HUNGRY CITIES PARTNERSHIP

Discussion Paper No. 57

APRIL 2023

# PANDEMIC PRECARITY AND FOOD INSECURITY IN URBAN GHANA DURING COVID-19

ELIZABETH OPIYO ONYANGO,[1] BERNARD OWUSU[2] AND JONATHAN CRUSH[3]

SERIES EDITOR: JONATHAN CRUSH

[1] School of Public Health, University of Alberta, Edmonton, Canada
[2] Department of Geography, Wilfrid Laurier University, Waterloo, Canada
[3] Balsillie School of International Affairs, Canada; University of the Western Cape, South Africa

## Abstract

The impact of the COVID-19 pandemic on urban households in the Global South has not yet been adequately explored, despite an emerging consensus that impacts of the pandemic were more severe in urban than rural Africa. This paper addresses the knowledge gap by examining the relationship between pandemic precarity and food insecurity in Ghana's urban areas during the pandemic in 2020. The data comes from the World Bank (WB) and Ghana Statistical Service (GSS) COVID-19 High-Frequency Phone Survey. Using a sub-sample of 1,423 urban households, the paper evaluates household experiences of the pandemic. Our findings show that household demographic characteristics are not a major predictor of food insecurity. Economic factors, especially the impact of the pandemic on wage income and total household income, were far more important, with those most affected being most food insecure. Additionally, food-insecure households were most aware of and were affected by food-price increases during the pandemic. These findings are important in planning the post-pandemic recovery initiatives and in addressing current and future emergencies and shocks to urban food systems.



## Keywords

food security, urban, pandemic precarity, Ghana

## Suggested Citation

Onyango, E.O., Owusu, B. and Crush, J. (2023). *Pandemic Precarity and Food Insecurity in Urban Ghana During COVID-19*. HCP Discussion Paper No. 57, Waterloo and Cape Town.

This is the 57th discussion paper in a series published by the Hungry Cities Partnership (HCP), an international research project examining food security and inclusive growth in cities in the Global South. The multi-year collaborative project aims to understand how cities in the Global South will manage the food security challenges arising from rapid urbanization and the transformation of urban food systems. The Partnership is funded by the Social Sciences and Humanities Research Council of Canada (SSHRC).

# Introduction

A recent assessment of the global impact of the COVID-19 pandemic on food security concluded that "while the overall detrimental effect of COVID-19 on different aspects of people's food security is unquestionable, the intensity and forms that this food insecurity takes is more difficult to establish precisely"(Béné et al., 2021) Because urban households in Africa purchase most of their food, the shock of COVID-19 with its disruption of food imports and supply chains, the reduction of daily access to formal and informal food retailers, and sudden increases in food prices exercised a major negative impact on household food security. In many African countries, there were and are few or no social protection structures such as food banks and social assistance programs to cushion the impact of the COVID-19 pandemic.

Before the onset of the pandemic in early 2020, many households in African cities were already struggling with unemployment, poverty, and difficulty accessing adequate health care, food, and nutrition (FAO, 2020). The emergence and spread of the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) led to a rapid and massive mobilization by African governments to contain the virus by imposing stringent restrictions on the mobility of citizens within urban areas and between town and countryside (Hale et al., 2021). However, these containment strategies took a heavy additional social and economic toll on poor and marginalised urban households across the continent (Birner et al., 2021). Lockdowns and restrictions on personal movement also had a major impact on the food security of urban households and vulnerable populations (Crush and Si, 2020). Studies in African countries including Kenya, Mali, Nigeria, Uganda, and South Africa all report increased food insecurity, worsening dietary diversity, and income shocks as a direct result of the pandemic (Adjognon et al., 2021; Agamile, 2022; Amare et al., 2020; Arndt et al., 2021; Ibukun and Adebayo, 2021; Kansiime et al., 2021; Nechifor et al., 2021).

Studies of pandemic precarity elsewhere suggest that pre-pandemic social and economic inequalities affected the degree of vulnerability of different population groups to infection, hospitalization and death (Perry et al., 2021; Sumner et al., 2020). A similar argument can be made in relation to the way in which pre-existing social and economic conditions had an uneven impact on the food security of the African urban population during the pandemic. Using data from 11 countries and six survey rounds, Dasgupta and Robinson (2022) show that households that were female-headed, less-educated, poor or without access to savings, were more likely to suffer from food insecurity during the pandemic. There is an emerging consensus that, like COVID-19 itself, the pandemic's food security impacts were more severe in urban than rural Africa. However, more research is needed on variations within urban areas and the role of pandemic precarity in producing uneven food security outcomes (Moseley and Battersby, 2020).

Before 2020, many households in African cities experienced high levels of chronic food insecurity which intensified during sudden shocks such as political unrest, droughts and floods, supply chain disruptions and food price spikes (Maxwell, 1999; Crush et al. 2012, Onyango et al., 2021). For example, surveys of the urban poor in ten major Southern African cities in eight countries by the African Food Security Urban Network (AFSUN) found that more than 75% of households were food insecure (Crush and Battersby, 2016; Frayne et al., 2018). High levels of pre-pandemic food insecurity were reported from household surveys in numerous cities in East and West Africa (Gebremichael, 2022; Kimani-Murage et al., 2012; Etana and Tolossa, 2017, Obayelu, 2018, Becquey et al., 2012; Tuholske et al., 2020). In West Africa, 58 million people were underweight, of which 22 million (38%) lived in cities. Another 52 million were overweight or obese, most of whom were adult urban dwellers (Van Wesenbeeck, 2018). Before the COVID-19 pandemic, about 1.2 million of the Ghanaian population were classified as food insecure, while an additional 2 million were also considered vulnerable to food insecurity (Cooke et al., 2016).

This discussion paper aims to contribute to the rapidly growing literature on the impact of COVID-19 in Ghana by examining the relationship between pandemic precarity and food insecurity in urban areas during the first wave of the pandemic in 2020. The first section provides a contextual overview of the pandemic in Ghana, drawing on the existing literature to demonstrate the current state of knowledge on pandemic precarity in the country. The second section discusses the source of the data on the impact of COVID-19 on food security in urban areas, which is followed by a presentation and discussion of the results. The conclusion summarizes the main findings and identifies future research priorities for understanding the pandemic precarity-food insecurity nexus.

## Pandemic Precarity in Ghana

The first confirmed cases of COVID-19 in Ghana occurred on 12 March 2020. By December 2022, the country had recorded 171,000 confirmed cases and 1,460 deaths. Both figures are undercounts due to limited testing capacity, asymptomatic spread, and excess mortality. Data from sero-epidemiological sample surveys indicate much higher levels of SARS-CoV-2 antibodies in various urban populations in Ghana, including 40% seroprevalence in both Accra and Kumasi in mid-2021 (Mensah et al., 2022; Struck et al., 2022). Data on confirmed cases shows that there have been five distinct waves of infection since the beginning of the pandemic in March 2020 (Figure 1).

