COVID-19 Ripples: Vulnerability to food insecurity and coping strategies for low-income fisheries-dependent lacustrine urban dwellers

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Abstract

The Coronavirus disease (COVID-19) measures were counter-productive in the food and nutritional security landscape for households that were already vulnerable before the pandemic. Our study assessed the food insecurity experiences of low-income, fisheries-dependent, urban dwellers of Manyatta slum in Kisumu, Kenya, during the implementation of the COVID-19 regulations. Data was collected from 24 households in July 2021 for a period of 14 days using a standard food security assessment questionnaire. Results indicate that the main sources of food during the pandemic were small shops (50%) and rural open-air markets (42%), with major shopping malls less frequented for food purchases. Further, most (83%) respondents had a reduction in their income during the pandemic. Overall, affected Manyatta slum dwellers were affected by increased food prices, reduced income and limited access to food products. The coping mechanism was borrowing money or food to meet the shortfall. The availability and affordability of fish, which is the main source of animal proteins for the community, was negatively impacted by the dusk-to-dawn curfew, which curtailed night fishing. Subsidies for nutritionally important food items such as fish, and increased access to credit for vulnerable slum dwellers to help them meet their food budgets during pandemics are recommended.

Keywords: pandemic, food security, nutrition, fisheries, lake, urban

Introduction

The COVID-19 pandemic was reported to have started in Wuhan-China in December 2019 (Kumar *et al.*, 2020; Lin *et al.*, 2020). The disease spread rapidly to many other countries globally resulting in the death of millions of people worldwide and significant impacts on the global economy (Onyeaka *et al.*, 2021). The virus is mainly spread through close contact with respiratory droplets released when an infected person sneezes, talks or coughs. Symptoms range from mild to severe, with the most common being fever, cough, and laboured breathing (Parvin *et al.*, 2020; Wilson and Wilson, 2021).

To curtail the spread of the pandemic, many governments developed regulations that restricted the movement of people and goods through the enforcement of curfews, quarantines, travel bans, social distancing, and limitations on social gatherings (Aura *et al.*, 2020). These measures varied in length depending on the country and were frequently supported by financial assistance for individuals and companies affected by the pandemic (Koh *et al.*, 2020). The regulations disrupted food production systems and trade, thereby leading to serious socioeconomic implications such as loss of employment, social unrest, reduced access to food products and widespread food insecurity (Aday and Aday, 2020; Meuwissen *et al.*, 2021).

In addition to food insecurity, lack of consistent access to nutritious food sources during pandemics was a leading cause of malnutrition and mental health problems (Fang *et al.*, 2021; Paslakis *et al.*, 2021). The Food and Agriculture Organization of the United Nations predicted that the COVID-19 pandemic would increase global food insecurity due to several factors, including the restrictions on access to sufficient or diverse nutritious foods that may have resulted from disruptions in trade and market supply chains (FAO, 2020).

Studies have shown the existence of socioeconomic vulnerabilities that worsen food insecurity during pandemics. For instance, poverty (Pereira and Oliveira, 2020), presence of children in a household (Ahn and Norwood, 2021), race and ethnicity (Morales and Ali, 2021), neighbourhood or residential area (Larson *et al.*, 2021), among others. Similarly, several social unrests (Campedelli and D'Orsogna, 2021) and political upheavals (Censolo and Morelli, 2020) have been witnessed during the pandemic in response to unwelcome government regulations and worsening living conditions. The impacts of the COVID-19 pandemic on food supply chains, food access, and food security were more severe in low-income countries (Udmale *et al.*, 2020). All these indicate that many citizens expect a more economically friendly environment during pandemics, yet many governments are mostly caught unprepared (Dodds *et al.*, 2020).

In Kenya, the COVID-19 pandemic was reported at a time when the country was already experiencing food shortages and hunger among 5.5% of its population (USAID, 2020). The government of Kenya moved with speed to enforce measures such as the ban on social gatherings, closure of all learning institutions and places of worship (Agwanda *et al.*, 2021). In addition, lockdowns of the capital city (Nairobi) and the second largest city (Mombasa) and shutdown of eateries and bars were also enforced (Lau *et al.*, 2021). Countrywide restrictions on movement except for essential goods and services, a dusk-to-dawn curfew, social distancing, frequent hand sanitization and mandatory wearing of masks were also among the regulations enforced (Mwesigye, 2021). Moreover, the importation of second-hand items such as clothing was banned (Curran *et al.*, 2021). Given that the country comprises about 14.5 million people engaged in informal employment (implying that 90% of the total number of people are employed) (Aura *et al.*, 2020), the immediate observable impact was the loss of employment to millions of Kenyans (Schwettmann, 2020). Tourism earnings also dropped by more than 80% (Wanjala, 2020).

