

Article

COVID-19 Struggles and Coping Strategies of Women Food Vendors in Nairobi's Informal Settlements

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Abstract

Although there is a growing body of literature on the impact of COVID-19 pandemic, limited evidence exists on the impact of the pandemic on informal female-owned enterprises, and especially those that are located in urban informal settlements. Based on a quantitative survey of 448 vendors selected through stratified random sampling, this study employed a descriptive design to examine the dynamics of women-led informal food vending enterprises across four informal settlements in Nairobi, with particular emphasis on the adverse impacts of the COVID-19 pandemic and the vendors' coping strategies. Our findings show that women food vendors face numerous challenges which intensified during the pandemic, leading to increased business operation costs, spoilage of perishable products, and oscillating daily sales and profits due to unpredictable market forces. The vendors adopted various strategies to cushion their enterprises and households, including price and stock adjustments; the implementation of hygiene measures; increased use of mobile phones for transactions; reliance on credit, loans, savings, and social networks; temporary business closures; and the relocation of household members to rural areas. These results underscore the critical need for context-specific strategies to support and foster the resilience and sustainability of informal economies during future global pandemics. This is particularly urgent given that very few vendors received some form of institutional support, in addition to having limited access to business loans and training opportunities.

Keywords: informal food vendors; women; gender; urban food system; COVID-19 pandemic; resilience



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1. Introduction

Most of the urban poor in the Global South live in informal settlements characterized by high poverty, food insecurity, and poor health and nutrition [1–3]. In many of these cities, the informal economy plays a crucial role in driving economic growth and social well-being [4]. In Kenya, approximately 60% of Nairobi's population resides in informal settlements [5], with many of these residents relying heavily on the informal economy for their livelihoods [6]. Therefore, the informal economy is not merely a temporary phenomenon; it creates employment opportunities for a significant portion of the unemployed

urban population [7]. It serves as a vital buffer against economic vulnerability and sustains the livelihoods of the urban poor, particularly women. For example, it is estimated that 83% of Kenya's workforce is informally employed, and over 89% of employed women work in the informal sector [8].

The informal food economy is a key part of the broader informal economy and urban food systems in the Global South, playing a vital role in providing food for the urban poor [9]. Urban food systems in the Global South feature a mix of market and non-market food sourcing methods, along with formal and informal food retail outlets—the latter including street and market food vendors [10]. These informal urban food systems have proliferated, attracting more attention from academics, researchers, and policymakers. According to Giroux et al. [11], informal food vendors are individual retailers who usually operate outside the formal food provisioning system and often conduct business without legal status or protection.

Battersby and Watson [10] noted that while urban households may purchase from both informal and formal outlets, lower-income households rely more heavily on informal vendors. These vendors offer food on credit and sell smaller, affordable portions, making diverse food accessible to low-wage earners. Furthermore, informal food vending provides essential opportunities for livelihoods and income, particularly for women in informal settlements [12]. These vendors play a crucial role in ensuring food security for the urban poor while simultaneously supporting the livelihoods of small-scale farmers, transporters, and other actors in the food supply chain [13,14]. Ultimately, the importance of informal food vendors for urban food security and sustainable livelihoods cannot be overstated.

Typically, many informal food vendors are women, although the gender balance varies within and across countries [15–19]. They are represented in large numbers due to traditional sociocultural roles in food preparation and the low barriers to entry into food vending enterprises. Chege et al. [20] estimate that women constitute 61% of food vendors in Nairobi, a trend consistent with many cities across the Global South. Ramasamy [21] highlights that informal food vending provides essential livelihood avenues for women operating within precarious and shifting economic environments. Moreover, the activity has fostered economic empowerment for women in the informal sector and improved their capacity to sustain household incomes [7].

Despite these benefits, women engaged in street food vending confront multiple structural and operational challenges in managing their enterprises [22–24]. For instance, they have constrained access to capital due to limited collateral and reduced bargaining power, often facing discrimination from formal financial institutions [25]. Additionally, they carry the disproportionate burden of unpaid care work, encountering sociocultural barriers that impede their business ventures. Women in the informal sector must balance their cultural, reproductive, and productive roles, resulting in an increased overall workload that remains largely undervalued, unmeasured, and unpaid [26].

Women working in the informal sector, particularly street vendors, were among the groups most severely affected by the COVID-19 pandemic [27–29]. In many sub-Saharan African countries, the pandemic caused multiple unintended and unprecedented negative consequences for the informal sector and informal food systems [27–30]. Bene [31] argues that the COVID-19 pandemic exposed the fragility of global food systems and how easily they can be destabilized. Global food supply chains faced significant disruptions [32], and as urban areas became 'hotspots' for infections, the business activities of urban food vendors were severely curtailed. Several large cities, including Nairobi, faced extended public health restrictions and experienced stronger socioeconomic shocks due to the pandemic [33]. Furthermore, the economic, health-related, and food security impacts of the crisis were most sharply felt by women employed and self-employed in the informal food sector [29].

While there is a growing body of literature on the impact of the COVID-19 pandemic, limited evidence exists regarding its effect on informal, female-owned enterprises—especially those situated in urban informal settlements. Most studies in the growing body of literature have focused on household-level analysis of the impact of COVID-19 [34–36]. Others have focused on the impact of the pandemic on (urban) food systems [37,38]; while others are city-based studies on both male and female vendors in, for example, a combination of cities [39]; Dhaka, Bangladesh [40]; Gauteng, South Africa [41]; Kampala, Uganda [42]; and in Nairobi, Kenya [43].

Available studies reveal that COVID-19 containment measures had profound consequences on the lives of residents in urban informal settlements, affecting economic stability, food security, and general well-being [44–47]. Notably, Pinchoff et al. [46] study in Nairobi’s informal settlements indicates that women were disproportionately affected during the pandemic and were significantly more likely to face income losses and food insecurity. Our study contributes to this discourse by examining the adverse impacts of the COVID-19 pandemic and the coping strategies adopted by women food vendors in urban informal settlements.

