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Food Insecurity during the COVID-19 Pandemic in Burkina Faso

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Abstract

This paper investigates the implication of the COVID-19 pandemic on households' food insecurity in Burkina Faso. We use data from the Burkina Faso High Frequency Phone Survey collected during the period June 2020 and June 2021 by the World Bank. To assess the persistence in food insecurity, we estimate a dynamic ordinary least squares regression. Our results reveal that female and the elderly household members were more likely to experience food insecurity than their respective counterparts. For households that skipped a meal due to the pandemic, the likelihood of facing food insecurity in the subsequent month increased by 37 per cent. While other shocks can cause food insecurity, the global health-related, economic, social, and information dimensions of the COVID-19 created a distinctive and multifaced form of food shortages that sets it apart from many other types of shocks.

Keywords: COVID-19 pandemic, Food insecurity persistence, Burkina Faso.
JEL codes: D10 · I12· O55 · Q18

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1. Introduction

The COVID-19 pandemic has led to substantial concern about threats to food security (Amare et al., 2020; Hirvonen et al., 2021; Laborde et al., 2020). In April 2020, the World Food Programme projected the number of acutely food insecure people in the world could double by the end of 2020 without concerted action (WFP, 2020). The World Bank's recent estimates show that, globally, the pandemic pushed 23 million people into extreme poverty in Sub-Saharan Africa in 2020. In addition, several scholars of food security, food systems, and poverty have come to realize that the hunger and malnutrition associated with the COVID-19 pandemic may actually kill or debilitate more people than the disease itself; especially in regions of the world with weaker social safety nets (Fanzo, 2020).

This paper investigates the implications of the COVID-19 pandemic for household food security in Burkina Faso. Burkina Faso is an interesting case study, as the pandemic could contribute to exacerbating food insecurity for three main reasons. First, agricultural production and food security are highly dependent on weather shocks. According to the Food Crisis Prevention Network (2020), rainfall variability has reduced agricultural production between 6 and 15% in 2019. This could tip 10.1% of population into food insecurity. In addition, over the past 5 years, the country is affected by violent terrorist attacks and regional unrest. Second, the Fund for Peace (2020)has concluded that Burkina Faso is rated as the fourth most affected country in 2019. This has led to the closure of more than 2000 schools, 600,000 internally displaced people and shutdown of health centers. As of December 31, 2022, 6,253 schools have been closed and 1.7 million people are internally displaced due to insecurity and violence. These recurrent and violent attacks have deteriorated households' livelihoods in several regions. Finally, the availability of a large nationally representative panel of households observed during the pandemic makes Burkina Faso an ideal setting for an early empirical examination of COVID-19's impacts.

The effects of the pandemic are expected to differ both by geography and by type of household, with preexisting vulnerabilities to food security likely to be magnified (Devereux et al., 2020; Ravallion, 2020). Impacts are expected to be most severe for poorer households in both rural and urban areas (Ravallion, 2020). According to FAO (2021), COVID-19 was a contributing factor to the increase in moderate and severe food insecurity between 2019 and 2020. Indeed, moderate and severe food insecurity increased from 43 percent to 59 percent in Burkina Faso. As the spread of the pandemic initiates in urban areas, government responses, including mobility restrictions and lockdowns, will likely be most intense in urban areas and may affect urban residents more directly than rural households in the short term. However, the impact of COVID-19 is also expected to vary across livelihood options, with those activities that require face-to-face interactions likely to experience a significant loss in demand (Abay et al., 2020). Value chain disruptions may extend deeply into rural areas, affecting both input supply and output demand for farmers and affecting the income of those employed in both upstream and downstream agricultural value chains(Amjath-Babu et al., 2020). FAO and WFP (2020) identified five ways that food insecurity can be affected by

COVID-19: (i) food access through reduced purchasing power of households (ii) availability of food by reducing agricultural production, and disrupting food supply chains; (iii) the limit of government capacities to protect vulnerable populations; (iv)leading to political stability; and (v) conflicts dynamics.

Our study more precisely answers the following questions:

- What is the persistence of food insecurity during COVID periods?
- Do the potential effects across households vary?
- What are the effects of the spread of the pandemic on food insecurity outcomes?

To answer the above questions, we use the 2020-2021 High Frequency Phone Survey. We also exploit changes in food insecurity indicators using a dynamic ordinary least squared model with fixed effects.

Previous studies on the effects of COVID-19 on food security in Burkina Faso have focused on the broader macroeconomic national level (Zidouemba et al., 2020) and urban environment (Ouoba and Sawadogo, 2022; Sawadogo and Ouoba, 2023). Our study fills the gap by analyzing the effect on a microeconomic level and on both rural and urban environment.

The remainder of the paper is organized as follows. In the next section, we present the literature review and discuss the COVID-19 situation in Burkina Faso in the Section 3. The theoretical framework is described in Section 4. In Section 5, we describe the data and document the food insecurity profile in section 6. We present the empirical strategy in section 7 as well as the discussion surrounding our results. We conclude the paper in section 8.

2. Literature Review

Several empirical studies document the impacts of the COVID-19 pandemic on food insecurity. Three main channels have been raised to highlight these impacts:

- Income losses and demand shocks
- Food supply chain disruptions
- Policy responses: hoarding at country level (food export bans) and fiscal stimulus.

