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URBAN FOOD SECURITY AND HOUSEHOLD SHOCKS IN NAIROBI, KENYA

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Abstract

Even though urban poverty is a key component of the development agenda in Nairobi with a focus on job creation, provision of basic infrastructure (such as roads and clean drinking water), food security has traditionally been omitted by city planners and managers despite its centrality to people's health and well-being. One of the consequences of the lack of integration of food security into development planning is that emergency food preparedness planning has not been viewed as a priority. Rather, emergency procedures are only enacted when a food emergency is already in progress. This discussion paper demonstrates that female-centred households, households reliant on casual labour, and low-income households are all particularly vulnerable to food insecurity. The findings boost the case for the focus of the draft policy on urban food emergencies. They also suggest that Nairobi needs to develop an integrated food security emergency plan for responding to major economic and other shocks to household food security.

Keywords

Suggested Citation

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Introduction

Population growth in African cities is among the highest in the world. The United Nations World Urbanization Prospects estimates that the 1.1 billion Africa's population will double by 2050 and 80% of this growth will occur in urban centres, much of which will be housed in informal settlements (United Nations 2019). This level of growth will lead to numerous challenges, including overcrowding, increasing poverty, deteriorating infrastructure, and an inability to meet the basic food needs and nutritional requirements of urban populations. While the numbers of urban residents are growing exponentially, urban economies have deteriorated, stagnated, or achieved minimal growth. The results are evident in the increase in urban poverty with many rural-urban migrants, especially youth, unemployed or underemployed. As many as 47% of people aged between 15 and 24 in Sub-Saharan Africa are officially unemployed (Betcherman and Khan 2015, World Bank 2014) although the rate of youth unemployment varies considerably by country (Awad 2020).

Food security is commonly defined as a situation "when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO 2006), and has four main dimensions or pillars—food availability, food accessibility, food utilization and food stability. All of these dimensions of food security are susceptible to external emergencies and shocks (Ansah et al 2019). Poor urban households can spend over half of their meagre income on food provisioning, an indicator of their precarious food security status and vulnerability to shock. Political violence, climate change, and food price crises are all shocks that have an immediate and negative impact on the availability of food, its accessibility and utilization, as well as disrupting the stability of food supply (Abbott and Borot de Battisti 2011, Ackello-Ogutu 2011, Doss et al 2018, Hamilton et al 2020). Most recently, the COVID-19 pandemic has provided a major shock to global and local food supply chains (Laborde et al 2020, Ouko et al

2020, Shilomboleni 2020). To date, studies on the linkages between shocks and food insecurity have tended to focus more on the impacts on agricultural production in rural areas (Akter and Basher 2014, Ansah et al 2019, Heltberg et al 2015, Lokonon et al 2015, Misselhorn 2005, Niles and Salerno 2018, Tongruksawattana and Wainaina 2019). Less well-researched, especially in the African and Kenyan contexts, are the effects of emergencies and shocks on urban household food security and the health and well-being of urban households (Frayne et al 2012).

In urban areas in low-to-middle income countries (LMICs), concerns about food insecurity in times of emergency primarily revolve around risk factors, and the resilience of individuals and households. Ansah et al (2020) provide a useful conceptual model for visualizing these relationships (Figure 1). Various types of shocks lead to loss of real income and assets. The (in)ability to secure sufficient income to be able to afford food and other basic needs is often compounded by rising prices of these necessities. While this directly impacts on food security, other compounding risk factors include overcrowding and unhygienic environments and the absence of functioning social safety nets in most LMIC cities. Using various metrics, recent studies have suggested that having access to stable social grants and remittances has a positive impact on the nutritional status of urban and rural households (Haysom and Fuseini 2018, Tevera and Simelane 2016, Waidler and Devereux 2019).

Individuals and households tend to rely more heavily on these mechanisms during food security shocks, provided they are available. However, in many African countries and cities, formal social grants are unavailable. As the model suggests, other informal coping strategies are often called into play, including asset smoothing (such as skipping meals, reducing food intake, and eating cheaper but less preferred foods) and consumption smoothing (including informal safety nets and reliance on social networks such as food sharing and borrowing). Frayne (2010) and Owuor (2019) found that informal food transfer systems—including rural-urban and urban-urban food transfers—play

an important role in sustaining food access for poor households in rapidly-growing cities in Africa. These informal food transfers may be even more important for households experiencing social or biophysical shocks.