Specifically, the study endeavours to answer the following research questions: (1) What are the characteristics of women informal food vendors in urban informal settlements? (2) What is the nature, importance, and challenges of the enterprises they operate? (3) In what ways did COVID-19 containment measures disrupt the operations of these women-led enterprises? and (4) How did the vendors cope with the adverse effects of the pandemic?

2. Materials and Methods

Adopting a descriptive research design, this study utilized a quantitative survey to gain a deeper understanding of the dynamics of women-led informal food vending enterprises in urban informal settlements. The survey aimed to achieve four main objectives: first, to identify the demographic characteristics of women food vendors; second, to determine the characteristics of their enterprises, including specific opportunities and challenges; third, to assess the impacts of COVID-19 on these businesses; and finally, to identify the coping strategies employed by the vendors during the pandemic and how these strategies supported their enterprise recovery.

The survey was carried out in four informal settlements in Nairobi: Mukuru Kwa Njenga, Mukuru Kwa Reuben (located in Embakasi sub-County), Viwandani (Makadara sub-County), and Mathare (Mathare sub-County). Mukuru Kwa Njenga, Mukuru Kwa Reuben, and Viwandani, which border each other, constitute the larger Mukuru informal settlement, situated near Nairobi’s industrial area, approximately 7 km south-east of the city’s Central Business District (CBD). On the other hand, Mathare is located about 6 km north-west of the CBD.

To achieve comprehensive spatial coverage across the four settlements, the study employed a stratified random sampling method, with stratification based on the villages within each settlement. Within each stratum (village), a random sample of informal food vendors was selected, paying attention to their distribution along specific streets or roads. The sampling process was coordinated with settlement leaders, whose contextual knowledge proved vital for navigating the villages.

Data collection was conducted between May and June 2024 using the KoboToolbox platform via Android mobile phones (<https://www.kobotoolbox.org/>, accessed on 25 April 2024). The data collection assistants comprised a mix of community-based and university-based co-researchers, overseen by project coordinators and settlement leaders who were trained as field supervisors (one from each settlement). Table 1 shows the distribution of sampled women informal food vendors across the four study settlements.

Table 1. Sampled Women Informal Food Vendors by Settlement.

Settlement	No. of Villages	Frequency	Percentage
Mukuru Kwa Njenga	6	65	14.5
Mukuru Kwa Reuben	12	172	38.4
Viwandani	14	129	28.8
Mathare	11	82	18.3
Total	43	448	100.0

3. Results

3.1. Characteristics of the Sampled Vendors

3.1.1. Socio-Demographic Characteristics

Table 2 displays the socio-demographic characteristics of the sampled vendors. The majority were between 18 and 39 years old, while 24% were between 40 and 50. The remaining 10% were aged 51 or older. More than half (55%) of the vendors were married, 5% were cohabiting, and 41% were either never married, separated, divorced, or widowed. Most vendors (53%) had some secondary level of schooling, while 13% had received post-secondary college or university education. Conversely, 31% had only a primary level of education, and only 3% had no formal education.

Table 2. Socio-Demographic Characteristics of the Vendors.

		Frequency	Percentage
Age	18–28	87	19.4
	29–39	210	46.9
	40–50	108	24.1
	51+	43	9.6
Marital status	Never married	60	13.5
	Married	243	54.9
	Separated or divorced	86	19.4
	Widowed	34	7.7
	Co-habiting	20	4.5
Highest level of education	No formal education	12	2.7
	Primary level	139	31.3
	Secondary level	237	53.4
	Post-secondary college	50	11.3
	University	6	1.4

3.1.2. Economic Characteristics

Table 3 shows the previous and current additional employment of the vendors. Over half (53%) reported having another job or business prior to starting their food vending ventures. Of these, nearly one-quarter (24%) had worked full-time in the formal sector, while 22% had full-time employment in the informal sector. A further 48% had held part-time jobs in either the informal (27%) or formal (21%) sector. A smaller portion operated a different informal business (14%), and 3% managed a formal business. Conversely, only 17% were involved in additional employment or business activities at the time of the survey. Of this group, 56% ran a separate informal business selling a different product, while 8%

sold the same food items at a second location. Additionally, 27% and 17% were employed part-time in the informal and formal sectors, respectively.

Table 3. Type of Previous and Additional Employment or Business.

	Frequency	Percentage
Engagement in previous employment or business		
Full-time employment in the formal sector	56	23.6
Full-time employment in the informal sector	52	21.9
Part-time wage employment in the formal sector	50	21.1
Part-time wage employment in the informal sector	63	26.6
Own formal sector business	8	3.4
Own informal sector business in different activity	32	13.5
Engagement in additional employment or business		
Another informal business in the same activity	6	8.0
Another informal business in different activity	42	56.0
Part-time wage employment in the formal sector	13	17.3
Part-time wage employment in the informal sector	20	26.7

3.1.3. Migration Profile

Of the sampled vendors, 20.5% were born in Nairobi, while 79.5% were born in other Kenyan counties or were non-citizens born abroad (Table 4). Nearly three-quarters (73%) of those born elsewhere moved to Nairobi between 2000 and 2019, with an additional 10% arriving between 2020 and 2024. A smaller portion (17%) were early arrivals who had lived in the city for at least 25 years. The primary driver for relocation was employment (73%). Additionally, 16% moved to accompany family, while 23% migrated specifically to join a spouse or relatives, and a further 6% arrived for educational purposes.

Table 4. Migration Profile of the Vendors.

	Frequency	Percentage
Place of birth	Born in Nairobi	92
	Born elsewhere in Kenya	345
	Born outside Kenya (non-citizens)	11
Year migrated to Nairobi	1980–1999	59
	2000–2019	256
	2020–2024	34
Reasons for migrating to Nairobi	Came to look for a job	260
	Came with my family	56
	Came to join spouse/family	83
	Came to school	21

3.2. Enterprise Characteristics

3.2.1. Location and Type of Enterprise Premises

Table 5 indicates that these food vending enterprises were predominantly located in high-human-traffic public areas, such as neighbourhood streets (55%) and main roads

(36%), to attract passers-by. Other vendors operated along railway lines (10%) or near bus stops (6%), while approximately 10% were located outside their homes or near institutions such as schools and churches. Only 1% of vendors occupied a designated market space. Regarding the structure of these premises, most vendors used raised makeshift platforms, either with a shade (48%) or without (13%). Others displayed their goods on the ground, with (11%) or without (12%) a makeshift shade. Additionally, 9% operated as a *kibanda* (makeshift hotel), while 6% ran their business from a mobile container.