**FIGURE 1: Data on Confirmed Cases**

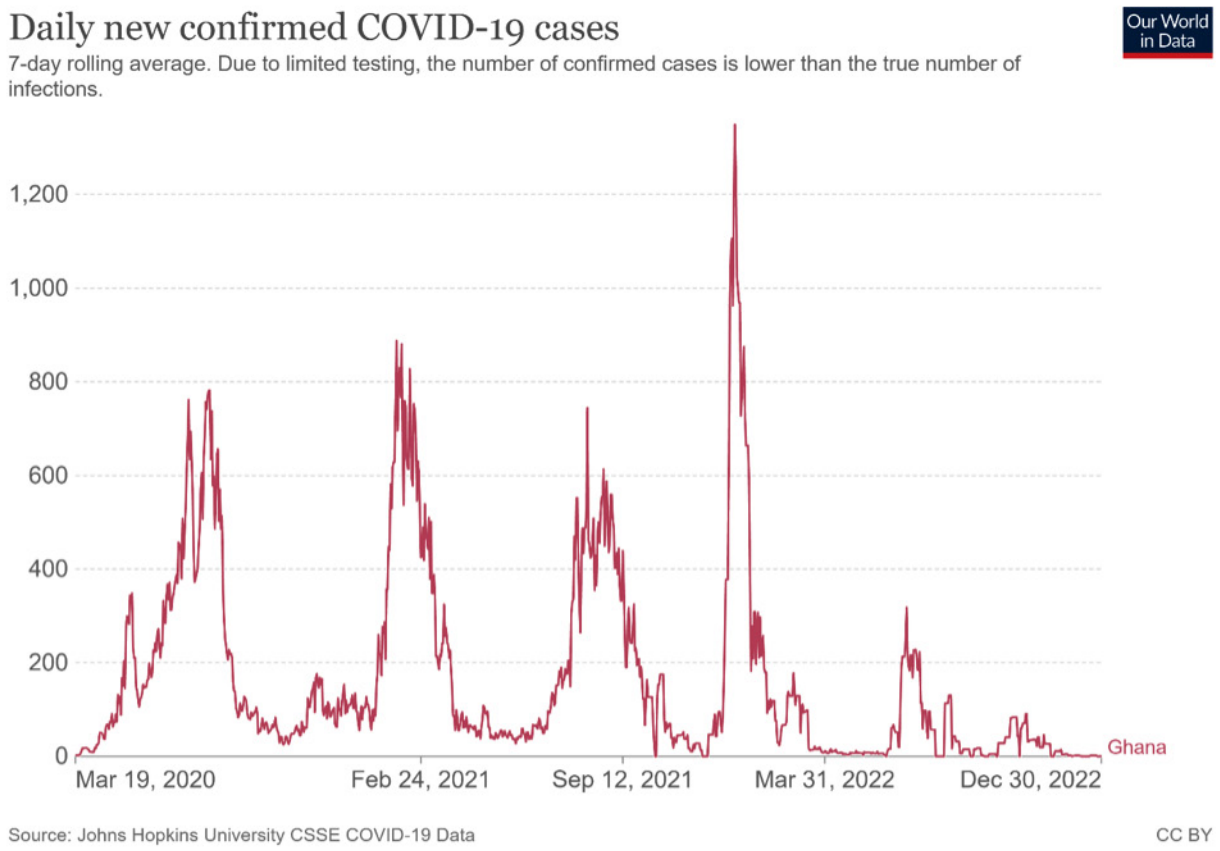
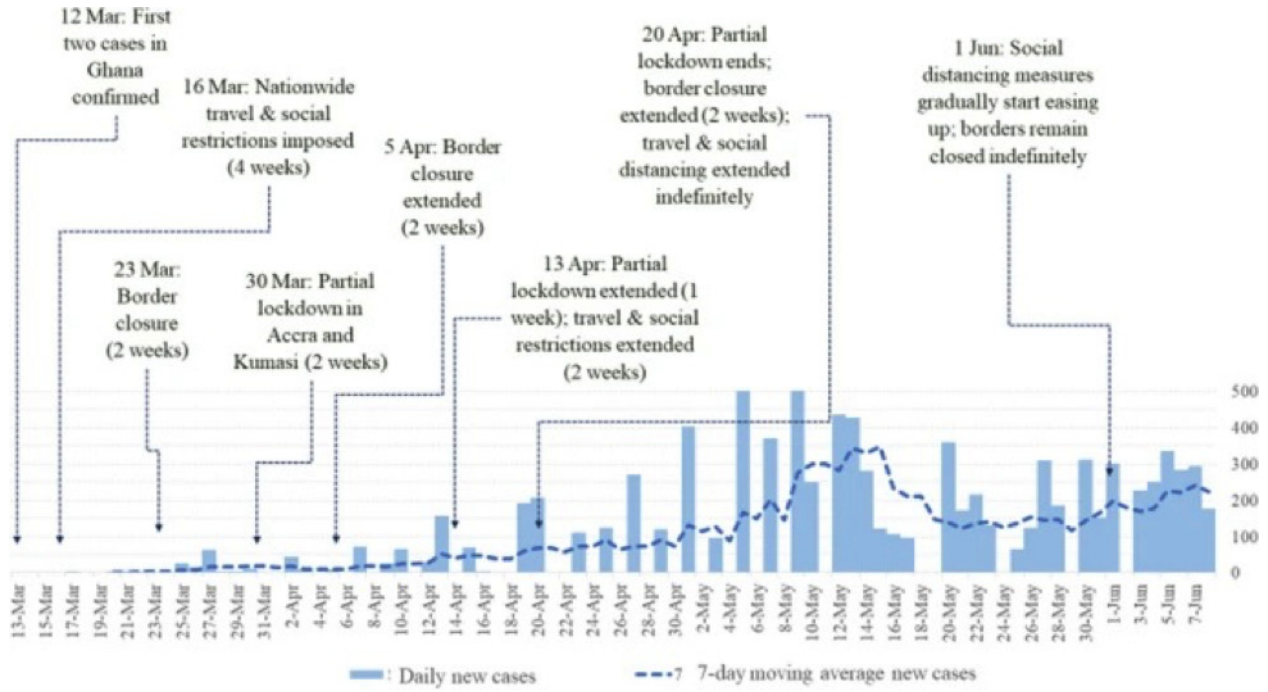


Figure 2 captures the policy response measures implemented by the government during the first wave of the pandemic from mid-March to mid-June 2020. A COVID-19 inter-ministerial presidential task force chaired by the President of Ghana was constituted, and the Parliament of Ghana quickly passed the Imposition of Restrictions Bill on 21st March 2020, which imposed nationwide travel restrictions, border closures, and a ban on social gatherings. Partial lockdowns were imposed in Greater Accra and Greater Kumasi from 30 March, a clear recognition of the vulnerability to COVID-19 of residents of Ghana's two largest city regions, with a combined population of more than 9 million (or almost 20% of the country's total population). The lockdown was lifted on 20 April 2020 but other restrictions remained in place for several more months. A COVID-19 Alleviation Program (CAP), implemented at the height of the pandemic, provided free water and electricity to citizens and support to micro and medium enterprises.

