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

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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

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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. 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). 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. 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.

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. 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.

As a consequence, nutritional status has become a particular concern especially among those exposed and vulnerable to the virus. 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. 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.

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. 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.

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
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

| Table 1. Profile of Households by Selected Household and Household Head Characteristics: RNAS, 2020. |
|----------------------------------------------------------|-------------|---------------|----------------|--------------|
| Characteristics                                           | N           | Prop          | Standard error (SE) | LL  | 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.
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
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

| Characteristics                  | n    | Prop | Standard error (SE) | 95% CI     | 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.
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 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.
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 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.
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, respectively, more likely to become moderate to severely 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% and unemployment rate at 10.3%, recording the Philippines with the highest economic contraction in the Southeast Asia Region.

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. As reported by households in this study, no
### Table 3. Odds of Becoming Moderate to Severely Food Insecure During the COVID-19 Pandemic.

| Characteristics                        | Odds ratio (OR) | P value | 95% CI   |
|----------------------------------------|-----------------|---------|----------|
| **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                     | Reference category |     |         |
| With employment                        | 1.033           | .579    | 0.922    | 1.156 |
| 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           | <.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 $P < 0.001$. 
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

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

| Characteristics                  | Multivariate logistic regression |  |
|----------------------------------|----------------------------------|---|
|                                  | Odds ratio (OR) | P value | Adjusted odds ratio (AOR) | P value | 95% CI 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 \(P < 0.001\).
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. The high-risk areas are mostly located in HUCs which have greater food availability and accessiblity 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. 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. 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.

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.

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. 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.\textsuperscript{1,2,3} This was also seen in the Philippines as about 71\% of micro, small, and medium enterprises closed down during the lockdown.\textsuperscript{21} Fortunately, there were LGUs that purchased local produce directly from farmers for emergency food packs.\textsuperscript{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.\textsuperscript{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* |
| 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 valuea |
|-----------------------|----------------------------|------------------------|----------|
|                       | 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) |
| Officials of government and special interest organizations, corporate executives, managers, managing proprietors, and supervisors |
| Professional |
| Technicians and associate professionals |
| Clerks |
| Service workers and shop and market sales workers |
| Farmers, forestry workers and fishermen |
| Craft and Related trades workers |
| Plant and machine operators and assemblers |
| Elementary occupation: laborers and unskilled workers |
| Not classified |
| Highest educational attainment |
| No grade completed |
| At least elementary level |
| At least high school level |
| At least college level |
| Others |
| Civil status |
| Single |
| Married |
| Widow |
| Divorced |
| Separated |
| Annulled |
| Common-law/Live-in |
| Profile of household members |
| Age-group |
| 0-23 months |
| 24-71 months |
| 72-120 months |

(continued)
Appendix A. (continued)

| Profile of households         | With contact number (RNAS) | Without contact number |
|-------------------------------|-----------------------------|------------------------|
|                               | 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 |
| 60 years old and above        | 2922 | 8.9  | 0.2 | 8.6  | 9.2  | 1533 | 16.1 | 0.4 | 15.4 | 16.8 |
| Women of reproductive age     |     |      |    |     |     |     |      |    |     |     |
| Pregnant Women                | 234  | 1.4  | 0.1 | 1.3  | 1.6  | 53   | 1.1  | 0.2 | 0.9  | 1.5  |
| Lactating mothers             | 654  | 4.0  | 0.2 | 3.7  | 4.3  | 186  | 4.0  | 0.3 | 3.5  | 4.6  |
| Nonpregnant women/nonlactating mothers | 5349 | 94.5 | 0.2 | 94.2 | 94.9 | 4430 | 94.9 | 0.3 | 94.2 | 95.5 |
| Sex                           |     |      |    |     |     |     |      |    |     |     |
| Male                          | 16520 | 50.4 | 0.3 | 49.9 | 51.0 | 4868 | 51.0 | 0.5 | 50.0 | 52.0 |
| Female                        | 16237 | 49.6 | 0.3 | 49.0 | 50.1 | 4669 | 49.0 | 0.5 | 48.0 | 50.0 |

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

| Areas*                      | 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          |
| I.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          |
| I. 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          |
| I. South Cotabato           | 1248                                         | 969                               | 801                 | 786               | 98.1          |
| TOTAL                       | 9170                                         | 6817                              | 5943                | 5,717             | 96.2          |

*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.
Authors' Note
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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.
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