Table 5. Location and Type of Enterprise Premises.

	Frequency	Percentage
Location of enterprise		
Along a neighbourhood street	245	54.7
Along a major road	160	35.7
Along a railway line	45	10.0
At a bus or <i>boda boda</i> (motorbike) stage	25	5.6
Outside the vendor's house	42	9.4
At a designated market	5	1.1
Near an institution (school or church)	44	9.8
Type of enterprise premises		
A raised makeshift platform with a shade	217	48.4
A raised makeshift platform with no shade	59	13.2
On the ground without a shade	55	12.3
On the ground with a makeshift shade	51	11.4
Makeshift hotel (<i>kibanda</i>)	40	8.9
Mobile food vending container	26	5.8

3.2.2. Entry into Food Vending: Timing and Motivation

Over half (53%) of the vendors established their food vending businesses between 2020 and 2024, while 37% began operations between 2010 and 2019 (Table 6). Only a small minority (10%) started before 2010. The primary motivations for engaging in informal food vending ventures were diverse and can be categorized into three main themes: economic survival, business opportunity, and factors related to the COVID-19 pandemic.

Table 6. Year and Reasons for Entry into Food Vending Enterprise.

	Frequency	Percentage
Year of entry into food vending enterprise		
1987–2009	44	9.9
2010–2019	165	37.1
2020–2024	236	53.0
Reasons for entry into food vending enterprise		

Table 6. Cont.

		Frequency	Percentage
Economic survival reasons	I was unemployed and unable to find a job	219	48.9
	I wanted to contribute to the family's sources of income	123	27.5
	I had another job, but the pay was low	93	20.8
	I had another business which was not doing well	53	11.8
	I wanted to help the family back home	48	10.7
Business opportunity reasons	I have always wanted to run my own business	91	20.3
	I wanted to keep myself busy than sit idle	64	14.3
	I saw a business opportunity	58	12.9
	I did not require any skills to start the business	57	12.7
	I did not require much capital to start the business	31	6.9
	I was influenced by a relative, friend or neighbour	12	2.7
COVID-19 related reasons	I had a job, but was terminated due to COVID-19	32	7.1
	I had a business, but I closed it due to COVID-19	6	1.3
	I needed additional income due to COVID-19	5	1.1

Approximately half (49%) of the vendors reported starting their business because they were unable to secure other forms of employment. Furthermore, 28% indicated a desire to contribute to their household's financial resources, while 11% aimed to support relatives in their rural homes. Regarding financial growth, 21% sought higher earnings than their previous jobs provided. Motivation for autonomy was also present with 20% wishing to run their own business and 14% wanting to be productively engaged. Additionally, 13% cited the ease of entry and perceived business opportunities as primary drivers. A small portion of the sample (7%) established their informal food businesses specifically after losing their jobs during the COVID-19 pandemic.

3.2.3. Enterprise Start-Up Capital

Almost all vendors (95%) required initial capital to launch their food vending businesses. As shown in Table 7, the majority drew their start-up capital from two primary sources: personal savings (69%) and loans or assistance from social networks (38%), which included family, relatives, friends, and *chamas* (informal savings groups). Additionally, nearly 16% of vendors utilized loans to finance their start-up. Specifically, 10% borrowed from mobile phone lending applications such as Tala and M-Shwari. These popular Kenyan platforms offer small, unsecured instant loans with flexible repayment periods and interest. Loan limits are typically determined by assessing the applicant's M-Pesa (mobile money service) transaction history and previous repayment behaviour on the platform. In contrast, only 7% of vendors obtained loans from formal financial institutions, such as banks and micro-credit organizations.

Table 7. Main Source of Enterprise Start-Up Capital.

	Frequency	Percentage
Personal savings	294	68.9
Loan or assistance from social networks	160	37.5

Table 7. *Cont.*

	Frequency	Percentage
Loan from a mobile phone app	39	9.1
Loan from a financial institution	30	7.0
Sale of personal or family assets	14	3.3
Loan from a shylock	5	1.2
Help from an NGO, CBO or FBO	4	0.9
Help from the government (county, national)	2	0.5

3.2.4. Food Products Sold and Sources of Supply

Our survey revealed that vendors offered a diverse selection of food products (Figure 1). The most common items included fruits (48%), green vegetables (38%), ready-to-eat cooked meals or snacks (33%), and roots and tubers (24%). Approximately one-fifth of vendors sold processed foods and beverages, while 9% sold dried cereals and grains. Additionally, 10% sold fish and a smaller portion (7%) sold fresh meat. While roughly 20% of vendors provided less nutritious processed food options, the vast majority contributed to urban food security by supplying a wide variety of nutrient-rich foods, including fruits, vegetables, cereals, grains, meat, and fish.

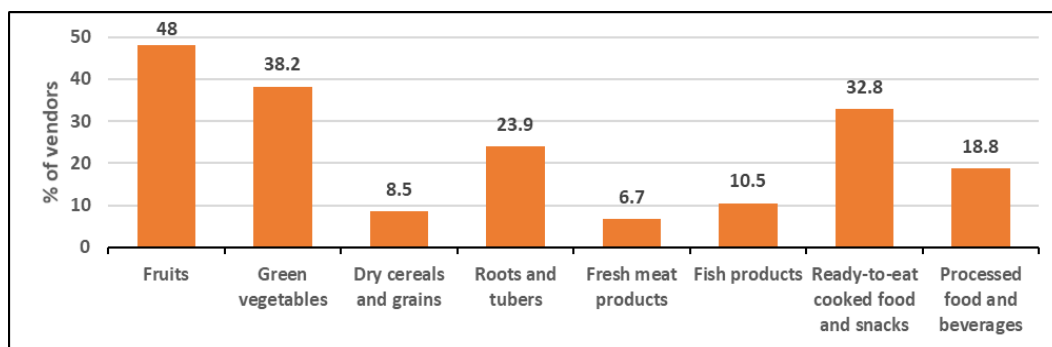


Figure 1. Types of Food Products Sold.