Income losses and demand shocks contribute significantly to the reduction of food security during the COVID-19 pandemic. Related to food access disruptions, preventive responses created employment shocks through employment losses. Evidence from low and middle-income countries shows overall income losses due to stay-at-home policies (Bottan et al., 2020; Ceballos et al., 2020; Hamadani et al., 2020; Kansiime et al., 2021; Koos et al., 2020; Laborde et al., 2021; Mahmud & Riley, 2021). Laborde et al. (2021) assess the impact of COVID-19 on poverty, food insecurity in Asia and Africa South of Sahara using IFPRI's global general equilibrium model. They find that the increases in poverty are concentrated in South Asia and sub-Saharan Africa with impacts harder in urban areas than in rural areas. The COVID-19-related lockdown measures explain most of the fall in output, whereas declines in savings soften the adverse impacts on food consumption. Using phone-based surveys in Mali, Adjognon et al. (2021) reported high levels of food insecurity and short-falls in labor market participation in urban areas. In Nigeria, food insecurity and short-falls in

labor market participation were also exacerbated with COVID-19 cases and some containment measures like lockdowns (Amare et al., 2021). The link between more stringent restrictions, food insecurity, and off-farm income reduction has also been established using a robust statistical analysis to compare areas of Nigeria which experienced differential restrictions (Amare et al., 2021). Moreover, several recent empirical studies document the impact of the externality of infection (that is the unintended impact of an individual's infection on the health and economic outcomes of others) on income (see Alinsato, 2021; Bethune & Korinek, 2020; Eichenbaum et al., 2021; Welfens, 2020 for a review). Indeed, the spread of the COVID-19 could have led to a decrease in economic productivity, which in turn can result in low incomes for individuals. With the COVID-19 outbreak, some people took time off to care for themselves or their family members, or to avoid getting infected. This could have led to reduced productivity in the workplace and, in turn, a decline in income for individuals and businesses.

Food supply chain disruptions: Stock-outs affected online markets due to reduced farm deliveries (Mahajan & Tomar, 2021), and prices of grains became unstable although minimum support prices shielded producers from very low prices (Varshney et al., 2020). Despite government support mechanisms, such as minimum prices some products (e.g., vegetables) still suffered price drops(Ali & Khan, 2020). COVID-19 has disrupted not only food markets but also the overall national and international supply chains(Aday & Aday, 2020; Ayanlade & Radeny, 2020; Cao et al., 2021; Elleby et al., 2020), including access to agricultural inputs, such as fertilizers and others(Ayanlade & Radeny, 2020; Nchanji et al., 2021; Pan et al., 2020; Pu & Zhong, 2020). We expect households to become more food insecure due to COVID-19 and related lockdown measures.

Policy responses - hoarding at country level (food export bans) and fiscal stimulus: COVID-19 has triggered a range of policy responses at both the national and international levels. Two important policy responses are hoarding at the country level, particularly food export bans, and fiscal stimulus. Hoarding at the country level refers to the act of governments restricting or banning exports of essential commodities such as food, medical supplies, and other goods in response to the COVID-19 pandemic. Some countries have implemented export bans on food and other essential goods to ensure their domestic food security and meet the needs of their population. However, these policies can lead to shortages in other countries, particularly in low-income countries, which can exacerbate food insecurity and contribute to global price volatility. Fiscal stimulus refers to policies aimed at boosting economic growth and mitigating the impact of the COVID-19 pandemic on businesses and individuals. Fiscal stimulus measures can take the form of direct payments to individuals, tax breaks, loans and grants to businesses, and increased government spending on public infrastructure projects. These measures are aimed at maintaining aggregate demand and supporting households and businesses that are struggling financially as a result of the pandemic. Fiscal stimulus policies have been widely implemented by governments around the world in response to the COVID-19 pandemic. The scale and scope of these policies have varied, with some countries implementing large-scale stimulus packages while others have adopted more targeted measures. The effectiveness of these policies in mitigating the economic impact of the pandemic has been mixed,

with some countries experiencing a rebound in economic activity while others continue to struggle. In summary, hoarding at the country level and fiscal stimulus are two important policy responses to the COVID-19 pandemic. While hoarding can contribute to global price volatility and exacerbate food insecurity, fiscal stimulus policies are aimed at mitigating the economic impact of the pandemic on households and businesses. The effectiveness of these policies in mitigating the impact of the pandemic will continue to be evaluated over time.

Although the literature on the effect of COVID-19 on food security in low and middle-income countries continue to grow, minimal research exists on the magnitude of the impact of the coronavirus pandemic on the above mechanisms, partly because detailed household survey data are not yet available. This study aims to examine the implication of the spread of the pandemic and associated lockdown measures on ultimate food security outcomes of households. Burkina Faso is highly susceptible to income shocks and food insecurity associated with the spread of the pandemic. Thus, national and regional lockdowns and mobility restrictions are disrupting major economic activities, including local businesses. These restrictions are affecting food transportation within the country, with clear implications for food supply. There are indications that Burkina Faso's domestic and international food supply chains have been disrupted, food prices are increasing, and informal sector unemployment rates are likely to be increasing. All these effects are likely to generate significant repercussions for food insecurity, particularly in poorer and vulnerable households (Amare et al., 2021; Ericksen et al., 2012; Gilligan, 2020; Tendall et al., 2015).

Syafiq et al. (2022)using a multivariate analysis show reduced income and stopped working status of households are related to household food security during the pandemic in Indonesia. Authors found that households with lower income had 4 times higher risk to experience food insecurity. Also, households with younger people had 2 times higher risk to experience food insecurity compared to those older counterparts. Quoba and Sawadogo (2022)analyze the effect of income loss due to COVID-19 on food security and poverty among urban households of small traders in Burkina Faso. Authors found that the pandemic has reduced incomes by increasing household likelihood of entering poverty. In addition, the COVID-19 has increased the likelihood of households being food insecure due to their lower food consumption. Authors suggest that households with adaptive capacity were able to adjust to the shock.

Using a computable general equilibrium model with two alternative scenarios (optimistic and pessimistic),*Z*idouemba et al. (2020) suggest that the pandemic of Covid-19 contributes to a worsening of food security as food insecurity is increasing among poor households in rural and urban areas in Burkina Faso. The authors show that urban non-poor households are resilient to the Covid-19 pandemic whereas the non-poor rural households are likely to fall into vulnerable people.