The massive loss of employment, disruption of supply chains for goods and services, and termination of feeding programmes for school children during the COVID-19 pandemic worsened the food insecurity situation within the already hunger-stricken population (Kansiime *et al.*, 2021). Yet, while the government offered some remedies such as tax reduction, waivers of transaction fees on electronic transactions and suspension of credit bureau listing (Banga and te Velde, 2020; Ouko *et al.*, 2020), there was no government-led programme that efficiently or continuously availed food to needy households. Many food-insecure households reside in the slums of major cities (Kimani-Murage *et al.*, 2014; Wanyama *et al.*, 2019). This is because, if they cannot afford adequate food (though food is a basic commodity) they will highly likely not be able to afford the secondary costs that are associated with a decent living. Life in slums is much fairer for them because the cost of housing is cheaper and at a minimum (Huchzermeyer, 2008). Slum dwellers also account for most of the labour force engaged in informal employment (Meagher, 2016). An assessment of the socioeconomic experiences of slum dwellers in the wake of the implementation of COVID-19 regulations thus gives useful insights into the extent to which the pandemic affected the ability of households in slums to access food and maintain food security.

Regulations are important in safeguarding the health of citizens during a pandemic (Dos Santos *et al.*, 2021). However, just as pandemics pose a significant threat to human health, access to sufficient and nutritious food is also a key determinant of human health and well-being (Kundu *et al.*, 2021). The fear of the COVID-19 pandemic caused many governments to focus more on controlling the disease without considering the welfare of their citizens (Ferreira *et al.*, 2021), and Kenya was no exception. Therefore, government regulations mostly impacted poor populations who were already experiencing socioeconomic challenges such as food insecurity (Van Barneveld *et al.*, 2020). Since the level of impact on these communities may not be known, the study investigated the extra burden that slum communities bore due to government regulations, including the coping strategies that they adopted during the COVID-19 pandemic. The study builds on existing research to establish a link between socioeconomically vulnerable communities and their livelihood safety nets during pandemics.

Materials and methods

Study area

The study was conducted within Manyatta Estate (Fig. 1). Manyatta is a peri-urban neighbourhood on the eastern outskirts situated within the slum belt of Kisumu County, Kenya's third-largest city (Baker, 2002). It is subdivided into two Wards - Manyatta A and B. The neighbourhood is predominantly characterized by informal settlements. According to the 2019 census, the population density in Manyatta was 60,000 people living in an area of five square miles (KNBS, 2019). The area has several female-headed households due to the high prevalence of HIV/AIDS-related deaths of male partners (Miller *et al.*, 2021). The main activities in the area are small-scale fish trade and groceries with many households living on less than a dollar a day (Kiaka *et al.*, 2021). The sanitation of the area is relatively poor, with more than 50% of the households either living in semi-permanent or temporary structures (Anderson, 2016; Othoo *et al.*, 2020). Manyatta slum provides features of a vulnerable community, which was of interest to