Wholesale or retail food markets within Nairobi served as the primary supply sources for vendors, followed by local suppliers. Sources outside the city were also utilized, particularly for fish, roots, and tubers. Vendors of cereals, grains, and processed food typically sourced their stock from stores or shops within Nairobi. Notably, supermarkets were rarely used as a source, with the exception of a few vendors selling cooked or processed food items. To move these supplies to their retail points, vendors relied on public transport (65%), walking (33%), motorbikes (26%), hand carts (17%), and direct delivery by suppliers (14.5%).

3.3. Enterprise Opportunities and Challenges

3.3.1. Importance of Food Vending Enterprise

Vendors were asked to assess the significance of their businesses to themselves and their families. An overwhelming majority (93%) considered the enterprise essential, with 69% describing it as “very important” and 23% as “important” (Figure 2). For 92% of participants, food vending served as the primary source of income, and 63% stated they could not survive without it. Despite the informal nature of the work, nearly half (47%) were able to save and invest a portion of their earnings.

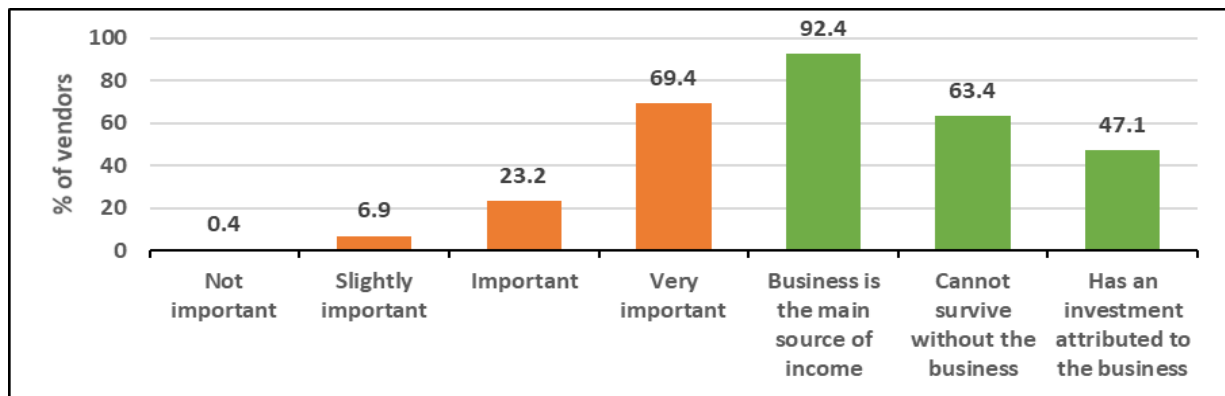


Figure 2. Importance of Food Vending Enterprise.

3.3.2. Access to Business Loan, Training and Growth Opportunities

Notably, the women food vendors in our sample faced significant barriers to growth, specifically regarding access to business loans and training opportunities. Only 14% of the sample (64 vendors) had successfully applied for and received a bank loan, while 11% had their applications rejected. Access to training opportunities was similarly limited. Only 15% had participated in training provided by non-state actors (NGOs, CBOs, or faith-based organizations), while 9% had benefited from training organized by the national or county government. Despite these structural challenges, a vast majority (95%) expressed an intention to expand their enterprises in the long term, with 53% seeking to secure better business or employment opportunities.

3.3.3. Food Vending Enterprise Challenges

The food vendors in our study faced multifaceted hurdles, which can be broadly categorized into operational, security and policing, and environmental challenges (Table 8). The most prevalent operational challenge was low sales resulting from a shrinking customer base (61%). Another significant concern reported by over half of participants (51%) was the limited shelf life and spoilage of perishable items, particularly fresh produce. Nearly half (49%) of the respondents identified the high cost of doing business, coupled with low profit margins, as a major issue. Additionally, 46% of participants cited intense competition from nearby vendors as a key difficulty, while 35% noted that non-payment by customers on credit was a persistent strain on their operations.

Table 8. Food Vending Enterprise Challenges.

	Frequency	Percentage
Operational challenges		
Low sales due to fewer customers	272	60.7
Spoilage of fresh produce	230	51.3
High operating costs coupled with low profit margins	221	49.3
Business competition from similar food sellers	206	46.0
Default on payment of debts by customers	157	35.0
Lack of adequate storage facilities	102	22.8
Security and policing challenges		

Table 8. *Cont.*

	Frequency	Percentage
Crime and theft	35	7.8
Harassment and solicitation of bribes by county officers	8	1.8
Detention and arrests by county officers	8	1.8
Eviction by county officers	7	1.6
Confiscation of goods by county officers	5	1.1
Environmental challenges		
Harsh weather conditions	26	5.8
Lack of water and electricity	11	2.5
Poor roads, drainage and sanitation	10	2.2

Few vendors reported facing security and policing challenges, a trend partly attributed to many paying private security or protection fees to local “gate-keepers”. Only 8% of vendors had been victims of crime or theft, and notably, fewer than 2% reported harassment or bribe demands from county officials. Some experienced arrests, eviction, or confiscation of goods by county enforcement officers. A small segment (6%) of vendors complained about harsh weather (hot sun, heavy rains, flooding), as well as inadequate access to basic infrastructure such as reliable water, sanitation facilities, electricity, roads, and drainage.