In order to develop better emergency food preparedness policies, it is important to identify which types of shocks are most likely to disrupt and impact negatively on household food security (Berger 2019, Jackson et al 2020, Pingali et al 2005, Wien and Sabate 2015). This paper draws on data from the city-wide household survey of Nairobi done by the Hungry Cities Partnership (HCP) to examine the relationship between household food security and 18 different shocks that each household experienced or did not experience in the six months prior to the administration of the survey. The first section of the paper describes the methodology used to draw the city-wide sample in the HCP survey. The next section provides a descriptive statistical breakdown of the sample according to various individual and household level demographic, economic, health-related and migration variables. General levels of food insecurity according to the Household Food

Insecurity Access Prevalence (HFIAP) are then identified.

Food insecurity is clearly a major issue in Nairobi with only 29% of the households classified as completely food secure. One-third were moderately food insecure and one-quarter were severely food insecure. This section of the paper also identifies the prevalence of three different types of household shock and finds that economic shocks (55%) were experienced by many more households than either socio-political (16%) or biophysical (10%) shocks. The final section of the paper uses four models to relate household food security to a range of independent household variables using a Generalized Linear Mixed Modelling (GLMM) approach. The overall aim is to ascertain which household characteristics and shocks are more likely to be associated with food insecurity. Model 1 focuses on the odds of different types of households being food insecure, while Models 2 to 4 introduce three different types of shock to determine if experience of the 18 individual shocks increases the odds of food insecurity. The conclusion reflects on the policy implications of these findings.

FIGURE 1: Conceptual Framework Linking Shocks, Coping Strategies and Food Security
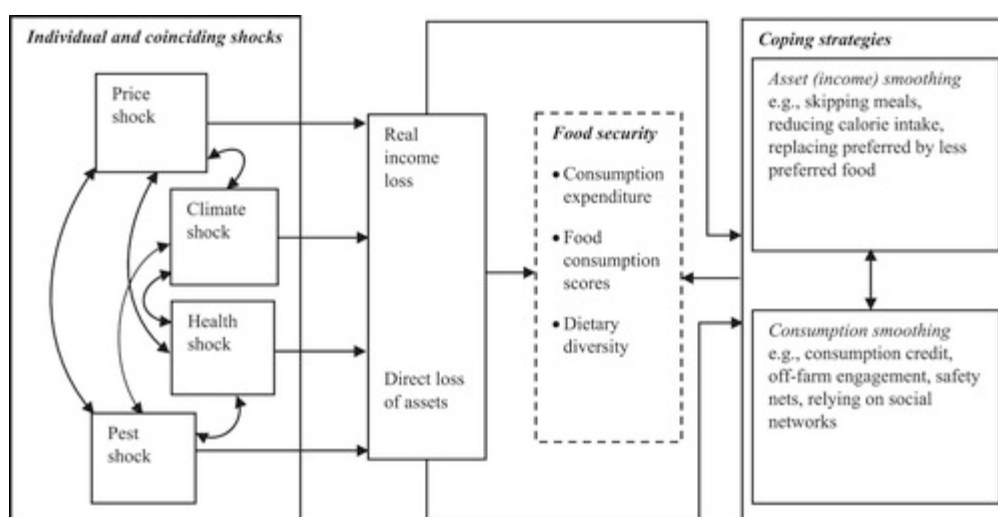
Source: Ansah et al (2020)

Methodology

The data for this paper was drawn from the 2017 HCP household food security survey for Nairobi City (see Owuor 2018). The survey was a cross-sectional study based on city-wide representative household data. A total of 1,414 households were randomly sampled across the city. A three-stage cluster sampling and probability proportion to size sampling strategy was used to identity 23 sublocations from eight divisions in the four districts/sub-counties of Nairobi City. In the selected 23 sub-locations, systematic random sampling was used to identify the participating households where every nth household was recruited and interviewed. The household head was the target interviewee in this survey. The data was collected in a face-to-face interview by trained enumerators using tablets for data collection. This paper uses the HCP survey data to investigate the effects of shocks and emergencies on household food security status and their health and wellbeing status.