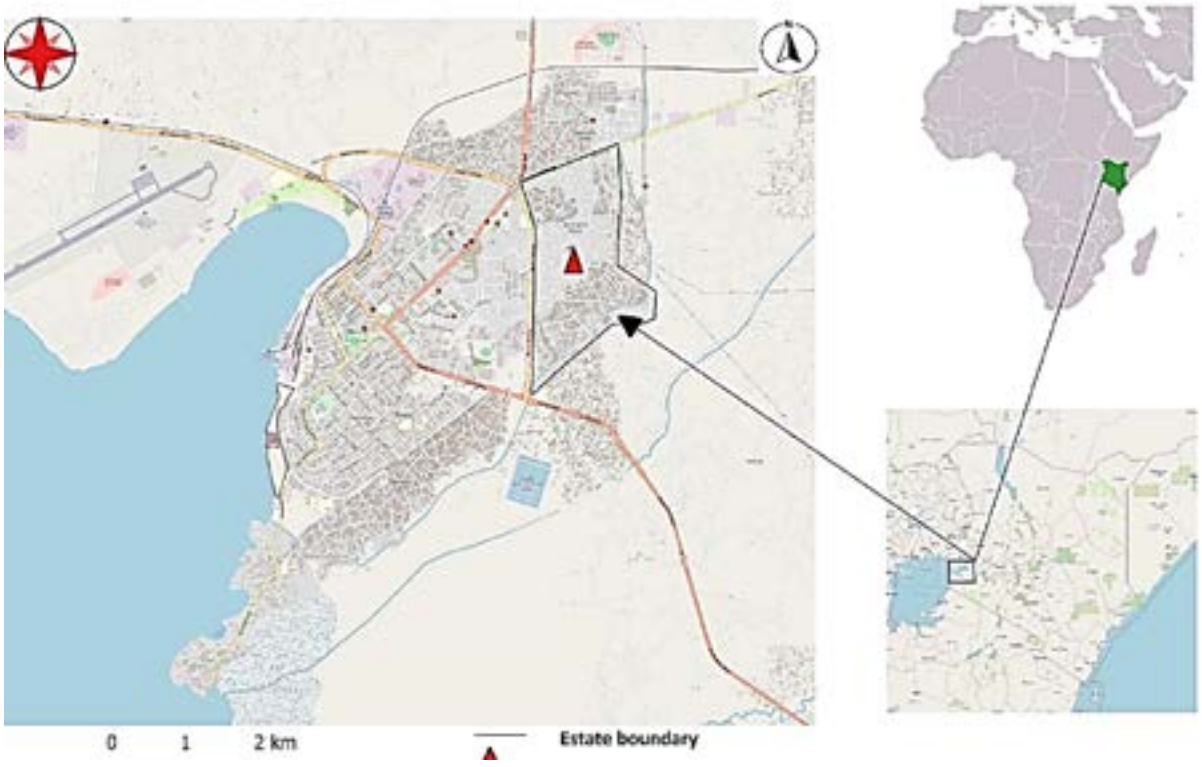

Figure 1. Map showing the location of the Manyatta Estate (Slums) in Kisumu County, Kenya (Source: Authors).

our study on the impact of COVID-19 regulations on household food security. Other factors, such as the availability of resources, including funding and ease of access to the community also played a role in the choice of the Manyatta slum.

Sampling

Manyatta has a population density of 2.4 people per square kilometre. The estate has about 8,600 households. The present study focused on Manyatta Centre due to the ease of accessibility and financial constraints. The Centre hosts about 300 households (KNBS, 2019). A sample of 24 (~10%) households were randomly selected at Manyatta Centre for the interviews in the month of July 2022. The sample size was thus largely moderated by resource constraints. Households which declined to participate in the survey cited limited availability, competing economic activities, and lack of funds for prior compensation for their interview time.

Ethical considerations

The study adhered to the ethical principles of confidentiality, anonymity, transparency, and no harm to the participants. Before the interviews began, the purpose of the study, data collection procedures, the absence of risks, and the benefits of participating in the study were explained to the respondents who verbally provided consent. The survey was designed and administered in a culturally sensitive manner, taking into account cultural and linguistic differences among the study participants. Consideration was also given to the vulnerable and marginalized members of the community to avoid bias.

Data collection

Semi-structured questionnaires were administered to the household representatives who were often the breadwinners, but in instances where the respondent was male and married, he mostly responded to questions on the preparation of food for the household with the assistance of the female partner. It is important to note that some chores within the household were given based on gender roles largely defined by cultural norms (Alonso *et al*., 2018). In some societies, cooking and food preparations are considered women's work, therefore, men are often deemed not to have as much knowledge or experience in this area (Taillie, 2018). As a result, it was considered more suitable for the male respondent to seek assistance from his wife or other female family members while answering questions about household food preparations. The questionnaire included questions on household socio-demographic characteristics, the food security situation during COVID-19 and before, and coping strategies during the pandemic. Each interview session lasted for a period of at least 30 minutes while the duration of the entire study was 14 working days.