3.4. The Impact of COVID-19 Pandemic on Informal Food Vending Enterprises

The results reported in this section are for 260 vendors (58% of the total sample) whose businesses were operational in 2020 and 2021, the first two years of the COVID-19 pandemic. The remaining 188 vendors (42%) started their businesses between 2022 and 2024. The vendors were asked to identify if and how COVID-19 containment measures affected their businesses, addressing multiple aspects, including the cost of operations, prices of food items sold, daily sales and profits, demand, spoilage of certain food products, and overall business operations and patronage. Notably, most vendors consistently observed curfew hours (85%) and wore face masks (84%). A larger percentage (92%) washed their hands frequently. However, physical distancing was regularly maintained by a slightly lower proportion of participants (67%).

3.4.1. Impact on Cost of Business Operations

The pandemic increased the overall costs associated with operating a business. Figure 3 illustrates that the vast majority of vendors were negatively affected by these shifts, particularly by food inflation. Only 5% of vendors reported being unaffected by the rising cost of running a business. Similarly, the higher cost of transporting stock impacted all but 7% of vendors, while a mere 4% were unaffected by the increased cost of purchasing stock. Over half (57%) reported being significantly impacted by overall higher operating costs, while another 27% were moderately affected. Additionally, 61% of participants were affected by increased transportation costs, and 59% experienced higher costs of purchasing stock.

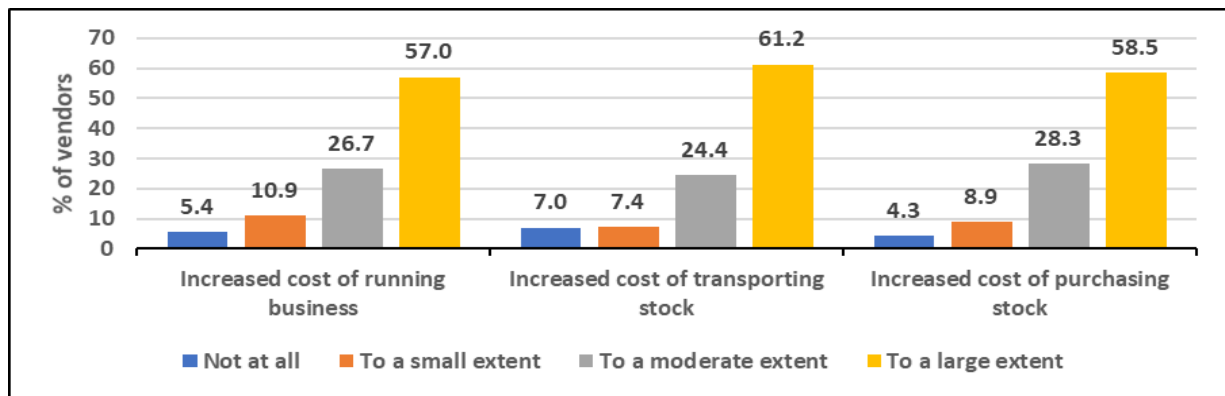


Figure 3. Extent of Impact on Cost of Business Operations.

3.4.2. Impact on Prices of Food Items

Participants were asked whether they had altered food prices during the pandemic. A portion of these vendors sold perishable goods with a short shelf life, such as cooked food, meat, and fresh produce. While some managed to maintain regular pricing, others were forced to adjust their prices to varying degrees (Figure 4) in response to shifting market conditions and operating costs. Notably, 35.5% of vendors experienced a significant impact from rising retail prices, while 30% faced a substantial impact from declining retail prices.

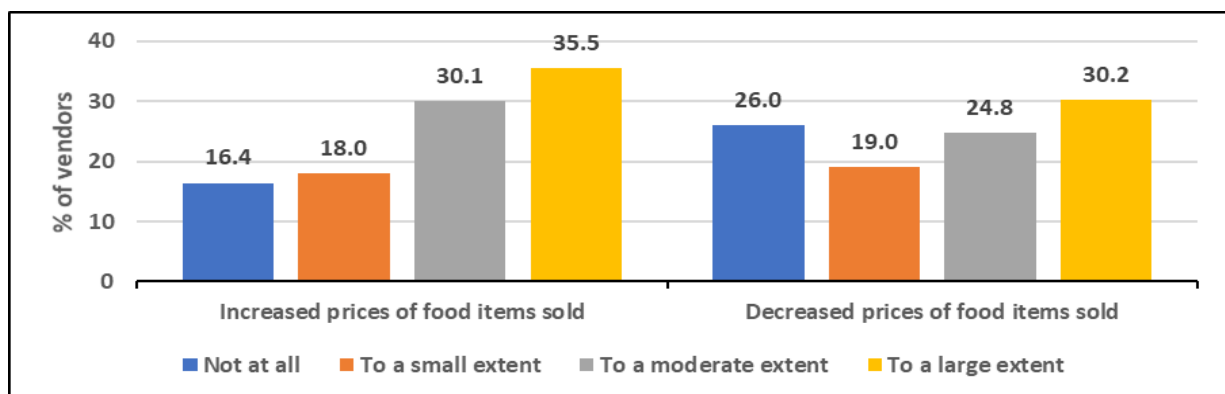


Figure 4. Extent of Impact on Prices of Food Items Sold.

3.4.3. Impact on Daily Sales and Profits

Depending on market forces, vendors experienced fluctuations in their daily sales and profits. While an increase would have been positive, a decrease could lead to negative consequences for small-scale businesses. Nearly all vendors, except for 9 (3.5% of the sample), reported being negatively affected by reduced daily sales and profits (Figure 5). For 61% of these vendors, the impact was significant. On the other hand, 19% reported a moderate increase in daily sales and profits, while 44% experienced a considerable boost. Restrictions on mobility, curfews, lockdowns, a fear of contracting the virus, and reduced consumer purchasing power likely compelled residents to change their shopping habits, adversely affecting vendor patronage.