The HCP survey instrument contains several questions relevant to this paper, including household and individual demographic characteristics; social and economic profile of the households including employment, income and expenditure; food security and poverty metrics; household food sourcing challenges and strategies; health status of household members; receipt and use of social grants; and, of particular relevance, household experience of various different types of shock in the six months prior to the survey. Seventeen pre-identified shocks were grouped into three broad types: economic shocks, socio-political shocks, and biophysical shocks. Economic shocks include the household going without food due to food price increases, the death or serious illness of a working member of the household, loss of employment or reduced income of a household member, and a reduction or cut-off of remittances. Socio-political shocks include insecurity and violence, theft of money or food, injury to a household member, family relocation, and political problems or issues. Biophysical shocks include health risks including epidemics, environmental hazards such as fire or floods, increases in the cost of water and the lack of storage or refrigeration for food.

The food security status of each household was measured using the Household Food Insecurity Access Prevalence (HFIAP) indicator developed by the Food and Nutrition Technical Assistance (FANTA) project (Coates et al 2007). A score was calculated for each household based on its responses to nine frequency-of-occurrence questions in the four weeks prior to the interview. Scores ranged between 0 and 27 with a score of 0 indicating that the household is food secure, and a maximum score of 27 indicating extreme food insecurity. The answers to the questions were converted into a categorical variable using the FANTA algorithm to generate the HFIAP classification. The HFIAP categorizes households into one of four status levels —food secure, mildly food insecure, moderately food insecure, and severely food insecure.

The health status variable was a self-reported binary (yes/no) response to questions about whether any of the household members had medically diagnosed health issues including non-communicable diseases (diabetes, cancers, heart disease, obesity, high blood pressure and stroke, arthritis, and asthma) and communicable diseases (tuberculosis and diarrhoea) at the time of the interview. The individual measures of health were then used to generate binary variables for household health status i.e., whether a household had "no health issues" or "some health issues." The primary limitation here is that all diseases had to have a medical diagnosis which may have led to undercounting of actual disease prevalence. Also, respondents were under no obligation to disclose medical information about individual medical conditions of household members and, for privacy reasons, may not have wanted to share such information. A third source of potential undercounting is the assumption that the respondent (usually the household head) had perfect knowledge of the health status of all household members.

Household Characteristics

Table 1 presents the socio–demographic and economic characteristics of the sampled households and household heads. The survey instrument classifies household structure into four basic types: female–centred (female–head without a male spouse or partner); male–centred (male head without a female spouse or partner); nuclear (male or female head with spouse or partner and immediate blood relatives) and extended (male or female head with partner plus relatives and non-relatives). As many as 55% of the households surveyed were nuclear, while 20% were male-centred, and 17% were female-centred. Overall, 83% of households had a male head and 18% a female head. The average household size was 3.5 persons (with standard deviation of 1.452). Two-thirds of the household heads were of working age between 25 and 44 years.

TABLE 1: Nairobi Household Demographic and Economic Characteristics

Socio-demographic characteristics		No.	%
Sex of household head	Male	1,026	82.5
	Female	217	17.5
Age of household head	<=24 years	105	8.4
	25-34 years	420	33.6
	35-44 years	392	31.4
	45-54 years	177	14.2
	55-64 years	69	5.5
	>=65 years	87	7.0
Place of birth of household head	Nairobi	266	21.3
	Another urban centres in Kenya	68	5.4
	Rural area in Kenya	874	70.0
	Foreign country	35	2.8
Duration of stay of household head in Nairobi	<5 years	69	7.9
	5-10 years	183	21.0
	>10 years	618	71.1
Type of household structure	Female-centred	239	17.3
	Male-centred	273	19.8
	Nuclear	752	54.5
	Extended	108	7.8
	Other	42	3.0
Main household income source	Formal work	653	46.4
	Informal work	227	16.0
	Casual work	154	10.9
	Formal business	165	11.7
	Informal business	142	10.0
	Do not know/no response	70	5.0
Monthly household income	<=KSh10,000.00	195	23.5
	KSh10,001.00-KSh19,000.00	140	16.8
	KSh19,001.00-KSh34,000.00	164	19.7
	KSh34,001.00-KSh75,000.00	166	20.0
	KSh75,001.00+	166	20.0
Heath status of household head	Healthy	1,171	94.0
	Unhealthy	75	6.0
Health status of household	Healthy	1,156	81.8
	Unhealthy	257	18.2

Only 8% of heads were under the age of 25 and 7% over the age of 65. Nearly 80% of the household heads were born outside Nairobi, with as many as 70% having migrated from a rural area. At the same time, only 8% of the household heads were recent migrants to the city, having lived in Nairobi for less than five years. Most were well-established with as many as 71% (including the 21% born in the city) having resided there for more than 10 years.

