more likely to become moderate to severely food insecure compared to middle-income households. No money to buy food (22.1%) was the top concern of food-insecure households. Purchasing food on credit, borrowing food from family, and loans from relatives and friends are the top coping strategies of food-insecure households. The results imply the need to extend assistance equitably to households and areas with fewer resources and minimal or no benefactors.

Keywords

COVID-19 pandemic, food security, food access, coping strategies

---

[1] Department of Science and Technology, Food and Nutrition Research Institute, Taguig City, Philippines

Corresponding Author:
Charina A. Javier, Department of Science and Technology, Food and Nutrition Research Institute, General Santos Avenue, Bicutan, Taguig City 1633, Philippines.
Email: caj910@gmail.com; caj@fnri.dost.gov.ph

Introduction

The State of Food Insecurity and Nutrition by the Food and Agriculture Organization 2020 showed that even before the coronavirus disease 2019 (COVID-19) pandemic happened, the world was not on track with its target of ending hunger by 2030.[1] In the Philippines, there has been an increase in the percentage of households who experienced food insecurity in the country before the COVID-19 pandemic, from 33.9% in 2015 to 56.0% in 2018 to 2019 based on the Household Food Insecurity Access Scale (HFIAS).[2] Moreover, the country ranked 70th out of 117 qualifying countries in the Global Hunger Index with a score of 20.1, a level of hunger considered serious.[3] Thus, food security is even more challenging during the COVID-19 pandemic with strict quarantine measures and movement restrictions were implemented in the country starting on March 16, 2020.

The COVID-19 pandemic has disrupted the food system, affecting both physical and economic access to food. The community quarantines and social distancing measures have resulted to transport restrictions that affected the food supply chain. Economic access such as job loss or reduced wages and increased food prices, and physical access such as mobility to groceries, food establishments, and other retail food shops challenge households to acquire safe, diverse, and healthy foods.[4,5]

In a survey done by the United Nations Development Programme—Philippines on May 2020 in 10 cities in Metro Manila and 4 cities in Cebu, about 83% of households experienced a reduction in income, about 34% totally lost their source of income, and about 33% reported having to skip a meal in a week.[6] Moreover, the National Economic Development Authority (NEDA) in the Philippines reported an overall 9.5% contraction in the gross domestic product (GDP) for 2020, with the highest contraction in the second quarter where the strictest community quarantine or lockdown was imposed.[7]

As a consequence, nutritional status has become a particular concern especially among those exposed and vulnerable to the virus.[8] Moreover, the triple burden of malnutrition, particularly undernutrition, overnutrition, and micronutrient deficiencies are likely to increase due to combined limited access to healthy foods, poor dietary habits, changes in diet due to lockdown, and reduced physical activities.[4] Projections from the World Food Programme incorporating the effects of COVID-19 suggest that around 265 million people from low- and middle-income countries will be suffering from hunger unless mitigation measures are taken.[9]

Given the severe economic and health crisis caused by the COVID-19 pandemic, this study assessed the household experiences of food insecurity particularly by area of risk to virus transmission, challenges and concerns related to food availability, and accessibility. It also included descriptions of food and cash assistance received, and coping strategies of food-insecure households during the pandemic. The survey was done approximately 8 months after the strictest community quarantine level was imposed in the Philippines in March.

Status of COVID-19 Pandemic in the Philippines and Government Response

The World Health Organization declared the COVID-19 as a global pandemic after the sudden increase in local transmissions on March 12, 2020. This was followed by Philippine President Rodrigo R. Duterte declaring the National Capital Region (NCR) and the entire Luzon Island under enhanced community quarantine (ECQ) (note 1). The ECQ was further imposed in the rest of the country upon the recommendation of local government units (LGUs) and the Department of Health through the Inter-Agency Task Force (IATF). The first ECQ lasted until June 1, 2020. The quarantine level per province or city was then assessed every 2 weeks by local IATF and approved by the national IATF.[10,12] The quarantine levels of provinces and highly urbanized cities (HUCs) were based on the risk levels categorized as low, medium, and high, which was based on 2 dimensions namely: (1) the risk of virus spread and (2) the risk of overburdening the health system.[13]

The Republic Act No. 11469 or the *Bayanihan* to Health as One Act was passed in order to

provide a quick response to the rapidly increasing COVID-19 cases and related concerns. This includes the guidelines in the implementation and enforcement of community quarantine levels, release of subsidies to low-income households via the Social Amelioration Program (SAP), allowing the LGUs to use more than 5% of their existing calamity funds, strict regulation of business and consumer practices, and ensuring availability of credit.[10,12]

Methods

Study Design, Survey Areas, and Participants

The Rapid Nutrition Assessment Survey (RNAS) was a cross-sectional survey conducted by the Department of Science and Technology—Food and Nutrition Research Institute (DOST-FNRI) from November 3, 2020, to December 3, 2020.

The study areas were selected first from the list of 39 provinces and HUCs covered in the 2019 Expanded National Nutrition Survey (ENNS). These areas were then categorized into low, medium, and high risk of COVID-19 infection. The Philippine islands are grouped into 3— Luzon (northern islands), Visayas (central islands), and Mindanao (southern islands). From each island group, one province or HUC was selected to represent a low-, medium-, or high-risk area based on the IATF for COVID-19 categories as of July 2020. However, 2 areas in the NCR, which are in Luzon, were included because there was no province under the high-risk category in Mindanao at the time of survey planning. A total of 9 provinces/HUCs were selected as study areas which are as follows: *low-risk areas*: Angeles City (Luzon), Guimaras (Visayas), South Cotabato (Mindanao); *medium-risk areas*: Pangasinan (Luzon), Southern Leyte (Visayas), Zamboanga City (Mindanao); *high-risk areas*: Pateros (NCR/Luzon), Parañaque City (NCR/Luzon), Lapu-lapu City (Visayas).

A total number of 9170 households from these identified 9 target areas were covered in the 2019 ENNS. Those with recorded mobile or telephone numbers were 6992 households and 5943 households were eligible to participate. However due to nonresponse, only 5717 (96.2%) households were covered for the RNAS. The profile of respondents in the RNAS is in Table 1.

About 25.7% of the households in the 2019 ENNS were excluded from the RNAS because they had no contact numbers. This difference is significant in terms of sociodemographic characteristics such as 62.8% (vs 38.2%, $P < .001$) of the rural households and 25.6% (vs 9.7%, $P < .001$) of the poorest households had no contact numbers. However, the 74.3% with contact numbers still represented the majority of households with different characteristics. Moreover, given the rapid nature of the assessment and restricted movement, the results should be viewed as a snapshot of the changes in household food security status before and during the pandemic and may not capture other issues and concerns across the whole country's pandemic response.

The household heads served as the respondents for the questionnaires on household food security and access to nutrition and social protection programs. Those who refused to participate in the study via telecommunication was not included in the survey.

Ethics Approval

The survey design of RNAS was approved by the DOST-FNRI Institutional Ethics Review Committee (FIERC #2020-013; October 29, 2020). The part of the conversation where the verbal consent of the household respondents is being obtained by the researcher was recorded to serve as the remote consent. Each remote consent was filed accordingly in the assigned laptop of each interviewer. All informed consent forms were collected and filed in a password-protected file.