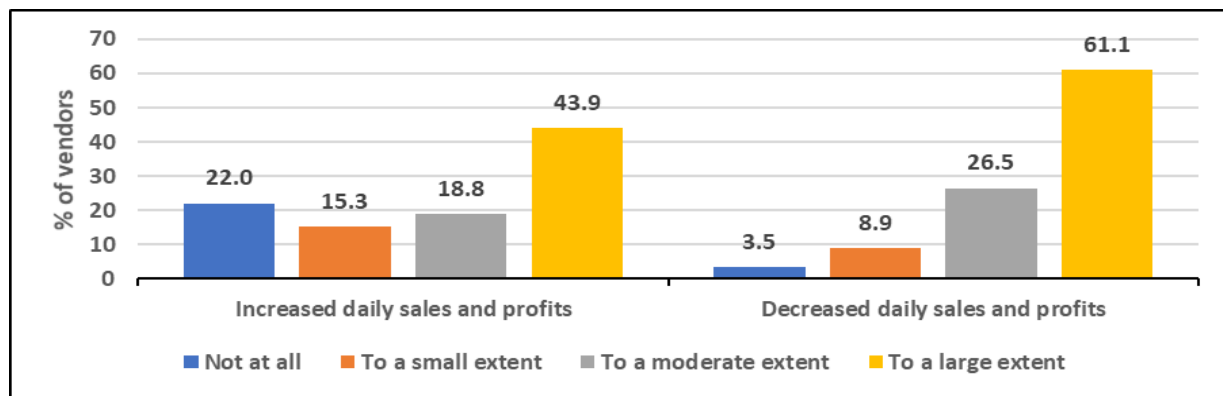


Figure 5. Extent of Impact on Daily Sales and Profits.

3.4.4. Impact on Demand and Spoilage of Certain Food Products

Approximately one-third (35%) of vendors experienced a significant impact driven primarily by increased demand (Figure 6). In contrast, 49% reported a considerable effect due to a decline in demand for certain food varieties. During the pandemic, specific items saw high demand due to the popular belief that they could boost immunity and reduce COVID-19 risk. Additionally, limited supplies of certain foods at the source occasionally triggered spikes in consumer demand. While increased demand for specific products benefited vendors, a decline in demand inevitably led to adverse outcomes. For instance, 60% of vendors reported that a lack of customers, combined with inadequate storage facilities, resulted in the spoilage and wastage of perishable food, leading to direct financial losses.

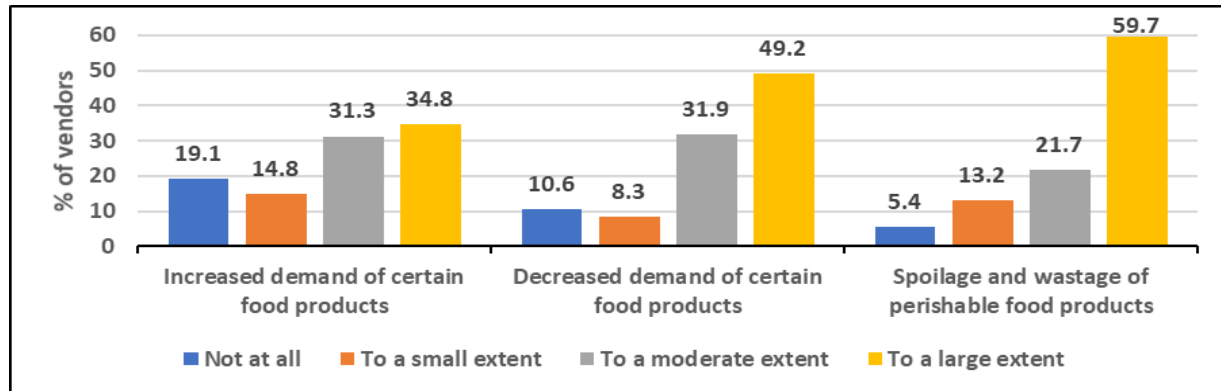


Figure 6. Extent of Impact on Demand and Spoilage of Certain Food Products.

3.4.5. Impact on Business Operation and Patronage

The curfews and lockdowns introduced in Nairobi significantly disrupted normal vendor operations. Over two-thirds (69%) of vendors were heavily affected, while an additional 24% experienced moderate impacts due to reduced operating hours (Figure 7). Consequently, the decline in daily customers had a very significant impact on 67% of the participants, with another 25% reporting that they were moderately affected by decreased daily patronage.

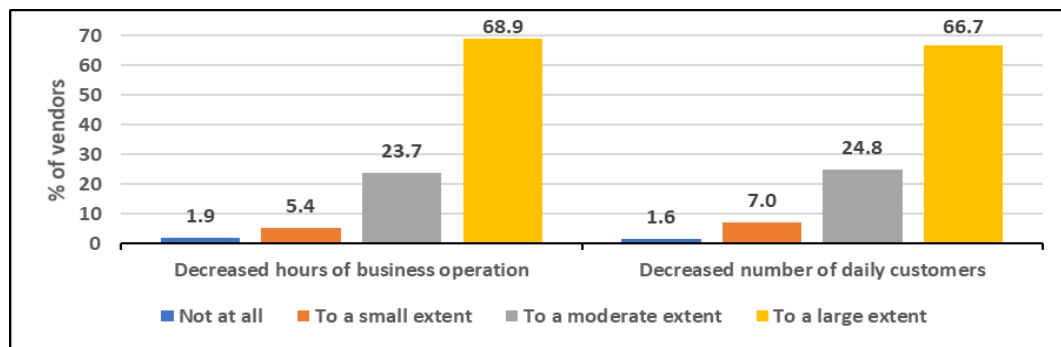


Figure 7. Extent of Impact on Business Operation and Patronage.

3.4.6. Overall Impact on Enterprise, Extent of Enterprise Recovery and Support

Respondents provided insights into the overall impact of containment measures on their enterprises, the extent of recovery by 2024—nearly two years after the pandemic’s official end—and the support received during the crisis. Results in Figure 8 highlight that nearly all vendors experienced major or severe negative outcomes. Only 2% remained unaffected. Specifically, half of the vendors (50%) faced significant, difficult-to-manage impacts, while an additional 31% experienced severe outcomes that carried a high risk of permanent closure.