3. Theoretical Framework

COVID-19 has had significant impacts on food security globally. Conceptually, the impacts of COVID-19 on food security can be understood through a range of theoretical frameworks, including the food systems framework, the household livelihoods framework, and the global political economy framework. The food systems framework emphasizes the interconnectedness of the different components of the food system, including production, processing, distribution, and consumption. The COVID-19 pandemic has disrupted all of these components, with impacts on farmers, food processors, transport workers, and retailers (Kumar & Kumar Singh, 2022). The resulting disruptions have led to food shortages, increased prices, and reduced access to nutritious foods, particularly for vulnerable populations (Laborde et al., 2020). The food systems framework can help to understand the complex and interrelated impacts of COVID-19 on food security and inform policy responses that address the different components of the food system.

The household livelihoods framework emphasizes the role of individual households in securing their access to food. The COVID-19 pandemic has led to widespread job losses and economic insecurity, which has had significant impacts on households' ability to access and afford food (Karpman et al., 2020). In addition, lockdowns and other public health measures have limited households' ability to access food markets and other sources of food. The household livelihoods framework can help to understand the differential impacts of COVID-19 on households, depending on their socio-economic status and other factors, and inform policy responses that target vulnerable households and address the underlying economic drivers of food insecurity.

The global political economy framework emphasizes the role of international trade and power relations in shaping food security. The COVID-19 pandemic has led to disruptions in global trade and supply chains, including food exports and imports. In addition, the economic impacts of the pandemic have disproportionately affected low-income countries and small-scale farmers, who are often reliant on international trade for their livelihoods (Clapp & Moseley, 2020). The global political economy framework can help to understand the underlying structural drivers of food insecurity, and inform policy responses that address the power imbalances and inequities in the global food system.

Overall, these theoretical frameworks can help to understand the complex and interrelated impacts of COVID-19 on food security, and inform policy responses that address the underlying drivers of food insecurity.

4. COVID-19 Measures in Burkina Faso

The COVID-19 pandemic, which began in China in December 2019, quickly spread to all countries in the world. Burkina Faso officially recorded its first infected case on March 9, 2020. As of April 12, 2022, there are 20,865 confirmed cases of COVID-19 with 383 deaths. Like many countries worldwide, Burkina Faso followed the physical distancing, handwashing and face covering measures as ways to limit the spread of the virus. In view of the increase in the incidence of COVID-19 cases,

in addition to the barrier measures, new additional social and economic measures had been taken three weeks after the start of the epidemic and gradually introduced within the country. To contain the spread of the disease, the Government of Burkina Faso has taken additional preventive measures, the first of which came into force on March 16, 2020. These measures include: the closure of schools and universities, the closure of certain markets, the closure of restaurants and bars, the closure of all places of worship, the introduction of a curfew (from 7pm to 5am in March and later from 9pm to 4 am in April) throughout the territory. Also, the government implementedthe restriction of travel within the country, the quarantine of cities recording at least one case, closure of air, land and rail borders, cessation of all non-essential activities including sports and cultural activities; the prohibition of gatherings of more than 50 people. While these restrictive measures are primarily intended to reduce the spread of the disease, they have impacted the living conditions of populations to varying degrees. For example, the closure of markets has also impacted access to food in cities and among the poor due to the increase in prices. Indeed, during the period of implementation of anti-COVID measures, 25 percent of households nationwide were unable to access staple foods (INSD, 2020). Thus, COVID-19 has affected people's ability to meet their food needs, which could ultimately exacerbate food and nutrition insecurity in Burkina Faso.

However, the closure of markets in the main cities was the most contested measure as a vast majority of self-employed young people work in the informal sector, in the markets, and make a living from day-to-day selling of their products (Tapsoba, 2022). In the political capital, Ouagadougou, 36 markets were closed from March 26 to April 20, 2020 and the big market was closed in the economic capital, Bobo Dioulasso from March 30 to April 12, 2020. To mitigate the impact of its measure on livelihood, the government opted for the distribution of food and necessities to those impacted by the decision specifically to informal traders. Although the donations, riots and demonstrations erupted, urging the government to suspend the decision to close the markets (Tapsoba, 2022). Indeed, weeks later, a decision was taken to reopen markets, but with the conditions to the respect of measures such as disinfection of all markets, reduction of clients' number, installation of hand-washing equipment in every shop, social distancing, and mask wearing for customers and merchants. While keeping markets opened help to maintain traders' incomes and preventing them from sliding into poverty, the food security of the many urban residents who rely on them is preserved. According to the FAO (2021), during the pandemic, a solidarity fund was established the government in the country to benefit actors in the informal sector, particularly for women, to revive trade activities in vegetables and fruits.

5. Data

We use data from the Burkina Faso's High Frequency Phone Survey (HFPS), collected by the World Bank in collaboration with the Burkina Faso National Institute of Statistics and Demography (INSD). The HFPS are used to assess the impacts of the COVID-19 pandemic and include 11 rounds collected from June 9, 2020, to June 28, 2021. Table 1 presents the dates of data collection. The HFPS is a subsample of the Burkina Faso 2018/19 Living Standards and Measurement Survey (LSMS). We merged data from all the 11 rounds and kept those with complete information. These

data provide information on food, nutrition security indicators, employment, income, etc. To adjust for potential attrition in the HFPS survey and construct nationally representative statistics, one must construct and apply appropriate sampling weights. The HFPS team constructed sampling weights using the weights for the LSMS as the basis, with further adjustment for attrition in the phone survey. The weights for the final sample of households from the HFPS were calculated in several stages and are shown to ensure comparable distribution of observable characteristics from the LSMS and the HFPS. Since HFPS data contain important information on households' participation in economic activities and food insecurity experience, we can therefore assess the persistence of the impacts of the COVID-19 pandemic on food insecurity.