Data Collection

The data in this study was collected through a phone interview and with the use electronic data collection system developed by DOST-FNRI.

Two food security assessment tools were used in the study. The Food Insecurity Experience Scale (FIES) with a recall period of "since the start of the community quarantine in March" (or 8 months from the time of declaration of the strictest community quarantine level to the actual

Table 1. Profile of Households by Selected Household and Household Head Characteristics: RNAS, 2020.

Characteristics	N	Prop	Standard error (SE)	95% CI LL	95% CI UL
Profile of households					
Risk to COVID-19 level					
Low risk	1934	34.3	0.6	33.1	35.6
Medium risk	2390	42.4	0.7	41.1	43.7
High risk	1313	23.3	0.6	22.2	24.4
Household size					
5 members and below	3814	67.7	0.6	66.4	68.9
Place of residence					
Rural	2256	40.0	0.7	38.7	41.3
Wealth quintile					
Poorest	603	10.7	0.4	9.9	11.5
Poor	1046	18.6	0.5	17.6	19.6
Middle	1203	21.3	0.5	20.3	22.4
Rich	1377	24.4	0.6	23.3	25.6
Richest	1408	25.0	0.6	23.9	26.1
Recipient of 4Ps					
No	4611	81.8	0.5	80.8	82.8
Yes, currently (during pandemic until now)	803	14.2	0.5	13.4	15.2
Yes, previously (before the pandemic)	223	4.0	0.3	3.5	4.5
Engagement in agriculture					
Yes	794	14.1	0.5	13.2	15.0
With children less than 5 years old					
Yes	1677	29.7	0.6	28.6	31.0
With pregnant women					
Yes	143	2.5	0.2	2.2	3.0
Profile of household head					
Sex					
Male	4065	72.1	0.6	70.9	73.3
Working status					
With employment	3725	66.1	0.6	64.8	67.3
Highest educational attainment					
No grade completed	77	1.4	0.2	1.1	1.7
At least elementary level	1534	27.2	0.6	26.1	28.4
At least high school level	2776	49.2	0.7	47.9	50.6
At least college level	1237	21.9	0.6	20.9	23.0
Others	13	0.2	0.1	0.1	0.4

Abbreviations: CI, confidence interval; RNAS, rapid nutrition assessment survey.

conduct of the phone survey) was used in the survey to capture chronic food insecurity. In addition, respondents were also asked which month/s they experienced each food insecurity item if their response is "yes, we experienced it." As a caveat, although FIES is often used with a recall period of 12 months to capture seasonality, it was used in the study to capture the experiences within the duration of the pandemic when movement restrictions were strictest. We deemed it is still valid as it captured 8 months of food insecurity experiences, particularly major disruptions in the food system due to the COVID-19 pandemic. Raw scores in the 2019 ENNS and 2020 RNAS were compared.

Another is the HFIAS with a recall period of "past month" to capture acute food insecurity. These tools were integrated into the Household Food Security Questionnaire of the RNAS. Coping mechanisms that households employed in

times of food insecurity were included in the questionnaire.

Social protection programs namely food assistance, cash assistance, and food production that were received by the households as well as problems encountered in accessing food during the pandemic were asked from the household heads. Food assistance is the provision of food packs usually containing rice, canned or dry goods, and other foods to households distributed by LGUs. Cash assistance or the SAP is the provision of emergency subsidies to low-income households to help them cope with the COVID-19 crisis based on the prevailing regional minimum wage.[14] Local government units also provided additional emergency cash aid depending on available local funds. Moreover, the respondents were also asked if they were previously or currently a beneficiary of the conditional cash transfer (CCT) program of the Philippines called *Pantawid Pamilyang Pilipino Program (4Ps)*. Meanwhile, household food production is the setting up or maintenance of edible garden and raising livestock or aquaculture either for own consumption or partly for sales.

Statistical Analysis

Descriptive statistics such as means, standard deviations, 95% confidence interval, and coefficient of variation were computed using STATA Version 16. Descriptive analyses of household food security status including coping mechanisms, food access experiences, and government program participation of the households during the COVID-19 pandemic were processed. A Chi-square test was implemented to test the association between household characteristics and household food insecurity status. Multivariate logistic regression was employed to determine the factors affecting the household food security status during the COVID-19 pandemic.

Because the FIES cannot precisely identify who among the households are food insecure in the population, the study used the estimated probabilities from the Rasch model for each raw score and assign those to each household. The continuous variable was then converted into discrete variable by assigning 1 if the probability is .5 or

higher or otherwise. The resulting dummy variable was then used as the dependent variable in the logistic regression analysis.

Results

The profile of respondents who experienced moderate to severe food insecurity is presented in Table 2. The proportion of moderate to severe food insecurity was significantly higher among households with more than 5 household members (64.5% vs 59.3%, $P < .001$), living in rural areas (67.2% vs 56.7%, $P < .001$), those engaged in agriculture (70.7% vs 59.4%, $P < .001$), with children 0 to 5 years old (65.4% vs 59.1%, $P < .001$), and with pregnant women (69.2% vs 60.7%, $P = .040$). The proportion of moderate to severe food insecurity also decreases as wealth status ($P < .001$) and education of household head ($P < .001$) increases. There were also significantly higher proportion of households who are recipients of 4Ps, whether previously or currently ($P < .001$), who were moderate to severely food insecure (Table 2). The 4Ps targets households belonging to the bottom 30% of the socioeconomic class with pregnant and/or children 0 to 18 years old. Thus, they are also likely the priority in food assistance programs that targets poor households.

Changes in Household Food Security Status

The prevalence of food insecurity among surveyed households in low-, medium-, and high-risk areas is presented in Figure 1. Based on FIES, more than half (62.1% vs 40.2%, $P < .001$) of the surveyed households experienced moderate to severe food insecurity, with 22-percentage point significant increase noted from the 40.2% prevalence in 2019 before pandemic. The impact of food insecurity was highest in low-risk areas with a 24.0-percentage point ($P < .001$) significant increase in moderate to severe food insecurity. This was followed by medium-risk areas with 22.9-percentage points ($P < .001$) and high-risk areas with 16.3-percentage points ($P < .001$).

The level of food insecurity peaked in April and May 2020 when the entire country was placed under ECQ, and gradually decreased

Table 2. Proportion of Households Who Experienced Moderate to Severe Food Insecurity Based on FIES: RNAS, 2020.