The Ghanaian government's COVID-19 policies have been hailed as a resounding success by international organizations and a number of scholars (Akorful, 2022; Assan et al., 2022; Dadzie 2022; Kenu et al., 2020; Osei-Kojo et al., 2022 ; Sibiri et al., 2021). However, Aduhene and Osei-Assibey (2021) have stressed that it had 'a significant adverse impact on the various communities within the area of catchment of the country.' Boateng (2022) argues that lockdowns prompted a 'toxic mix' of police violence and mass defiance because most urbanites were trapped in precarious low-income jobs in poorly serviced and overcrowded neighbourhoods and therefore could not lockdown. Assan et al. (2022), for example, conclude that the lockdowns in Accra and Kumasi 'distressed those with few resources, particularly residents of urban slums; stopped activities of the informal sector, the largest sector and source of employment, and the main contributor to national income; and slowed socioeconomic activities in major cities'. Foli and Ohemeng (2022) assess the adequacy of pre-pandemic social protection programs and conclude that the government's response to the COVID and the lockdown "was devoid of any organizational framework and thus became a classic case of crisis management." The lockdown, coupled with the fact that there was no support for micro-enterprises in the informal sector or those working in formal employment who were laid off, led to business

**FIGURE 2: Timeline of Pandemic Response in Ghana, 2020**




Source: Amewu et al. (2020)

failure and hardship for women market traders (Frimpong et al., 2022)

The response to the COVID-19 pandemic caused a major shock to the Ghanaian economy (Dzigbede and Pathak, 2020). Urban lockdown was responsible for an estimated 28% drop in GDP and descent into temporary poverty for nearly 4 million Ghanaians (Amewu et al., 2020). The surveys of the Ghana Statistical Service (GSS) during the first wave of the pandemic reported that 72% of local businesses saw reductions in production and 90% reductions in sales (SSG, 2020a). A total of 37% of businesses had closed and 46% had reduced wages for an estimated 770,000 workers (SSG, 2020b) In the lockdown cities, 52% and 55% of companies had shut down in Accra and Kumasi, respectively. Nationally, more than three quarters of Ghanaian households reported a decrease in income after the imposition of COVID restrictions, a figure that increased to 83% for households that received income from a family business (compared to 55% of households receiving wage income) (SSG, 2020c) A number of research studies have shown that informal sector enterprises and employees, internal migrants, and urban poor were particularly badly affected by the official pandemic response (Aberese-Ako et al., 2022; Adom et al., 2020 ; Akuoko et al., 2021; Amoah-Nuamah et al., 2020 ; Asante and Mills 2020; Asante at al., 2021; Dauda and Imoro, 2022).

COVID-19 related travel restrictions, disrupted supply chains, city lockdowns, job losses, income decline, and rising food prices had a direct impact on the food security of households throughout Ghana (Drafor-Amenya, 2021; Bukari et al., 2021; Narty et al., 2021; Nyarko-Morrison, 2022). A national survey by GSS (2020a) in June 2020 found that in the previous month, 45% of households were worried about not having enough food to eat, 41% were unable to eat healthy and nutritious or preferred foods, 39% were skipping meals, 31% had run out of food and 9% had gone a whole day without eating anything. A second survey of nearly 4,000 households in May 2020 found that 58% had gone without enough food to eat in the previous two months due to COVID-19 and 49% said their food situation was worse than before the pandemic (Bukari et al., 2022). The study also found that female-headed households and households with COVID-19 cases were more likely to be food insecure and that the food insecurity status of urban households was "substantially higher" than rural households. However, a survey of rural households in western Ghana found that they still experienced increased food insecurity, primarily because their ability to market agricultural produce to cities was curtailed (Hodey and Dzanku, 2021). Finally, a 2020 phone survey of 423 urban consumers reported that food availability was not a significant problem, but that decreased income meant that food was less accessible and that the consumption of many foods decreased (Ragasa et al., 2022).

## Methodology

The data used in this study was collected by the World Bank (WB) and Ghana Statistical Service (GSS) COVID-19 High Phone Frequency Survey. The households in the High Phone Frequency Survey were selected from the respondents to the Ghana Living Standards Survey Round Seven, which had a phone number of the head of the household or their representative. In this analysis, we use the data from the Wave 3 Survey which was conducted from December 1st to December 13, 2021 and covered all 16 regions in Ghana. The data are divided into two modules: Modules A and B. The current study is based on a sub-sample of urban households in Module A (n=1423), which focused on the economic impact of the COVID-19 pandemic on households.

The outcome variable in the analysis is self-reported household food insecurity. Respondents were asked a series of eight standardized questions to explore their experiences of food insecurity in the 30 days before the survey. The questions are based on the FAO Food Insecurity Experience Scale (FIES), measured as binary yes / no responses to each question (FAO, 2015) (Table 1). We used the responses to generate a score for each household between 0 and 8 where each affirmative (yes)

response = 1. We divided the food insecurity experience into three categories: (1) food secure (FIES = 0); (2) mild/moderate food insecurity (FIES = 1–4); and (3) severe food insecurity experiences (FIES = 5–8).

**TABLE 1: FIES Binary Response Questions**

| During the last 30 days, was there a time when you, any other adults or any children above 15 years old in your household, because of lack of money or other resources (N=0, Y= 1): | | |
|---|---|---|
| 1 | Worried you would not have enough to eat? | WORRIED |
| 2 | Were unable to eat health and nutritious/preferred foods? | HEALTHY |
| 3 | Ate only a few kinds of foods? | FEW FOODS |
| 4 | Had to skip a meal? | SKIPPED |
| 5 | Ate less than you thought you should? | ATE LESS |
| 6 | Ran out of food in your household? | RAN OUT |
| 7 | Were hungry but did not eat? | HUNGRY |
| 8 | Went without eating for a whole day? | WHOLE DAY |
| Source: https://www.fao.org/3/i7835e/i7835e.pdf | | |

The independent variables in the analysis were divided into three groups: (a) household characteristics; (b) pandemic experiences (since the beginning of the pandemic in March 2020); and (c) household coping strategies (since the beginning of the pandemic in March 2020). Household characteristics in the analysis included household size and specific characteristics of household members, including the age of the household and the sex of the caregiver for children under the age of 18. The variables of the pandemic experience included the ease of community testing, the payment of COVID-19 testing, the knowledge of someone who tested positive for the virus, access to the vaccine, satisfaction with the government response, change in income and work conditions, and experiences of other shocks such as theft of crops, livestock and property, illness of an income earning family member, and increase in the price of major food items. With the reduction in income and the increase in food insecurity, many households resorted to one or more coping strategies. The third group of variables included in this study were coping strategies used in the previous week and included the sale of household assets, borrowing from friends, credit purchases, delayed payment obligations, selling of harvest in advance, and reduced consumption of food and non-food items. All covariates were categorical and are listed in Table 2 with the codes.