In terms of income source, 46% of the households reported that formal employment was their main source of income, while 15% had informal employment and 11% had casual work as their main source. Nearly 12% and 10% of the households relied on formal and informal businesses, respectively, as their main source of income. The fact that over one-third of the households had no formal sector income source is consistent with the high rates of formal unemployment in the city, especially in the informal settlements. Income quintiles show that nearly one-quarter of all households surveyed had a net monthly income of less than KSh10,000 (USD92) and that nearly 60% had an income of KSh34,000 (USD312) or less. Only 20% had a

net monthly income of KSh75,000 (USD680) or more. Finally, with regard to health status, a total of 18% of the household members had a diagnosed medical condition with hypertension, asthma and diabetes most common (Table 2).

TABLE 2: Diagnosed Medical Conditions Among Household Members

Health conditions	No.	% of total
Diabetes	37	2.6
Heart problems	10	0.7
Obesity	1	0.1
Malnutrition	2	0.1
Hypertension	85	6.0
Asthma	69	4.9
Arthritis	21	1.5
Tuberculosis	6	0.4
Chronic diarrhoea	8	0.6
Cancer	11	0.7
Total	254	18

Table 3 shows the prevalence of experience of 17 different types of household shock in the six months prior to the survey. Economic shocks had been experienced by many more households than

TABLE 3: Experience of Household Shocks

|	No. of households	% of total households
Economic shocks		
Going without foods due to price increases	825	60.5
Death of a working household member	35	2.5
Serious illness of a household member	158	11.2
Loss of employment for a household member	335	23.7
Reduced income of a household member	537	38.0
Reduction or cut-off of remittances	19	1.3
Sociopolitical shocks	226	16.3
Insecurity/violence	64	4.5
Theft of money/food	85	6.0
Accident of a household member	18	1.3
Relocation of the family	29	2.1
Took in orphans due to death of parents	10	0.7
Political problems/issues	20	1.4
Biophysical shocks	136	9.8
Health risks/epidemics	26	1.8
Environmental hazards	13	0.9
Increased cost of water	40	2.8
Food cannot be safely stored	44	3.1
Lack of refrigeration for food	46	3.3

socio-political or biophysical shocks. Just over 60% experienced going without food due to food price increases and 48% experienced a decline in income from a household member. Nearly one-quarter (24%) had a household member who had lost their job. Of the possible socio-political shocks, theft of food or money was the most common (experienced by 6%), followed by insecurity or violence (5%). None of the biophysical shocks had been experienced by more than 4% of households. Conducted prior to COVID-19, a similar study now would show a significant increase in several economic shocks (especially loss of income and employment) and the biophysical health risks/epidemics shock (Nyadera and Onditi 2020).

Table 4 shows that only 29% of households in the sample were completely food secure on the HFIAP scale. All the other households had some degree of food insecurity, including 36% who were mildly or moderately food insecure and 25% who were severely food insecure. Figure 2 shows that there was considerable variability in levels of food security and insecurity in different urban communities. All urban communities had at least some food insecure households except for South C. Communities with informal settlements—including Kibera, Huruma and Kawangware—had a higher proportion of severely food insecure households, a finding that confirms earlier observations (Ahmed et al 2019, Kimani-Murage et al 2014, Mohamed et al 2016).