| | | Moderate to severe food insecurity | | | | |
| | | | | 95% CI | | |
Characteristics	n	Prop	Standard error (SE)	LL	UL	*P* value
Profile of households						
Household size						
5 members and below	2260	59.3	0.8	57.7	60.8	<.001
More than 5 members	1176	64.5	1.1	62.3	66.7	
Place of residence						
Rural	1517	67.2	1.0	65.3	69.1	<.001
Urban	1919	56.8	0.9	55.1	58.4	
Wealth quintile						
Poorest	492	81.6	1.6	78.3	84.5	<.001
Poor	810	77.4	1.3	74.8	79.9	
Middle	815	67.7	1.3	65.1	70.3	
Rich	791	57.4	1.3	54.8	60.0	
Richest	528	37.5	1.3	35.0	40.1	
Recipient of 4Ps						
No	2695	58.4	0.7	57.0	59.9	<.001
Yes, currently (during pandemic until now)	574	71.5	1.6	68.3	74.5	
Yes, previously (before the pandemic)	167	74.9	2.9	68.8	80.1	
Engagement in agriculture						
No	2875	59.4	0.7	58.0	60.7	<.001
Yes	561	70.7	1.6	67.4	73.7	
With children less than 5 years old						
No	2339	59.1	0.8	57.5	60.6	<.001
Yes	1097	65.4	1.2	63.1	67.7	
With pregnant women						
No	3337	60.7	0.7	59.4	62.0	.040
Yes	99	69.2	3.9	61.2	76.2	
Profile of household head						
Sex						
Male	2509	61.7	0.8	60.2	63.2	.057
Female	927	59.0	1.2	56.5	61.4	
Working status during pandemic						
Without employment	1175	61.5	1.1	59.3	63.6	.582
With employment	2261	60.7	0.8	59.1	62.3	
Highest educational attainment						
No grade completed	62	80.5	4.5	70.2	87.9	<.001
At least elementary level	1149	74.9	1.1	72.7	77.0	
At least high school level	1723	62.1	0.9	60.2	63.9	
At least college level	494	39.9	1.4	37.2	42.7	
Others	8	61.5	13.5	34.4	83.0	

Abbreviations: FIES, Food Insecurity Experience Scale; RNAS, rapid nutrition assessment survey.

thereafter as mobility restriction eased in most areas (Figure 2). The results also revealed that households with less than 5-year-old children had significantly higher percentage of food insecurity (65.2%; $P < .001$) as compared to households without young children and pregnant member (58.9%; $P < .001$). Food insecurity among households with pregnant only (67.5%; $P < .001$) and with both pregnant and children less than 5 years old (71.2%; $P < .001$) were also observed to
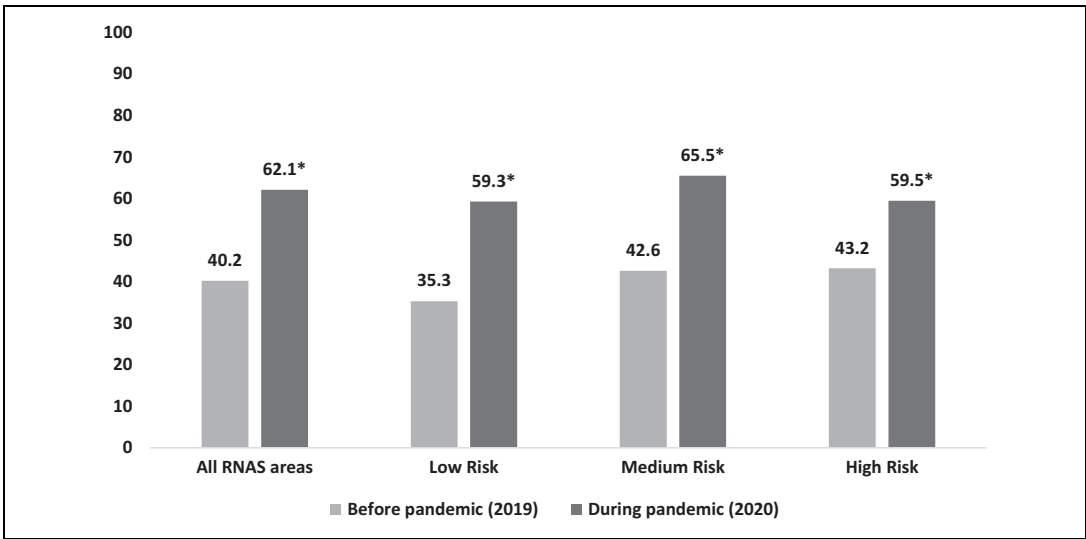
Figure 1. Prevalence of moderate to severe food insecurity based on FIES among households in low-, medium-, and high-risk areas during the COVID-19 pandemic. *Significant at $P < .001$. FIES indicates Food Insecurity Experience Scale.
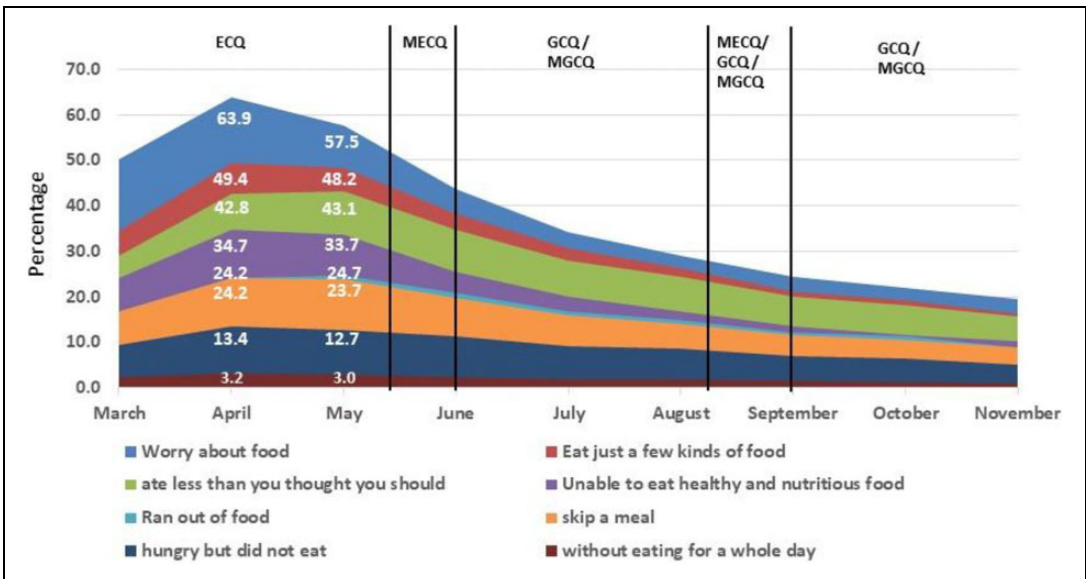

Figure 2. Prevalence of food insecurity experiences by month during the COVID-19 pandemic in 2020 based on FIES. ECQ indicates enhanced community quarantine; MECQ, modified enhanced community quarantine; GCQ, general community quarantine; MGCQ, modified general community quarantine. FIES indicates Food Insecurity Experience Scale.

be higher than those without pregnant and less than 5 years old but the differences were not significant (Figure 3).