**TABLE 2: Outcome and Independent Variables**

| Outcome Variables | Codes |
|---|---|
| Food Insecurity Experience Score (FIES) | |
| Food secure | 0 |
| Mild/moderate food insecurity | 1 |
| Severe food insecurity | 2 |
| Independent variables | |
| Household characteristics | |
| Household size | |
| 1 person | 0 |
| 2-3 persons | 1 |
| 4-5 persons | 2 |
| 6+ persons | 3 |
| Age of household head | |
| 16-24 years | 0 |
| 25-34 years | 1 |
| 35-44 years | 2 |
| 45-54 years | 3 |
| Sex of caregiver for children under 18 | |
| Male | 0 |
| Female | 1 |
| Pandemic experiences | |
| Household head knowledge about COVID-19 | |
| Low | 0 |
| Moderate | 1 |
| High | 2 |
| Ease of COVID-19 testing in community | |
| Very difficult | 0 |
| Somewhat difficult | 1 |
| Neither easy nor difficult | 2 |
| Somewhat easy | 3 |
| Very easy | 4 |
| Ever had COVID-19 | |
| Yes, I got positive test | 0 |
| Yes, but never tested | 1 |
| No | 2 |
| Received COVID-19 vaccine | |
| No | 0 |
| Yes | 1 |

| Household expenditure on PPE in previous 7 days | |
|---|---|
| >25 Ghana cedis | 0 |
| 25-49 Ghana cedis | 1 |
| 50-74 Ghana cedis | 2 |
| >=75 Ghana cedis | 3 |
| Satisfied by government response since January 2021 | |
| No | 0 |
| Yes | 1 |
| Change in work conditions with restrictions | |
| Yes, because of COVID | 0 |
| Yes, but not because of COVID | 1 |
| No | 2 |
| Change in wage income due to COVID-19 compared with before March 2020 | |
| Reduced more than half | 0 |
| Reduced, but less than half | 1 |
| Stayed about the same | 2 |
| Increased by less than half | 3 |
| Increased by more than half | 4 |
| Change in total income compared with before March 2020 | |
| Reduced more than half | 0 |
| Reduced, but less than half | 1 |
| Stayed about the same | 2 |
| Increased by less than half | 3 |
| Increased by more than half | 4 |
| Severity of household being affected by COVID since March 2020 | |
| Not severely at all | 0 |
| Not severely | 1 |
| Neither | 2 |
| Severely | 3 |
| Very severely | 4 |
| Shocks experienced by household since March 2020 | |
| Theft of crops, livestock, and property | |
| No | 0 |
| Yes | 1 |
| Illness of income earning household member | |
| No | 0 |
| Yes | 1 |
| Increase in price of major food items | |
| No | 0 |
| Yes | 1 |
| Coping strategies since March 2020 | |
| Sale of assets | |
| No | 0 |
| Yes | 1 |
| Borrowed from friends and family | |
| No | 0 |
| Yes | 1 |
| Purchases on credit | |
| No | 0 |
| Yes | 1 |
| Delayed payment obligations | |
| No | 0 |
| Yes | 1 |
| Sold harvest in advance | |
| No | 0 |
| Yes | 1 |
| Reduced consumption of food | |
| No | 0 |
| Yes | 1 |
| Reduced non-food consumption | |
| No | 0 |
| Yes | 1 |
| Received assistance from NGO | |
| No | 0 |
| Yes | 1 |
| Received assistance from government | |
| No | 0 |
| Yes | 1 |

The data was analyzed using SPSS version 28 (IMB Statistics 28). The analysis included both descriptive and analytical modelling using a generalised linear model (GLM) to conduct logistic regression with a multinomial cumulative complementary log-log function given the multivariate nature of the outcome variable. To investigate the relationship between the outcome variable and the independent variables, we first performed a descriptive cross-tabulation to determine within-group distributions. This was then followed by a logistic regression analysis to determine which household characteristics, COVID-19 pandemic experiences, and household coping strategies were associated with household food insecurity. The results of all models are presented using proportions (Tables 3 and 5) and predictive odds ratios (OR) and 95% confidence intervals (CI) (Table 6). The significance level of the findings is set at a p-value less than or equal to 0.005.

# Results

## Household Characteristics

Table 3 presents the descriptive statistics for the dependent and independent variables. Nearly two-thirds of the urban households surveyed in Ghana had four or more members (62%), with nearly one in ten (12%) being single-member occupants. Most household heads were of working age between 25 and 34 years old (60%) and 35 and 44 years old (34%). Only 5% were over the age of 45 years. More women than men were primary caregivers in the household (73% versus 27%). The sex difference in caregivers is largely because of Ghanaian society's gender defined roles where women are tasked with the preparation of food and providing care to their household.

## Pandemic Experiences

Since the start of the pandemic in Ghana in March 2020, almost 60% of urban households in Ghana had been "severely affected" (35%) or "very severely affected" by COVID-19. About three quarters of the household heads exhibited moderate to high knowledge levels about the virus (with most reporting that television and radio are the main and reliable source of information). Just over one-third said that access to COVID-19 testing was difficult. Low testing rates and asymptomatic spread meant that less than 1% of the respondents had tested positive for COVID-19 and 93% saying they had never been infected. Over half of the respondents (54%) had received at least one COVID-19 vaccine. Most households had spent some of their income on personal protection equipment (PPE), including masks and sanitizers, with three-quarters spending more than 75 Ghana Cedis (USD7.50) in the week prior to the interview. Most respondents (89%) said they were satisfied with the government's response to the pandemic with only 11% reporting dissatisfaction. This contrasts with the findings by Kutor et al. (2021) from the first year of the pandemic that showed that most Ghanaians blamed the government for the increase in COVID-19 cases.

## Household Shocks

The survey questioned households about three pandemic-related shocks experienced since March 2020: (a) theft of crops, livestock and property; (b) illness of an income-earning household member; and (c) increase in the price of major food items. Less than 10% of households had experienced either of the first two shocks. However, 43% had been affected by the increased cost of food.

**TABLE 3: Descriptive Characteristics of Outcome and Independent Variables**

| Key Variables | | | Coded | Frequency (%) |
|---|---|---|---|---|
| Food Insecurity Experience Score (FIES) | Food secure | | 0 | 514 (36.1) |
| | Mild/moderate food insecurity | | 1 | 444 (31.2) |
| | Severe food insecurity | | 2 | 465 (32.7) |
| Household characteristics | Household size | 1 person | 0 | 169 (11.9) |
| | | 2-3 persons | 1 | 368 (25.9) |
| | | 4-5 persons | 2 | 483 (33.9) |
| | | 6+ persons | 3 | 403 (28.3) |
| | Age of household head | 16-24 years | 0 | 11 (0.8) |
| | | 25-34 years | 1 | 853 (59.9) |
| | | 35-44 years | 2 | 489 (34.4) |
| | | 45-54 years | 3 | 70 (4.9) |
| | Sex of caregiver for children under 18 | Male | 0 | 272 (27.3) |
| | | Female | 1 | 725 (72.7) |

