

**SOCIO-ECONOMIC EFFECTS OF COVID-19 ON HOUSEHOLDS EXPENDITURE IN
THE URBAN AREAS OF KENYA.**

BY

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award of the Degree of Masters of Arts in Economics at the School of Economics,
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DECLARATION

I, Sally Atieno Odunga, declare that this research paper is my original work and has not been presented for any degree award in any other institution.

Signature: 

Date: 1/10/2021

This research paper has been submitted as a requirement for partial fulfilment of the requirements for the award of Master of Arts in Economics with my approval as the university supervisor.

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DEDICATION

To my lovely siblings, my sister and brother, Mercy Obim and Daniel Odunga, who have been supportive and have encouraged me throughout my studies. My late parents, whose words of encouragement to me as a young girl played a vital role in my pursuit of education.

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ABSTRACT

Background: Coronavirus disease 2019 (COVID-19) presents itself as not only a health crisis but also an economic crisis. This implies that while the primary goal is to contain the spread of the virus, tracking urban household's expenditures and coping mechanisms is equally important as it depicts their economic wellbeing. This is because urban households have been disproportionately disadvantaged in terms of infections as well as the economic burden of the pandemic.

Objective: The objectives of the study were: to determine the expenditure patterns of urban households in Kenya during the COVID-19 period; to assess the socio-economic effects of Coronavirus disease on the expenditure of households in the urban areas of Kenya and; to determine households coping mechanisms to meet and maintain their expenditures.

Method: The study used a high frequency phone survey panel data collected in four waves by the World Bank, University of California, Berkeley and Kenya National Bureau of Statistics (KNBS) to assess the socio-economic effects of COVID-19 on households expenditure in the urban areas of Kenya. The panel data was analyzed using random effects (RE) regression model, given that the Hausman test showed that RE model was the most suitable model for analysis for our study.

Results: Data analysis showed that there is a positive correlation between the socio-economic effects of COVID-19 and urban households' one-week expenditures. This implies that as household heads lost their income, lost their jobs or closed their businesses due to COVID-19, there was a corresponding decrease in their one-week household expenditures. Household heads who lost their jobs specifically, decreased their household one-week expenditures by 25.1%. In addition, household heads who had higher education levels spent 25.5% more than those with no education or had lower education qualifications. Implying that a higher education level enables one to have more income that enables them to spend more. Similarly, as household size increased there was an increase in households-one week expenditure by 4.5% across all the income groups. On the other hand, the older the household head was, the lesser the expenses they incurred in a week by 0.4%. In addition, as prices of food and non-food items

increased, households reduced their one-week expenditures. Expenditure patterns of households of all the income groups was the same across the four waves of data collection. The difference only came in terms of the magnitude of the decrease or increase in expenditure. This shows that consumers have the same expenditure behaviour when faced with a pandemic regardless of the income group they belong to. Expenditure on food and masks respectively were the key contributors to the household's one-week expenditure for all income groups. Reduction in food consumption was the main coping mechanism adopted by households at 42.5% followed by a reduction in non-food consumption at 34.8%.

Conclusion: The socio-economic effects of COVID-19 has pushed some households into adopting coping mechanisms such as reduction of food consumption in order to meet their expenditures on items such as masks which are mandatory for one to have. Such coping mechanisms exposes these households to poor nutrition, which has implications on their health. In addition, it regresses the country's efforts in reducing/eliminating food insecurity. Some of the coping mechanisms adopted to meet or maintain households expenses might be short term but may have long-term negative consequences. Therefore, there is need for the government to provide financial protection through the provision of cash transfers and other safety nets to the most vulnerable and those with the greatest need in order to cushion them from the socio-economic effects of the pandemic.

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ACRONYMS

AIDS:	Acquired Immune Deficiency Syndrome
HIV:	Human Immunodeficiency Virus
KIHBS:	Kenya Integrated Household Budget Survey
KNBS:	Kenya National Bureau of Statistics
MOH:	Ministry of Health, Kenya
SSA:	Sub Saharan Africa
UNAIDS:	United Nations Programme on HIV/AIDS
UNDESA:	United Nations Department of Economic and Social Affairs
UNDP:	United Nations Development Program
WHO:	World Health Organisation

OPERATIONAL DEFINITION OF TERMS

- Household expenditure:** This refers to the expenditures made by resident households to meet their everyday needs, such as food, clothing, housing (rent), energy, transport, durable goods (notably cars), health costs, leisure, and miscellaneous services.
- Food expenditure:** This refers to spending on food items such as milk, bread, flour among others.
- Nonfood expenditure:** This refers to spending on items that do not include food items like rent, school fees, and hospital bills among others.
- Transfer payments:** This refers to payments made to an individual without any exchange of goods and services taking place.
- Coping mechanism:** This refers to the strategies people often use or adopt to respond to sudden changes in income or a general reduction in economic wellbeing.
- Shock:** This refers to an unexpected occurrence that has a significant effect, which most times is a negative effect to an individual, household or economy.
- Socio-economic effects:** This refers to loss of income, loss of jobs and closure of businesses due to Coronavirus disease
- High-income earner:** A person earning higher than the average income.
- Middle-income earner:** A person earning the average income.
- Low-income earner:** A person earning below the average income.

CHAPTER ONE: INTRODUCTION

1.1: Background

The novel Coronavirus disease of 2019 (COVID-19), which was first reported in Wuhan City, China in December 2019 (WHO, 2020a), has since become a global pandemic having spread in over 180 countries (Were, 2020). WHO (2020b) defines COVID-19 as an infectious disease that spreads through discharge from the nose when an infected person coughs or sneezes or through saliva droplets. According to the health organisation, most people infected with the virus will experience some mild to moderate respiratory illness and hence might recover without requiring special treatment. However, other people more so the elderly and those with underlying medical conditions, may become seriously ill which may lead to their hospitalization (WHO, 2020b). When individuals become seriously ill as a result of COVID-19, there are financial costs borne to these individuals and their families such as the cost of treatment more so when a family lacks health insurance or when the amount on the insurance cover gets depleted or funeral costs in case the household member dies (UNDP, 2020).

Hospitalization also translates to low productivity, as individuals are unable to continue with income generating activities. The situation is made worse when the sick member is the breadwinner (Cutler & Summers, 2020). To date, over 200 million cases have been confirmed worldwide, and the disease has claimed more than 4 million lives (WHO, 2021). In Kenya, the first COVID-19 case was reported on 13 March, 2020 and as of 15 September, 2021, the number of cumulative confirmed cases had reached 244,826. Of these patients, 235,196 had recovered and the number of cumulative deaths stood at 4,949. This made cumulative active cases to be 4,681 as of that date. Table 1.1 shows the number of confirmed cumulative COVID-19 cases, recoveries, deaths and active cases by month and year (MOH, 2020a,2020b, 2020c, 2020d, 2020e, 2020f, 2020g, 2020h, 2020i, 2020j, 2020k, 2021a, 2021b, 2021c, 2021d, 2021e, 2021f, 2021g, 2021h).

Table 1.1: Distribution of confirmed Cumulative COVID-19 cases, recoveries, deaths and active cases by month and year.

Month	Year	Cumulative cases	Cumulative recoveries	Cumulative deaths	Cumulative active cases
March	2020	59	-	-	59
April	2020	396	144	17	235
May	2020	1,962	474	64	1,424
June	2020	6,366	2,039	148	4,179
July	2020	14,805	6,757	260	7,788
August	2020	34,705	20,644	585	13,476
September	2020	38,529	24,908	711	12,910
October	2020	53,797	35,876	981	16,940
November	2020	83,618	55,344	1,469	26,805
December	2020	96,458	78,737	1,670	16,051
January	2021	100,733	83,907	1,733	15,093
February	2021	105,973	86,678	1,856	17,439
March	2021	134,058	92,679	2,153	39,226
April	2021	156,981	106,836	2,643	47,502
May	2021	170,735	116,847	3,172	50,716
June	2021	175,176	120,031	3,396	51,749
July	2021	203,213	188,936	3,931	10,346
August	2021	235,863	223,637	4,726	7,500
September	2021	244,826	235,196	4,949	4,681

Source: MOH, 2020, 2021.

Table 1.1 shows that there has been a general increase in the number of confirmed cumulative COVID-19 cases as well as active cases since the first case was reported. This has been accompanied by a general increase in the number of people recovering from the illness as well as an increase in the number of fatalities. The months of March, April and May 2020, registered a relatively low number of cases as compared to the period between June and October 2020. In November 2020, there was a spike in the number of cases. However, from December 2020 to the end of February 2021, there was a steady

rise in the number of confirmed cases until the beginning of March 2021, when the number of cases increased significantly again before starting to decline towards the end of July. Due to the rise in the number of confirmed cases, the Kenyan government instituted precautionary and preventive measures to control the virus from spreading. The measures included the suspension of public gatherings, temporary closure of schools/bars/restaurants, dusk to dawn curfew as well as restricted travel between counties with high infection rates (Barasa et al., 2020; Janssens et al., 2021; Were, 2020).

The containment measures were expected to have a positive outcome as far as reduction of COVID-19 transmission is concerned but instead, the measures also had substantial negative health and socio-economic effects more so among the urban population (Barasa et al., 2020; Nechifor et al., 2020). Urban areas of Kenya have not only been disadvantaged in terms of COVID-19 infections but also in terms of disruption of livelihoods and economic wellbeing of urban residents (United Nations, 2020). This resonates with literature from previous pandemics that found that infection levels were relatively more in urban areas as compared to rural areas (Bishop, 2020). A study conducted in five African countries, Kenya included, found that HIV/AIDS infection levels in urban areas was almost two times higher or more than in rural areas (Greif et al., 2011). A similar ecological study of cholera outbreak in Haiti found that urban areas had 65,046 cases of cholera while the rural areas had 57,381 cases. This was attributed to high population density and improper sanitation in urban areas (Emilien, 2015).

The findings from the two studies is similar to what is being witnessed in Kenya with COVID-19 in the sense that, the larger proportion of confirmed cases come from Nairobi, Mombasa and Kiambu counties which predominantly consist of urban population as compared to Wajir, Samburu and Elgeyo Marakwet counties which predominantly consists of the rural population as shown in Table 1.2 (MOH, 2021f; SymbioCity Kenya, 2015).

Table 1.2: Distribution of COVID-19 cases in 12 counties by the percentage of urban population

County	Cumulative cases	Percentage of urban population
Nairobi	98,685	100
Mombasa	15,654	100
Kiambu	15,284	61
Nakuru	12,117	46
Uasin Gishu	7,994	39
Kisumu	6,445	52
West Pokot	356	8
Mandera	356	18
Tana River	338	15
Elgeyo Marakwet	336	14
Samburu	277	17
Wajir	212	15

Sources: Faria, 2021; SymbioCity Kenya, 2015.

In Table 1.2, the first six counties represent counties with the highest number of COVID-19 infections and the last six counties represent counties with the lowest number of infections as of September 5, 2021. Nairobi is the hotbed of COVID-19 in Kenya since at that time the city had registered 98,685 cases, which is a reflection of the majority of the number of confirmed Coronavirus cases. Mombasa, which is also a city, had 15,654 confirmed cases and lastly, Kiambu, which is predominantly urban, had registered 15,284 cases. On the other hand, Wajir county and Samburu counties which consists of less than 20 per cent of the urban population, had by that time recorded the lowest cumulative cases of COVID-19 cases that is 212 cases and 277 cases respectively (Faria, 2021).

Empirical evidence from studies on HIV/AIDS, Spanish flu and cholera outbreaks have shown that pandemics have a significant effect on households. This is because they are the principal units in which individuals not only cope with the disease but also some of the effects associated with a pandemic such as loss of income before trickling up to the economy (Garrett, 2007; Kirigia et al., 2009; UNDESA, 2004). While the socio-economic

effects of a pandemic might affect all households, the effects are more profound among residents of urban areas (United Nations, 2020). In the case of the Spanish flu, between 5000 and 6,000 cinema employees were rendered jobless in metropolitan Sydney due to the compulsory closure of cinemas. In addition, the urban residents who were small and large retailers reported that the volume of their sales dropped by 25 to 40 percent due to a sharp decline in customers as people were staying indoors. This made businesses to close down due to loss of income (Bishop, 2020).

The situation in Australia is similar to Kenya in the sense that, the containment measures by the Kenyan government to curb the spread of Coronavirus, led to job losses for workers in both the formal and informal sectors (Owino, 2020). For instance, in one road Construction Company, 4,013 employees were forced to take unpaid leave as a result of the COVID-19 crisis (Wafula, 2020). In addition, the restriction of international and local travel did not only affect tourism but also made many roles within the aviation industry redundant (Were, 2020). This contributed to a well-renowned aviation company, to let go of 4,000 casual employees and put the majority of its permanent staff on a 75 percent pay cut. In the education sector, teachers of private schools, teachers employed with the Board of Management (BOM) and support staff were most affected by the closure of schools as most school proprietors or the BOM could not sustain their pay and hence had to be laid off. Wafula (2020) found that a low-cost private school chain sent half of their teachers and support staff on compulsory leave after failing to sustain their pay.

The closure of entertainment facilities such as bars and restaurants, jeopardized the livelihoods of two million people as some had to be laid off while others were put on indefinite leave since some businesses decided to close completely (Wafula, 2020). With the loss of jobs, closure of business and loss of income, a large (86%) proportion of Kenyans had worries about getting adequate food (Owino, 2020). In addition, households particularly those whose income was affected significantly decided to shift their focus to purchasing only food items that were necessary during the pandemic. Such changes in consumer purchasing habits to sustain their living standards pose a challenge in achieving food security in Kenya (Owino, 2020). In addition, closure of borders and restriction of movement-affected trade, including disruptions to the steady supply of goods

and services such as staple foods from neighboring countries. This led to rising concerns of food shortages among many households (Were, 2020; Owino, 2020).