Data entry and analyses

Raw data from the questionnaires were entered into an electronic form (Google®) which was transmitted into the Kobo Collect system for onward transmission and archiving. This mode of data entry was meant to minimize errors and to utilize inbuilt analytical features in Google Sheets to speed up the data analysis process (Aura *et al*., 2023). The data was later downloaded into a MS Excel sheet for data cleaning and validation. Further analyses were also performed in MS Excel. The main analyses performed included summaries such as means, percentages, and graphic visualization. Qualitative data or long explanations were subjected to thematic analyses.

Results and discussion

Socio-demographic characteristics

Figure 2 shows the socio-demographic characteristics of the respondents. A proportion of 53% of respondents originated from Manyatta B ward with the rest residing in Manyatta A. The majority (75%) of respondents were female, with at least 75% of the respondents having either primary

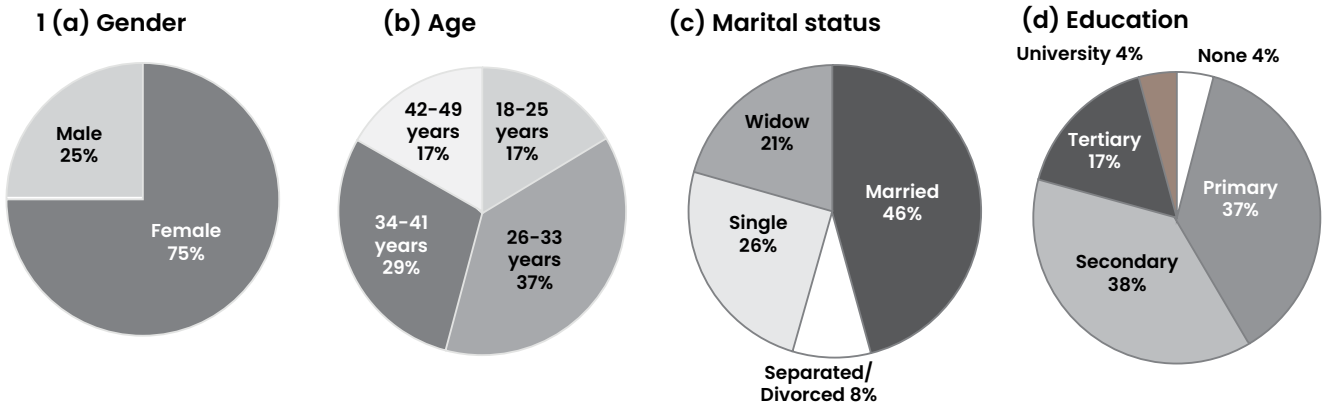

Figure 2. Socio-demographic characteristics of respondents showing (a) gender, (b) age, (c) marital status and (d) level of education amongst the residents of Manyatta Slums.

(37%) or secondary (38%) education. This could be attributed to the involvement of women in household chores as compared to men (Alonso *et al.*, 2018). Most of the households sampled were represented by youths (26-33 years, 37%), with fewer households represented by either much younger (18-25 years) or much older citizens (42-49 years). Most households were in marital unions.

Figure 3 shows the mean monthly income of the respondents. The respondents relied on several casual jobs and some low-paying salaried jobs. These included security guards, hairdressing, small-scale grocers, fish trade, social work, and hotel services. Their income levels were relatively low (mostly less than USD 100 per month) ranging from KES 5,000-20,000 a month (1 USD = KES 117 in 2022) which is the dominant income level for peri-urban and urban dwellers in informal settlements (KNBS, 2019).

Income during COVID-19

Figure 4 shows the outcome when respondents were asked about the changes in income, which they experienced during the COVID-19 pandemic due to the regulations. During the interviews, respondents were probed to help identify the factors that may have contributed to income reduction during the pandemic, such as job loss, and decreased demand for products or services. From the results, most respondents (83%) had a reduction in their income, with none indicating any increase in income. This exhibits the possible negative effect that COVID-19 regulations had on these households' livelihoods. Similar findings were reported in other studies conducted on the impact of the COVID-19 pandemic (Aura *et al.*, 2023).