| | | | | |
|---|---|---|---|---|
| Pandemic experiences | Household head knowledge about COVID-19 | Low | 0 | 378 (26.6) |
| | | Moderate | 1 | 732 (51.4) |
| | | High | 2 | 313 (22.0) |
| | Ease of COVID-19 testing in community | Very difficult | 0 | 253 (17.8) |
| | | Somewhat difficult | 1 | 233 (16.4) |
| | | Neither easy nor difficult | 2 | 309 (21.7) |
| | | Somewhat easy | 3 | 311 (21.9) |
| | | Very easy | 4 | 317 (22.3) |
| | Ever had COVID-19 | Yes, I got positive test | 0 | 13 (0.9) |
| | | Yes, but never tested | 1 | 31 (2.2) |
| | | No | 2 | 1323 (93.0) |
| | Received COVID-19 vaccine | No | 0 | 657 (46.2) |
| | | Yes | 1 | 766 (53.8) |
| | Household expenditure on PPE in previous 7 days | >25 Ghana cedis | 0 | 236 (16.6) |
| | | 25-49 Ghana cedis | 1 | 36 (2.5) |
| | | 50-74 Ghana cedis | 2 | 112 (7.9) |
| | | >=75 Ghana cedis | 3 | 1039 (73.0) |
| | Satisfied by government response since January 2021 | No | 0 | 151 (10.6) |
| | | Yes | 1 | 1272 (89.4) |
| | Change in work condition with restrictions | Yes, because of COVID | 0 | 348 (25.8) |
| | | Yes, but not because of COVID | 1 | 35 (2.6) |
| | | No | 2 | 968 (71.7) |
| | Change in wage income due to COVID-19 compared with before March 2020 | Reduced more than half | 0 | 136 (23.4) |
| | | Reduced, but less than half | 1 | 163 (28.0) |
| | | Stayed about the same | 2 | 251 (43.1) |
| | | Increased by less than half | 3 | 25 (4.3) |
| | | Increased by more than half | 4 | 7 (1.2) |
| | Change in total income compared with before March 2020 | Reduced more than half | 0 | 479 (33.7) |
| | | Reduced, but less than half | 1 | 498 (35.0) |
| | | Stayed about the same | 2 | 368 (25.9) |
| | | Increased by less than half | 3 | 62 (4.4) |
| | | Increased by more than half | 4 | 16 1.1) |
| | Severity of household being affected by COVID since March 2020 | Not severely at all | 0 | 93 (6.5) |
| | | Not severely | 1 | 273 (19.2) |
| | | Neither | 2 | 224 (15.7) |
| | | Severely | 3 | 494 (34.7) |
| | | Very severely | 4 | 339 (23.8) |
| Shocks experienced by household since March 2020 | Theft of crops, livestock, and property | No | 0 | 1305 (91.7) |
| | | Yes | 1 | 118 (8.3) |
| | Illness of income earning household member | No | 0 | 1333 (93.7) |
| | | Yes | 1 | 90 (6.3) |
| | Increase in price of major food items | No | 0 | 815 (57.3) |
| | | Yes | 1 | 608 (42.7) |

| | | | | |
|---|---|---|---|---|
| Coping strategies since March 2020 | Sale of assets | No | 0 | 1264 (88.8) |
| | | Yes | 1 | 159 (11.2) |
| | Borrowed from friends and family | No | 0 | 1149 (80.7) |
| | | Yes | 1 | 274 (19.3) |
| | Purchases on credit | No | 0 | 1168 (82.1) |
| | | Yes | 1 | 255 (17.9) |
| | Delayed payment obligations | No | 0 | 1263 (88.8) |
| | | Yes | 1 | 160 (11.2) |
| | Sold harvest in advance | No | 0 | 1337 (94.0) |
| | | Yes | 1 | 86 (6.0) |
| | Reduced consumption of food | No | 0 | 824 (57.9) |
| | | Yes | 1 | 599 (42.1) |
| | Reduced non-food consumption | No | 0 | 931 (65.4) |
| | | Yes | 1 | 492 (34.6) |
| | Received assistance from NGO | No | 0 | 1415 (99.4) |
| | | Yes | 1 | 8 (0.6) |
| | Received assistance from government | No | 0 | 1363 (95.8) |
| | | Yes | 1 | 60 (4.2) |

## Coping Strategies

Most of the coping strategies included in the survey instrument were implemented by fewer than 20% of households. These included borrowing from friends and family (19%), buying on credit (18%), selling assets (11%), delaying repayment obligations (11%), and selling agricultural produce before harvest (6%). Only 4% said they had received government assistance and less than 1% had received help from an NGO, an indication of the limited pandemic-related social welfare support within urban Ghana. However, 35% of households reported a reduction in their non-food consumption, and 42% said they had reduced their food consumption, clearly affecting their overall food security.

## Household Food Security

In late 2021, only 36% of urban households were food secure on the FIES (Table 3). All remaining households had a degree of food insecurity, with 33% severely food insecure and 31% mildly/moderately food insecure. An important question is whether levels of food security had recovered to pre-pandemic levels and whether or not they had improved since the early months of the pandemic. In fact, the opposite is true.

Table 4 compares the urban food security situation in Ghana in 2018, June 2020 (Wave 1) and December 2021 (Wave 3). First, there were high levels of food insecurity prior to the pandemic across all the FIES responses: 41% of urban household heads were worried about the household food supply, 40% of households ate a limited range of foods, and over 30% of households were unable to eat healthy and preferred foods, had skipped a meal, and had eaten less than they thought they should. During the first wave of the pandemic, there was an increase in worry about the food supply but most metrics did not change significantly in either a negative or positive direction. This suggests that the urban food system was reasonably resilient in the early months of the pandemic. However, the situation had deteriorated markedly by the end of 2021 from June 2020 (Table 4). The greatest deterioration in food security categories were in the variables RAN OUT (10.1%), FEW FOODS (9.5%), ATE LESS (9.4%), and SKIPPED (7.0%). The final column of Table 4 assesses whether food security had recovered to pre-pandemic levels by late 2021. Again, all variables had a higher incidence in 2021. The greatest increases compared to before the

pandemic were in ATE LESS (8.6%), HEALTHY (7.0%), FEW FOODS (7.0%), SKIPPED (6.0%) and RAN OUT (6.3%).

Table 5 cross-tabulates the three FIES food security categories with the three groups of independent variables and indicates a number of suggestive relationships. First, with respect to food security and household characteristics, there are slight variations within each group, but the between group differences do not reveal statistically significant values (at p-value = 0.05). In other words, neither household size, nor the age of the household head, nor the sex of the caregiver have a strong relationship with levels of food insecurity.

Second, a number of household behavioural variable do have a statistically significant relationship with levels of food insecurity. Attitudinally, the level of knowledge about COVID-19 of the household head and satisfaction with government policies both have a significant relationship with levels of food insecurity. Thus, the greater the head's knowledge, the lower the risk of food insecurity, and the greater the dissatisfaction the higher the risk of food insecurity. Various economic variables also exhibit a strong relationship with levels of food insecurity. Expenditure on PPE, working conditions and household income status are all significantly related to the level of food insecurity. For example, while 17% of food-secure households report a change in work conditions, this rises to 34% among severely food-insecure households. Similarly, while 36% of food-secure households experienced reduced wage income from household heads, the figure was as high as 71% for severely food-insecure households. The equivalent figures for total household income were 54% (for food secure households) and 81% (for severely food insecure households). Overall, 39% of food-secure households had been severely affected by COVID-19, compared with 70% of severely food-insecure households.