TABLE 4: Levels of Household Food Insecurity in Nairobi by Household Structure

	Total (N)		Female-centred		Male-centred		Nuclear		Extended	
	No.	%	No.	%	No.	%	No.	%	No.	%
Food secure	410	29.2	65	4.6	73	5.3	216	15.8	39	2.8
Mildly food insecure	176	12.6	28	2.0	27	2	108	7.9	9	0.7
Moderately food insecure	463	33.0	72	5.3	97	7.1	255	18.6	30	2.2
Severely food insecure	353	25.2	74	5.3	76	5.5	168	12.3	29	2.2
Total	1,402	100	239	17.4	273	19.8	747	54.5	107	7.8

FIGURE 2: Household Food Insecurity by Urban Community in Nairobi
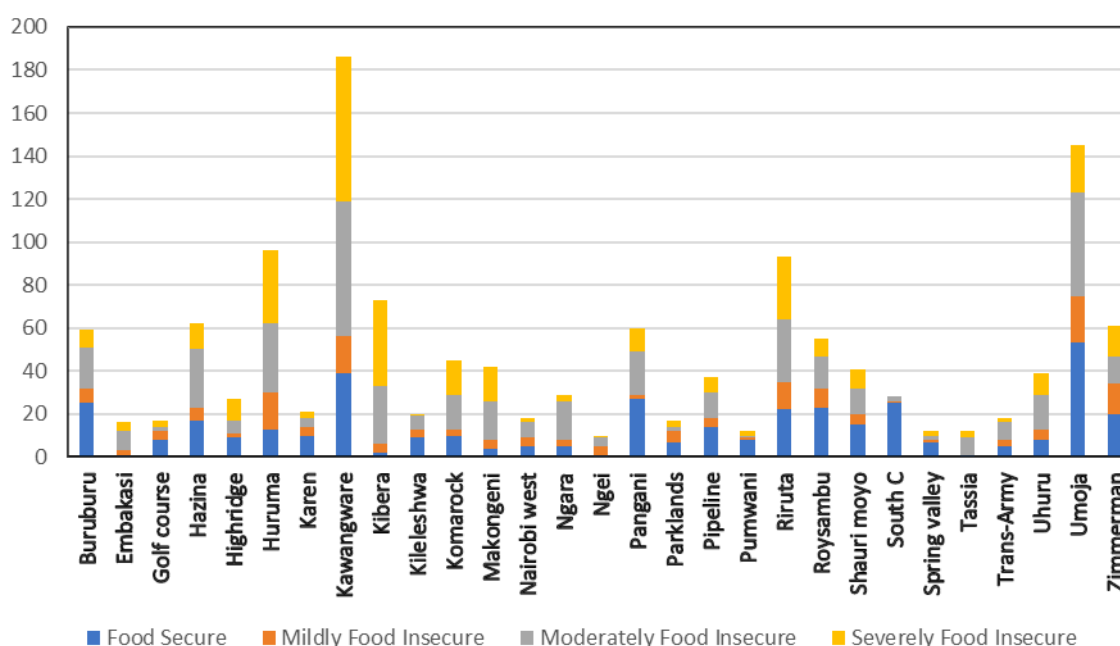
Relationship Between Food Insecurity and Household Shocks

Generalized Linear Mixed Models (GLMM) with an ordinal cumulative logit link function were used to determine the relationship between household food security and shocks experienced by households. The GLMM was used given the hierarchical nature of the survey data where individual households were nested onto the different administrative levels within the city; that is, sub-counties, divisions, locations, and sublocations. The data, therefore, violates the assumption of independence of respondents in standard logistic regression and may increase the chances of biases in the standard errors and hence the estimation of population parameters (Schielzeth and Nakagawa 2013, Skrondal et al 2003). The ordinal cumulative logit link was used given the ordered nature of the dependent variable HFIAP—that is food secure, mildly food insecure, moderately food insecure, and severely food insecure. A stepwise analysis was adopted where the variables were entered into the model in four steps based on the three types of shocks experienced by households: economic, socio-political, or biophysical, while controlling for household socio-demographic characteristics.

Table 5 presents the odds ratios for the independent variables using adjusted odds ratios (OR) and 95% CI. The significance level of the findings is set at p-value <=5%. Model 1 controls for the socio-demographic characteristics of the household heads and households as a whole and shows that the odds of being food insecure are highest for households whose main source of income is casual wages and lowest for households with a regular wage. Households with an informal sector income were half as likely to be food insecure as those reliant on casual wages but more likely to be food insecure than those with a regular wage. The odds of being food insecure also increased as household income decreased. Households in the lowest income quintile were 14 times more likely to be food insecure than those in the upper quintile. In between, those in the other three income quintiles were 8, 6.5 and 3 times more

likely to be food insecure respectively than the most well-off households. Another finding in Model One is that type of household affects the odds of being food insecure. Of the four main household types, female-centred households have the greatest chance of being food insecure and extended households the least. Male-centred and nuclear households have about the same odds of being food insecure, well below those of female-centred households. If everyone in the household is healthy, this increases the odds of being food secure.