Surveyed households engaged in various strategies to cope up with food insecurity. The top food-coping strategies adapted by the food insecure
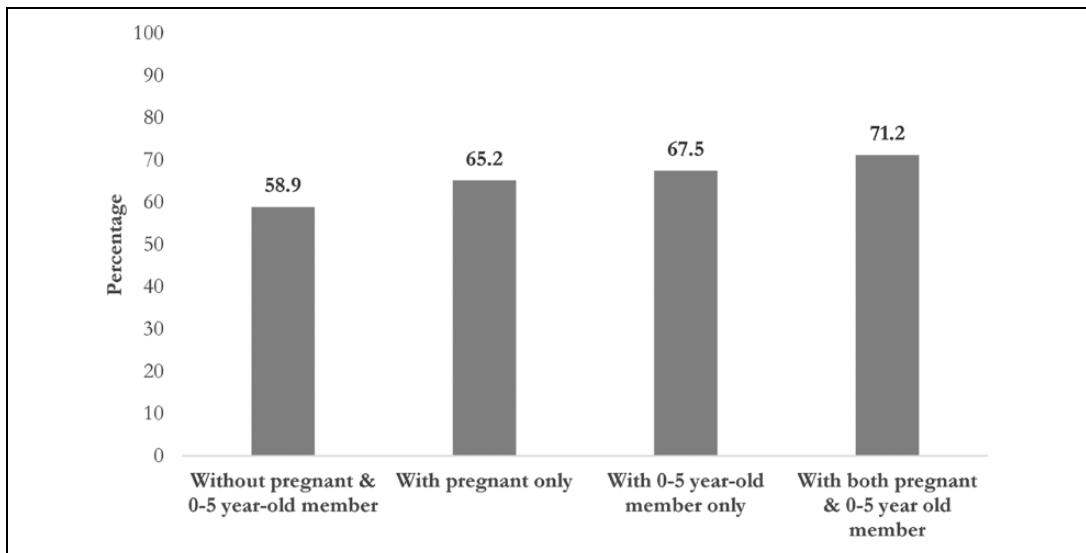
Figure 3. Proportion of households with pregnant and 0- to 5-year-old children who experienced moderate to severe food insecurity based on FIES during the pandemic. *Significant at *P* < .05. FIES indicates Food Insecurity Experience Scale.
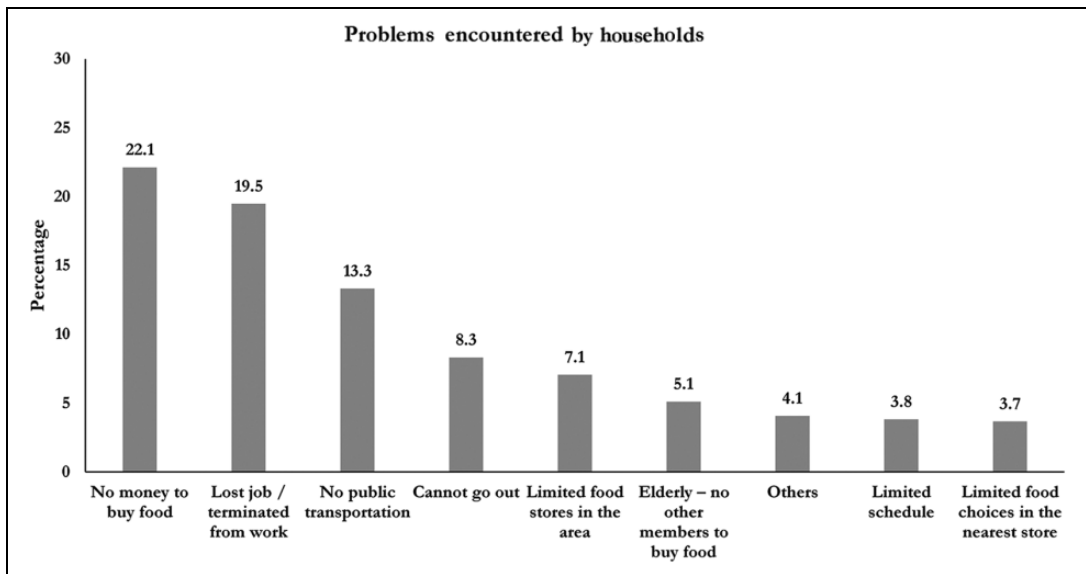

Figure 4. Most common problems encountered by households in accessing food during community quarantine from March to November 2020. *Multiple response.*

households included purchasing food on credit (71.8%), borrowing food from family/neighbors/friends (66.3%), bartering of food (30.2%), and reducing amount of intake of adults in order for children to have more (21.1%). Loan or borrowing money from relatives (74.4%) and nonrelatives (51.2%) were the top nonfood coping strategies of households. There were also households who
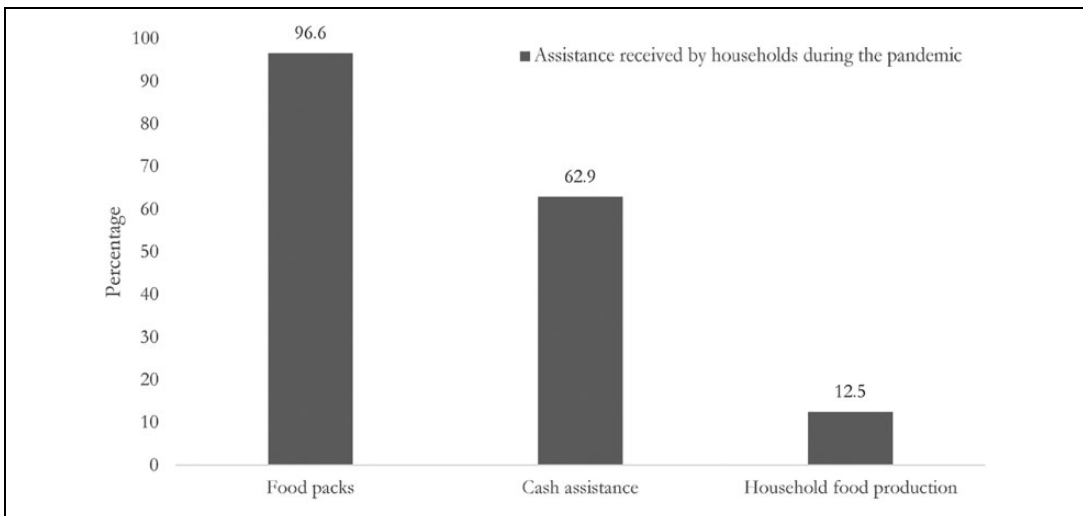
Figure 5. Proportion of households by assistance program received during the COVID-19 pandemic.

asked assistance from local government officials like mayor, municipal councilor or barangay/village captain (19.9%), asking their child to earn income (18.2%), pawned (14.8%) or sold assets (11.0%), and loan from formal institutions (11.4%).

More than half (56.3%) reported having problem accessing food during the community quarantine period primarily due to having no money to buy food (22.1%), no public transportation or cannot go out because of movement restriction (21.6%), loss of job (19.5%), limited food stores in the area (10.8%), and the household are all elderly with no other members to buy food (5.1%) (Figure 4).

COVID-19 Intervention Programs Availed by RNAS Households

Food Assistance Program

Nearly all (96.6%) survey households received food assistance provided by their LGUs, and other private or nongovernment organizations of which 48.9% received the food assistance 2 to 3 times and 42.6% received more than 3 times.

High-risk areas, which were highly urbanized areas, received food assistance more frequently with 40.1% reported receiving 4 to 5 times, 11.6% received 6 to 7 times, and 12.7% received more than 8 times. Meanwhile, majority of the households in the low-risk areas (57.6%) and medium-risk areas (51.2%) received food assistance 2 to 3 times only.

Among the most common food items included in the distributed food packs were rice and cereals (93.2%); canned and other dry goods such as sardines, corned beef, meat loaf, and condiments (82.6%); instant coffee (31.3%); and milk and other dairy products such as yogurt and cheese (14.0%) Figure 5.