Studies that were conducted in Kariobangi, Mathare, Huruma, Kibera and Dandora which are the five largest urban informal settlements in Nairobi show that respondents had significant economic and food insecurity because of the socio-economic effects of Coronavirus which had greatly impacted in their daily lives (Population Council, 2020; Quaife et al., 2020; Tifa Consulting, 2020). Quaife et al. (2020) found that more than 80 percent of the survey participants in the informal settlements had experienced at least some loss of income while at the same time experiencing increases in food prices. In addition to that, 54 percent of the respondents had been rendered jobless because of COVID-19 (Tifa Consulting, 2020). As much as 21 percent of the respondents reported that they were receiving some financial or non-financial support, 78 percent of them mentioned that food remained one of the biggest unmet need. In addition, because of the control measures, a large proportion of people saw their friends and family less time than usual. This led to heightened social stress (Quaife et al., 2020).

In Mombasa, Kenya (Kithiia et al., 2020) did find that more than 30 percent of the study participants had experienced loss of income and according to them; it was the main ramification of the COVID-19 containment measures. They also experienced an increase in the prices of some essential items. Due to COVID-19 measures and restrictions, most people in Mombasa found themselves having to work from home. However, half of the population who were able to work from home were in full-time employment as opposed to 25 percent who were self-employed. Unfortunately, those who were in casual employment were unable to work from home, which lead them to be rendered jobless. On the other hand, working from home came with challenges that were mainly linked to affordability, accessibility and reliability of internet services (Kithiia et al., 2020).

Due to partial or complete loss of income and increase in prices of food, households adjusted their expenditures (Quaife et al., 2020; Gansey et al., 2020; Kithiia et al., 2020). Households resorted to either switching expenditures from non-essentials to essential or reducing the overall expenditure in totality (Baker et al., 2020; Reinsdorf et al). In Nairobi

urban informal settlements, 94 percent of the participants who had been faced with income loss reduced their expenditures mainly on food commodities and non-alcoholic drinks (Tifa Research Limited, 2020). However, in some rural areas and some urban areas, families maintained their food expenditures as before the COVID-19 pandemic outbreak. This was attributed to the fact that with the closure of schools, households had some money to spare from their budget to maintain expenditures on food since they were now spending much less on transportation and payment of school fees (Janssens et al., 2021; Kithiia et al., 2020). For those households that reduced their expenditures, rent, clothing, entertainment and transportation were the key expenditure areas that were sharply curtailed (Tifa Research Limited, 2020). However, in rural areas, the reduction in expenditure was not about basic needs but rather about spending on recreation ceremonies, funerals and communication (Janssens et al., 2021).

The altering of expenditures more so in urban households is not unique to COVID-19 alone but also in, HIV/AIDS and cholera pandemics. A study conducted in urban households of Côte d'Ivoire showed that, where a person got critically ill due to HIV/AIDS, there was a 28 percent fall in the expenditure of basic needs so as to use the money for treatment costs (Cornia & Zagonari, 2002). The same case applied to urban households from 16 countries that dealt with cholera patients. The caregivers reported that the cost of treatment was high and yet urgent and hence the households sacrificed their expenditures on basic items more so on food to cater for treatment costs (Kirigia et al., 2009).

Urban households that were unable to maintain or meet their expenditures because of the income shock due to COVID-19, adopted various coping mechanisms (Quaife, 2020). The coping mechanisms adopted included; withdrawal of savings, selling off assets, reliance on transfer payments, taking loans and borrowing from friends and families (Population Council, 2020; Tifa Research Limited, 2020). These coping mechanisms adopted are similar to the case of urban households in India, Tanzania and Kenya for households that had difficulties in making ends meet for their families due to income loss because of having AIDS patients (Cornia & Zagonari, 2002; Agatha et.al., 2010). Also for both HIV/AIDS and COVID-19 pandemics, households who had inadequate food,

reduced food consumption as a way of coping mechanism. In Nairobi, informal settlements to be specific, 74 percent of the respondents either skipped meals or ate less food and this was because of having inadequate money to spend on meals and that this was due to the situation with COVID- 19 (Quaife et al., 2020).

While the government had the best interest of the citizens when they came up with the containment mechanisms to reduce the transmission of COVID-19 infections, these containment measures likewise led to disruption of the socio-economic activities of the people (Were, 2020). This led to income loss caused by the closure of businesses and job losses. The effect of loss of income was more profound among the urban population (United Nations, 2020). The urban families had to adjust their expenditures to be able to sustain their livelihoods due to the loss of income. The adjustment meant either switching expenditures from non-essentials to essentials or reduction of expenditure in totality (Quaife et al., 2020; Tifa Research Limited, 2020). Households that were unable to maintain their expenditures, resorted to adopting coping mechanisms such as reduction in food consumption, utilization of savings, reliance on transfer payments, selling off assets and borrowing of loans (Quaife et al., 2020; World Bank, 2021). Evidence from previous pandemics have shown that some of the coping mechanisms might be short term but have long-term consequences. For instance, reduction in food consumption could lead to poor nutrition that has implications on health (Rugalema, 2000).

Since there is a delicate balance between containing the virus and ensuring the sustainability of livelihoods more so for the case of urban households who are reported to be the most affected (Were, 2020), there is need for assessing the socio-economic effects of COVID-19 on urban households' expenditure (Nicola et al., 2020; Were, 2020). Existing studies conducted with the aim of assessing the socio-economic effects of Coronavirus on urban households have provided limited information concerning the extent to which the spending levels of households have been affected due to these effects of the disease (Kithiia et al., 2020; Population Council, 2020; Quaife et al., 2020; Tifa Research Limited, 2020; World Bank, 2021). This is because the focus has been inclined towards the aggregate socio-economic effects of the virus on these households. The lack of detailed analysis is the gap that our study aims to fill. Literature on HIV/AIDS pandemic

has shown that low-income earners and high-income earners respond differently to income-related shocks that occur because of the disease. In addition, it has been reported that households who had assets coped better even when they experienced the income shock (Stover & Bollinger, 1999; Rugalema, 2000; UNDESA, 2004).

It is for this reason that we aim to conduct both pooled and disaggregated analysis by income and asset ownership to test if there will be significant differences in expenditure and coping strategies for different income groups and if having assets plays a role in households being able to cope better. Tracking how people's expenditures were differentially affected by the socio-economic effects of the pandemic and coping mechanisms adopted, will enable policymakers and government to understand what their citizens are going through better. Also, it will enable them to make informed decisions that are data-driven as far cushioning their citizens from the effects of the pandemic is concerned (Josephson & Michler, 2020). This information will also be important to the government when making budgetary allocations for the cash transfers and other provisions of safety nets to the most vulnerable as it provides a clear framework and modalities for identifying those with the greatest need (Were, 2020).

1.2: Research problem statement

While some studies have looked into the socio-economic effects of Coronavirus disease on urban households, limited information has been provided concerning how spending levels were affected due to the socio-economic effects of the disease (Kithiia et al., 2020; Population Council, 2020; Quaife et al., 2020; Tifa Research Limited, 2020; World Bank, 2021). This is because these studies have focused on the aggregate socio-economic effects of the pandemic on these households. However, studies related to HIV/AIDS pandemic have shown that high and low-income earners respond differently to any income-related shock, which occurs because of a disease (Stover & Bollinger, 1999; Rugalema, 2000; UNDESA, 2004). Therefore, there is a need to conduct a detailed analysis on how urban households spending levels were influenced by the socio-economic effects of the disease. Also, there is a need to conduct a disaggregated

analysis by income to test if there will be significant differences in expenditure and coping strategies for different income groups.

1.4: Objectives

1.4.1: General objective

To assess the socio-economic effects of COVID-19 on household's expenditure in the urban areas of Kenya.

1.4.2: Specific objectives

1. To determine urban household's expenditure patterns during the COVID-19 pandemic.
2. To assess the socio-economic effects of COVID-19 on the expenditure of urban households.
3. To determine urban households coping mechanisms to maintain or meet their expenditures during the COVID-19 pandemic.

CHAPTER TWO: LITERATURE REVIEW

2.1: Introduction

In this chapter, we discuss empirical and theoretical literature with the aim of highlighting the knowledge gaps that this study aims to fill. We will start by looking into the theoretical review focusing on the consumption/expenditure theories, followed by the empirical review on the socio-economic effects of a pandemic, and finally the methodological review.

2.2: Theoretical review

This section entails a review of four consumption/expenditure theories. The theories include the Keynesian theory of consumption, permanent income hypothesis, relative income hypothesis and life cycle hypothesis. The theories provide insights into consumer spending behaviour.

2.2.1: Keynesian theory of consumption

Keynesian theory of consumption (1936) provides a theoretical framework for understanding the relationship that exists between current expenditure and current income. Keynes stated that current consumption expenditures was determined primarily by current disposable income. In this theory, as current income increases, current expenditure also increases but not proportional to the increase in income. Keynes referred to the relationship that exists between current income and aggregate consumption as the propensity to consume. He further defined average propensity to consume (APC) as the ratio of consumption to income whereas marginal propensity to consume (MPC) was referred to as the amount by which consumption increases when current income rises by one dollar. Keynes assumed that the APC should be decreasing as income increases. Also for MPC, he assumed that it decreases or remains constant as income increases and must lie between zero and one (Keynes, 1936; Parker, 2010).

From this theory, we can deduce the source of savings for individuals. This is derived from the assumption that even with the increase in current income; an individual's current expenditure does not increase with the same magnitude as the increase in income. This means that individuals remain with some portion of their income to save (Keynes, 1936;

Miller, 1996). In addition, the fact that MPC lies between zero and one explains why it is impractical for people to keep on spending more than what they earn (Miller, 1996). According to Keynes, for individuals to stay alive, a particular level of expenditures is fundamental. While most times such kinds of expenditures would consist of basic needs, in some cases it could include other non-essential items. What this means is that expenditure varies with individuals however, some expenditures are necessary for survival (Keynes, 1936; Miller, 1996).

Keynes also found that consumer expectations, which he referred to as a psychological factor, affects current expenditure. He stated that if consumers are optimistic that there would be a rise in income or rise in prices, they are more likely to increase their expenditures as compared to the ones who expect no such changes (Keynes, 1936). This is true for the case of COVID-19. When the disease had just started spreading, people anticipated shortages and increases in food prices due to the containment measures. This made people to significantly increase their purchases of goods needed at home so that they could have sufficient stock as they expected that businesses would increase the prices of items (Baker et al., 2020). Interest rates also affect expenditure. Keynes defined interest rates as an objective factor. According to him, if interest rates are too high, an individual will not necessarily be able to dissave, and therefore consumption will decrease than before at various income levels (Keynes, 1936; Miller, 1996).

Based on consumer behavior, current expenditures do not mainly rely on the current income but also on other resources such as levels of wealth (Miller, 1996; Pretoria, 1996). This implies that if a person has already a great volume of wealth, his/her propensity to consume will be high (Parker, 2010). In addition, the assumption that as an individual's current income increases, the current expenditure also increases but not with the same magnitude as the increase in income, is not entirely true. This is because human wants and needs are many and yet many people earn less income (Tregarthen & Rittenberg, 2011). Therefore, when people have increased income, they increase their expenditures and cater for foregone expenditures because of insufficient funds. This makes expenditure to be equal to income or even more, which leads to borrowing.

2.2.2: Relative income hypothesis

This hypothesis introduces the social factors that affect expenditure apart from income (Palley, 2008). According to Duesenberry (1948), a household's consumption expenditures is influenced by their previous expenditure standards that they did set based on their own past income or based on the income of their neighbors. He argued that households would often try to make sure that their consumption expenditures are almost similar to those households who are in the same financial group as them. This leads to households who having higher income within the same financial group consuming less but saving more. On the other hand, households with low income relative to others within the same group will consume a larger portion of their income in order to "fit in" (Duesenberry, 1948; Parker, 2010).

This hypothesis provides insights as to why when the income of individuals or households falls, their consumption expenditures do not fall much. McCormick (2018) argues that it is because people grow accustomed to a particular consumption pattern and therefore find it difficult to cut their consumption when their income falls. He further states that people tend to maintain their expenditure because they are more concerned about their status relative to others as opposed to the fall in income.

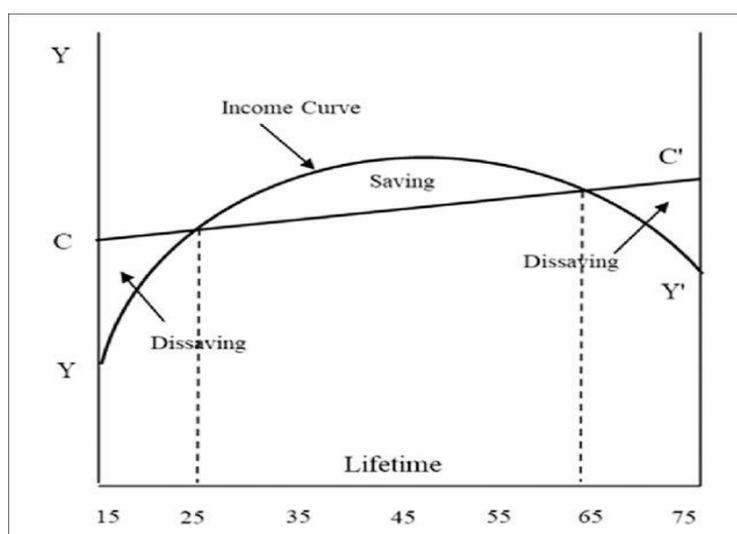
While the hypothesis could be used to explain why families having the same income may have different consumption patterns, which is dependent on the financial group, which they belong, it is very difficult to obtain the utility of individual households. This is because based on this hypothesis; the utility of households is dependent on not only their own previous consumption expenditure standards that they did set but also consumption activities of neighboring households. This makes it difficult to model the consumption behaviour of a household when utility is interdependent (Parker, 2010).

2.2.1: Life cycle hypothesis

The life-cycle hypothesis illustrates how people are able to transfer their expenditures throughout their lifetime by taking into account not only their current income but also their future income (Ketkaew et al., 2020). According to Modigliani & Brumberg (1954),

People's ability to incur any expenditures and to save depends on the future income that they are expecting to get. They argued that when one is young and at the beginning of their working years, they normally receive low salaries or wages as compared to when they have advanced in their careers. This results in income mostly being at its peak when one is about to retire but then drops at retirement. In order to smoothen consumption, individuals choose to borrow money during periods when they are earning less income. They then repay the borrowed loans and take advantage of the period when they earn high income by building up wealth. This enables them to have some savings to spend when they retire as illustrated in Figure 2.1 below (Modigliani & Brumberg, 1954).