Contrary to expectations that those who migrate to the city are likely to be more food insecure than those who were born there, Model 1 shows that the chances of being insecure are similar if the household head was born in Nairobi, born in other Kenyan towns or born in rural areas in Kenya, although all three are twice as likely to be food insecure than households with foreign-born heads. The marginal difference between urban and rural-born migrants may be because the latter retain closer links with rural homes and through rural-urban food transfers (Owuor 2019). The length of time a migrant household head has lived in Nairobi does not appear to significantly affect the odds of their household being food insecure.

Model 2 controls for the six different types of economic shock to the household. The relationships between the socio-demographic and economic characteristics of the household and food insecurity in Model 1 remained robust. In Model 2, the frequency of experiencing food price shocks emerged as the most significant driver of urban food insecurity, with the odds of being food insecure decreasing the less frequently the household experienced the impact. Households that had never experienced food price shocks were more likely to be food secure than those that had, even if that experience was only monthly or weekly. The model also shows that loss of employment by a household member and a reduction in income also increased the odds of being food insecure when compared with households that experienced neither shock. While the cut off of remittances was also associated with increased household food insecurity, less than 2% of households had experienced this shock.

Model 3 controls for six socio-political shocks including insecurity/violence, theft, death of or accident to a household member, relocation of the family, taking in of orphans, and political problems. The relationships identified in Models 1 and 2 remain robust in Model 3. The shock associated with increased odds of being food insecure included insecurity/violence and relocation. Households that had taken in orphans were also more likely to be food insecure but the numbers involved were very small. Model 4 included the biophysical shocks and after controlling for these, the other relationships remain robust. Households that had experienced environmental hazards were more likely to be food insecure than those that did not. Similarly, households that had experienced health/epidemic shocks showed an elevated risk of being food insecure.

TABLE 5: Generalized Linear Mixed Model of Shocks to Urban Household Food Security

Dependent/ independent variables	Model 1 OR (95%CI) p-value	Model 2 OR (95%CI) p-value	Model 3 OR (95%CI) p-value	Model 4 OR (95%CI) p-value
Household main income source (ref=informal business)				
Formal	0.763 (0.418-1.392)	0.695 (0.375-1.288)	0.767 (0.446-1.320)	0.803 (0.461-1.397)
Informal	1.473 (0.745-2.913)	1.050 (0.519-2.128)	1.262 (0.650-2.448)	1.328 (0.675-2.614)
Casual wage (formal & informal)	2.404 (1.121-5.155)**	1.625 (0.739-3.571)	1.803 (0.822-3.955)	1.772 (0.795-3.947)
Formal business	1.072 (0.513-2.242)	0.886 (0.412-1.904)	0.950 (0.455-1.983)	0.908 (0.426-1.937)
Net household income without loans (ref=75,001.00+)				
<=10,000.00	14.902 (7.21-30.798)****	5.422 (2.770-10.613)****	5.674 (2.893- 11.127)****	5.171 (2.635-10.146)****
10,001.00-19,000.00	8.096 (4.026-16.278)****	2.340 (1.209-4.529)***	2.298 (1.172-4.506)***	2.336 (1.186-4.601)***
19,001.00-34,000.00	6.507 3.359-12.607)****	2.950 (1.638-5.311)****	2.954 (1.631-5.347)****	2.761 (1.515-5.030)****
34,001.00-75,000.00	3.165 (1.691-5.924)****	1.743 (1.010-3.010)**	1.716 (0.986-2.990)*	1.686 (0.959-2.966)*
Household health status (ref=unhealthy)				
Healthy	0.656 (0.407-1.057)	0.654 (0.418-1.025)	0.665 (0.418-1.057)	0.723 (0.449-1.163)
Household structure				
Female-centred	11.452 (1.948-67.337)***	10.577 (0.297-377.046)	8.768 (0.241-318.358)	8.134 (0.244-271.110)
Male-centred	7.774 (1.517-39.841)***	4.496 (0.141-143.419)	4.544 (0.14-147.527)	4.456 (0.147-135.331)
Nuclear	7.343 (1.445-37.320)***	4.298 (0.137-134.551)	4.343 (0.136-138.475)	4.147 (0.140-123.147)
Extended	6.206 (1.075-35.819)**	3.931 (0.113-136.986)	4.222 (0.119-149.408)	3.617 (0.109-119.607)
Duration of stay in Nairobi (ref=>10 years)				
<5 years	1.048 (0.534-2.055)	1.242 (0.614-2.511)	0.890 (0.412-1.922)	0.863 (0.403-1.846)
5-10 years	0.897 (0.569-1.413)	1.035 (0.642-1.667)	1.042 (0.643-1.687)	0.994 (0.611-1.617)
Household head place of birth (ref=foreign born)				
Nairobi	2.096 (0.556-7.898)	2.067 (0.100- 42.645)	2.853 (0.586-13.880)	2.887 (0.494-16.885)
Another urban centre in Kenya	2.395 (0.638-8.993)	1.790 (0.395-8.105)	1.182 (0.265-5.267)	1.193 (0.252-5.658)
Rural area in Kenya	2.053 (0.590-7.144)	1.491(0.362-6.143)	0.946 (0.224-3.992)	0.971 (0.216-4.358)