Cash Assistance

Almost two-thirds (62.9%) of the surveyed households were able to receive cash assistance either from the national or their local government units. Among the households who reported receiving cash assistance, more than half (58.7%) received only once, about 37.1% received twice, while about 4.2% reported receiving more than twice at the time of the survey. Majority of the households in the high-risk areas (56.4%) received cash assistance twice. Meanwhile, 78.2% of the households in low-risk areas and 53.4% households in moderate-risk areas received cash assistance only once.

Household Food Production

Over 87.5% of the households did not receive assistance for food production from the government. The proportion of households who did not receive assistance for food production was 77.6% in low-risk areas, 89.8% in moderate-risk areas, and 98.1% in high-risk areas.

Determinants of Household Food Insecurity During the Pandemic

Univariate analysis was done for each variable to determine its association with moderate to severe food insecurity. Household characteristics, such as being in a high-risk area, having more than 5 members, living in an urban area, wealth status, being a recipient of 4Ps, engagement in agricultural work, having children less than 5 years old and pregnant family member, as well as the lowest educational attainment of the household head, were found to be significantly associated with moderate to severe food insecurity (Table 3). All significantly associated variables with becoming moderate to severely food insecure from the univariate logistic regression analysis were included in the full model.

Table 4 shows the final model for the factors associated with becoming moderate to severe food insecure during the COVID-19 pandemic. Households in high-risk areas and those with more than 5 members were 1.2 times more likely to become moderate to severely food insecure compared to their counterpart households, holding other variables constant. Wealth status seems to be the most significant predictor affecting household food security with the poor and poorest households having 1.5 and 1.7 times ($P < .001$), respectively, more likely to become moderate to severe food insecure compared to middle-income households. This may be a modest estimate considering that the respondents in the study were those who have mobile phones or telephones, and the ultra-poor who did not have contact numbers may have a greater effect in terms of food insecurity. In contrast, the rich and richest were 0.69 and 0.36 ($P < .001$), respectively, less likely to become moderate to severely food insecure

compared to a middle-income household, holding other variables constant.

Discussion

Household Food Insecurity

The COVID-19 pandemic has greatly affected the food system and the economy of the Philippines. As shown in this study, moderate to severe food insecurity significantly increased by 21.9% ($P < .001$) from 2019 to 2020 among households in the RNAS areas with the highest increase among the low-risk areas. It should be noted, though, that the 2020 RNAS had a recall period of 8 months since the start of the ECQ while the 2019 ENNS had a 12-month recall period, thus, the changes in food security may even be larger. The high-risk areas are the highly urbanized cities where there are better economic opportunities and access to food aid and other assistance from the local government and other organizations as shown in the study, while low- and medium-risk areas are the rural areas where physical and economic access to food are more difficult. Moreover, the poor and poorest households were 1.5 and 1.7 times, respectively, more likely to become moderate to severe food insecure compared to middle-income households. The ultra-poor who did not have contact numbers and were mostly from the rural areas were excluded. Thus, while the probability of becoming moderate to severe food insecure among the poor and poorest in the RNAS is already significant, the true difference may even be larger among the excluded ultra-poor households. This is consistent with the economic recession reported by the Philippines' NEDA where the GDP full-year contraction was 9.5%[7] and unemployment rate at 10.3%,[15] recording the Philippines with the highest economic contraction in the Southeast Asia Region.[15]

This economic contraction resulted in a reduction in purchasing power among those who lost income which has a major impact on food security, especially populations who are already vulnerable like those in the informal sector.[1,10,11,16] As reported by households in this study, no

Table 3. Odds of Becoming Moderate to Severely Food Insecure During the COVID-19 Pandemic.

| Characteristics | Univariate logistic regression | | | |
| | Odds ratio (OR) | P value | 95% CI | |
			LL	UL
Profile of households				
Risk to COVID-19 level				
Low risk	Reference category			
Medium risk	1.103	.174	0.958	1.271
High risk	**1.541**	<.001	1.342	1.768
Household size				
5 members and below	Reference category			
More than 5 members	**1.252**	<.001	1.116	1.406
Place of residence				
Rural	Reference category			
Urban	**0.637**	<.001	0.570	0.712
Wealth quintile				
Poorest	**2.108**	<.001	1.660	2.676
Poor	**1.625**	<.001	1.346	1.962
Middle	Reference category			
Rich	0.641	<.001	0.545	0.753
Richest	0.285	<.001	0.242	0.335
Recipient of 4Ps				
No	Reference category			
Yes, currently (during pandemic until now)	**1.776**	<.001	1.508	2.092
Yes, previously (before the pandemic)	**2.123**	<.001	1.560	2.889
Engagement in agriculture				
No	Reference category			
Yes	**1.651**	<.001	1.402	1.943
With children less than 5 years old				
No	Reference category			
Yes	**1.304**	<.001	1.158	1.469
With pregnant women				
No	Reference category			
Yes	**1.457**	.040	1.017	2.086
Profile of household head				
Sex				
Male	Reference category			
Female	0.891	.056	0.791	1.003
Working status during pandemic				
Without employment	1.033	.579	0.922	1.156
With employment	Reference category			
Highest educational attainment				
No grade completed	Reference category			
At least elementary level	0.722	.267	0.406	1.284
At least high school level	**0.396**	.001	0.224	0.699
At least college level	**0.161**	<0.001	0.090	0.286
Others	0.387	0.137	0.111	1.353

Abbreviation: CI, confidence interval.
Bold numbers mean that the value is significant at *P*<0.001.

Table 4. Final Model for the Odds of Becoming Moderate to Severely Food Insecure During the COVID-19 Pandemic.

Characteristics	Multivariate logistic regression				95% CI	
	Odds ratio (OR)	P value	Adjusted odds ratio (AOR)	P value	LL	UL
Risk to COVID-19 level						
Low risk			Reference category			
Medium risk	1.103	.174	1.022	.779	0.878	1.189
High risk	**1.541**	<.001	1.**220**	.009	1.052	1.416
Household size						
5 members and below			Reference category			
More than 5 members	**1.252**	<.001	**1.197**	.007	1.050	1.365
Wealth quintile						
Poorest	**2.108**	<.001	**1.753**	<.001	1.371	2.240
Poor	**1.625**	<.001	**1.507**	<.001	1.244	1.825
Middle			Reference category			
Rich	**0.641**	<.001	**0.687**	<.001	0.583	0.810
Richest	**0.285**	<.001	**0.363**	<.001	0.306	0.430
With children less than 5 years old						
No			Reference category			
Yes	**1.304**	<.001	1.**125**	.085	0.984	1.287
Highest educational attainment of head						
No grade completed			Reference category			
At least elementary level	0.722	.267	0.955	.878	0.528	1.726
At least high school level	**0.396**	.001	0.685	.208	0.380	1.234
At least college level	**0.161**	<.001	**0.394**	.002	0.216	0.717
Others	0.387	.137	0.514	.312	0.141	1.867

Abbreviation: CI, confidence interval.
Bold numbers mean that the value is significant at *P*<0.001.

money to buy food (22.1%) and job loss (19.5%) were the most common problem of households in accessing food. The results are consistent with the World Bank study in the Philippines on COVID-19 Household Survey Round 1 in August 2020 in which 1 in every 4 household heads who used to work no longer works. Unemployment was highest in the construction sector followed by accommodation and food services and trades. Lack of money and mobility restrictions were among the main reasons constraining households' capacity to buy food.[17] According to the International Labor Organization, vulnerable employment, or those contributing family-workers and own-account workers, and part-time workers are highly prevalent in sectors that are at medium to high risk of COVID-19-induced job disruption that include transportation and storage, accommodation and food services, and wholesale and retail trade.[18]

Other concerns unleashed by the pandemic, aside from disruption of food supply chains and loss of income and livelihood, are altered food environments, uneven food prices, disruptions to social protection programs, and widening inequality.[1,19] As shown in this study, aside from having no money to buy food, no public transportation, unavailability go out to buy food, limited food stores, and limited choices of food in stores were among the concerns of households that alter food environments in the RNAS areas.