Table 1: Dates of data collection

Rounds	Start	End	Survey
1	2020-06-09	2020-07-01	
2	2020-07-20	2020-08-14	
3	2020-09-12	2020-10-21	
4	2020-11-06	2020-12-02	
5	2020-12-09	2020-12-30	
6	2021-01-15	2021-02-01	HFPS
7	2021-02-12	2021-03-02	
8	2021-03-13	2021-04-01	
9	2021-04-20	2021-05-04	
10	2021-05-25	2021-06-15	
11	2021-06-28	2021-07-20	

Source: World Bank

We measure food security using three indicators, capturing households' experience of food insecurity. In HFPS, households' food insecurity experiences are elicited using the self-reported experience of hunger and food shortage in the last 30 days (Hoddinott, 1999; Carletto et al., 2013; Bellemare and Novak, 2017). The first indicator asks if a household head or any other adult in the household had to ***skip a meal*** because there was not enough money or other resources to get food. The second indicator elicits whether the household has ***run out*** of food due to lack of monetary or other resources to get food. The third indicator takes a value of 1 if the household or any other adult in the household ***went without eating for a whole day*** because of a lack of money or other resources.

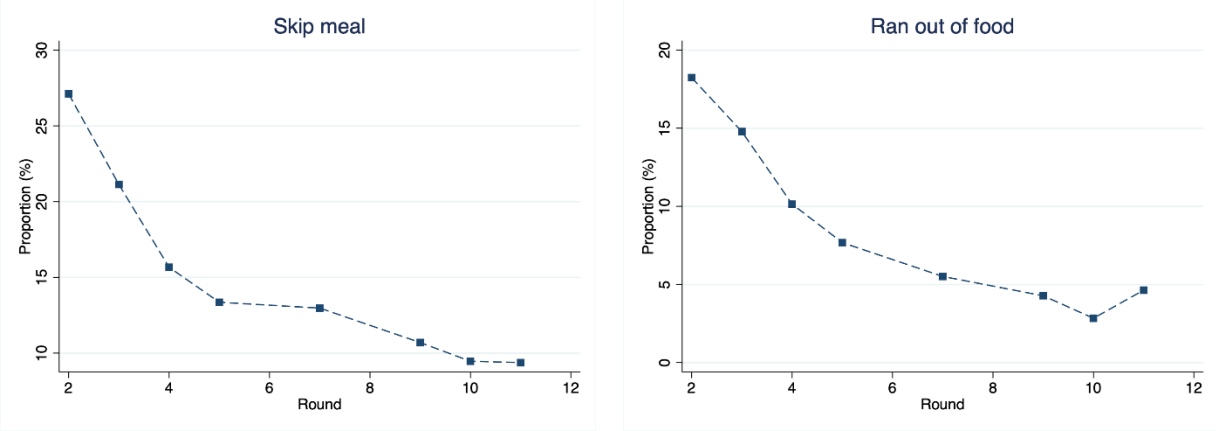
Table 1reports weighted and pooled summary statistics of our sample. About 15 percent of respondents in our sample are female; 14.9 percent of households skip a meal because of a lack of monetary resources; 8 percent ran out of food and 5 percent went out without eating for a whole day. Figure 1 plots the proportion of respondents who experienced food insecurity between 2020 and 2021. Although between 10 percent and 28 percent of people experienced food insecurity

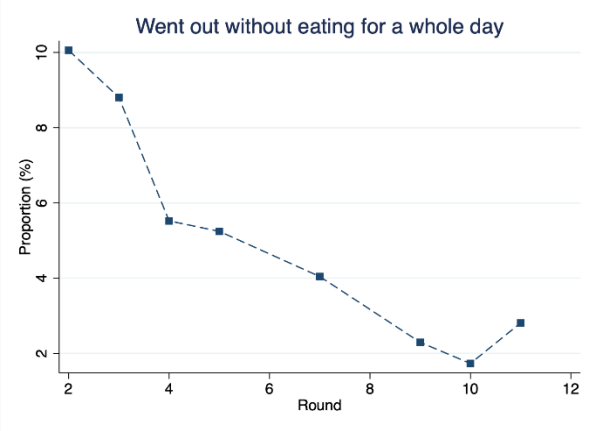
during the beginning of the pandemic, the trend over this time shows that less than 10 percent of respondents experienced food insecurity in the second quarter of 2021.

Table2: Summary statistics of key variables

Variables	Mean
Female	15.1
Age	47.8
Household size	7.9
Urban	65.8
Farm (agriculture) activities	64.2
Skip a meal	14.9
Run out of food	8.4
Went without eating for a whole day	5
Sample size	8144