Third, of the three potential household shocks, the increase in food prices had a statistically significant relationship with level of food insecurity. Food price shocks tend to have a disproportionate impact on poorer and more vulnerable households with a high [proportion of household income spent on food (KC et al., 2018; Kuwornu et al., 2012). In urban Ghana, as many two-thirds of food secure and mild or moderately food insecure households had still been negatively affected by pandemic-related food price shocks. However, the proportion of severely food insecure households affected was as high as 81%.

Finally, in terms of coping strategies adopted by households, the use of each strategy increased consistently with increasing food insecurity. Therefore, the sale of assets, purchasing on credit, delaying payment obligations, advance selling, and reduced purchase of non-food items were significantly more common in severely food insecure households than in food-secure households. The largest differences were related to the reduced consumption of food. Only 16% of food secure households had reduced food consumption, compared with 43% of mild/moderately food insecure households, and 71% of severely food insecure households.

**TABLE 4: Changes in Levels of Urban Household Food Insecurity**

| Variable | Ghana Living Standards Survey (2018) | Wave One Survey (June 2020) | Wave Three Survey (December 2021) | % Change Between 2020 and 2021 (%) | % Change Between 2018 and 2021 |
|---|---|---|---|---|---|
| WORRIED | 40.7 | 42.1 | 45.4 | +2.7 | +4.7 |
| HEALTHY | 35.4 | 36.1 | 42.4 | +6.3 | +7.0 |
| FEW FOODS | 40.1 | 37.6 | 47.1 | +9.5 | +7.0 |
| SKIPPED | 33.0 | 32.6 | 39.6 | +7.0 | +6.6 |
| ATE LESS | 34.6 | 33.8 | 43.2 | +9.4 | +8.6 |
| RAN OUT | 28.4 | 24.6 | 34.7 | +10.1 | +6.3 |
| HUNGRY | 19.4 | 20.4 | 24.3 | +3.9 | +4.9 |
| WHOLE DAY | 5.2 | 5.3 | 10.0 | +4.7 | +4.8 |

**TABLE 5: Relationship Between Household Food Insecurity and Independent Variables**

| | Coded | Food secure (%) | Mild/moderate food insecurity (%) | Severe food insecurity (%) | p-value |
|---|---|---|---|---|---|
| Sample size | | 514 (36.1) | 444 (31.2) | =465 (32.7) | |
| Household characteristics | | | | | |
| Household size | | | | | |
| 1 person | 0 | 79 (15.4) | 38 (8.6) | 52 (11.2) | 0.064 |
| 2-3 persons | 1 | 132 (25.7) | 121 (27.3) | 115 (24.7) | |
| 4-5 persons | 2 | 165 (32.1) | 159 (35.8) | 159 (34.2) | |
| 6+ persons | 3 | 138 (26.8) | 126 (28.4) | 139 (29.9) | |
| Age of household head | | | | | |
| 16-24 years | 0 | 2 (0.4) | 4 (0.9) | 5 (1.1) | 0.058 |
| 25-34 years | 1 | 289 (56.2) | 262 (59.0) | 302 (64.9) | |
| 35-44 years | 2 | 195 (37.9) | 152 (34.2) | 142 (30.5) | |
| 45-54 years | 3 | 28 (5.4) | 26 (5.9) | 16 (3.4) | |
| Sex of caregiver for children under 18 | | | | | |
| Male | 0 | 92 (27.5) | 77 (23.9) | 103 (30.3) | 0.182 |
| Female | 1 | 243 (72.5) | 245 (76.1) | 237 (69.7) | |
| Pandemic experiences | | | | | |
| Household head knowledge about COVID-19 | | | | | |
| Low | 0 | 120 (23.3) | 112 (25.2) | 146 (31.4) | <0.001 |
| Moderate | 1 | 252 (49.0) | 239 (53.8) | 241 (51.8) | |
| High | 2 | 142 (27.6) | 93 (20.9) | 78 (16.8) | |
| Ease of COVID-19 testing in community | | | | | |
| Very difficult | 0 | 82 (16.0) | 86 (19.4) | 85 (18.3) | 0.260 |
| Somewhat difficult | 1 | 79 (15.4) | 73 (16.4) | 81 (17.4) | |
| Neither easy nor difficult | 2 | 113 (22.0) | 96 (21.6) | 100 (21.5) | |
| Somewhat easy | 3 | 108 (21.0) | 108 (24.3) | 95 (20.4) | |
| Very easy | 4 | 132 (25.7) | 81 (18.2) | 104 (22.4) | |
| Ever had COVID-19 | | | | | |
| Yes, I got positive test | 0 | 9 (1.8) | 1 (0.2) | 3 (0.7) | 0.231 |
| Yes, but never tested | 1 | 10 (2.0) | 10 (2.3) | 11 (2.4) | |
| No | 2 | 417 (96.1) | 417 (97.5) | 435 (96.9) | |
| Received COVID-19 vaccine | | | | | |
| No | 0 | 242 (47.1) | 205 (46.2) | 210 (45.2) | 0.834 |
| Yes | 1 | 272 (52.9) | 239 (53.8) | 255 (54.8) | |
| Household expenditure on PPE in previous 7 days | | | | | |
| >25 Ghana cedis | 0 | 96 (18.7) | 64 (14.4) | 76 (16.3) | 0.032 |
| 25-49 Ghana cedis | 1 | 11 (2.1) | 8 (1.8) | 17 (3.7) | |
| 50-74 Ghana cedis | 2 | 52 (10.1) | 28 (6.3) | 32 (6.9) | |
| >=75 Ghana cedis | 3 | 355 (69.1) | 344 (77.5) | 340 (73.1) | |
| Satisfied by government response since January 2021 | | | | | |
| No | 0 | 34 (6.6) | 46 (10.4) | 71 (15.30) | <0.001 |
| Yes | 1 | 480 (93.4) | 398 (89.6) | 394 (84.7) | |
| Change in work condition with restrictions | | | | | |
| Yes, because of COVID | 0 | 85 (17.4) | 117 (27.4) | 146 (33.6) | <0.001 |
| Yes, but not because of COVID | 1 | 9 (1.8) | 12 (2.8) | 14 (3.2) | |
| No | 2 | 395 (80.8) | 298 (69.8) | 275 (63.2) | |