This is the first known study to look into the status of food security of households by area of

level of risk to COVID-19 infections. From their 2019 status, this study found out that those in the low-risk areas had the highest increase in food insecurity by 24.0 percentage points while the increase in high-risk areas was only 16.3 percentage points. This is linked to job opportunities available in these areas that have been affected by business closures and mobility restrictions.[20] The high-risk areas are mostly located in HUCs which have greater food availability and accessibility either through LGU-, national government-, or private-induced donations. In contrast, the low-risk areas are mostly rural areas where access to many services including livelihood, health, and food are usually difficult. Although the multivariate regression results showed that households in the high-risk areas were about 1.2 times more likely to become moderate or severe food insecure than those in low-risk areas, wealth status is still a greater predictor of household food insecurity which is seen even in periods when there is no economic shock.

Coping Strategies

The top coping strategies among the households were purchasing food on credit (71.8%), borrowing food from family (66.3%), and loan from relatives (74.4%) and nonrelatives like friends (51.2%). This was similar to the World Bank Philippines report, where about half of households have borrowed from family and friends, reduced consumption or shift to cheaper alternatives, 3 in every 5 households delayed payment obligations and more than half used their savings.[17]

Similar findings were seen from the UNICEF survey among NCR households where majority of the respondents cutting out all nonessential expenses, obtaining food items on credit from *sari-sari* or local convenience stores, borrowing from loan sharks, reducing food consumption or changing type of food like eating less meat or cheaper vegetables and selling assets to a few.[21] In contrast to the RNAS results, the UNICEF survey did not find child labor as a major coping strategy.

In rural Uganda, households make 3 key adjustments in response to the income drop: first is by decreasing money spent on food purchases resulting in 50% reduction in food expenditure per adult equivalent. Second, they use up nearly 50% of their savings and increase borrowing by 100%. Third, adults in each household are working on average 6 days more in a month, a 40% increase in days worked.[22]

In previous studies, financial crises resulted to large increases in labor supply as a coping strategy, as well as increases in credit and depletion of savings. They found that households most reliant on wage labor, with more educated heads had experienced larger negative impacts of an aggregate shock.[22]

Social Protection Programs

In this study, there was a high proportion of households receiving food assistance, but in terms of frequency, the low- and medium-risk areas had lesser frequency of food packs received considering that food insecurity were higher and employment opportunities were lower in these areas. Highlighting this could point out the need to increase frequency of food assistance among those who are more vulnerable to food insecurity, instead of targeting all equally.

The high percentage of households receiving food assistance was similar with the UNICEF-Philippines December report on the impacts of the COVID-19 Crisis on households in the NCR, with about 96% of households who received food assistance from their LGU, which is the same from the results of the RNAS. Moreover, the UNICEF report showed 71% of households in NCR received cash assistance either from the SAP or from the LGU, higher than the results from the RNAS (62.9%) which included selected provinces and cities across the country.

The economic recession which resulted from the pandemic and measures to contain it have strained government's capacities to provide social protection for those most affected by the crisis.[1] Many countries moved to shut down informal food markets, which governments saw as spaces for potential disease transmission, but

these informal markets are extremely important sources of food and livelihoods in developing countries.[1,23] This was also seen in the Philippines as about 71% of micro, small, and medium enterprises closed down during the lockdown.[21] Fortunately, there were LGUs that purchased local produce directly from farmers for emergency food packs.[10]

The need for fresh food supply, disruption in distribution chains and people needing diversion from daily spare time while in lockdown have turned households into home gardening and livestock raising.[24] However, based on the RNAS, only 12.5% of households received any form of assistance from the government in their household food production.

Strengths and Limitations

The RNAS was done among households surveyed in the 2019 ENNS, thus, their status in the previous year served as pre-COVID-19 pandemic data for these households. Also, since these households have been respondents in the nutrition survey the previous year, the response rate for the phone survey was high. This study also included provinces from the major island groups in the Philippines, which was not done in other rapid surveys on the effects COVID-19 pandemic where the majority targeted only HUCs.

However, as mentioned in the methodology, about a quarter of the households in the 2019 ENNS were not included because they did not have contact numbers and due to mobility restrictions, they were not reached and excluded. Since this survey was rapid in nature and was only done through phone, question items and probing were limited. Working status was only limited to the household head and those of other members during the pandemic were not probed. In addition, each local government unit has different content in their food packs but in this study, only the common food items were reported and the quantity received was not determined based on household size.

Conclusion

There was a high increase in the percentage of moderate to severe food insecurity among households in low- and medium-risk areas of COVID-19 infection than in high-risk areas. The poorest households are 1.7 more likely to become moderate to severe food insecure during the pandemic compared to middle-income households. The ultra-poor who did not have phone were not reached and excluded, thus, may have experienced worse during the pandemic. Food insecurity was also significantly higher among households with 0- to 5-year-old children (65.2%). No money to buy food was the top

Appendix A. Profile of Households With No Contact Numbers and Without Using 2019 ENNS Data.

Profile of households	With contact number (RNAS)					Without contact number					
	n	%	SE	LL	UL	n	%	SE	LL	UL	P value[a]
Household size											
5 members and below	4659	68.3	0.6	67.2	69.4	1775	75.4	0.9	73.7	77.1	**<0.001**
More than 5 members	2158	31.7	0.6	30.6	32.8	578	24.6	0.9	22.9	26.3	**0.001**
Place of residence											
Rural	2607	38.2	0.6	37.1	39.4	1477	62.8	1.0	60.8	64.7	**<0.001**
Urban	4210	61.8	0.6	60.6	62.9	876	37.2	1.0	35.3	39.2	**<0.001**
Wealth quintile											
Poorest	664	9.7	0.4	9.1	10.5	603	25.6	0.9	23.9	27.4	**<0.001**
Poor	1196	17.5	0.5	16.7	18.5	580	24.6	0.9	22.9	26.4	**0.0004**
Middle	1432	21.0	0.5	20.1	22.0	463	19.7	0.8	18.1	21.3	0.538

(continued)

Appendix A. (continued)