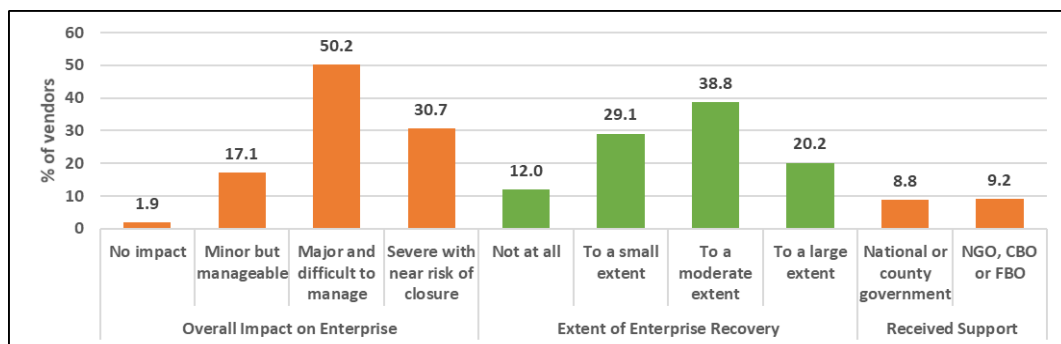


Figure 8. Overall Impact on Enterprise, Extent of Enterprise Recovery and Support.

The recovery of enterprises from the adverse effects of COVID-19 containment measures has been slow and gradual. At the time of the survey, only 20% of vendors had largely recovered, while 39% had recovered to a moderate extent. However, nearly one-third (29%) had recovered only to a small extent, and an additional 12% had not recovered at all. These challenges were compounded by a lack of institutional assistance. For example, only 23 vendors (9% of the sample) reported receiving aid from the national or county government, which primarily consisted of financial support such as cash transfers. Support from other sources was similarly limited. A comparable number of participants (24 vendors or 9%) received assistance from NGOs, CBOs, or faith-based organizations. This assistance was predominantly financial, though some vendors also received food and hygiene supplies, such as soap.

3.5. Vendors’ Coping Strategies During COVID-19 Pandemic

3.5.1. Enterprise-Level Coping Strategies

Our study participants employed various coping strategies to adapt to public health restrictions and continue their businesses during the pandemic (Table 9). These strategies included price adjustments, stock management, reliance on credit and loans, use of mobile phones for business activities, public health and hygiene measures, and temporary clo-

asures. The most common strategies among more than three-quarters of vendors involved reducing stock levels (92%) and frequency of supplies procurement (77%) to mitigate losses, improving hygiene conditions at their premises (95%), and installing handwashing stations for customers (92%). Additionally, at least half of the vendors reduced prices (61%), sold items on credit (64%), and relied on mobile phone for transactions (56% and 56%) to avoid losses. Despite these adaptive measures, 38% of vendors were ultimately forced to close their businesses temporarily.

Table 9. Enterprise-Level Coping Strategies.

	Frequency	Percentage
Price adjustment strategies		
Reduced prices to clear stock and reduce loss	159	61.2
Increased prices because of high cost of stock	111	42.7
Increased prices because of high demand of reduced stock	84	32.3
Stock management strategies		
Reduced stock to avoid loss	239	91.9
Reduced the frequency of weekly stock replenishment	201	77.3
Increased stock because of high demand	72	27.7
Reliance on credit and loan facilities		
Sold items on credit	167	64.2
Bought stock on credit	124	47.7
Took a loan to support business operations	70	26.9
Reliance on mobile phone for business		
Relied on mobile phone to procure stock	146	56.2
Relied on mobile phone to receive orders from customers	145	55.8
Public health and hygiene strategies		
Increased the hygiene conditions at business premises	248	95.4
Placed a handwashing point for customers	238	91.5
Temporary closure of business		
Temporarily closed my business	99	38.1

3.5.2. Household-Level Coping Strategies

On the other hand, the sampled vendors adopted several household-level coping strategies, which can be categorized into reliance on personal savings, assets, and additional income; reliance on loans and friends; reducing household consumption and expenditure; and temporary relocation to the rural home (Table 10). However, the most common strategies used by more than half of the households were drawing on personal savings (82%) and reducing non-food consumption (77%). A striking and challenging finding is that 74% of vendors were forced to reduce household food consumption in response to the pandemic's financial shocks. Additionally, one-third (34%) reported increased reliance on mobile phone-based loans. Regarding relocation, 25% of households saw at least one member temporarily return to their rural home, while 13% of the vendors themselves also adopted this strategy.

Table 10. Household-Based Coping Strategies Adopted by the Vendors.

	Frequency	Percentage
Reliance on personal savings, assets and additional income		
Relied on personal savings to survive	369	82.4
Sold some household assets to survive	147	32.8
Engaged in additional income-generating activities to survive	139	31.0
Reliance on loans and friends		
Received assistance from family and friends	206	46.0
Increased the frequency of taking loan from mobile phone apps	150	33.5
Took a loan from banks and shylocks	72	16.1
Reducing household consumption and expenditure		
Reduced household non-food consumption	345	77.0
Reduced household food consumption	333	74.3
Moved to a cheaper rental house	210	46.9
Temporary relocation to rural home		
Part of the family temporarily moved to my rural home	110	24.6
I temporarily moved to my rural home	60	13.4

4. Discussion

This study set out to explore the adverse impacts of the COVID-19 pandemic on women food vendors and their coping strategies across four informal settlements in Nairobi, Kenya. Our findings reveal that food vending is the sole income-generating activity and source of livelihood for the majority of young, unemployed women vendors—many of whom have a secondary level of education and are recent migrants to Nairobi. However, for a few vendors, factors related to the COVID-19 pandemic pushed them to start their food vending enterprises. This implies that food vending provided a crucial safety net and alternative source of income for those who experienced lockdown-induced employment and business losses, especially from other informal sector activities that were significantly impacted.