Figure 1: Dynamics of Food Insecurity

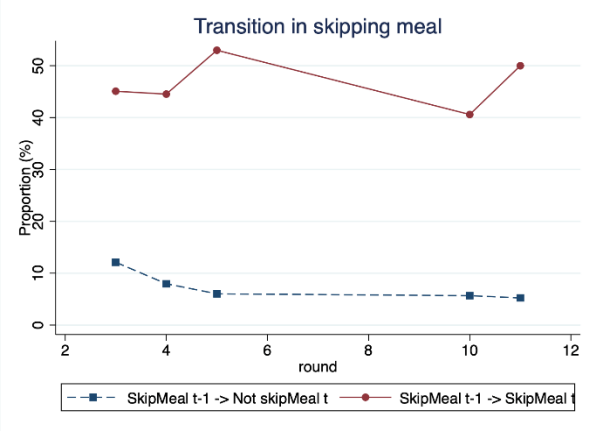


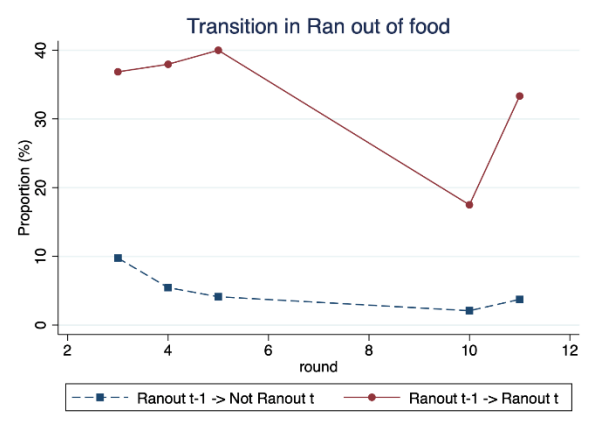


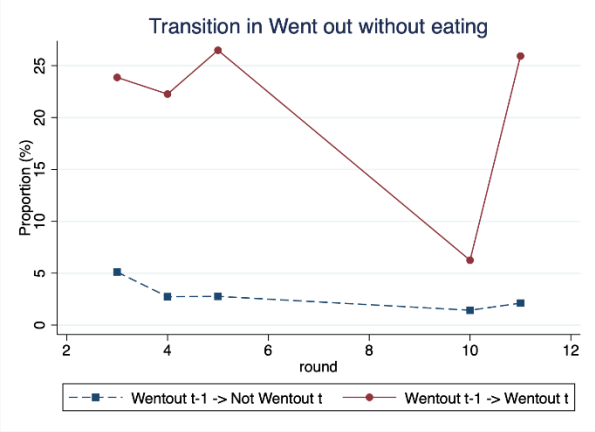
6. Food Insecurity Profile in Burkina Faso

In this section, we provide other patterns in the dynamics of food insecurity as well as its individual correlates. The proportion of people transitioning into and out of food insecurity points to a changing pattern in the experience of food insecurity. Figure 2 shows the changes in the proportion of people becoming food insecure and those moving out of food insecurity. It shows that between 40% and 50% of individuals who reported having skipped meals in the previous months still skipping meals in the following months. In the same vein, between 18% and 40% of households starting with running out of food during the pandemic stays in that state even 1 year after the pandemic. The same figure is observed among those who went out without eating (between 5% and 25%). These patterns reveal a high persistence in food insecurity. Moreover, we observe that women have a higher prevalence of food insecurity than men (Figure 3 in the Annex). Young respondents (18-24) are particularly more affected, followed by people over 45 years old (Figure 4). There is a substantial difference in food insecurity depending on the household size, the place of residence and the type of activities of household members (Figures 5-7). All these patterns confirm that food insecurity still remains a growing social issue in Burkina Faso.

Figure 2: The dynamics of food insecurity and its transition between 2020 and 2021







7. Empirical Analysis

We assess the persistence of food insecurity through the coefficient ρ in the following fixed-effects model:

$$Y_{it} = \rho Y_{i,t-1} + \boldsymbol{X}_{it}\boldsymbol{\theta} + \mu_i + \delta_t + \varepsilon_{it} \qquad (1)$$

where Y_{it} stands for each of the food insecurity indicators presented in the previous section.$Y_{i,t-1}$ is a one-period lagged food insecurity, with autoregressive parameter ρ. This coefficient is expected to be between 0 and 1, which is consistent with the convergence idea. In addition to the persistence in food insecurity, we include the lag of food insecurity in the equation (1) to account for the environmental time-invariant determinants of food insecurity at individual level.$\boldsymbol{X}_{it}$ is a vector of observable characteristics. The individual fixed-effects are represented by μ_i and δ_t controls for year fixed-effects.ε_{it} is an error term assumed to be uncorrelated to μ_i, δ_t, $COVID_t$, and $\boldsymbol{X}_{it}$. We rely on the Ordinary Least Squares regression (Linear Probability Model) to estimate equation (1). The individual fixed effects capture the individual-specific characteristics which could be innate qualities and which could remain constant for a particular individual throughout the period analyzed. By including individual fixed-effects in the LPM, we control for the influence of unmeasured individual-specific factors.

The time fixed-effects are introduced in the model to control for the influence of time-related factors that affect all individuals in the same way. The time-fixed effects therefore capture common

shocks or events that might simultaneously impact all individuals in the sample in a given period. This helps in distinguishing the effects of individual-level variables (captured by individual-fixed effects) from those related to changes occurring at the same time for all individuals (captured by time fixed-effects).

Table 2 shows the implications of the spread of the pandemic on food security outcomes, measured as binary indicators of food insecurity experience. Females and the elderly were more likely to experience food insecurity than their respective counterparts.[3] Several interconnected factors may contribute to this result. Firstly, pre-existing gender disparities played a crucial role. Burkina Faso, like many other African societies, often assigns traditional gender roles, with women primarily responsible for household chores and caregiving. The pandemic-induced disruptions disrupted these roles, increasing the burden on women who had to juggle multiple responsibilities, hindering their ability to engage income-generating activities or access essential resources for food security.

Secondly, elderly individuals faced heightened risks due to their susceptibility to severe illness from COVID-19, which prompted many to isolate themselves to avoid infection. This isolation limited their mobility, making it challenging to access markets or participate in agricultural activities, thus compromising their ability to secure sufficient food.

Moreover, the pandemic disrupted supply chains and economic activities, leading to increased unemployment and reduced income for vulnerable populations. Women, who often engage in informal and precarious employment, were disproportionately affected by these economic shocks. The elderly, reliant on pensions or familial support, were more likely to see their income sources diminish, exacerbating their vulnerability to food insecurity.

Our results also reveal that whatever the background characteristics considered, the coefficients on the lagged values of the food insecurity indicators are statistically significant, indicating strong dependence in food insecurity. In fact, the estimates on the one lagged food insecurity are respectively 0.37 (for households who skipped the meal), 0.28 (among respondents who ran out of food) and 0.25 (among those who went without food). Indeed, Burkina Faso's economy, heavily rely on agriculture, faced disruptions due to pandemic-induced lockdowns and restrictions. The limited activities in many markets and disruptions in supply chain might imped farmers' ability to produce, transport, and sell their goods, creating a ripple effect that might be reverberated across the entire food system. This disruption would significantly diminish the country's capacity to domestically produce and distribute food, leading to increased dependence on external sources. Furthermore, Burkina Faso's susceptibility to climate change and recurrent droughts may have strained local agricultural productivity. The pandemic would be overlapped with these existing challenges, exacerbating the reliance on external aid for food assistance. International assistance and

[3]Please note that respondents in this paper are not household heads, but rather households' individuals. When surveyed, we asked questions to the respondents' household members.

humanitarian aid became crucial to fill the widening gap between local food production and the population's nutritional needs.