Figure 2.1: Illustration of the life cycle hypothesis



Source: Ketkaew et al (2020)

Based on Figure 2.1 above, during the early years, people are incapable of saving because the expenditures they make are often financed with the money that they borrow. However, during the later working years, they are able to make savings since they consume less than what they earn (Ketkaew et al., 2020).

From the hypothesis, employed people are able to have some safety nets for their retirement when they save and accumulate wealth. This can enable them to continue with the level of consumption that they had even with the reduction in income when they do retire (Deaton, 2011). In addition, by accumulating wealth and saving, individuals are able

to make decisions on the level of consumption expenditures they need to make at different stages in their lives regardless of the income they are earning at that particular age. This implies that consumption is proportional to lifetime resources, which enables consumers to smoothen their consumption over a lifetime. This implies that with the right financial planning, people can insure themselves against income shock in their lifetime. This explains why some people during this COVID-19 period, despite losing income, were able to maintain their expenditures (Janssens et al., 2021). In addition, it is indeed true that during low income, people borrow to sustain their expenditure and during high income, people save (Deaton, 2011; Parker, 2010).

Based on this hypothesis, people need to have precautionary savings because of the uncertainty that the future holds so that they are able to sustain themselves in the event they are faced with income shock. However, many people lack the discipline to save. In addition, it is easy for high-income earners to save as they remain with some income after deduction of their expenditures as compared to low-income earners who have many responsibilities. They might be willing to save but they lack the “luxury” of saving and hence they have to procrastinate to save. (Ketkaew et al., 2020). Also, the high rate of unemployment and underemployment, make many young people unable to save and hence planning for retirement becomes difficult (Deaton, 2011). While wealth is an important component that determines expenditure, it is difficult to measure wealth hence most of the time, only a few assets whose value can be measured easily are included to represent the wealth variable (Parker, 2010).

2.2.2: Permanent income hypothesis

The fundamental building block of this hypothesis is that the amount individuals consume depends on their permanent income. According to Friedman (1957), consumers have two types of income: permanent income and transitory/temporary income. He argues that people limit their spending based on their expected permanent income and not temporary income (Friedman, 1957). This is attributed to the fact that temporary income is inconsistent and is prone to variations and hence it is only permanent income that determines the individual's consumption expenditures (Friedman, 1957; Meghir, 2004; Corugedo, 2004).

From the hypothesis, we can deduce that individuals can achieve financial stability even when there is a possible reduction in future income. This would be made possible if they are able to save their current income when it is greater than the expected permanent income (Ketkaew et al., 2020; Meghir, 2004). On the other hand, the assumption that consumers spend more when they see it, as an increase in permanent income is not entirely true. This is because consumer behavior is influenced by so many factors and hence it is not predictable. For example, if an individual anticipates that he/she may have a permanent increase in income, it is expected that he/she might increase their expenditures due to the additional income although in some instances he/she might decide to save more so that he/she is financially secured in case of financial difficulties in the future (Corugedo, 2004; Ketkaew et al., 2020; Meghir, 2004).

2.2.3: Summary of theoretical review

The critical deduction from the Keynesian consumption function is that current income more so from employment has a significant impact on household expenditure. Another deduction is that while income is the main factor that affects current expenditures, psychological factors such as expectations also affect current expenditures. Also, this hypothesis informs our understanding of the sources of savings for individuals and why some expenditures are necessary. The relative income hypothesis, on the other hand, brings out the aspect that people's consumption decisions are influenced by what others consume. The hypothesis provides the theoretical underpinning on why when income falls; it is not guaranteed that consumption will fall much.

The life cycle hypothesis demonstrates how expenditures can be transferred throughout one's lifetime. It also highlights several factors that affect household expenditure. The main factor being the expected income during the entire lifetime. Other factors include age, level of savings, rate of borrowing, wealth, and employment. This hypothesis provides background information on some of the variables to include as independent variables when assessing household expenditure and some of the coping mechanisms adopted by households to maintain their expenditure/consumption over a lifetime.

Lastly, the permanent income hypothesis forms the basis of our understanding of the role of income shock on the spending levels of households. That is; whether income shock changes or does not change the expenditure patterns of households.

It is therefore from the four theories that we can derive some of the factors affecting household spending, the expenditure patterns of households, and the coping mechanisms households adopted to maintain their consumption when faced with an income shock.

2.3: Empirical review

2.3.1: Socio-economic effects of a pandemic on household expenditures and the associated variations in expenditure patterns.

The socio-economic effects of a pandemic such as the closure of businesses, job losses as well as loss of income not only affect the economy but also households (Were, 2020). Empirical evidence from previous pandemics has shown that households tend to be significantly affected by pandemics because they not only bear the burden of treatment costs when a family member gets ill or funeral costs when a member dies but also making necessary expenditure adjustments to cope with the loss of income or loss of job (Garrett, 2007; Kirigia et al., 2009; UNDESA, 2004; Stover & Bollinger).

According to Stover and Bollinger (1999), the socio-economic effects of HIV/AIDS begins immediately after a household member begins to suffer from an illness that is related to HIV/AIDS (Stover & Bollinger, 1999). In India, 87 percent of those who were suffering from HIV –related illness, lost their jobs due to illness (Haldar et al., 2011). However, in the case of Coronavirus, the socio-economic effects of the disease have been mainly associated with the containment measures instituted by the government (Nicola et al., 2020; Kithiia et al., 2020; Were 2020). This was also the same case for the Spanish flu (Bishop, 2020).

Many of the containment measures used during this current pandemic such as the closure of schools, churches, entertainment venues and hotels and the requirement of wearing masks in public places are remarkably similar to those implemented during the Spanish

flu pandemic (Nicola et al., 2020; Bishop, 2020). While the precautionary guidelines were aimed to contain the transmission of the virus for both the Spanish flu and COVID-19, in the case of Spanish flu in Australia, the restrictions led to a decline in economic activities which lead to people losing jobs and closing businesses that ultimately led to the loss of income (Bishop, 2020; Garrett, 2007). The same case has been witnessed with COVID-19 (Quaife, 2020; Were, 2020).

While all households tend to be affected due to the socio-economic effects of a pandemic, the effects are more profound in urban households (United Nations, 2020). In the case of the Spanish flu, more than 6,000 cinema employees were rendered jobless in metropolitan Sydney due to the compulsory closure of cinemas. Small and large retailers also experienced a drop in the volume of sales by 25 to 40 percent due to a sharp decline in customers as people were staying indoors. This made businesses to close down due to loss of income (Bishop, 2020). The situation in Sydney is not only similar to Nairobi but also in Mombasa. Studies that were done during the COVID-19 period in the five largest informal settlements of Nairobi show that there was a significant economic and food insecurity because of Coronavirus, which had greatly affected their daily lives (Population Council, 2020; Quaife et al., 2020; Tifa Consulting, 2020).

In Mombasa, Kithiia (2020) found that financial loss was the major consequence of the COVID-19 measures. For the case of Nairobi informal settlements, the majority (80%) of the study participants experienced some income loss while at the same time experiencing increases in food prices (Quaife et al., 2020). The price hike was also experienced in Mombasa (Kithiia, 2020). The containment measures also played a role in rendering 54 percent of the respondents in Nairobi unemployed since they had to shut down their small-scale businesses (Tifa Consulting, 2020). Quaife et al. (2020) found that as much as 21 percent of the respondents in Nairobi informal settlements were receiving monetary or non-monetary assistance, food remained one of the biggest unmet needs for a majority of them. In addition, COVID-19 control measures made a majority (92%) of the respondents see their friends less, and 64 percent see their family less. This led to heightened social stress (Quaife et al., 2020).

COVID-19 measures and restrictions forced people to work from home. However, half the population who were able to work from home were in full-time employment as opposed to 25 percent who were self-employed. Unfortunately, those who were in casual employment were unable to work from home, which led them to be rendered jobless. It was reported by 31 percent of the respondents that working from home came with challenges in the form of accessing internet services, which is affordable but also reliable (Kithiia et al., 2020).

Due to partial or complete loss of income and increase in prices of food, households adjusted their expenditures (Kithiia et al., 2020; Quaife et al., 2020; Gansey et al., 2020). Households resorted to either switching expenditures from non-essentials to essential or reducing the overall expenditure in totality (Baker et al., 2020; Reinsdorf et al.). In Nairobi's urban informal settlements, a majority (94%) of those who lost their income minimized their expenditure mainly on non-alcoholic drinks and food commodities (Tifa Research Limited, 2020). However, in some rural areas and some urban areas, families spent the same amount of money on food and even on non-food as before the crisis struck. This was attributed to the fact that with the travel restrictions and closure of schools, people had some spare money to ensure that their expenditures on food remained at the same level since the spending on school fees and transportation had been reduced significantly. (Janssens et al., 2021; Kithiia et al., 2020). The school closures, however, also came with an increase in expenditure in some instances. First, since children were at home all the time meant that consumption increased (Kithiia et al., 2020; Baker et al., 2020). Second, due to lack of preparedness for homeschooling, households had to incur costs of buying devices that could enable online classes to continue, and yet these costs were unbudgeted for (World Bank, 2021).

Areas that urban households significantly reduced their expenditure on included transportation cost, purchasing of clothes, payment of rent and lastly entertainment cost (Tifa Research Limited, 2020). However, in rural areas, the reduction in expenditure was not about basic needs but rather about spending on recreation ceremonies, funerals and communication (Janssens et al., 2021). The altering of expenditures more so in urban households is not unique to COVID-19 alone but also in, HIV/AIDS and cholera

pandemics. A study conducted in urban households of Côte d'Ivoire, where a person got critically ill due to HIV/AIDS, showed a 28 percent fall in the expenditure of basic needs so as to use the money for treatment costs since there was a reduction in income (Cornia & Zagonari, 2002). The same case applied to urban households from 16 countries that dealt with cholera patients. The caregivers reported that the cost of treatment was high and yet urgent and hence the households sacrificed the expenditure on basic items more so on food to cater for treatment costs (Kirigia et al., 2009).

Health remains an important factor in the expenditure levels of a household. Those with pre-existing conditions already had an expenditure on treatment of their illness. However, in the event that one was found with COVID-19 and the households lacked medical insurance, it meant that the households would incur additional expenditure due to the treatment costs (World Bank, 2021). This is true for households that had HIV/AIDS, Spanish flu and Cholera patients. In the three pandemics, the households reported having had a substantial increase in medical expense due to the cost of treatment (Bishop, 2020; Stover & Bollinger, 1999; Kirigia et al., 2009; UNDESA, 2004). Other equally important factors that affect household spending levels are the household characteristics such as the gender of the household head, the level of education of the household head, age of the household head, the employment status of the household head and lastly the size of the household (Gansey et al., 2020; Were, 2020; Baker et al., 2020; Quaife et al., 2020; Barasa et al., 2020; Kithia, 2020).

2.3.2: Households coping mechanism to maintain or meet their expenditures during a pandemic.

When households are faced with a pandemic that results in an income shock, they adopt various coping mechanisms to sustain their livelihood (UNDESA, 2004). In the case of urban households in Kenya, Tanzania and India, families that were affected by HIV/AIDS, resorted to reducing their savings, selling their assets and borrowing from friends and relatives and switching and reduction of expenditures as coping mechanisms (Cornia & Zagonari, 2002; Haldar et al., 2011; Agatha et al., 2010). In Kagera, Tanzania to be precise, the lower income group affected by HIV, reduced their food expenditure by 30 percent to cater for the treatment costs (Lundberg et al, 2000). The coping mechanisms

adopted by the three countries is similar to urban households that had a difficult time to put food on the table after loss of income which was attributed to Coronavirus (Population Council, 2020; Tifa Research Limited, 2020).

In altering expenditures, urban households in Cote d'Ivoire who had HIV/AIDS patients, their families reduced their outlay on education by half, so as to increase the expenditure on health care by four times (Stover & Bollinger, 1999). Similarly, in Kenya, a larger proportion of people who faced income loss emanating from the socio-economic effects of Coronavirus, decided to reduce their expenditure mainly on non-alcoholic drinks and food. Also, spending on rent, clothing, entertainment and transportation was sharply curtailed (Tifa Research Limited, 2020). Reduction in food consumption was also a coping mechanism adopted. In Nairobi informal settlements to be specific, 74 percent of the respondents reported that they skipped meals or ate less food because of lack of sufficient money to buy meals and that this was due to the situation with COVID-19 (Quaife et al., 2020).

Kenyan government helped the vulnerable households to cope with the pandemic's socio-economic effects through issuing cash transfers (Quaife et al., 2020). This approach differed from what the Australian government did during the Spanish flu. The interventions came in the form of in-kind transfers of food, blankets, clothing and rent (Bishop, 2020). While the cash transfers by the Kenyan government was important and useful, it was not enough as the food prices continued to be high. This led to food being the biggest unmet need in this pandemic. As a result, households resorted to skipping meals or eating less as a coping mechanism (Population Council, 2020; Quaife et al., 2020; Tifa Research Limited, 2020).

2.3.4: Methodological review

The Organisation for Economic Co-operation Development (OECD) defines household expenditure as the expenditure households make in order to meet their everyday needs and wants. The expenditures include payment of rent, purchasing of clothes, buying food, incurring medical expenses, transport costs, buying assets, leisure and sundry expenses (OECD, 2021). Other household expenditure types include education, water/sanitation,

recreation, and communication (KIHBS, 2016; KNBS, 2020; Gracia & Young, 2014; Janssens et al., 2021). Household expenditure is calculated as a percentage of the individual household disposable income (OECD, 2021) and the expenditure type is calculated as a percentage of total expenditures (Gracia & Young, 2014).

Studies that have assessed the socio-economic effects of COVID-19 have used panel data (Janssens et al., 2021; World Bank, 2021; Josephson & Michler, 2020). However, there are also some that have used cross-sectional data (Kithiia, 2020; Population Council, 2020; Quaife et al., 2020). This has also been the case for studies conducted to assess the socio-economic effects of HIV/AIDS and cholera outbreaks (Haldar et al., 2011; Kirigia et al., 2009). In Spain and the United States of America (USA), the two studies that focused specifically on tracking individual household expenditures trajectories overtime during the COVID-19 period also used panel secondary data (Baker et al., 2020; Carvalho et al., 2020). Usage of panel data is highly encouraged in expenditure analysis since one is able to obtain comprehensive spending data which enables one to measure how a given household's spending changes over time and the spending patterns (Carroll et al., 2015).