Household shocks			
Economic shocks			
Food price change Never	0.013 (0.002-0.077)****	0.018 (0.003-0.097)****	0.031 (0.005-0.192)****
About once a month	0.100 (0.017-0.576)***	0.128 (0.024-0.694)***	0.204 (0.035-1.178)*
About once a week	0.170 (0.029-0.996)**	0.226 (0.042-1.212)*	0.350 (0.061-2.008)
> =Once a week but <every day of week	0.263 (0.044-1.555)	0.327 (0.060-1.778)	0.518 (0.088-3.062)
Death of a working household member	1.178 (0.303-4.584)	0.994 (0.252-3.923)	1.076 (0.276-4.185)
Serious illness of household member	0.837 (0.518-1.351)	0.837 (0.51-1.371)	0.793 (0.474-1.324)
Loss of employment for household member	2.597 (1.674-4.029)****	2.412 (1.543-3.772)****	2.234 (1.404-3.553)***
Reduced income of a household member	1.783 (1.206-2.636)***	1.678 (1.132-2.489)***	1.637 (1.097-2.442)**
Reduced/cut-off of remittances	3.539 (1.284-9.760)**	3.633 (1.337-9.873)****	3.77 (1.278-11.163)****
Socio-political hazards			
Insecurity/violence		1.877 (0.877-4.015)	1.789 (0.822-3.893)
Theft of money/food		0.946 (0.454-1.970)	0.968 (0.466-2.013)
Relocation of the family		2.505 (0.643-9.753)*	2.516 (0.609-10.384)*
Taking in orphans		1.526 (0.203-11.503)	1.638 (0.135-19.865)
Political problems/ issues		1.032 (0.289-3.688)	1.126 (0.328-3.868)
Biophysical hazards			
Health risks/epidemics			1.792 (0.580-5.539)
Environmental hazards			3.520 (0.784-11.876)
Increased cost of water			1.163 (0.598-2.663)
Food cannot be safely stored			0.663 (0.286-1.534)
Lack of refrigeration for food			1.133 (0.522-2.460)
Note: Net monthly income in Kenyan Shillings Significance level: ****P≤ 0.001.; ***P≤ 0.01.; **P≤ 0.05.; *P≤ 0.1.			