| | | | | | |
|---|---|---|---|---|---|
| Change in wage income due to COVID-19 compared with before March 2020 | | | | | |
| Reduced more than half | 0 | 35 (13.9) | 41 (22.9) | 60 (39.5) | <0.001 |
| Reduced, but less than half | 1 | 57 (22.7) | 58 (32.4) | 48 (31.6) | |
| Stayed about the same | 2 | 144 (57.4) | 71 (39.7) | 36 (23.7) | |
| Increased by less than half | 3 | 11 (4.4) | 7 (3.9) | 7 (4.6) | |
| Increased by more than half | 4 | 4 (1.6) | 2 (1.1) | 1 (0.7) | |
| Change in total income compared with before March 2020 | | | | | |
| Reduced more than half | 0 | 107 (20.8) | 140 (31.5) | 232 (49.9) | <0.001 |
| Reduced, but less than half | 1 | 171 (33.3) | 183 (41.2) | 144 (31.0) | |
| Stayed about the same | 2 | 198 (38.5) | 106 (23.9) | 64 (13.8) | |
| Increased by less than half | 3 | 32 (6.2) | 13 (2.9) | 17 (3.7) | |
| Increased by more than half | 4 | 6 (1.2) | 2 (0.5) | 8 (1.7) | |
| Severity of household being affected by COVID since March 2020 | | | | | |
| Not severely at all | 0 | 36 (7.0) | 30 (6.8) | 27 (5.8) | <0.001 |
| Not severely | 1 | 123 (23.9) | 85 (19.1) | 65 (14.0) | |
| Neither | 2 | 104 (20.2) | 71 (16.0) | 49 (10.5) | |
| Severely | 3 | 188 (36.6) | 154 (34.7) | 152 (32.7) | |
| Very severely | 4 | 63 (12.3) | 104 (23.4) | 172 (37.0) | |
| Shocks experienced by household since March 2020 | | | | | |
| Theft of crops, livestock, and property | | | | | |
| No | 0 | 490 (95.3) | 414 (93.2) | 401 (86.2) | <0.001 |
| Yes | 1 | 24 (1.7) | 30 (6.8) | 64 (13.8) | |
| Illness of income earning household member | | | | | |
| No | 0 | 491 (95.5) | 413 (93.0) | 429 (92.3) | 0.088 |
| Yes | 1 | 23 (4.5) | 31 (7.0) | 36 (7.7) | |
| Increase in price of major food items | | | | | |
| No | 0 | 176 (34.2) | 144 (32.4) | 89 (19.1) | <0.001 |
| Yes | 1 | 338 (65.8) | 300 (67.6) | 376 (80.9) | |
| Coping strategies since March 2020 | | | | | |
| Sale of assets | | | | | |
| No | 0 | 488 (94.9) | 402 (90.5) | 374 (80.4) | <0.001 |
| Yes | 1 | 26 (5.1) | 42 (9.5) | 91 (19.6) | |
| Borrowed from friends and family | | | | | |
| No | 0 | 459 (89.3) | 377 (84.9) | 313 (67.3) | <0.001 |
| Yes | 1 | 55 (10.7) | 67 (15.1) | 152 (32.7) | |
| Purchases on credit | | | | | |
| No | 0 | 456 (88.7) | 387 (87.2) | 325 (69.9) | <0.001 |
| Yes | 1 | 58 (11.3) | 57 (12.8) | 140 (30.1) | |
| Delayed payment obligations | | | | | |
| No | 0 | 488 (94.9) | 402 (90.5) | 373 (80.2) | <0.001 |
| Yes | 1 | 26 (5.1) | 42 (9.5) | 92 (19.8) | |
| Sold harvest in advance | | | | | |
| No | 0 | 496 (96.1) | 415 (93.5) | 428 (92.0) | 0.025 |
| Yes | 1 | 20 (3.9) | 29 (6.5) | 37 (8.0) | |
| Reduced consumption of food | | | | | |
| No | 0 | 434 (84.4) | 253 (57.0) | 137 (29.5) | <0.001 |
| Yes | 1 | 80 (15.6) | 191 (43.0) | 328 (70.5) | |

| | | | | | |
|---|---|---|---|---|---|
| Reduced non-food consumption | | | | | |
| No | 0 | 414 (80.5) | 295 (66.4) | 222 (47.7) | <0.001 |
| Yes | 1 | 100 (19.5) | 149 (33.6) | 243 (52.3) | |

## Multinomial Regression Analysis Results

To determine the strength of the relationship between levels of household food insecurity and household characteristics, pandemic experiences, and coping strategies, this section shows the results of the multinomial logistic regression using a generalised linear model and cumulative complementary log-log analysis. In the model, severe food insecurity was set as the reference and the Odds Ratio (OR) was calculated for each independent variable (Table 6). None of the household characteristics have a strong association with severe insecure although larger households are marginally more likely to experience severe food insecurity (OR = 1.14). Similarly, households with heads with low knowledge about COVID-19, a COVID-19 infection, and dissatisfaction with the government response, were all marginally more likely to experience severe food insecurity. Contrary to expectations, there was an inverse relationship between vaccine status and severe food insecurity (OR = 0.75). However, heads of households with a low opinion of the government response were more likely to be severely food insecure (OR = 0.75)

As with the descriptive statistics, the strongest association with severe food insecurity was with the economic variables. A reduction in overall household income by more than half increased the odds of being severely food insecure (OR = 1.51). A reduction in the wage income of the household head by more than half had a similar effect (OR = 1.52). As the overall severity of the pandemic impact on the household declined, so did the odds of being severely food insecure.

**TABLE 6: Odds Ratios of Experiencing Severe Food Insecurity**

| Dependent variable | FIES-Categorical (n=1423) |
|---|---|
| Independent variables | OR [95% CI] |
| Household size (Ref: 6+ persons) | |
| 1 person | 1.023 (0.661-1.583) |
| 2-3 persons | 1.135 (0.838-1.537) |
| 4-5 persons | 1.136 (0.858-1.504) |
| Age of household head (Ref: 45-54 years) | |
| 16-24 years | 1.741 (0.812-3.734) |
| 25-34 years | 0.854 (0.564-1.294) |
| 35-44 years | 0.776 (0.497-1.213) |
| Sex of caregiver (Ref: Female) | |
| Male | 1.126 (0.810 -1.566) |
| Household head knowledge about COVID (Ref: High) | |
| Low | 1.195 (0.873-1.693) |
| Moderate | 1.181 (0.911-1.595) |
| Ease of testing in community (Ref: Very easy) | |
| Very difficult | 0.610 (0.258-1.440) |
| Somewhat difficult | 1.396 (0.509-3.825) |
| Neither easy nor difficult | 0.979 (0.545–1.757) |
| Ever had COVID-19 (Ref: No) | |
| Yes, I got positive test | 1.145 (0.526-2.496) |
| Yes, but never tested | 1.353 (0.805-2.275) |