In order to assess the household expenditures by use of panel data, either fixed effects or random effects model has been adopted by different studies (Josephson & Michler, 2020; Carvalho et al., 2020; Janssens et al., 2021; Baker et al., 2020). Fixed effects model controls for variables that do not change with time such as gender while the random effects model does not. The choice of models to be estimated is at the discretion of the researcher given no consensus on a standard approach (Gujarati, 2004). This is because different models have different assumptions and hence depending on the researcher's study assumptions, that is when they can select a suitable model (Torres-Reyna, 2007).

2.3.5: Summary of empirical review

Reviewed literature has shown that pandemics have a significant impact on households since they are the principal units in which individuals deal with the costs borne as a result of the disease such as hospitalization cost and low productivity when one is admitted and funeral cost when one dies as well as economic costs such as loss of income due to the

disease. However, urban households are reported to experience greater socio-economic effects of a pandemic as compared to rural households. Few studies that have been conducted during the COVID-19 period, have found that a large proportion of the urban population, lost their income as a result of job loss or closure of businesses as a result of the pandemic's socio-economic effects and the associated containment measures.

Due to the loss of income, while at the same time experiencing an increase in prices of basic commodities, urban households had to adjust expenditures and adopt coping mechanisms to maintain or meet their expenditures. The existing studies have provided only limited information on how spending levels of households were affected as a result of the socio-economic effects of Coronavirus. However, detailed exploration to assess whether there exists a compelling difference in expenditure and coping strategies for different income groups and if having assets plays a role in households being able to cope better is needed. This is informed by empirical evidence from the HIV/AIDS pandemic that has shown that high and low-income earners respond differently to income-related shocks, which occur because of the disease. In addition, it has been reported that households who had assets coped better even when they experienced the income shock. Furthermore, data from such analysis is crucial to the government when making budgetary allocations for the cash transfers and other provisions of safety nets to the most vulnerable as it provides a clear framework and modalities for identifying those with the greatest need. Finally, from the literature, panel data has been used in tracking household expenditure. However, the model to be estimated depends on the study design and study assumptions.

CHAPTER THREE: METHODOLOGY

3.1: Introduction

In this chapter, we describe the methodological approach, which we applied to meet the study objectives. It contains the theoretical framework, model specification and analysis approach, variables definition and measurement, study sites, data source, and lastly ethical considerations.

3.2: Theoretical framework

This study was guided by the rational optimization framework emanating from the life cycle hypothesis. The framework is based on the assumption that consumers plan and incur expenditures after making a thorough assessment of what their future and current financial situation look like (Tregarthen & Rittenberg, 2011). The life cycle hypothesis portrays the interplay that exists between expected future income, expenditure, and savings (Ketkaew et al., 2020).

According to the hypothesis, during the early working years, income from salaries and wages is usually low as compared to labour income in the later working years. Income from labour tends to be at its highest peak when one is about to retire but then drops when one has retired (Modigliani & Brumberg, 1954). This is true to some extent to the urban population. A study conducted in the United Kingdom found that young people are paid low salaries, due to lack of experience and skills and weaker bargaining positions when negotiating for pay. However, as they progress through the job brackets and acquire adequate experience and educational qualifications, they get to earn more income. The income drops during retirement since most retirees receive pension money only, which is relatively less than the actual salary (Hudson-Sharp et al., 2019).

The hypothesis further states that individuals whose aim is to maintain their consumption expenditure patterns throughout their lifetime, often prefer to borrow money when they are earning low income, repay the loans when they receive a raise in income and then accumulate wealth and savings when they earn high income so that when they retire they are able to live off the savings and assets purchased (Modigliani & Brumberg, 1954; Ketkaew et al., 2020). This means that for one to be able to insure themselves against income shock at any stage of their life, they need to do proper planning more so having

adequate savings and acquiring assets. However, planning is relatively easier for high-income earners since they are more capable of indulging in savings and acquiring assets from their income as opposed to low-income earners, who even affording basic needs is a challenge (Ketkaew et al., 2020). This explains the reason why, that even with the COVID-19 pandemic, some urban households that lost income, were still able to maintain their expenditures while others more so those in the urban informal settlements, who are inherently poor, were not able to do so which lead them to either reduce expenditures or switch expenditures from non-essentials to essentials (Were, 2020, Quaife, 2020).

From the hypothesis, saving, wealth accumulation and borrowing of loans were identified as mechanisms to ensure consumption was maintained in one's lifetime. These mechanisms were equivalent to coping mechanisms adopted by households to maintain or meet their expenditures when they were faced with loss of income due to the pandemic's socio-economic effects (Janssens et al., 2021; Quaife et al., 2020; Tifa Research Limited, 2020).

Lastly, from the hypothesis, we extracted some independent variables that we included in the study model. Variables extracted included; income, household head employment status and the age of the head of household. Other independent variables that were included in our study were extracted from some of the literature reviewed. They included; food and non-food prices, household head marital status, gender of the head of the household, size of the household and lastly the health insurance status of the household head (Deloitte, 2020; Quaife et al., 2020; Were, 2020). In addition, we assessed household's expenditure patterns during the Coronavirus pandemic. Concerning the coping mechanisms, we looked into the role of savings, borrowing, remittances, and assets in coping amidst the pandemic.

3.3: Model specification and analysis approach

This study aimed to assess the socio-economic effects of the Coronavirus disease on urban households' expenditure. For that reason, we used panel data since panel data allows for observation of the behavior of an entity across time (Torres-Reyna, 2007). The method of data analysis for this panel data was guided by the research objectives. Our

unit of observation was the household head. Our study's dependent variable was household expenditure while the independent variables included income, prices of both food and non-food items, and socio-demographic characteristics that comprise of household head gender, household head marital status, household head employment status, household head education level, insurance status of household head, household head age and size of the household. We broke down income into three sub-categories that included high-income earners, low-income earners and middle-income earners.

For the first objective, we used line graphs to determine the expenditure patterns of urban households amidst the Coronavirus pandemic. We first plotted line graphs that showed the trend of household's one-week expenditures by income groups. We then drew line graphs that displayed the expense types made by households in the following order; the first graph showed what expenditures were made by low-income earners, the second one showed the expenditures made by middle-income earners and lastly, the last graph showed expenditures made by high-income earners. We were interested in knowing whether there was a difference in expenditures made by middle, low or high-income earners. From the graph, we were able to deduce the trend for the three categories.

For the second objective, we estimated both a random effects (RE) model and a fixed effects (FE) model. This is because, these are the key models used when dealing with panel data that allow any or all model parameters to vary across individuals (Torres-Reyna, 2007). For the fixed effects model, there is an assumption that there are some individual characteristics that may have an effect or bias the independent or dependent variables. Due to this, there is a need for controlling for that/those element(s). This forms the basis of the assumption of the correlation between independent variables and the error term of the entity.

The advantage of the FE model is that the effect of those characteristics that do not vary with time such as gender is eliminated. This leads to one being able to determine the net effect of the predictor variables on the outcome variables. One other critical assumption of the FE model is that those characteristics that do not vary with time, should not be correlated with other characteristics of individuals and that those characteristics are

FE model is selected. Based on the Hausman test, RE model was selected as the appropriate model for our study.

For the first objective, which was assessing the socio-economic economic effects of the Coronavirus pandemic on urban household’s expenditure, we started by conducting descriptive statistics analysis and obtained the summary of our study variables, which included mean, standard deviation, minimum and maximum values. We then estimated four equations that enabled us to conduct pooled and disaggregated analysis by income groups. The estimation of the equations enabled us to find out if there existed any differences in expenditure between different income earners. This was informed by the fact that empirical evidence had shown that household expenditures varied across different income groups (Quaife, 2020; Janssens, 2021). Therefore, we were interested in testing if there were differences in expenditures among different income earners.

From equation 2 above which represented the RE model, we deduced four equations that were estimated under this objective.

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + U_{it} + V_{it} \dots \dots \dots 3$$

$$Y_{it} = \beta_0 + \beta_1 X_{l_{it}} + \beta_2 X_{2t} + \beta_3 X_{3t} + U_{it} + V_{it} \dots \dots \dots 4$$

$$Y_{it} = \beta_0 + \beta_1 X_{m_{it}} + \beta_2 X_{2t} + \beta_3 X_{3t} + U_{it} + V_{it} \dots \dots \dots 5$$

$$Y_{it} = \beta_0 + \beta_1 X_{h_{it}} + \beta_2 X_{2t} + \beta_3 X_{3t} + U_{it} + V_{it} \dots \dots \dots 6$$

Where;

Y_{it} = household expenditures (i) at time (t)

i = households and t = time

β_0 = constant

β_1, β_2 and β_3 = the parameters to be estimated.

X_1, X_2 and X_3 , -Independent variables where; X_1 = income, X_2 = prices of food and non-food commodities and X_3 = household’s socio-demographic characteristics

X_h =high income earners, X_l =low income earners and X_m =middle income earners

U_{it} = unobservable effect and V_{it} = error term

Equation 3 enabled us to do pooled analysis to determine the net effect of income and the other independent variables, which are prices of food and non-food commodities and household socio-demographic characteristics on household expenditure. On the other hand, equation 4 enabled us to estimate how spending levels of low-income earners were able to respond to the socio-economic effects of the Coronavirus disease. Similarly, equation 5 and 6 was used to estimate how spending levels of middle-income earners and high-income earners respectively may have been affected by the socio-economic effects of COVID 19.

Lastly, for the third objective, we used bar graphs to determine urban households coping mechanisms to maintain or meet their expenditures in the COVID-19 pandemic. We first plotted a graph that displayed various coping mechanisms adopted by households. We then plotted three graphs that disaggregate the respondents based on their income i.e. we drew a graph that showed what coping mechanisms were made by low-income earners. A second graph that showed the coping mechanisms adopted by middle-income earners and lastly, a graph that showed the coping mechanisms adopted by high-income earners. We were interested in knowing if there was a difference in coping mechanisms adopted across the three income groups. Stata version 15.1 was the key statistical analysis software used in this study.

3.4: Assessment of model fit

3.4.1: F-Test

We assessed the model predicting value by use of the F-test. Here, we looked at how jointly the independent variables influenced the dependent variable. We used 5% as the significance level.

3.4.2: R -squared

We used the overall R-squared to assess if the model was a good fit i.e. if the variation of the outcome variable could be explained by the predictor variables.

R-squared was calculated as follows;

$$R^2 = 1 - \frac{RSS}{TSS}$$

Where; RSS- represents the residual sum of squares and TSS represents the total sum of squares

3.5: Definition of variables and measurement

Variables that are relevant to this study were extracted from the data set. They included variables with information on the dependent and independent variables (see Appendix A).

3.4.1: Dependent variable

The study's dependent variable was household expenditures across different categories. The information about household expenditures was collected at the household level. The period that households were supposed to recall their expenditures was seven days. Information about household expenditures was broken down into nine categories, which consisted of food and non-food components and was reported in Kenyan shillings (see Appendix A). We did a summation of all the expenditure expenses to obtain total household expenditures.

3.4.2: Independent variables

This study's independent variables included income, and prices of items, size of the household, gender of the household head, household head level of education, household head employment status, household head marital status, household head health insurance status and the age of the household head (see Appendix A). Respondents were asked about two weeks earnings under the income variable.

3.5: Description of study population and settings

Containment measures pursued by the Kenyan government to curb the transmission of Coronavirus disease had some significant socio-economic effects on households all over the country. While these effects have been felt by many households in Kenya, urban households have been hit the hardest more so those located in the urban informal

settlements since they already have existing vulnerabilities even before the pandemic (Tifa Research Limited, 2020). It is for this reason that our study focused on urban areas since the urban areas were most hit by COVID-19 in terms of the number of infections as the socio-economic effects of the pandemic (Population Council, 2020; Zollmann et al., 2020).

The target population for this study comprised of urban residents represented in all the 47 counties of Kenya who are estimated to be about 15 million in total (KNBS, 2019a). Due to associated health risks as a result of COVID-19, data was collected by conducting phone interviews as opposed to face-to-face interviews. This means that the study population had to possess a mobile phone to be able to participate in the phone survey. Results from the 2019 KNBS census report showed that 62.6% of the urban population own a mobile phone (KNBS, 2019b). Therefore, findings from our study largely represent this part of the population who own mobile phones.

3.6: Data source

The study used high frequency phone survey panel data that is being collected by the World Bank in partnership with the University of California, Berkeley and KNBS (World Bank, 2021). The five-wave bi-monthly panel household survey is ongoing with only the fifth wave remaining. At the time of data analysis, data from four waves had been made available. This study, therefore, utilized data from waves 1 to 4, which was collected between May 2020 and March 2021. Wave 1 interviews took place between May 14 and July 8, 2020, while wave 2 interviews began on July 16, 2020, and ended on September 18, 2020. Wave 3 interviews were done between September 28 and November 30, 2020, and finally, wave 4 interviews were conducted between January 15 and March 25, 2021.

The COVID-19 Rapid Response Phone Survey (RRPS) household survey encompasses data obtained from two samples. The first sample was randomly drawn from a subgroup of the households that were study participants of the 2015/2016 KIHBS Computer – Assistant Personal Interviewing (CAPI) survey. The survey was nationally representative because the sample was obtained from the sampling frame of the National Sample Survey and Evaluation Programme (NASSEP V). The survey participants were stratified

by county and location of residence (whether rural or urban). While the target sample size for this sample was 4,000 households, the enumerators were able to complete 3,975 interviews. On the other hand, the second sample was made up of households that were selected by the use of the Random Digit Dialing method. This method involved creating a list of random mobile numbers by the use of a random number generator from the 2020 Numbering frame which was produced by the Kenya Communications Authority. The initial sampling frame consisted of a total of 92,999,970 randomly ordered phone numbers assigned across all mobile phone networks. However, only 4,075 numbers were active out of the 5,000 who were texted to determine if their numbers were still in service. This led to 4,075 phone numbers forming the final sampling frame. The target sample size for this sample was 750. However, the completed interviews exceeded the target by 254 interviews making the final number be 1,004 interviews. The interviews were conducted using Computer Assisted Telephone Interviewing (CATI) techniques. The interviews happened bi-monthly with the same households. However, sampled households that were unreachable in earlier waves were contacted together with households that had already been interviewed before. The household survey included information on the demographic characteristics of the household, employment, income loss, health, knowledge of COVID-19, subjective welfare, travel patterns and interactions, and food security for 4,979 households of which, 2,298 were urban households (World Bank, 2021).