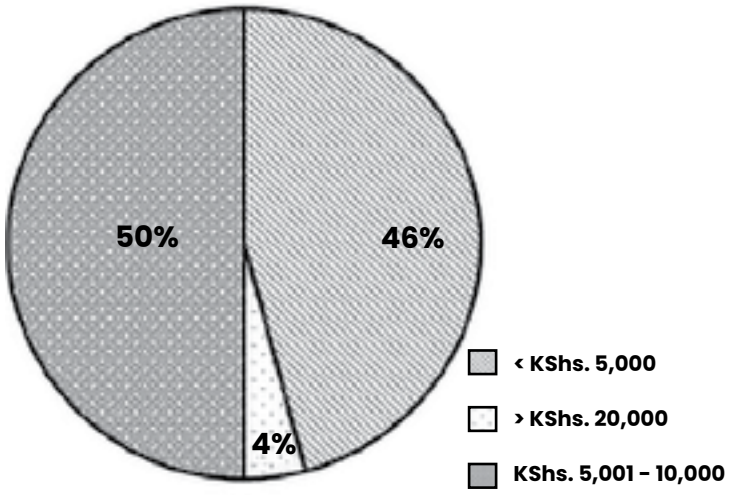

Figure 3. The mean monthly income of slum dwellers in Manyatta, Kisumu, based on a survey of 30 respondents conducted in 2022.

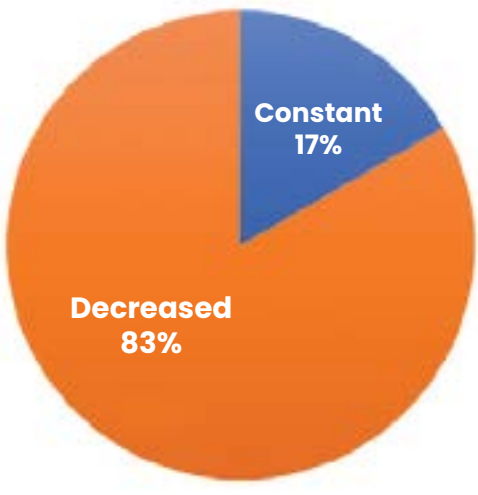

Figure 4. Change in income during implementation of COVID-19 regulations.

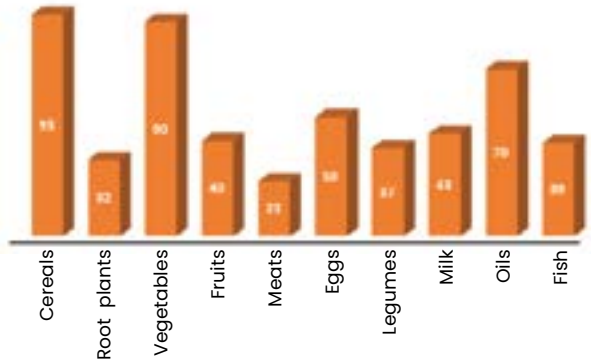

Figure 5. The frequency of food types accessed by slum dwellers in Manyatta, Kisumu during implementation of COVID-19 regulations, based on a survey of 30 respondents conducted in 2022.

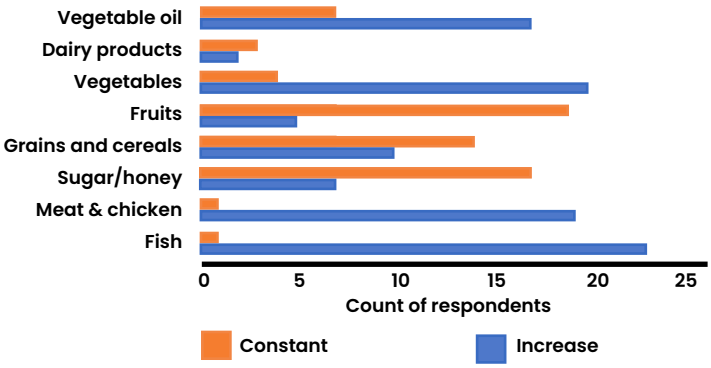

Figure 6. The average prices of common food products accessed by slum dwellers in Manyatta, Kisumu during implementation of COVID-19 regulations, based on a survey of 30 respondents conducted in 2022.