Profile of households	With contact number (RNAS)					Without contact number					P value[a]
	n	%	SE	LL	UL	n	%	SE	LL	UL	
Rich	1628	23.9	0.5	22.9	24.9	347	14.7	0.7	13.4	16.2	**0.0002**
Richest	1896	27.8	0.5	26.8	28.9	360	15.3	0.7	13.9	16.8	**<0.001**
Profile of household head											
Sex											
Male	5233	76.8	0.5	75.7	77.8	1670	71.0	0.9	69.1	72.8	**<0.001**
Female	1584	23.2	0.5	22.2	24.3	683	29.0	0.9	27.2	30.9	**0.004**
Occupation											
Special occupations (AFP personnel)	21	0.4	0.1	0.3	0.6	6	0.4	0.1	0.2	0.8	0.993
Officials of government and special interest organizations, corporate executives, managers, managing proprietors, and supervisors	332	6.2	0.3	5.6	6.9	77	4.7	0.5	3.8	5.9	0.614
Professional	212	4.0	0.3	3.5	4.5	35	2.1	0.4	1.5	3.0	0.596
Technicians and associate professionals	261	4.9	0.3	4.3	5.5	42	2.6	0.4	1.9	3.5	0.504
Clerks	175	3.3	0.2	2.8	3.8	36	2.2	0.4	1.6	3.0	0.734
Service workers and shop and market sales workers	802	15.0	0.5	14.1	16.0	179	11.0	0.8	9.5	12.6	0.159
Farmers, forestry workers and fishermen	930	17.4	0.5	16.5	18.5	620	38.0	1.2	35.7	40.4	**<0.001**
Craft and Related trades workers	767	14.4	0.5	13.5	15.4	165	10.1	0.7	8.7	11.7	0.147
Plant and machine operators and assemblers	899	16.9	0.5	15.9	17.9	161	9.9	0.7	8.5	11.4	**0.025**
Elementary occupation: laborers and unskilled workers	930	17.4	0.5	16.5	18.5	309	18.9	1.0	17.1	20.9	0.551
Not classified	1	0.02	0.02	0.00	0.1	1	0.1	0.1	0.0	0.4	-
Profile of households											
Highest educational attainment											
No grade completed	75	1.1	0.1	0.9	1.4	83	3.5	0.4	2.9	4.4	0.317
At least elementary level	1764	25.9	0.5	24.9	26.9	1128	47.9	1.0	45.9	50.0	**<0.001**
At least high school level	3314	48.6	0.6	47.4	49.8	824	35.0	1.0	33.1	37.0	**<0.001**
At least college level	1652	24.2	0.5	23.2	25.3	316	13.4	0.7	12.1	14.9	**<0.001**
Others	12	0.2	0.1	0.1	0.3	2	0.1	0.1	0.0	0.3	0.976
Civil status											
Single	392	5.8	0.3	5.2	6.3	204	8.7	0.6	7.6	9.9	0.178
Married	4232	62.1	0.6	60.9	63.2	1237	52.6	1.0	50.5	54.6	**<0.001**
Widow	927	13.6	0.4	12.8	14.4	537	22.8	0.9	21.2	24.6	**<0.001**
Divorced	2	0.0	0.0	0.0	0.1	0	0.0	-	-	-	-
Separated	271	4.0	0.2	3.5	4.5	127	5.4	0.5	4.6	6.4	0.520
Annulled	2	0.03	0.02	0.01	0.1	0	0.00	-	-	-	-
Common-law/Live-in	990	14.5	0.4	13.7	15.4	248	10.5	0.6	9.4	11.8	0.103
Profile of household members											
Age-group											
0-23 months	1063	3.2	0.1	3.1	3.4	264	2.8	0.2	2.5	3.1	0.691
24-71 months	2353	7.2	0.1	6.9	7.5	637	6.7	0.3	6.2	7.2	0.660
72-120 months	2939	9.0	0.2	8.7	9.3	792	8.3	0.3	7.8	8.9	0.557

Appendix A. (continued)

Profile of households	With contact number (RNAS)					Without contact number					P value[a]
	n	%	SE	LL	UL	n	%	SE	LL	UL	
10.08-19.9 years	6830	20.9	0.2	20.4	21.3	1925	20.2	0.4	19.4	21.0	0.524
20-59.9 years	16650	50.8	0.3	50.3	51.4	4386	46.0	0.5	45.0	47.0	**<0.001**
60 years old and above	2922	8.9	0.2	8.6	9.2	1533	16.1	0.4	15.4	16.8	**<0.001**
Women of reproductive age											
Pregnant Women	234	1.4	0.1	1.3	1.6	53	1.1	0.2	0.9	1.5	0.863
Lactating mothers	654	4.0	0.2	3.7	4.3	186	4.0	0.3	3.5	4.6	0.978
Nonpregnant women/nonlactating mothers	5349	94.5	0.2	94.2	94.9	4430	94.9	0.3	94.2	95.5	0.363
Sex											
Male	16520	50.4	0.3	49.9	51.0	4868	51.0	0.5	50.0	52.0	0.453
Female	16237	49.6	0.3	49.0	50.1	4669	49.0	0.5	48.0	50.0	0.462

Abbreviations: RNAS, rapid nutrition assessment survey; -, insufficient observations.
[a]Boldface values indicates significant at $P < .05$.

Appendix B. List of Areas by Level of COVID-Risk, Targeted and Covered Households in the RNAS, 2020.

Areas[a]	Total number of covered households in 2019 ENNS	Target households with contact Nos	Eligible households	Households covered	Response rate
High risk	*2006*	1658	1411	1333	94.5
Parañaque City	505	421	314	302	96.2
Lapu-Lapu City	1013	832	784	757	96.6
1.Pateros	488	405	313	274	87.5
Medium risk	*4152*	2888	2489	2413	96.9
Pangasinan	1483	1072	974	931	95.6
Southern Leyte	1465	864	729	717	98.4
1. Zamboanga City	1204	952	786	765	97.3
Low risk	*3012*	2271	2043	1971	96.5
Angeles City	1058	890	828	774	93.5
Guimaras	706	412	414	411	99.3
1. South Cotabato	1248	969	801	786	98.1
TOTAL	9170	6817	5943	5,717	96.2

[a]Based on IATF announcement on July 15, 2020 and number of COVID-19 positive cases from the DOH NCOV tracker as of July 16, 2020.

concern of food insecure households. Purchasing food on credit, borrowing food from family, and loan from relatives and friends are the top coping strategies of food insecure households. Majority of households did not receive assistance in setting up household food production.

Finally, realizing the implications brought about the current food security situation during the COVID-19 pandemic, extending of centralize donations, government services and benefits from the HUCs to provinces with less resources and minimal or no benefactors should be considered. Livelihood and job creation should be integral in the recovery plan so that households will have economic access to food. Assistance on food production either as home or community-based gardening should be improved to mitigate food insecurity at the household-level.

Notes

1. Community Quarantine Levels:

   a. Enhanced Community Quarantine (ECQ) refers to the implementation of temporary measures imposing stringent limitations on movement and transportation of people, strict regulation of operating industries, provision of food and essential services, and heightened presence of uniformed personnel to enforce community quarantine protocols.
   b. Modified Enhanced Community Quarantine (MECQ) refers to the transition phase between ECQ and GCQ, when the following temporary measures are relaxed and become less necessary: stringent limits on movement and transportation of people, strict regulation of operating industries, provision of food and essential services, and heightened presence of uniformed personnel to enforce community quarantine protocols.
   c. General Community Quarantine (GCQ) refers to the implementation of temporary measures limiting movement and transportation, regulation of operating industries, and presence of uniformed personnel to enforce community quarantine protocols.
   d. Modified General Community Quarantine (MGCQ) refers to the transition phase between GCQ and new normal, when the following temporary measures are relaxed and become less necessary: limiting movement and transportation, the regulation of operating industries and the presence of uniformed personnel to enforce community quarantine protocols.
   e. New Normal refers to the emerging behaviors, situations, and minimum public health standards that will be institutionalized in common or routine practices and remain even after the pandemic while the disease is not totally eradicated through means such as widespread immunization. These include actions that will become second nature to the general public as well as policies such as bans on large gatherings that will continue to remain in force.