In addition, the pandemic's economic repercussions, including widespread job losses and income reductions, left a substantial portion of the population financially strained. This economic downturn further heightened dependence on external assistance, as many individuals and households lacked the financial means to secure an adequate food supply.

Our result estimation also indicates that skipping a meal in a given month increases the probability of experiencing food insecurity in the next month by 0.37 (37%), a substantial increase. In addition, running out of food in two consecutive months (e.g., month t and t+1) increases the probability to experiencing the same situation in the following month (t+2) by 0.28 compared to someone who reported not running out of food during the last two months. Our findings also provide evidence that women are more likely to go out without food, followed by people aged 45-64.

Table 3: Estimation results: food insecurity persistence, by demographics

		Gender		Age group				Household size		
	All	Male	Female	18-24	25-44	45-64	65+	4-6	7	8
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ρ (skip meal)	0.368***	0.359***	0.407***	0.135	0.358***	0.362***	0.391***	-0.407	0.377***	0.362***
	(0.017)	(0.018)	(0.040)	(0.098)	(0.027)	(0.024)	(0.039)	(0.263)	(0.077)	(0.017)
ρ (*ran out*)	0.280***	0.261***	0.352***	0.221	0.220***	0.321***	0.347***	-0.163	0.198***	0.282***
	(0.019)	(0.022)	(0.040)	(0.150)	(0.029)	(0.030)	(0.045)	(0.278)	(0.077)	(0.020)
ρ(*went witho*	0.253***	0.240***	0.313***	0.005	0.209***	0.304***	0.200***	-0.266	0.179**	0.257***
	(0.025)	(0.027)	(0.064)	(0.101)	(0.039)	(0.041)	(0.043)	(0.351)	(0.084)	(0.026)
Observations	8,144	6,858	1,286	91	3,669	3,341	1,194	39	376	7,729

Note: Regressions include control variables such as gender, age, household size, urban place of residence, farm activities and region. Standard errors are in parentheses.

It also appears that the size of household affects significantly the persistence in food insecurity. In fact, increasing household size translates into a dilution of wealth and lower per capita income, all else being equal. The high dependency ratio and limited income opportunities available to members of the households surveyed could also be potential drives. For instance, Mitiku et al. (2012)find that large household size is associated with higher food burden and food insecurity in Kenya.

The relationships and estimates in Table 2 are likely to be compounded by national and regional-level government responses to the pandemic, which included social distancing and mobility restrictions as well as partial lockdown measures. Due to the lack of data, we do not quantify the implication of variations in region-level responses to the pandemic. However, Amare et al. (2021)examine the effects of infection rates and lockdowns in Nigeria and find that households in states recording high COVID-19 cases and with lockdown measures are hit hardest and hence

experience the greatest increase in food insecurity. Their results suggest that both the spread of the pandemic as well as government-induced lockdown measures are associated with increased food insecurity.

Similar to food security results, several empirical studies document that lockdowns limit economic activities and hence households' participation in labor market activities. Indeed, Amare et al. (2021)show that state-level lockdown measures in Nigeria are associated with larger reductions in non-farm business activities. However, wage-related activities may be less affected by lockdown measure since they may still be operated remotely and individuals can continue working remotely(Dingel & Neiman, 2020). In addition, individuals engaged in wage-related activities are likely to have formal contracts and hence less likely to lose their job in short notice (Abay et al., 2020; Amare et al., 2021; Dingel & Neiman, 2020).

8. Discussion

The persistent food insecurity in Burkina Faso, exacerbated by the lingering impacts of the COVID-19 pandemic, demands a critical examination to understand the depth of challenges facing the country. Burkina Faso, with its predominantly agrarian economy, has long contended with issues such as climate variability and resource scarcity. The emergence of the global health crisis, however, has unveiled the intricate layers of vulnerability woven into the fabric of the country's socio-economic landscape. One of the central concerns lies in the gendered dimensions of food insecurity. The pandemic disrupted traditional gender roles, disproportionately burdening women with increased responsibilities and limiting their access to income-generating activities. This not only deepened existing gender inequalities but also contributed to a more pronounced vulnerability of women to food insecurity.

The reliance on agriculture, a cornerstone of Burkina Faso's economy, faced unprecedented challenges during the pandemic. Lockdowns and restrictions disrupted supply chains and markets, leaving farmers unable to produce, transport, or sell their goods. This compounded the pre-existing vulnerabilities stemming from the country's susceptibility to climate change, resulting in a double blow to food production and availability. Furthermore, the economic fallout from the pandemic, characterized by widespread job losses and income disparities, intensified food insecurity. Vulnerable populations, already on the brink, found themselves pushed further to the margins, struggling to meet basic nutritional needs.

Importantly, the dependence on external aid for food assistance underscored the nation's vulnerability to global shocks. While humanitarian assistance played a crucial role in immediate relief, questions arise about the sustainability of such interventions and the need for comprehensive, long-term strategies to build resilience within the country. In sum, the persistence of food insecurity in Burkina Faso amid the enduring impacts of the COVID-19 pandemic demands a holistic and critical approach. Addressing the root causes of vulnerability, reimagining gender roles, and fostering

sustainable agricultural practices are essential components of a comprehensive strategy to not only alleviate immediate suffering but also build a more resilient and food-secure future for the nation.