Food accessibility

Figure 5 shows responses on the types of food that the respondents accessed during the pandemic. Most respondents reported accessing cereals, vegetables, and oils as their primary food sources during COVID-19 regulations. Meat products were the least accessible product to households in Manyatta. This could be attributed to the relatively higher price of meat, making it a lesser priority during economically difficult times.

Food Prices

Figure 6 shows the trend of food prices. Most food prices were reported to have increased during the implementation of COVID-19 regulations. The greatest increase was noted for prices of fish, meat, vegetables/vegetable products and dairy products whereas prices of sugar, grains and fruits were mostly constant. The COVID-19 pandemic thus had an upward effect on the prices of food commodities. However, other market factors such as changes in global trade, production costs, and consumer preferences could have also influenced the prices of food commodities (Anderson and Martin, 2021; Nekmahmud, 2022).

Impact of regulations on access to food

Figure 7 shows the respondents' rating of the effect of various categories of COVID-19 regulations on food access. Among the regulations, the dusk-to-dawn curfew was rated to have had the

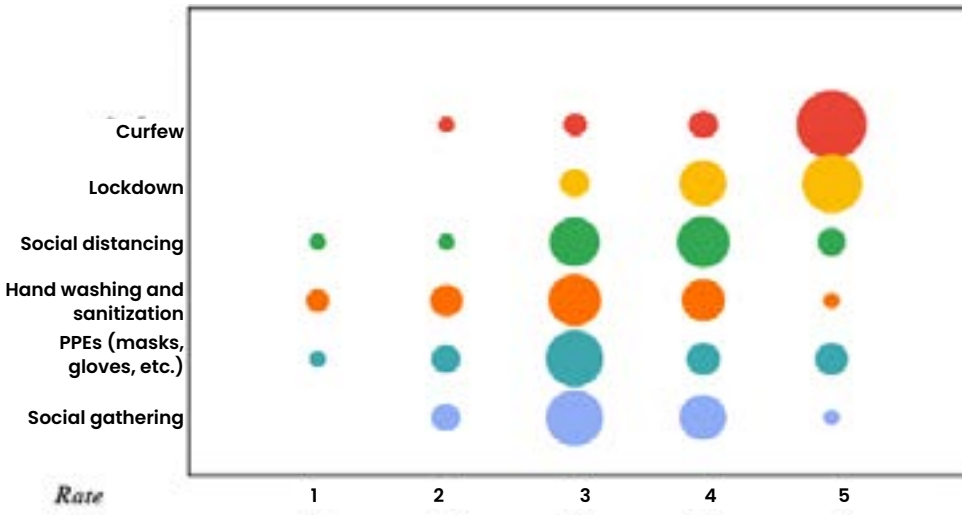

Figure 7. Respondents' rating of the effect of COVID-19 regulations on food access. The different colours represent the various regulations enforced during the COVID-19 pandemic, whereas the size of the dots shows the magnitude of a particular regulation on food access in the area.

most effect on food access for the slum dwellers. Most perishable food items are sold during periods of cooler temperatures of the day within slums due to limited refrigeration facilities. This implies that most trading in perishable food products is effective at dusk or dawn, possibly explaining the relatively high rating for the curfew regulation as the regulation that has the highest impact on food access among residents of Manyatta (Fiorella *et al.*, 2021).

Food source during COVID-19 regulations

Figure 8 shows major sources of food consumed by respondents during the regulation period. Most respondents purchased food from small shops (50%) and rural markets (42%). Unlike many urban dwellers of the middle and upper classes (Mandal *et al.*, 2021), the Manyatta residents rarely visited supermarkets for food products during the periods of government-imposed restrictions following the COVID-19 pandemic.

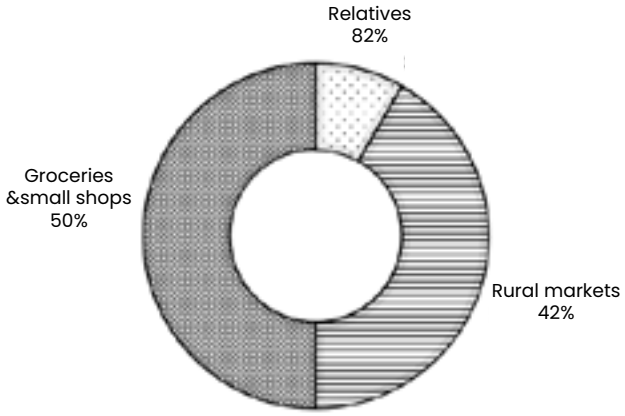

Figure 8. Food sources during the implementation of COVID-19 regulations.