Data from this survey was selected because it is a new data set that contains variables of interest that help to achieve the study objectives. It is also nationally representative data that reflects the urban areas of Kenya. Since it is panel data, it was the most suitable data set to track household expenditure over time and assessing the socio-economic effects of the Coronavirus disease pandemic on household expenditures.

3.7: Ethical considerations.

The study used the high frequency phone survey data obtained from a study being conducted by the World Bank in partnership with the University of California, Berkeley and KNBS. Data was available on request and did not contain any personally identifying information; hence, no ethical approval was required.

CHAPTER FOUR: RESULTS

4.1: Introduction

This chapter presents the empirical results and discussions on the socio-economic effects of COVID-19 on household's expenditures in the urban areas of Kenya. The findings are presented in accordance with specified objectives in chapter one.

4.2: Descriptive statistics

Table 4.1 presents the descriptive characteristics of the households surveyed. A total of 6,903 urban households were surveyed in the four waves. In wave 1, 1,495 households were interviewed while in wave 2, wave 3 and wave 4, 1,611, 1,916 and 1,881 households were interviewed respectively. The same households were interviewed every two months. However, sampled households that were not reached in earlier waves were also contacted along with households that were interviewed before which explains the increase in the sample in the subsequent waves.

In all four waves, the youngest household head was 18 years while the oldest was 92 years. The mean age of the respondents remained almost the same in wave 1 (mean=41.2 years, SD= 13.3), wave 2 (mean=41.4 years, SD=13.4), wave 3 (mean=39.8 years, SD=13.5) and wave 4 (mean=40.4 years, SD=13.4). A higher proportion of households were headed by males in wave 1 (66.0%), wave 2 (66.1%), wave 3 (62.8%) and wave 4 (57.0%) compared to the proportion of female-headed households in all four waves (wave 1 - 34.0%, wave 2 - 33.9%, wave 3 - 37.2% and wave 4 - 43.0%).

There were only slight differences in education levels across all four waves. 42.0 percent in wave 1, 39.3% in wave 2, 39.4% in wave 3 and 41.3% in wave 4 had primary/vocational education. Moreover, over 30% and at least 25% had attained secondary education and had tertiary education respectively in all the four waves. The majority of the respondents in the four waves were married (wave 1 - 64.2%, wave 2 - 62.9%, wave 3 - 59.9%, and wave 4 - 56.0%). Though reducing across waves, unemployment was relatively high among respondents in all the four waves (wave 1 - 82.5%, wave 2 - 81.5%, wave 3 - 77.0% and wave 4 - 68.6%). In addition, a higher proportion of household heads in all the four waves did not have health insurance (wave 1 - 57.5%, wave 2 - 59.6%, wave 3 - 60.2%,

wave 4 - 60.2%). The number of persons per households in all the waves varied from a minimum of 1 to a maximum of 27. The mean household size was high in wave 1 (mean=4.0, SD= 2.7) and wave 2 (mean=4.1, SD=2.6) in comparison to wave 3 (mean=3.3, SD=2.1) and wave 4 (mean=3.1, SD=2.1). The mean price of food and non-food items/services was higher in wave 1 (mean=2606) compared to wave 2 (mean=244.8), wave 3 (mean=302.5) and wave 4 (452.4). There was a huge two-week income variation for households with the lowest being Ksh 0 and the highest being Ksh 470,000 in the four waves. The mean of household's two-week income was Ksh 2468.5 (SD=1476.3) in wave 1, Ksh 3585.4 (SD=16,147.0) in wave 2, Ksh 2772.4 (SD=7190.8) and Ksh 4554.9 (SD=11,176.2) in wave 4.

Similarly, there was also variation in household's one-week expenditures with the lowest weekly expenditure being Ksh 0 while the highest weekly expenditure being Ksh 113,000 across all the four waves. In wave 1, the mean of the household's one-week expenditure was Ksh 3527.1 (SD=5112.4). This was followed by an increase in the mean of the household's one-week expenditure in wave 2 to Ksh 4021.1 (SD=4864.5). However, in wave 3, there was a decline in households one-week expenditure to Ksh 3583.6 (SD=3785.1) but by the time of wave 4 survey, there was an increase in the mean household one-week expenditures to Ksh 4594.2 (SD=5095.9).

Household's one-week expenditure was always greater than the two-week earnings across all the four waves. This implies that current expenditure is not solely determined by current income. Households can supplement their current income with savings or borrowing to meet or maintain their expenditures.

The P-value was used to test whether the difference between household heads characteristics and households characteristics across the four waves was statistically significant or not. At a 5% significance level, the differences between the household head characteristics and household characteristics was statistically significant.

Table 4.1: Descriptive statistics of households by wave of interviews

Characteristic	Wave 1 N = 1495 n (%)	Wave 2 N = 1611 n (%)	Wave 3 N=1916 n (%)	Wave 4 N=1881 n (%)	P-value
Current age in years	0	0	0	0	<0.001
Minimum value	18	18	18	18	
Maximum value	90	89	92	92	
Mean age (standard deviation)	41.2 (13.3)	41.4 (13.4)	39.8 (13.5)	40.4(13.4)	
Gender					<0.001
Male	987 (66.0)	1,065 (66.1)	1,204 (62.8)	1,073 (57.0)	
Female	508 (34.0)	546 (33.9)	712 (37.2)	808 (43.0)	
Highest level of education					0.048
Never attended school	30 (2.6)	43 (2.7)	31 (2.9)	26 (2.7)	
Primary/vocational	477 (42.1)	633 (39.3)	428 (39.4)	395 (41.3)	
Secondary	335 (29.6)	499 (31.0)	320 (29.5)	274 (28.7)	
College/university	291 (25.7)	436 (27.1)	306 (28.2)	261 (27.3)	
Marital status					<0.001
Never married	235 (16.1)	276 (17.7)	382 (23.4)	366 (24.1)	
Married	936 (64.2)	982 (62.9)	979 (59.9)	849 (56.0)	
Separated/divorced	148 (10.1)	158 (10.1)	155 (9.5)	161 (10.6)	
Widowed	140 (9.6)	145 (9.3)	119 (7.3)	140 (9.2)	
Employment status					<0.001
Employed	261 (17.5)	251 (18.5)	339 (23.0)	540 (31.4)	
Unemployed	1,234 (82.5)	1,103 (81.5)	1,138 (77.0)	1,178 (68.6)	
Insurance status					0.036
Insured	636 (42.5)	643 (40.4)	656 (39.8)	607 (39.8)	
Not insured	859 (57.5)	948 (59.6)	994 (60.2)	918 (60.2)	
Household size	1	1	1	1	<0.001
Minimum value	27	26	14	17	
Maximum value	4.0 (2.7)	4.1 (2.6)	3.3 (2.1)	3.1 (2.1)	
Mean (standard deviation)					
Income					<0.001
Minimum value	0	0	0	0	
Maximum value	470,000	439,000	75,000	295,000	
Mean	2468.5	3585.4	2772.4	4554.9	
(standard deviation)	(14796.3)	(16147.0)	(7190.8)	(11176.2)	

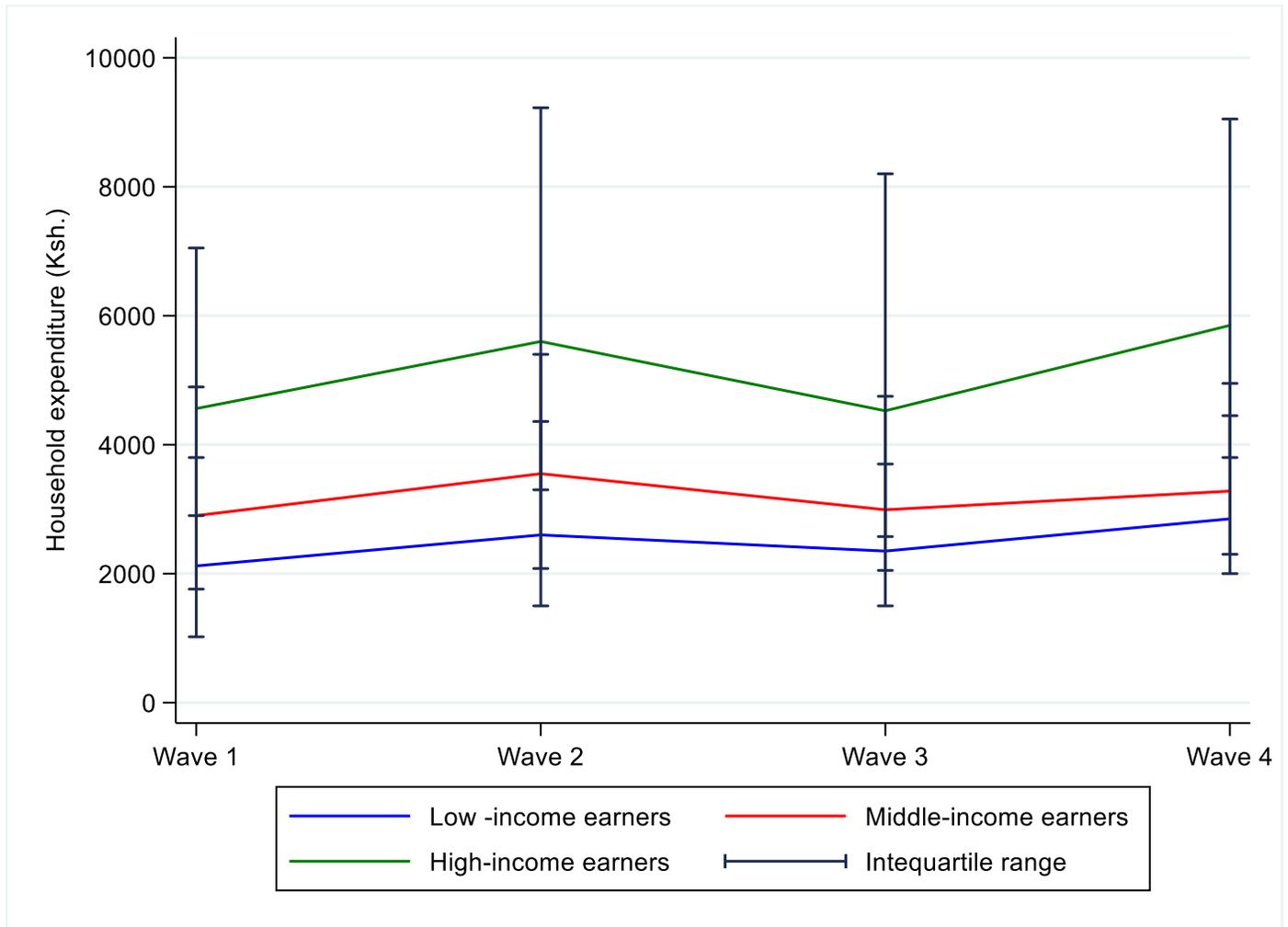
Characteristic	Wave 1 N = 1495 n (%)	Wave 2 N = 1611 n (%)	Wave 3 N=1916 n (%)	Wave 4 N=1881 n (%)	P-value
Price of food and non-food items/services					<0.001
Minimum value	0	0	0	0	
Maximum value	41,100	7,175	8,140	15,020	
Mean (standard deviation)	2606.5 (4843.3)	142.2 (244.8)	124.9 (302.5)	151.0 (452.4)	
Household expenditures					<0.001
Minimum value	0	0	0	0	
Maximum value	113,000	101,300	86,600	100,500	
Mean (standard deviation)	3527.1 (5112.4)	4021.1 (4864.5)	3583.6 (3785.1)	4594.2 (5095.9)	

Source: Author's computation

4.3: Households' expenditure pattern in the COVID-19 period

On average, household's one-week expenditures was high for all income groups from wave 1 to wave 2. However, from wave 2 to wave 3, the one-week household expenditures declined for all the income groups but with the drop of expenditures being relatively high for high-income earners. Similarly, from wave 3 to wave 4, the average one-week household expenditures increased for all income groups with the increase being significantly high for high-income earners compared to other income groups as shown in Figure 4.1. Generally, the one-week expenditure pattern of households during the COVID-19 –pandemic across the four waves was the same for all the income groups. The difference came only in terms of the magnitude of the decline or increase in the one-week expenditure. This pattern exhibits that consumers behave the same way when it comes to their household expenditures regardless of what income group they belong to when they are faced with an economic shock caused by a pandemic such as COVID-19.