8. Conclusion and Future Public Policy Research

Food insecurity is a common social issue affecting several African households. The ongoing COVID-19 pandemic is likely to increase food insecurity, with long-term consequences that may be hard to measure with pandemic data. This paper contributes to our understanding of the dynamics of food insecurity and its persistence. We use panel data from eleven rounds of the High Frequency Phone Survey, in which we were able to track down changes in food insecurity over almost two years after the pandemic. We find that there is a strong persistence in food insecurity in Burkina Faso. Estimates from our dynamic ordinary least square model indicate that skipping meal, running out of food and going out without eating in a given month increases the likelihood to experience food insecurity in the following months. Women and individuals aged between 44 and 64 are most affected.

These findings have three policy implications. First, there it is important to enable access to food for most disadvantaged groups. Policies must implement assistance programs to help in reducing food insecurity considering gender, area of residence type of activities of individuals. Second, given that women and elderly experience more the persistence in food insecurity, it is necessary that policies to mitigate the impact of COVID-19 and related shocks to be gender sensitive. Third, in the context of terrorism it is critical to design policies to reduce inequalities and household vulnerability, promote social protection, and build resilience during pandemics and crises. This will ultimately allow individuals and households to adapt to exogenous shocks and reduce their dependence. As the study does not quantify the implication of variations in region-level responses to the pandemic, further empirical analysis across a wider variety of national policy and economic contexts in Burkina Faso may further clarify such relationships and the policy lessons they imply.

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ANNEX

Figure 3: Dynamics of Food Security by Gender

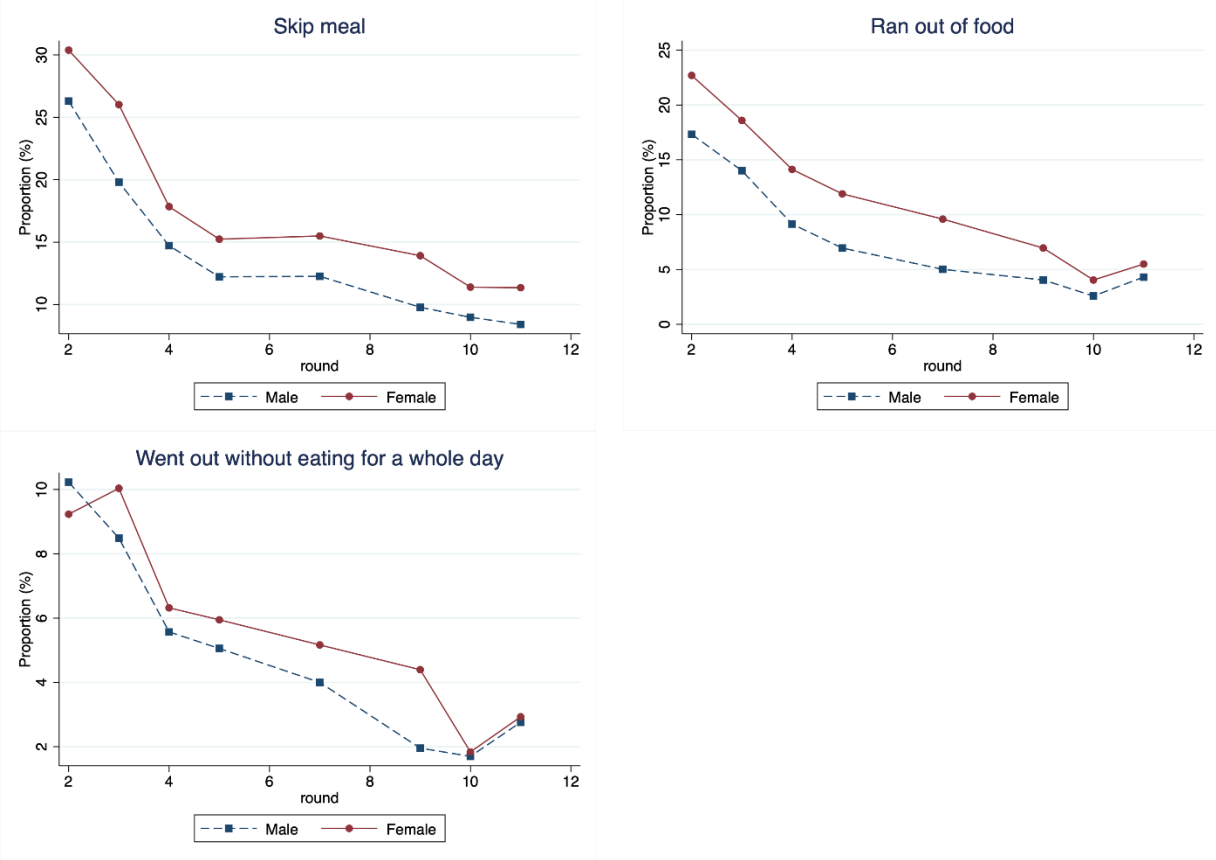
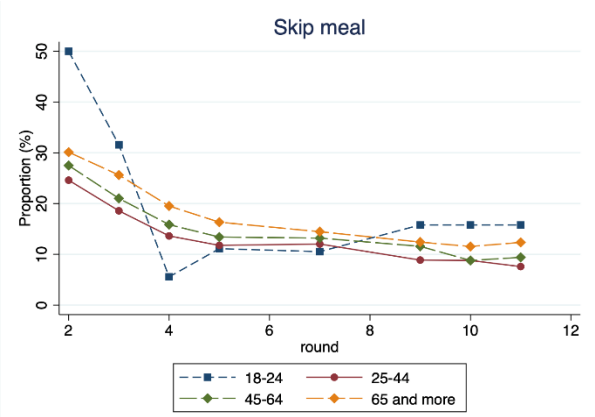
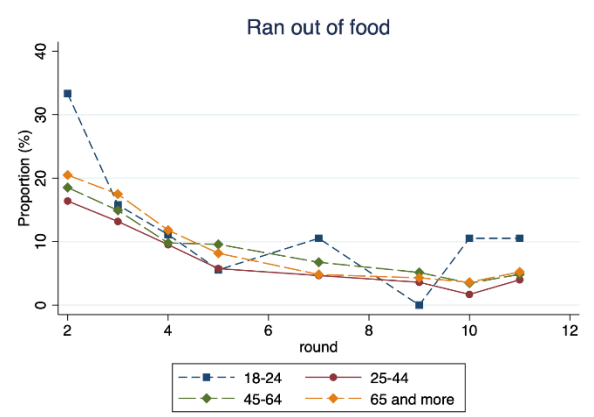