| | |
|---|---|
| Received COVID-19 vaccine (Ref: Yes) | |
| No | 0.751 (0.608-0.927)** |
| Household expenditure on PPE in previous 7 days (Ref: >=75 Ghana cedis) | |
| >25 Ghana cedis | 0.759 (0.555-1.037)* |
| 25-49 Ghana cedis | 1.357 (0.489-3.768) |
| 50-74 Ghana cedis | 1.068 (0.717-1.592) |
| Satisfied by government response since January 2021 (Ref: Yes) | |
| No | 1.206 (0.856-1.700) |
| Change in work condition with restrictions (Ref: No) | |
| Yes, because of COVID | 1.027 (0.795-1.327) |
| Yes, but not because of COVID | 1.211 (0.685-2.143) |
| Change in wage income due to COVID compared with before COVID-19 (Ref: Increased by more than half) | |
| Reduced more than half | 1.520 (0.569-4.057) |
| Reduced, but less than half | 1.760 (0.669-4.631) |
| Stayed about the same | 1.113 (0.429-2.888) |
| Total income changed compared with before COVID-19 (Ref: Increased by more than half) | |
| Reduced more than half | 1.511 (0.513-4.452) |
| Reduced, but less than half | 1.220 (0.423-3.518) |
| Stayed about the same | 1.043 (0.357-3.043) |
| Increased by less than half | 0.921 (0.304-2.790) |
| Severity of household being affected by COVID since March 2020 (Ref: Very severely) | |
| Not severely at all | 0.684 (0.414-1.130) |
| Not severely | 0.570 (0.398-0.816)*** |
| Severely | 0.770 (0.571-1039)* |
| Theft of crops, livestock, and property (Ref: Yes) | |
| No | 0.800 (0.497-1.287) |
| Illness of income-earning household member (Ref: Yes) | |
| No | 1.625 (1.030-2.556)** |
| Increase in price of major food items (Ref: Yes) | |
| No | 0.908 (0.719-1.145) |
| Sale of assets (Ref: Yes) | |
| No | 0.680 (0.458-1.010)* |
| Borrowed from friends & family (Ref: Yes) | |
| No | 0.653 (0.480-0.888)** |
| Credit purchases (Ref: Yes) | |
| No | 0.916 (0.652-1.286) |
| Delayed payment obligations (Ref: Yes) | |
| No | 0.839 (0.575-1.225) |
| Sold harvest in advance (Ref: Yes) | |
| No | 1.452 (0.913-2.308) |
| Reduced consumption (Ref: Yes) | |
| No | 0.318 (0.239-0.423)**** |
| Reduced non-food consumption (Ref: Yes) | |
| No | 1.145 (0.848-1.544)* |

## Conclusion

Since the start of the pandemic in Ghana in March 2020, almost 60% of urban households in Ghana had been 'severely affected' or 'very severely affected" by COVID-19. The economic and food security impacts of the pandemic continued to late 2021. Three quarters of household heads had worked for pay in the week prior to the interview, and only a quarter reported that the restrictions of COVID-19 had impacted their working conditions. However, many more had experienced a reduction in income compared with their pre-pandemic situation. Just over half had experienced a reduction in wage income, while almost three-quarters said that total household income had fallen. As many as a third of the households had experienced an income decline of more than half. In relation to the impacts of the pandemic on food accessibility, the main shock was an increase in the price of the main items of food. In terms of overall impact of the pandemic on the household, nearly 60% said that it had been severe or very severe. While food is not the only component of severity of impact, it clearly plays a significant part. For example, 58% of mild or moderately food insecure households, and 70% of extremely food insecure households said that the overall impact had been severe.

The Wave 3 Survey presented all households with a list of typical coping strategies used by households internationally during the pandemic. Most of these were used by only a minority of urban households in Ghana (less than 20% and in many cases less than 10%). However, households that used these strategies tended to be more food insecure. For example, sale of assets increased from five percent of food secure households to 20% of severely food insecure households. Borrowing from friends and family increased from 11% to 33%, and reducing food consumption increased from 16% to 71%. It is possible that some of the food secure households would have been more food insecure without the use of these strategies but others, the majority, remained severely food insecure.

Ghana has experienced three major waves of COVID-19 in early 2020, early 2021 and late 2021. In this article, we made a decision to focus on the data generated in the survey in late 2021. This is partly because previous researchers have used the Wave 1 data and partly because we wanted to see if the pandemic had lasting effects on the food insecurity of urban households or whether households had managed to recuperate from the initial shock of the pandemic. We therefore extracted the responses for the FIES food security indicator for Wave 1 and compared them to the Wave 3 data. We hypothesized that since most household heads were gainfully employed in late 2021, there had probably been a partial recovery and falling off in food insecurity. On the contrary, however, food insecurity had increased by up to ten percent on every single measure between Wave 1 and Wave 3. This provided us with some assurance that we were, in fact, looking at the ongoing consequences of pandemic precarity and food insecurity. Given this finding, we used descriptive statistics and regression modelling to build a profile of food insecure households in urban Ghana in late 2021. In both analyses, we found that household demographic characteristics and COVID-19 mitigation strategies such as vaccines and expenditure on PPE were not a major predictor of food insecurity. Economic factors, especially the impact of the pandemic on wage income and total household income, were far more important with those most affected being most food insecure. At the same time, food insecure households were most aware of and affected by food price increases during the pandemic.

In an analysis of pre-pandemic responses to sudden shocks in Nairoby, Kenya, Onyango et al. (2021) were able to clearly identify which types of households were most vulnerable to shocks, which would therefore be most affected by the COVID-19, and which should be targeted for future pandemic support and relief by government. In the case of urban Ghana, there was only a limited number of household variables in the survey and none of those appeared to make a substantial difference to the likelihood of the household being food insecure. However, other variables, such as household

income, expenditure on food, household type (male or female-headed), remitting practices, and household head characteristics such as level of education could conceivably have allowed us to repeat the Nairobi thought experiment in urban Ghana.

The drivers of high levels of food insecurity in rapidly-urbanizing Africa have emerged as a major research field in the last decade (Crush and Battersby, 2017; Frayne et al., 2022). National and city governments are also increasingly recognizing the need to develop food security and food system governance strategies that go well beyond the tired mantra of urban agriculture. Both processes – research on urban food security and policy responses to growing food insecurity – have been disrupted by the COVID-19 pandemic and created a new and still evolving research and policy environment. The urgent need for relevant information on the impact of the pandemic on the food security of urban populations prompted the widespread adoption of rapid response surveys using CAT. Rapid response surveys by the World Bank, national governments and others have generated a wealth of data in open repositories that is still largely unmined. In drawing on one of these rapid response data sets for Ghana, this article demonstrates the potential of rapid response surveys conducted during the first, and most lethal, waves of the pandemic for understanding its food security impacts in cities.

The initial shock of the pandemic in early 2020 drove panicked governments and public health authorities to impose often draconian restrictions on the mobility, employment, and social lives of urban dwellers up and down the African continent. Ghana was no exception. Unsurprisingly, in retrospect, policies to contain the spread of the virus had a profound disruptive impact on global and national food supply chains, food prices, and food accessibility in the country. The inevitable consequence was a sharp increase in food insecurity throughout the country, but especially in large cities such as Accra and Kumasi. However, as we demonstrate in the paper, although restrictions continued to ease and were less severe in subsequent waves of COVID-19, the negative impact on food security was more enduring, especially for certain types of urban household.

Although this paper has identified some of the characteristics of these households, the analysis was somewhat constrained by the design of the World Bank survey. For example, data on other variables such as household type (male or female-headed), the sex of the household head, and the demographic and occupational profile of household members were absent and could be built into future surveys. Additionally, the FIES is a useful first approximation for assessing acute episodes of food insecurity but, due to its one-month recall, is not as robust for assessing enduring or chronic food insecurity. Rapid response surveys were not designed to capture the nuances of food security and insecurity and are therefore of limited utility for capturing their six different dimensions: availability, accessibility, utilisation, stability, agency, and sustainability (FAO, 2020). Post-pandemic recovery and planning for possible future pandemics in cities requires attention to and reliable data on all of these aspects.

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