Figure 4.1: One-week Household Expenditure Pattern by Income Groups



** Interquartile range shows how spread out the data points of household expenditures was from the mean*

Source: Author’s computation

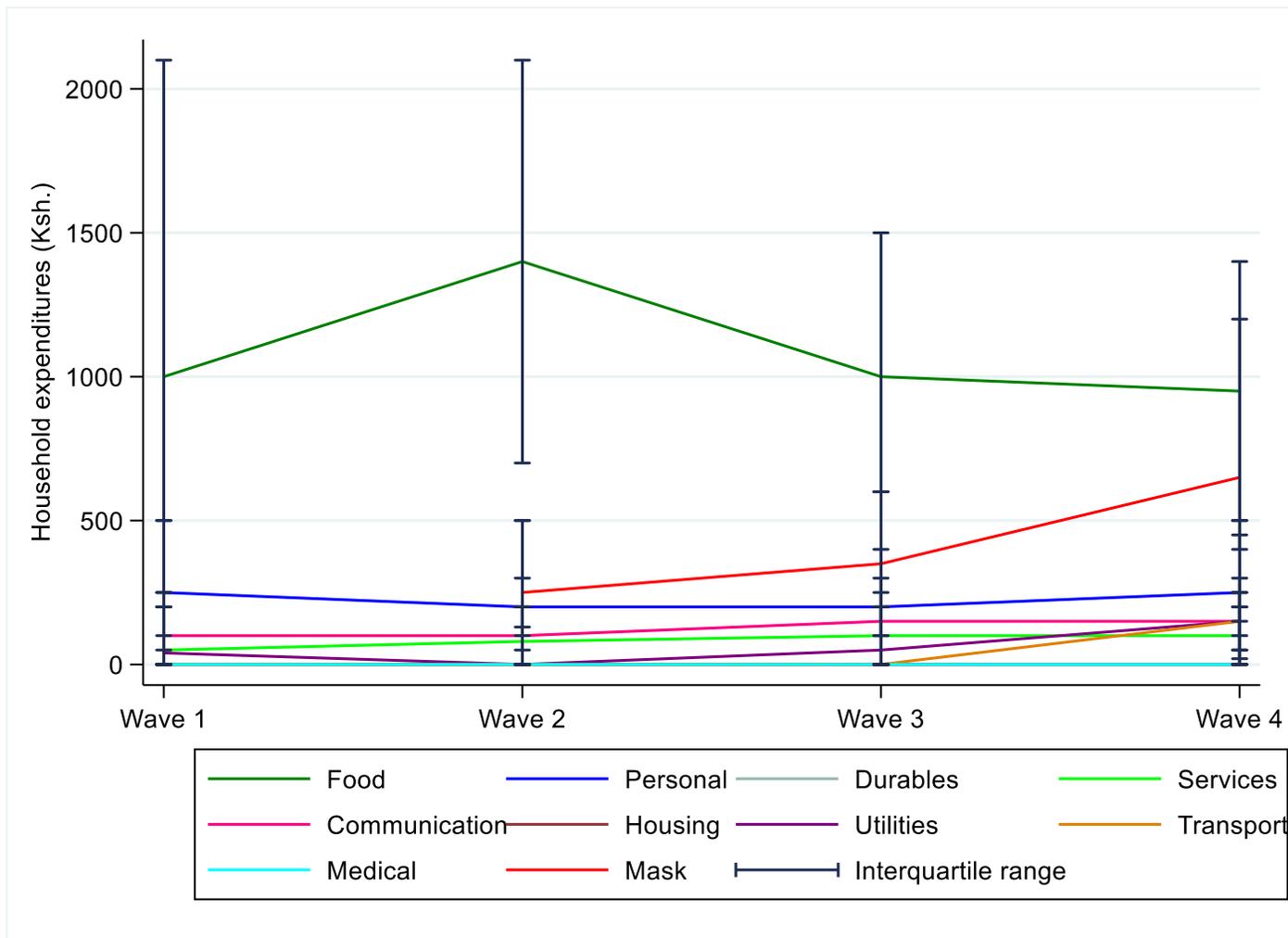
4.4: Categories of household expenditure made in the COVID-19 period

Figure 4.2 shows that the average one-week expenditure on food in all four waves remained significantly high compared to non-food expenditures. From wave 1 to wave 2, there was a rise in the average spending on food however, from wave 2 to wave 3, there was a decline in the average amount spent on food to the level it was in wave 1. Households maintained their average food expenditures from wave 3 to wave 4.

Regarding non-food expenditures, the average expenditure on masks was relatively high in comparison to other non-food expenditures and kept on increasing from wave 2 to wave 4. Households expenditure on other non-food items remained relatively low throughout the four waves and was prioritized in the following order; personal items (e.g. toiletries, cosmetics etc.), communication, services (e.g. haircuts, recreation etc.) and utilities (e.g. water, electricity, charcoal etc.) respectively. On average, households spent the least amount of money on assets/durables, housing, transport and medical expenses although spending on transport slightly increased from wave 3 to wave 4.

Overall, urban households had different expenditures that needed to be incurred during the pandemic. However, they had to make decisions on what items were to be prioritized hence why households spent more on food than on non-food and more on masks than any other non-food expenditure. This shows the comparability behavior of consumers when faced with a list of items from which they are supposed to choose. Often, consumers compare the items based on the utility they obtain from the items and their budget constraints.

Figure 4.2: Overall One-week Household Expenditures by Expense Type



* Interquartile range shows how spread out the data points of the expenses was, from the median

Source: Author's computation

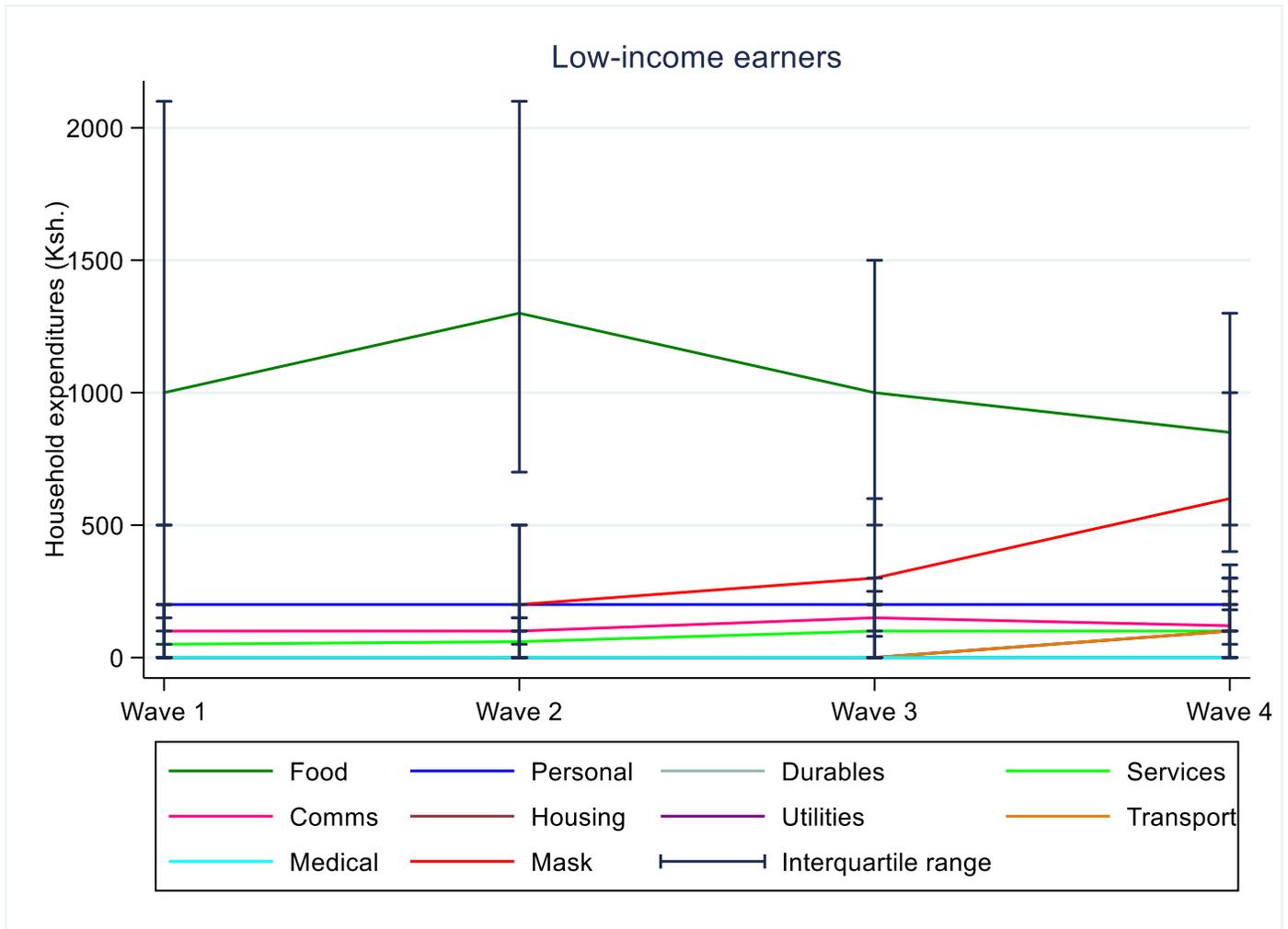
4.4.1: Households expenditure by expense type and income group

On average, households spent more on food as compared to non-food items regardless of the income group they belonged to. For the low-income earners and high-income earners, their average expenditure on food rose between wave 1 and wave 2 before starting to decline from wave 2 through to wave 4 as shown in Figures 4.3 and 4.5.

However, for middle-income earners, their average food expenditure kept on declining from wave 1 until wave 4 as illustrated in Figure 4.4. The average expenditure on masks was competing with food expenditure as it kept on rising although remained being below the average expenditure on food. However, for high-income earners, the average expenditure on masks and food reached a point of intersection in wave 4. For high-income earners, the average expenditure on communication increased between wave 1 and wave 2 before declining between wave 2 and wave 3 and then stabilizing from wave 3 to wave 4. This was different for low and middle-income earners whose average expenditure on communication remained almost the same in all four waves. While low-income earners average expenditure on personal items remained almost at the same level in between the waves, for middle and high-income earners, there was a decline in the average expenditure on personal items more so between wave 2 and wave 3. The average expenditure on transport rose at different times of the interview waves for different income groups. For instance, the average expenditure on transport slightly rose between wave 3 and wave 4 for low-income earners while for middle-income earners it rose between wave 2 and wave 4. As for the high-income earners, the average transport expenditure rose from wave 1 to wave 3 and only stabilized between wave 3 and wave 4. In general, families spent less on medical-related costs regardless of the income group they belonged to as shown in Figures 4.3, 4.4 and 4.5.

These findings show that the expenditure type made by households during the COVID-19 pandemic for the different income groups was dependent on what they needed at different points in time across the four waves subject to their individual budget constraints.

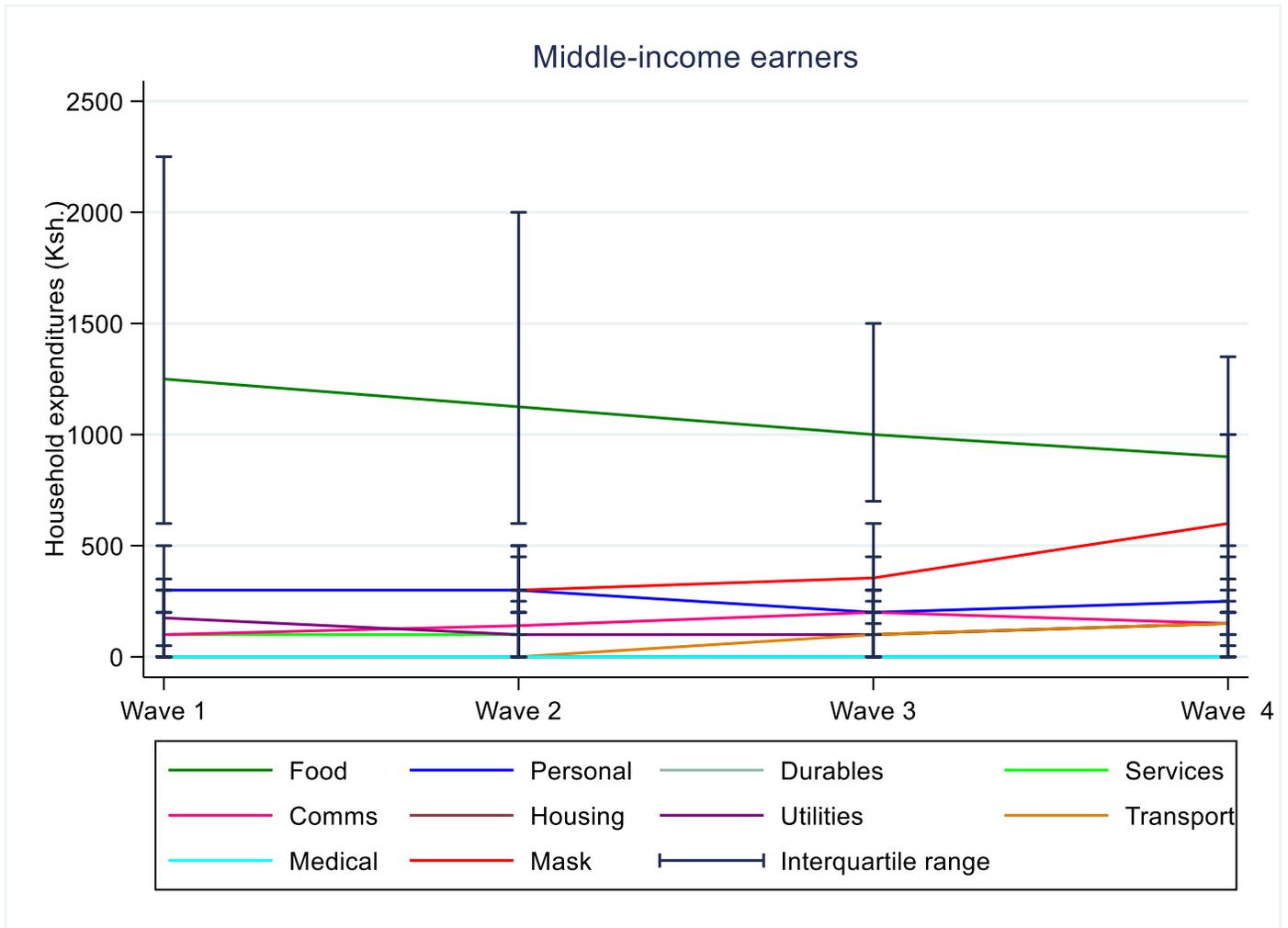
Figure 4.3: One-week Household Expenditures by Expense Type for Low-Income Earners



* Interquartile range shows how spread out the data points of the expenses made by low-income earners was, from the median