Conclusion

Even though urban poverty is a key component of the development agenda in Nairobi with a focus on job creation, provision of basic infrastructure (such as roads and clean drinking water), food security has traditionally been omitted by city planners and managers despite its centrality to people's health and wellbeing. There are several reasons for this. First, food insecurity is seen as an essentially rural and agricultural production rather than urban and food access challenge (Crush and Riley 2019). However, food insecurity in cities is not necessarily linked to seasonal agricultural changes or other community–wide phenomena, as in rural areas, but is rather a function of individual and household fortunes in the labour market and the informal economy. One of the consequences of the lack of integration of food security into development planning is that emer-gency food preparedness planning has not been viewed as a priority. Rather, emergency procedures

are only enacted when a food emergency is already in progress (Schofield et al 2013). Second, it was assumed that creating employment and improving urban infrastructure would guarantee urban food security. While there is growing evidence in other contexts that both strategies do produce better food security outcomes, the assumption that this is also true for Nairobi means that a fuller understanding of the urban food system and specific drivers of and remedies for food insecurity are unexplored. Third, there has been a pervasive view in Nairobi and elsewhere that urban agriculture is a panacea for food insecurity in cities. This is nowhere more evident than in the passage in 2015 of the Urban Agriculture Promotion and Regulation Act to promote urban food production.

In collaboration with FAO, Nairobi City County began developing a food system strategy in 2017 and joined two major global initiatives: the Milan Urban Food Policy Pact (MUFPP) and the C40 Cities programme. Nairobi City County also created a new Directorate of Food System and Sector Programmes. The third draft of Nairobi's new food system strategy "acknowledges that Nairobi City food system is presently not able to deliver adequate amounts of safe, nutritious and good quality food to all the city residents nor afford good benefits" (NCC 2019: 12). The strategy has four main objectives: increased food production in Nairobi and rural counties supplying food to the city, stability of food supply and incomes, reduction of food losses, and the welfare of food consumers. In 2019, the MUFPP Monitoring Framework Pilot Cities Project undertook a comprehensive review of the extent to which Nairobi was on track to meet the goals of the Pact (NCC 2019). The report reviews the evidence on 11 monitoring indicators. including child stunting, school feeding, policies targeting vulnerable populations, urban and peri-urban agriculture, access to fresh fruit and vegetable outlets, municipal investment in food markets or retail outlets, food safety and food waste. In 2017, Nairobi started to implement an Urban Early Warning and Early Action (UEWEA) Initiative on food security in partnership with Concern Worldwide, Kenya Red Cross, and Oxfam (Start Network 2017). Among its aims are the set-up of a

coordinated urban early action mechanism within the city; strengthening the capacity of six Nairobi sub-counties and one informal settlement community to mitigate and respond quickly to the impacts of slow onset emergencies; and ensuring routine surveillance in urban informal settlements.

These new food system governance initiatives present an important opportunity for evidence-based interventions in Nairobi. Previous HCP reports have examined the food system as a whole, the state of household food security and inequality, and the informal food vending retail sector (Owuor 2018, 2020, Owuor et al 2017). This paper adds value to these contributions by (a) identifying which households across the city are most vulnerable to food insecurity, and (b) analyzing the relationship between household food security and a range of economic, biophysical, and socio-political shocks experienced by those households. On the first issue, the paper shows that households that are female-centred, and without a formal wage income are more likely to be food insecure. Food security is also clearly related to household income; as income declines, the likelihood of food insecurity increases. Place variation confirms that households in informal settlements are more prone to food insecurity. On the second issue, the paper demonstrates that in the months leading up to the survey, households were more likely to experience economic shocks (of price increases, loss of employment and reduced income in particular) than socio-political shocks (such as taking in of orphans, insecurity and political violence, relocation of households), and biophysical shocks (environmental hazards, health epidemics, and increased cost of water). Of course, we cannot conclude this is always the case as periodic political conflict and terrorist attacks have affected Nairobi in recent years (Mueller 2011, 2018).

The vulnerability of households to economic shocks has been starkly exposed by the current COVID-19 pandemic. This is likely to be extremely severe and have a major impact on levels of food insecurity (Nyadera and Onditi 2020). As this paper has shown, female-centred households, households reliant on casual labour, and low-income households are all particularly vulnerable to food insecurity and

COVID-19 will therefore affect these households most dramatically through ill health and economic shocks. A recent survey of a sample of households in Kenya, for example, reports that the food insecurity of respondents increased by 38% and the regular consumption of fruits decreased by about 30% during the COVID-19 crisis compared to before the pandemic (Kansiime et al 2021). Income-poor households and those dependent on labour income were more vulnerable to income shock, and had poorer food consumption during the pandemic. These findings boost the case for the focus of the new draft policy on urban food emergencies. They also suggest that the city needs to develop an integrated food security emergency plan for responding to major economic and other shocks to household food security.

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