   Source: Republic of the Philippines Inter-Agency Task Force for the Management of Emerging Infectious Diseases. Omnibus Guidelines for the Implementation of Community Quarantine in the Philippines with Amendments as of May 06, 2021.

References

1. High Level Panel of Experts on Food Security and Nutrition. *Impacts of COVID-19 on Food Security and Nutrition: Developing Effective Policy Responses to Address the Hunger and Malnutrition Pandemic*. Food and Agriculture Organization; 2020. Accessed March 13, 2021. http://www.fao.org/3/cb1000en/cb1000en.pdf

2. Food and Nutrition Research Institute. *2019 Expanded National Nutrition Survey (ENNS) Results: Household Food Security Survey*. Department of Science and Technology; 2020. Accessed March 13, 2021. https://enutrition.fnri.dost.gov.ph/presentations/2019ENNS/FoodSecurity

3. Global Hunger Index (GHI). *Global Hunger Index 2019: Philippines*2019. Accessed February 7, 2021. https://www.globalhungerindex.org/pdf/en/2019/Philippines.pdf

4. Zurayk R. Pandemic and food security: a view from the Global South. *J Agri Food Syst Commun Develop*. 2020;9(3):17-21. doi:10.5304/jafscd.2020.093.014

5. Devereux S, Bene C, Hoddinott J. Conceptualising COVID-19's impacts on household food security. *Food Secur*. 2020;12:769-772. doi:10.1007/s12571-020-01085-0

6. United Nations Development Programme (UNDP) Philippines. *#TAWID COVID: A Pulse on Poverty: Application of Citizen-Centered Innovation*. United Nations Development Programme (UNDP) Philippines. 2020.

7. National Economic Development Authority. 2021 Joint Statement of the Duterte administration's economic managers on the Philippine economic performance for the fourth quarter and full-year of 2020; 2021. Accessed March 13, 2021. https://www.neda.gov.ph/joint-statement-of-the-duterte-administrations-economic-managers-on-the-philippine-economic-performance-for-the-fourth-quarter-and-full-year-of-2020/

8. Asian Development Bank. Food security in Asia and the Pacific amid the COVID-19 pandemic. 2020. ADB Briefs No. 139. Accessed February 9, 2021. https://www.think-asia.org/bitstream/handle/11540/12119/adb-brief-139-food-security-asia-pacific-covid-19.pdf?sequence=1

9. World Food Programme. Global report on food crises 2020; 2020. Accessed February 7, 2021. https://www.wfp.org/publications/2020-global-report-food-crises

10. COVID-19 and Food Systems in the Philippines. In: Australian Centre for International Agriculture Research. COVID-19 and food systems in the Indo-Pacific. Australian Government. 2020. Accessed March 12, 2021. https://aciar.gov.au/publication/covid19/7-covid-19-and-food-systems-philippines

11. Philippine Statistics Authority. 2020 Annual preliminary estimates of labor force survey (LFS). 2021. Accessed March 13, 2021. https://psa.gov.ph/content/2020-annual-preliminary-estimates-labor-force-survey-lfs

12. Republic of the Philippines Inter-Agency Task Force for the Management of Emerging Infectious Diseases. Omnibus guidelines for the implementation of community quarantine in the Philippines with Amendments as of May 6, 2021. Accessed October 10, 2021. https://doh.gov.ph/sites/default/files/health-update/20210506-OMNIBUS-RRD.pdf

13. Congressional Policy and Budget Research Department. A risk assessment on the Covid-19 situation in the Philippines: implications on the ECQ Policy. 2020. Accessed October 10, 2020. https://cpbrd.congress.gov.ph/images/PDF%20Attachments/CPBRD%20Policy%20Brief/PB2020-05_FINAL.pdf

14. Congress of the Philippines. Bayanihan to heal as one act. Republic Act No. 1169: an act declaring the existence of a national emergency arising from the coronavirus disease (COVID-19) situation and a national policy in connection therewith, and authorizing the president of the republic of the Philippines for a limited period and subject to restrictions, to exercise powers necessary and proper to carry out the declared national policy and for other purposes. 2020. Accessed March 13, 2021. http://legacy.senate.gov.ph/Bayanihan-to-Heal-as-One-Act-RA-11469.pdf

15. Asian Development Bank. Asian development outlook supplement. 2020. Accessed March 13, 2021. https://www.adb.org/sites/default/files/publication/658721/ado-supplement-december-2020.pdf

16. Kansiime MK, Tambo JA, Mugambi I. COVID-19 implication on household income and food security in Kenya and Uganda: finding from a rapid assessment. *World Develop*. 2021;137:105199.

17. World Bank. Impacts of COVID-19 on households in the Philippines: Round 1—August 2020. 2020. Accessed March 12, 2021. http://pubdocs.worldbank.org/en/109011605520157559/Results-from-the-Philippines-COVID-19-Households-Survey-conducted-in-August-2020-Presentation.pdf

18. International Labour Organization. COVID-19 labour market impact in the Philippines: assessment and national policy responses. Australian Aid; 2020. Accessed March 14, 2021. https://www.ilo.org/wcmsp5/groups/public/—asia/—ro-bangkok/—ilo-manila/documents/publication/wcms_762209.pdf

19. Pakravan-Charvadeh MR, Mohammadi-Nasrabadi F, Gholamrezai S, et al. The short-term effects of COVID-19 outbreak on dietary diversity and food security status of Iranian households (A case study in Tehran province). *J Clean Product*. 2021;281:124537. doi:10.1016/j.jclepro.2020.124537

20. Workie E, Mackolil J, Nyika J, Ramadas S. Deciphering the impact of COVID-19 pandemic on food security, agriculture, and livelihoods: a review of the evidence from developing countries. *Curr Res Environ Sustain*. Published online December 2020. doi:10.1016/j.crsust.2020.100014

21. Economic Policy Research Institute. *The Impacts of the COVID-19 Crisis on Households in the National Capital Region of the Philippines*. UNICEF; 2020. Accessed March 12, 2021. https://www.unicef.org/philippines/media/2061/file/Finalreport:TheImpactoftheCOVID-19CrisisonHouseholdsintheNationalCapitalRegionofthePhilippines.pdf

22. Mahmud M, Riley E. Household response to an extreme shock: evidence on the immediate impact of the COVID-19 lockdown on economic outcomes and well-being in rural Uganda. *World Develop*. 2021;140:105318. doi:10.1016/j.worlddev.2020.105318

23. Fan S, Teng P, Chew P, et al. Food system resilience and COVID-19—Lessons from the Asian experience. *Global Food Secur*. 2021;28:100501. doi:10.1016/j.gfs.2021.100501

24. Nicola S, Ferrante A, Cocetta G, et al. Food supply and urban gardening in the time of Covid-19. *Bull Univ Agri Sci Veteri Med*. 2020;77(2):141-144. doi:10.15835/buasvmcn-hort:2020.0051