Source: Author's computation

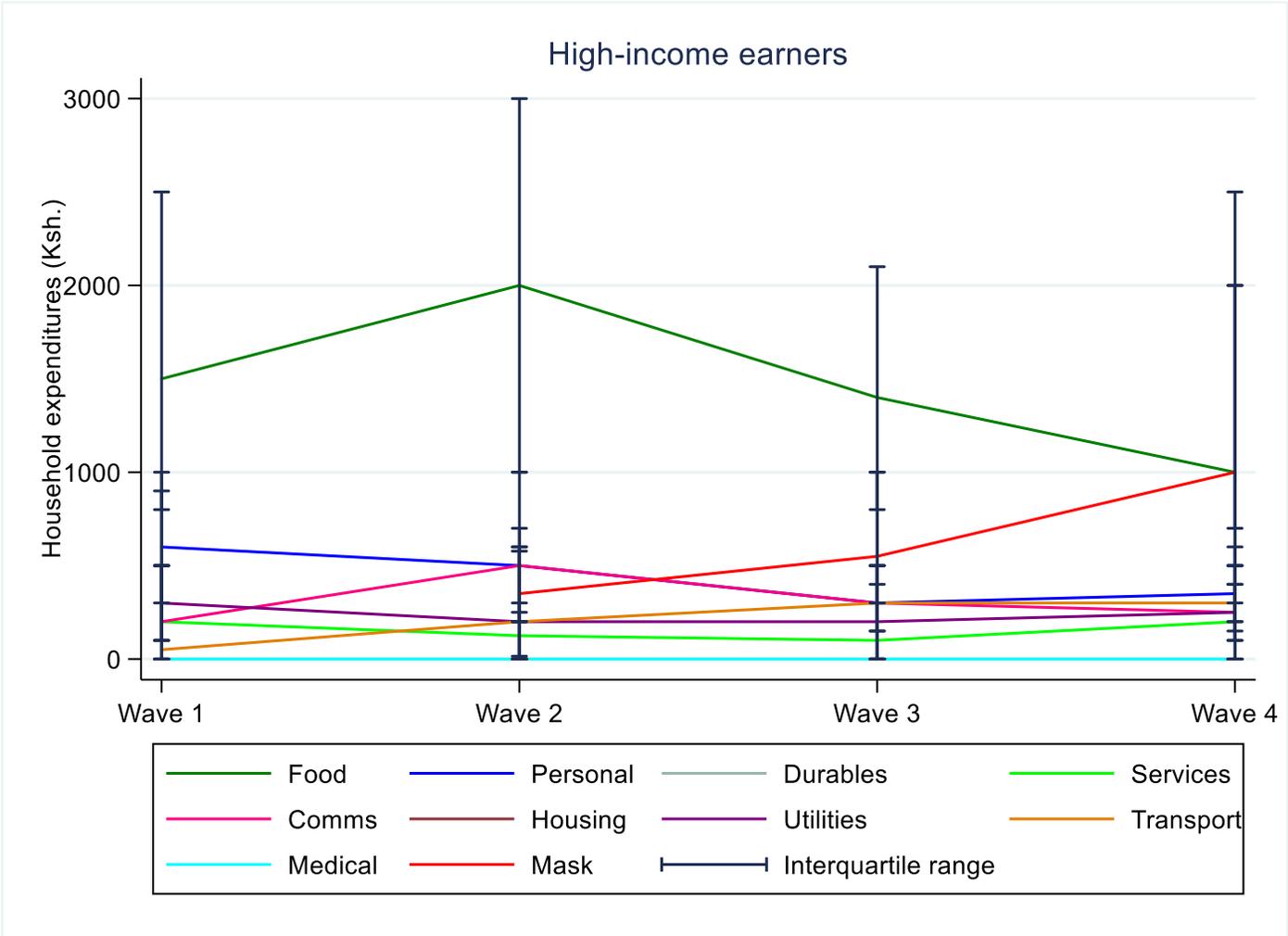
Figure 4.4: One-week Household Expenditures by Expense type for Middle-Income Earners



* Interquartile range shows how spread out the data points of the expenses made by middle-income earners was, from the median

Source: Author's computation

Figure 4.5: One-week Household Expenditures by Expense type for High-Income Earners



* Interquartile range shows how spread out the data points of the expenses made by high-income earners was, from the median

Source: Author's computation

4.5: Diagnostic tests

4.5.1 Normality test

The normality test was done using the Shapiro-Wilk test to test if the variables included in this study were normally distributed or not as shown in Table 4.2.

Table 4.2: Normality Test Results

Observations	Observations	Test statistic	Prob>z
Household size	6,903	13.879	0.00000
Head_gender	6,903	1.342	0.91021
Head_age	6,903	14.087	0.00000
Head_employment status	6,903	2.579	0.00496
Head_marital status	6,903	11.900	0.00000
Head_education	6,903	8.614	0.00000
Head_insurance status	6,903	2.541	0.99447
Asset ownership	6,903	5.154	0.00000
Price	6,903	20.818	0.00000
Income	6,903	20.514	0.00000
Household expenditures	6,903	19.748	0.00000

Source: Author's computation

From Table 4.2, at a 5% significance level, we rejected the null hypothesis for the majority of variables that they were normally distributed. Only the gender of household head and insurance status of household head p-value displayed normal distribution. To correct for this, we transformed the household's expenditure into logarithm form since the residuals were normally distributed.

4.5.2: Multicollinearity test

Correlation analysis was conducted to find out the nature of the relationship of the independent variables. From Table 4.3, we conclude that we do not have multicollinearity problem amongst the independent variables since these values are below the benchmark of 0.8 (Gujarati, 2004).

Table 4.3: Correlation matrix for independent variables

	Household size	Gender	Age	Employment status	Marital status	Education	Insurance	Asset ownership	Income	Price
Household size	1.000									
Gender	-0.075	1.000								
Age	0.175	-0.026	1.000							
Employment status	-0.136	-0.102	-0.164	1.000						
Marital status	0.143	0.243	0.417	-0.112	1.000					
Education level	-0.121	-0.081	-0.283	0.206	-0.246	1.000				
Insurance status	-0.025	-0.081	-0.021	0.219	-0.065	0.340	1.000			
Asset ownership	0.041	0.003	-0.037	0.119	-0.012	0.076	0.029	1.000		
Income	0.034	-0.072	-0.027	0.268	-0.038	0.106	0.136	0.061	1.000	
Price	0.0353	-0.0386	0.0159	-0.0279	0.0120	-0.0078	0.0410	0.0052	-0.0090	1.0000

Source: Author's computation

4.5.3: Hausman test

The Hausman test was conducted to find out which between FE model and RE model was most suitable. The null hypothesis is that RE model is appropriate while the alternative hypothesis is that FE model is appropriate. The output of the result is shown in Table 4.4.

Table 4.4: Hausman test for fixed effects and random effects model

Independent variables	Coefficients			
	(b)	(B)	(b-B)	Sqrt (diag(V_b-V_B))
	Fixed Effects	Random Effects	Difference	S.E.
Income	0.000103	7.87e-06	0.0000951	0.0000157
Price	-0.0001109	-0.0000112	-0.0000997	0.0000206
Age	-0.0998756	-0.0062367	-0.0936389	0.22229
Employment status	0.1964566	0.231375	-0.0349184	0.2919923
Household size	0.0333004	0.0509726	-0.0176722	0.1286913
Prob>chi2 = 0.9794				

Source: Author's computation

From Table 4.4, we failed to reject the null hypothesis since the p-value of chi2 was greater than 0.05 and our significance level was 5%. We, therefore, concluded that random effects model was the most appropriate model to use in our study.

4.5.4: Heteroscedasticity test

We conducted a heteroscedasticity test using Breusch Pagan Lagrange Multiplier test to find out whether variance of error term varied across observations or it was constant. From Table 4.5, with a significance of 5%, we failed to reject the null hypothesis and hence we concluded that we did not have a heteroscedasticity problem.

Table 4.5: Breusch Pagan Lagrange Multiplier test for heteroscedasticity

Test statistics	P-value	Null hypothesis	Alternative hypothesis
0.01	0.4627	Homoscedasticity	Heteroscedasticity

Source: Author's computation

4.5.5: Autocorrelation test

We used the Wooldridge test to test for serial correlation. Output from Table 4.6 shows that our p-value was significant. Therefore, with a significance of 5%, we rejected the null hypothesis, and hence we concluded that there was a first-order autocorrelation. To correct for this, we used robust standard errors during the final regression analysis.

Table 4.6: Wooldridge test for autocorrelation in panel data

Test statistics	P-value	Null hypothesis	Alternative hypothesis
24.4	0.000	No first-order autocorrelation	First-order autocorrelation

Source: Author's computation

4.6: Model estimation and interpretation

4.6.1: Bivariate analysis

We estimated the effect of each independent variable on household expenditure using the RE model. All variables that we had selected to be included to estimate household expenditures were significant at 5% significance level. From the bivariate analysis, we found that, for every one-unit increase in two-week earnings, one-week household expenditure does increase by a negligible percentage. Similarly, when there is an increase in household size by one -unit, one-week household expenditures increases by 3.2%. In addition, when households heads are on a higher education level, are employed, have health insurance translates to an increase in one-week household expenditures by 26.3%, 51.8% and 40.0% respectively. On the other hand, an increase in one unit in the prices of items, causes families to reduce their one-week household expenditures but by a very small percentage. Likewise, as the age of the household head increases, their one week- household expenditure also decreases. Married household heads and female-headed households incur less one-week household expenditures compared to unmarried household heads and male-headed households respectively as shown in Table 4.7.

Table 4.7: Bivariate Analysis Output

	Coefficients	Standard error	P-value
Household expenditures (Y)			
Income	0.0000128 (0.0013)	8.32e-07	0.000*
Price	-0.0000111 (-0.0011)	4.06e-06	0.006*
Age	-0.0081909 (-0.8157)	0.0008682	0.000*
Household size	0.0313348 (3.1831)	0.0046906	0.000*
Marital status (<i>base=not married</i>)	-0.0401090 (-3.9315)	0.0323419	0.000*
Education (<i>base = no education</i>)	0.2334264 (26.2919)	0.0923845	0.012*
Employment status (<i>base=not employed</i>)	0.4172718 (51.7815)	0.0272256	0.000*
Gender (<i>base=male</i>)	-0.106068 (-10.0637)	0.0239855	0.000*
Insurance (<i>base=not insured</i>)	0.3217799 (37.9581)	0.0257718	0.000*

Legend: * -indicate that the values are significant at 5% significance level.

Source: Author's computation

4.6.2: Multivariate analysis

We included all the independent variables from the bivariate analysis since they all did have a significant effect on one-week household expenditures. We estimated four models using the RE model. In model 1, we did a pooled analysis to find out the net effect of the independent variables i.e. income, price, age of household head, household size, marital status of household head, education level of household head, employment status of household head, gender of household head and insurance status of the household head on one-week household expenditures. On the other hand, model 2, model 3 and model 4, enabled us to do disaggregated analysis by income levels for low-income earners, middle-income earners and high-income earners respectively as shown in Table 4.8.

Table 4.8: Socio-economic Effects of COVID-19 on One-Week Expenditure of Urban Households.

		Log coefficients (Back transformed in %)	Robust Standard Error	Test statistic	P-value	Statistics	
Variation in Household Expenditures For All Income groups							
Model 1	Income	6.78e-06 (0.0007)	9.82e-07	6.90	0.000*	Wald chi2(14) = 412.77 Prob > chi2 = 0.0000 R ² within = 0.0227 between = 0.1805 overall = 0.1135 rho_ar - 0.1973 sigma_u - 0.1513 sigma_e - 0.8214 rho_fov -0.0328	
	Price	-0.000012 (-0.0012)	4.68e-06	-2.57	0.010*		
	Age	-0.004608 (-0.4598)	0.001290	-3.57	0.000*		
	Household size	0.044130 (4.5119)	0.006244	7.07	0.000*		
	Marital status (<i>base=not married</i>)	-0.000402 (-0.0402)	0.048978	-0.01	0.993		
	Education (<i>base = no education</i>)	Primary	0.083413 (8.6991)	0.100091	0.83		0.405
		Secondary	0.226798 (25.4576)	0.102125	2.22		0.026*
		Tertiary	0.367051(44.3473)	0.104255	3.52		0.000*
	Employment status (<i>base=not employed</i>)	0.2243362 (25.1492)	0.036076	6.22	0.000*		
	Gender (<i>base=male</i>)	-0.041377 (-4.0532)	0.038676	-1.07	0.285		
Insurance (<i>base=not insured</i>)	0.149735 (16.1526)	0.033402	4.48	0.000*			
Constant	7.653689 (2108.4092)	0.121179	63.16	0.000			
Variation in Household Expenditure for Low- Income Earners							
Model 2	Price	-0.000011 (-0.0011)	5.59e-06	-1.94	0.050*	Wald chi2(13) = 167.34 Prob > chi2 = 0.0000 R ² within = 0.0032 between = 0.0976 overall = 0.0697 rho_ar - 0.2292 sigma_u - 0.0000 sigma_e - 0.8210 rho_fov - 0.0000	
	Age	-0.006127 (-0.6109)	0.001546	-3.96	0.000*		
	Household size	0.047850 (4.9013)	0.007850	6.09	0.000*		
	Marital status (<i>base=not married</i>)	-0.012816 (-1.2735)	0.062346	-0.21	0.837		
	Education (<i>base = no education</i>)	0.069862 (-7.2361)	0.113522	0.62	0.802		
	Employment status (<i>base=not employed</i>)	0.242645 (27.4617)	0.072921	3.33	0.001*		
	Gender (<i>base=male</i>)	-0.039689 (-3.8912)	0.047835	-0.83	0.407		
	Insurance (<i>base=not insured</i>)	0.124599 (13.2695)	0.041906	2.97	0.003*		
	Constant	7.678040 (2160.3813)	0.141234	54.36	0.000		

		Variation in Household Expenditure for Middle- Income Earners					
Model 3 Middle Income Earners	Price	-0.000011 (-0.0011)	9.78e-06	-1.11	0.268	Wald chi2(13) = 49.40 Prob > chi2 = 0.0000 R ² within = 0.0025 between = 0.0708 overall = 0.0582 rho_ar - 0.2292 sigma_u - 0.0000 sigma_e - 0.8210 rho_fov - 0.0000	
	Age	-0.002313 (-0.2310)	0.002233	-1.04	0.300		
	Household size	0.031963 (3.2479)	0.011242	2.84	0.004*		
	Marital status (<i>base=not married</i>)	0.027969 (2.8364)	0.077622	0.36	0.719		
	Education (<i>base = no education</i>)	0.026341 (2.6691)	0.232887	0.11	0.910		
	Employment status (<i>base=not employed</i>)	-0.061976 (-6.0095)	0.049090	-1.26	0.207		
	Gender (<i>base=male</i>)	-0.043738 (-4.2788)	0.064595	-0.68	0.498		
	Insurance (<i>base=not insured</i>)	0.159923 (17.3421)	0.051390	3.11	0.002*		
	Constant	7.896314 (2687.3584)	0.258912	30.50	0.000		
		Variation in Household Expenditure for High- Income Earners					
Model 4: High Income Earners	Price	-7.05e-06 (-0.0007)	0.000019	-0.37	0.712	Wald chi2(13) = 37.57 Prob > chi2 = 0.0003 R ² within = 0.0305 between = 0.1086 overall = 0.0901 rho_ar - 0.2731 sigma_u - 0.0000 sigma_e - 0.7633 rho_fov - 0.0000	
	Age	0.000662 (0.0662)	0.004044	0.16	0.870		
	Household size	0.057575 (5.9265)	0.014639	3.93	0.000*		
	Marital status (<i>base=not married</i>)	-0.105688 (-10.0295)	0.123820	-0.85	0.393		
	Education (<i>base = no education</i>)	0.222573 (24.9287)	0.358577	0.62	0.535		
	Employment status (<i>base=not employed</i>)	-0.035891 (-3.5255)	0.092304	-0.39	0.697		
	Gender (<i>base=male</i>)	0.122762 (13.0616)	0.113991	1.08	0.282		
	Insurance (<i>base=not insured</i>)	0.073617 (7.6394)	0.094339	0.78	0.435		
	Constant	7.896401 (2687.5923)	0.408228	19.34	0.000		

Note-* indicates value is significant at 5% significance level.