Coping strategies

Figure 9 shows the variety of food-related coping strategies employed by the respondents. The main coping strategies used by Manyatta slum dwellers were the purchase of food on credit, borrowing food from friends or relatives and reduction in meal portions. This finding provides a possible insight into how access to credit facilities may have served as a useful buffer for these residents in economic difficulty. The finding could be useful in the future for government agencies and development partners who are interested in improving access of these communities to finances. Financial services could be tailored by existing banking or microfinancing institutions to meet the needs of this unique sector of clients and enable them to mitigate livelihood risks during pandemics.

Conclusion and recommendations

This study established that the COVID-19 pandemic severely affected Manyatta slum dwellers in Kisumu City. Manyatta, as one of Kenya's largest and most densely populated slums, provides a representative case study of the experiences of low-income groups in urban regions. As a result, the study's findings are likely to mirror the situation in other low-income suburbs in Kenya and other African countries. The main effects of the pandemic included an increase in food prices, the reduction in income sources, and the reduction in access to food products. Food products like meats and fruits, which are nutritionally very

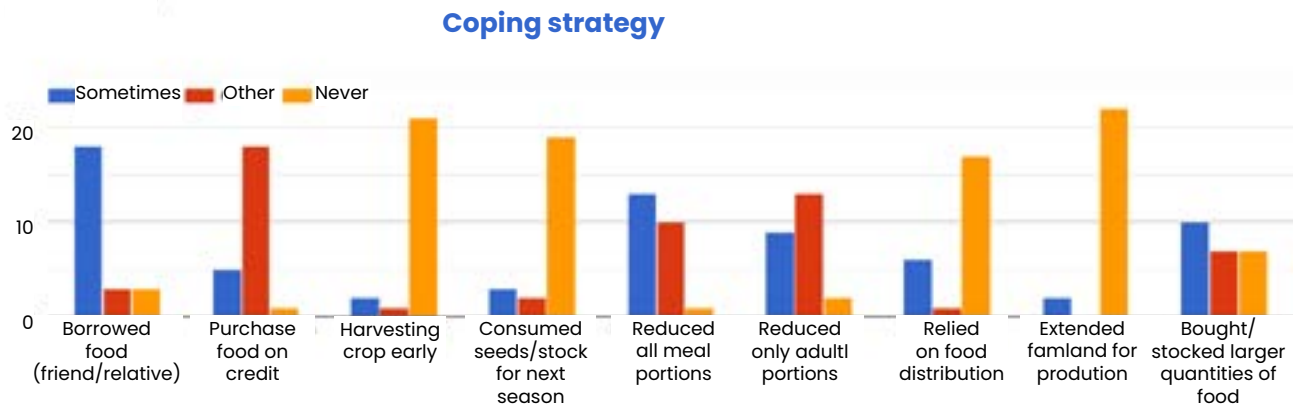

Figure 9. The frequency of coping strategies employed by slum dwellers in Manyatta, Kisumu during COVID-19 regulations, based on a survey of 30 respondents conducted in 2022.

important, were the least accessible during the pandemic. This implies that the pandemic affected both food and nutritional security. These findings are especially significant because they emphasize the critical need for initiatives to address the pandemic's impact on vulnerable communities and improve their food security and general well-being. The main sources of food were donations and rural markets while the dusk-to-dawn curfew was rated as the severest regulation with respect to food access. The main coping strategy for these communities was borrowing to meet their shortfall in food expenditures. Policymakers should thus consider adopting measures to support vulnerable communities during pandemics, such as providing social safety nets, access to credit facilities, and improving the availability and affordability of essential food products. These measures could help to build community resilience and enhance the ability of low-income communities to cope with the challenges of future crises. The study, therefore, recommends the following:

i. Subsidizing expensive food products that are nutritionally important for households during pandemics. These include all classes of meat and fruits.

ii. Increasing access to credit for vulnerable slum dwellers during pandemics to help them meet their food budgets.

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