Although economic survival is the main reason for entry into the food vending business, most vendors are recent entrants into the informal food vending sector, which generally has limited individual longevity. This finding qualifies Singh's [7] assertion that, far from being a transient phenomenon, the informal economy offers employment opportunities to a large segment of urban residents. In addition, women vendors offer a diverse selection of nutrient-rich foods, contributing to household food and nutrition security within urban informal settlement communities. According to Steyn et al. [48] and Ameye et al. [49], street foods make a significant contribution to energy and protein intake. However, Brouwer et al. [50] emphasize that healthy diets must be safe, accessible, and affordable for all, including disadvantaged and nutritionally vulnerable groups.

On a day-to-day basis, the majority of vendors face operational challenges ranging from high operating costs to low sales and profit margins, fresh produce spoilage, and competition from similar sellers. Our findings also show that women vendors face significant barriers to growth, specifically in terms of limited access to training opportunities, credit, and business loans. Very few vendors had successfully applied for and received a bank loan or had benefited from training organized by state and non-state actors. These challenges, which were exacerbated during the COVID-19 pandemic, are consistent with

those reported in similar studies in Nairobi [51] and other cities in Africa [23,52,53] and Asia [24].

While women play a pivotal role in urban food systems, ignoring these systemic challenges leads to further marginalization. This implies that failing to address the deep-rooted inequalities faced by women in the informal economy not only leaves them behind, but also worsens their economic vulnerability and destabilizes the entire urban food supply [54]. According to Gitau et al. [52], unequal access to financial resources affects male and female food vendors differently, with women vendors being disproportionately disadvantaged due to limited asset ownership, which restricts their access to loan collateral. Combined with adequate skills in financial management, access to affordable loans and credit addresses systemic challenges faced by women in the informal sector [55,56]. On the other hand, adequate skills in entrepreneurship help them expand their businesses, reduce losses, and increase sales [57]. This is against the backdrop that the vast majority of vendors in our study drew their start-up capital from personal savings and social networks, and expressed an intention to expand their enterprises in the long term.

COVID-19 containment measures had varying degrees of negative impacts on the sampled women vendors. These vendors experienced increased operational costs driven by a combination of factors, including higher supply and transportation expenses as well as mandatory hygiene measures. Furthermore, unpredictable fluctuations in daily sales and profits directly influenced retail price volatility. Due to a lack of adequate storage facilities, perishable products were especially vulnerable to spoilage. Ultimately, increased costs and reduced profits resulted in diminished household income. This implies a fundamental threat to their daily survival, economic stability, and the long-term viability of their livelihoods. Indeed, nearly all vendors experienced major or severe pandemic-related outcomes that were either difficult to manage or placed their enterprises at risk of permanent closure.

The vendors adopted a number of strategies to cope with the negative impacts of the pandemic and associated containment measures. The most common enterprise-level coping strategies included reducing stock and the frequency of supply procurement, improving hygiene conditions, installing handwashing stations, reducing prices, selling items on credit, and relying on mobile phones for business transactions. On the other hand, the most commonly used household-level coping strategies included drawing on personal savings to survive, and reducing food and non-food household consumption. This suggests that the pandemic not only drained household savings but also increased household vulnerability to food and nutrition insecurity, pushing many into a survival mode that may take significant time to recover from.

Recovery of enterprises from the adverse effects of COVID-19 containment measures has been slow and gradual. At the time of the survey, the vendors had recovered to various degrees. However, 12% had not recovered at all from the pandemic's severe effects, while about a quarter had only recovered to a small extent. Recovery may have been hampered by the fact that only a small proportion of the vendors received some form of institutional support or assistance from state or non-state actors. This implies that gaps in support remain a significant barrier to post-pandemic recovery and underscores that women in the informal food economy are central to this process and must be deliberately targeted for assistance. These findings on the impact of the COVID-19 pandemic, coping strategies, and enterprise recovery among women food vendors in Nairobi's informal settlements resonate with results from similar studies in Kisumu [26] and other African cities [58,59].

In the context of this study, livelihood resilience theory provides a valuable theoretical framework for understanding the resilience of marginalized communities, particularly women food vendors during global pandemics. The theory focuses on how livelihood

systems absorb, adapt to, and recover from shocks and stresses. It has been applied in similar studies in Dhaka [40], Kigali [60], and Ghana [61]. By emphasizing absorptive, adaptive, and transformative capacities, the theory enables an analysis of both immediate responses and long-term resilience within the informal food sector. The ability of women vendors to recover from the impacts of the COVID-19 pandemic while sustaining their livelihood opportunities and well-being highlights their varying degrees of resilience. However, these trajectories are influenced by differing vulnerability contexts and access to the five livelihood capitals: human, social, natural, physical, and financial.

5. Conclusions

Street food vending provides employment and income for women in urban informal settlements. Additionally, it serves as an essential livelihood source for those navigating the dual burden of earning an income and meeting socio-cultural caregiving responsibilities. Despite its critical role in sustaining livelihoods, limited strategies exist to strengthen its potential, address vendor challenges, and enhance resilience to evolving global economic, climatic, and environmental conditions. A lack of financial support and training hinders enterprise growth, forcing vendors to rely on social networks, personal savings, and mobile-phone lending platforms. High operational costs, a decline in income, and limited organizational support during the COVID-19 pandemic period adversely affected vendors' livelihoods and household food security. These impacts highlight the importance of targeted support—such as improved access to financing and training opportunities—to build resilience against future external shocks. Our study underscores the urgent need for tailored strategies that promote entrepreneurship, inclusive growth, innovation, and sustainability within the informal food sector. Given that these vendors constitute a vital component of the urban landscape, city planners should integrate them into planning processes while explicitly addressing gendered dimensions. Despite its descriptive research design, this study has highlighted the vulnerabilities and resilience of women food vendors in marginalized urban informal settlement communities during a global pandemic crisis. We recommend further analysis, specifically comparing female and male vendors, including inherent enterprise and household factors that influence resilience. Moreover, while loans accessed through mobile phone applications have created new opportunities, further research is needed to assess whether they contribute to new hardships or debt-related issues.

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