Figure 4: Dynamics of Food Security by Age group





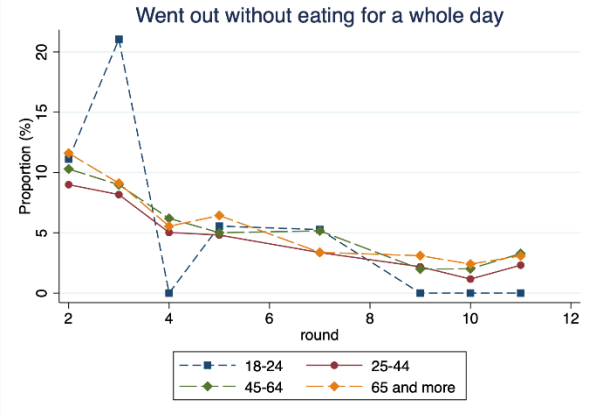
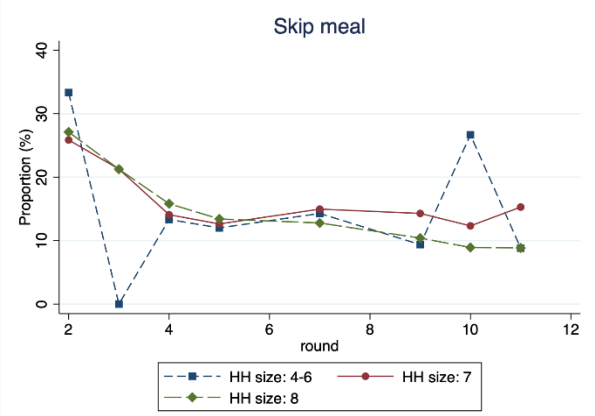


Figure 5: Dynamics of Food Security by Household Size



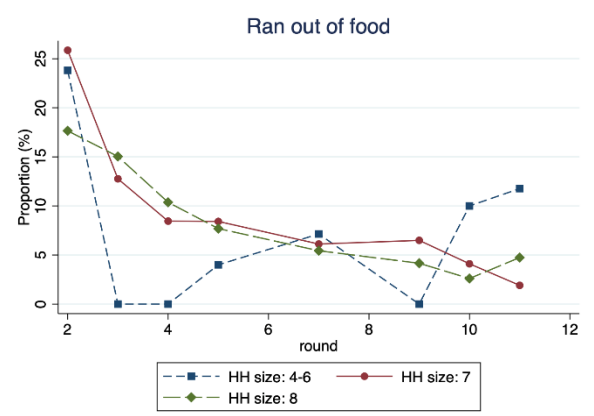
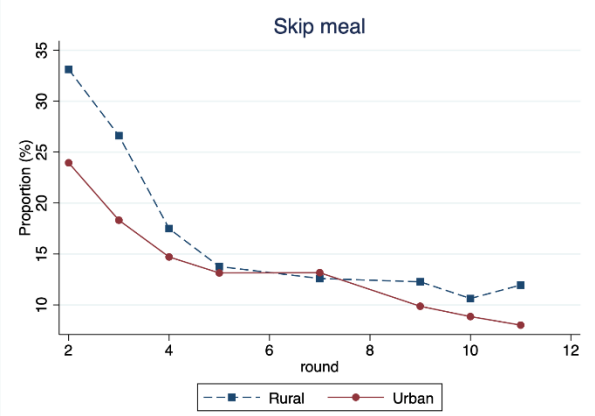
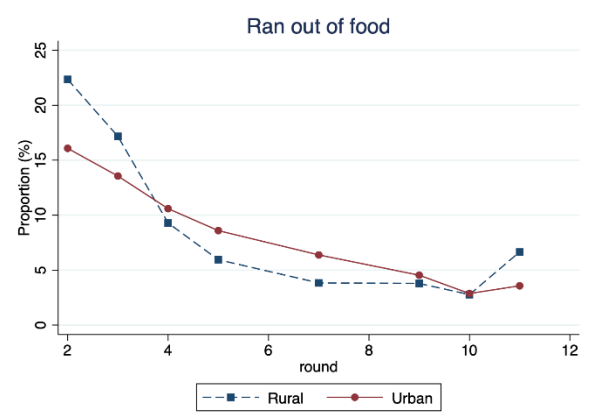


Figure 6: Dynamics of Food Security by the Place of Residence





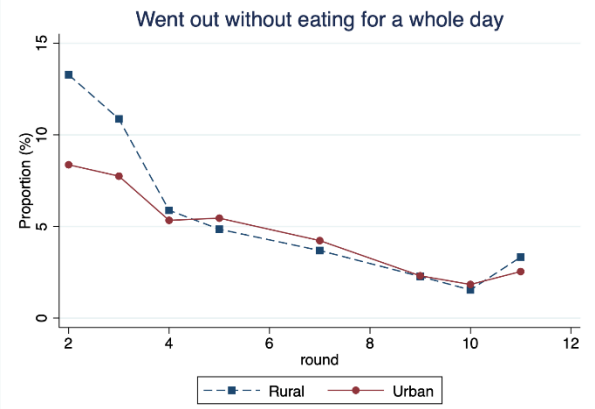


Figure 7: Dynamics of Food Security by Type of Activities