Source: Author's computation

In model one, the regression analysis output shows that it is only the gender of the household head and marital status of the household head that did not have a significant effect on one week-household expenditure. However, a study conducted by Population Council in 2020, found that the gender of the household head had a significant effect on household expenditures. The variation could be because, for them, they looked at total monthly expenditure while for our case, we referred to one-week household expenditures. The remaining independent variables had a significant effect on household expenditures. Specifically, as household two-week earnings increased by one unit, the household's one-week expenditure increased but the percentage increase was less than 1%. This shows that current income has a positive effect on current household expenditure. Similarly, an increase in household size by one unit resulted in a 4.5% increase in the household's one-week expenditures. This implies that when many people are at home, the rate of consumption increases making households to spend more.

Employment status, education level and insurance status of the household head were also associated with a positive effect on one-week household expenditures. Households with higher education levels i.e. secondary or tertiary education incurred a 25.5% and 44.3% increase in their one-week household expenditures respectively as compared to those with primary education or no education at all. This could be because household heads with higher education levels are likely to earn more because of their qualifications and hence spend more. Regarding the employment status of household heads, an increase in one unit of the number of employed household heads led to an increase in household's one-week expenditures by 25.1%. This could be because employed individuals often have a consistent source of income hence they are able to spend more as compared to unemployed individuals whose income is inconsistent. Similarly, a one-unit increase in household's heads who have insurance caused a 16.2% increase in household's one-week expenditures. On the other hand, a one-unit increase in the price of items led to a decline in household expenditures by a negligible percentage. This could be because as prices increase, households cut down on the cost of items that are not

essential. In addition, an increase in the age of the household head by one unit caused a decrease in household percentage by less than 1%.

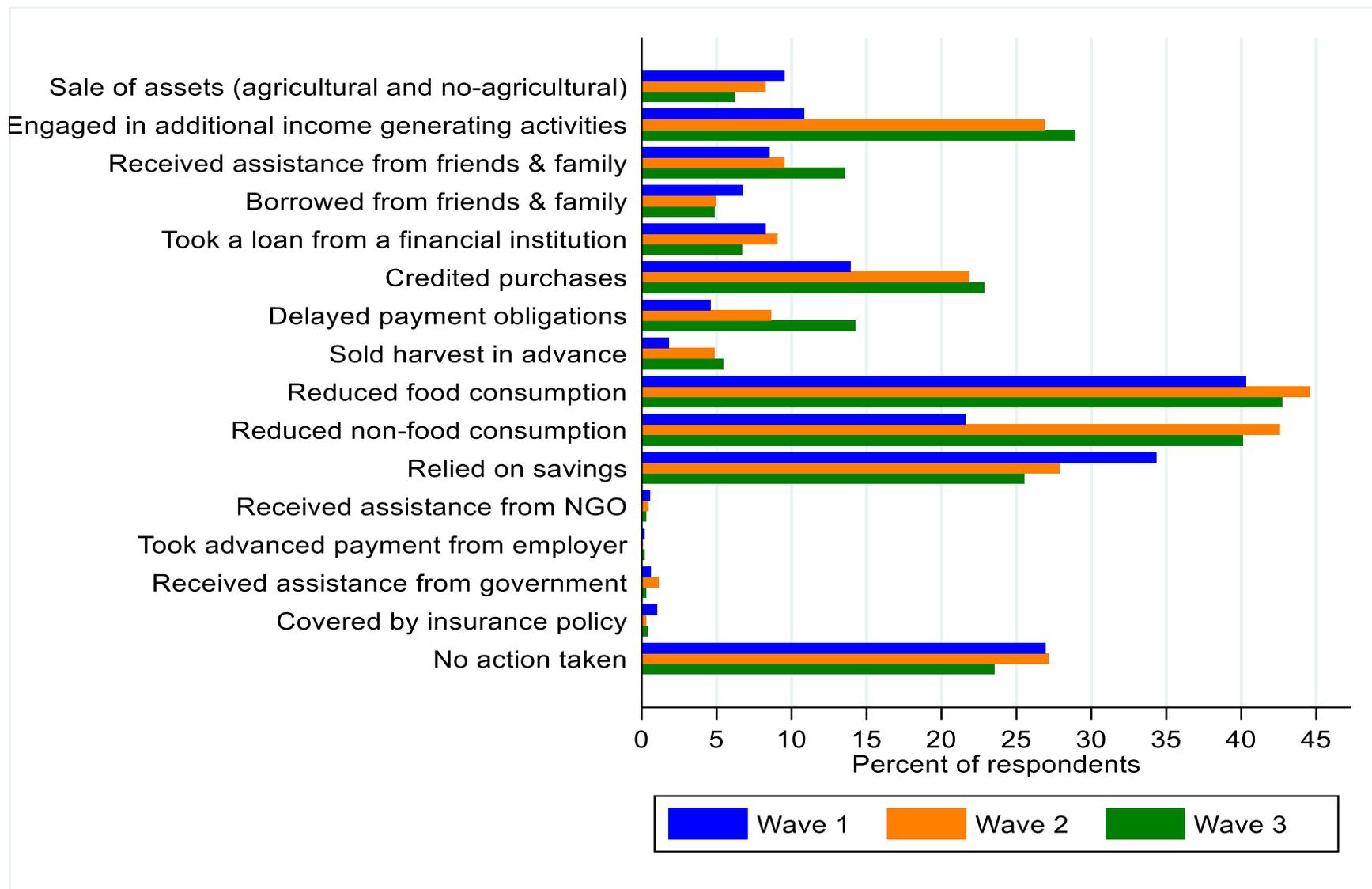
The results from model two, model three and model four show that the factors that affected household expenditures differed from one income group to the other except for household size, which had a significant effect on household expenditures for all the income groups. For low-income earners, a one-unit increase in household size led to a 4.9% increase in household's one-week expenditures. On other hand, a one-unit increase in household size for middle-income earners, led to household expenditures increasing by 3.2%. Similarly, an increase in household size for high-income earners by one unit caused a 5.9% increase in household's one-week expenditures. Household size was the only determinant of household's expenditures for high-income earners. This could be because high-income earners income or jobs may have not have been affected by COVID-19. After all, they most likely have stable jobs, businesses and/or adequate savings or multiple sources of income and hence their expenditure was not affected by these factors. However for household size, with the restrictions of working at home and school closures, many people were at home and this meant all households had to increase their expenditure to adjust with the increase in household size. Apart from household size, household head insurance status was also a determinant for changes in household's one-week expenditure for middle-income earners in the sense that, an increase in one unit of household heads who had insurance led to a 17.3% increase in household expenditures. Regarding low-income earners, a one-unit increase in the number of employed and insured household heads led to a 27.5% and 13.3% increase in one-week household expenditures respectively. However, for every unit increase in prices of items and age of household head, caused a decrease in household expenditures by less than 1%.

4.7: Coping strategies adopted by households in the COVID-19 period

The socio-economic effects of the pandemic made households to employ coping mechanisms to maintain or meet their expenditures. Reduction of food consumption was the key strategy that was adopted by households in all three waves. In wave 1, 40.0% of households reduced their food consumption. However, in wave 2, there was a slight

increase (44.9%) in the number of households who reduced their food consumption before this number slightly declining in wave 3 (42.5%). Additionally, only 22.0% of the respondents reduced their non-food consumption in wave 1 as opposed to 42.5% in wave 2 and 40% in wave 3 who did reduce their consumption of non-food items. Households relied more on their savings in wave 1 (34.8%) as compared to wave 2 (28.0%) and wave 3 (26%). More than 25.0% of the respondents engaged in additional income generating activities in wave 2 and wave 3 as opposed to about 11.0% in wave 1. Similarly, less than 5% of the respondents relied on receiving assistance from friends, non-governmental organizations (NGO's) and the government. Other coping strategies adopted by households are shown in Figure 4.6.

Figure 4.6: Household's Coping Mechanisms by Wave



4.7.1: Households coping mechanisms by income group and waves

Different income groups adopted different main coping strategy in different waves except for low-income earners who maintained reduction of food consumption as the key coping mechanism in all three waves. In wave 1, 42.5% of low-income earners reduced their food consumption as their main strategy for managing expenditure. On the other hand, 36.5% of middle-income earners, as well as 42.0% of high-income earners, relied on their savings as their key coping mechanism. In wave 2, about 47.0% of low-income earners still relied on reduction of food consumption as their key coping mechanism contrary to 47.1% of middle-income earners who reduced their non-food consumption as the key coping strategy and about 34.0% of high income-income earners who decided not to take any action. Similarly in wave 3, 44.9% of low-income earners reduced their food consumption as the key coping strategy while more than 40% of middle-income earners and 42.0% of high-income earners engaged in income generating activities as their main coping mechanisms as shown in Figures 4.7. 4.8 and 4.9.

Figure 4.7: Coping Mechanisms for Low-Income Earners by Waves

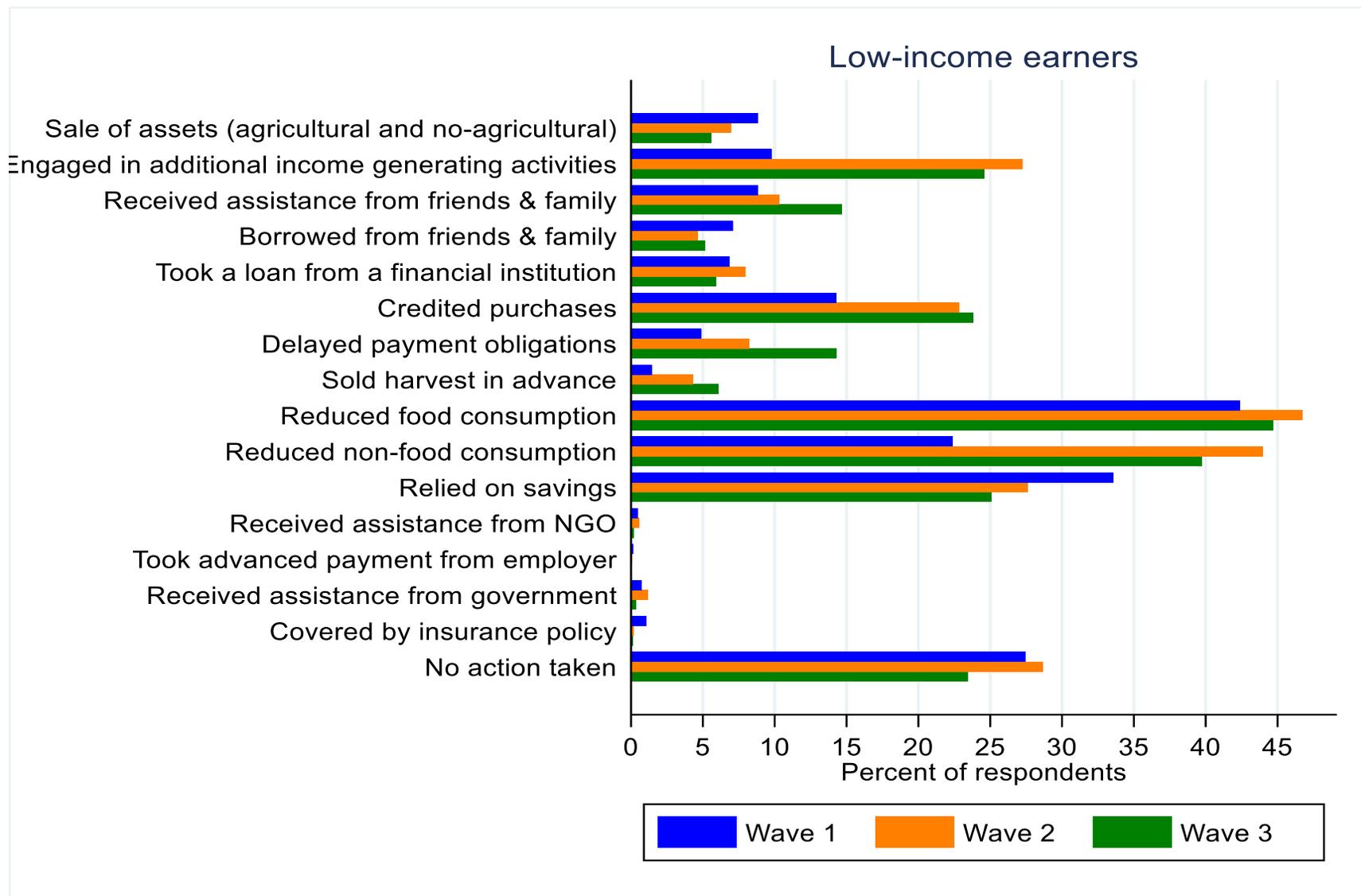


Figure 4.8: Coping Mechanisms for Middle-Income Earners by Waves

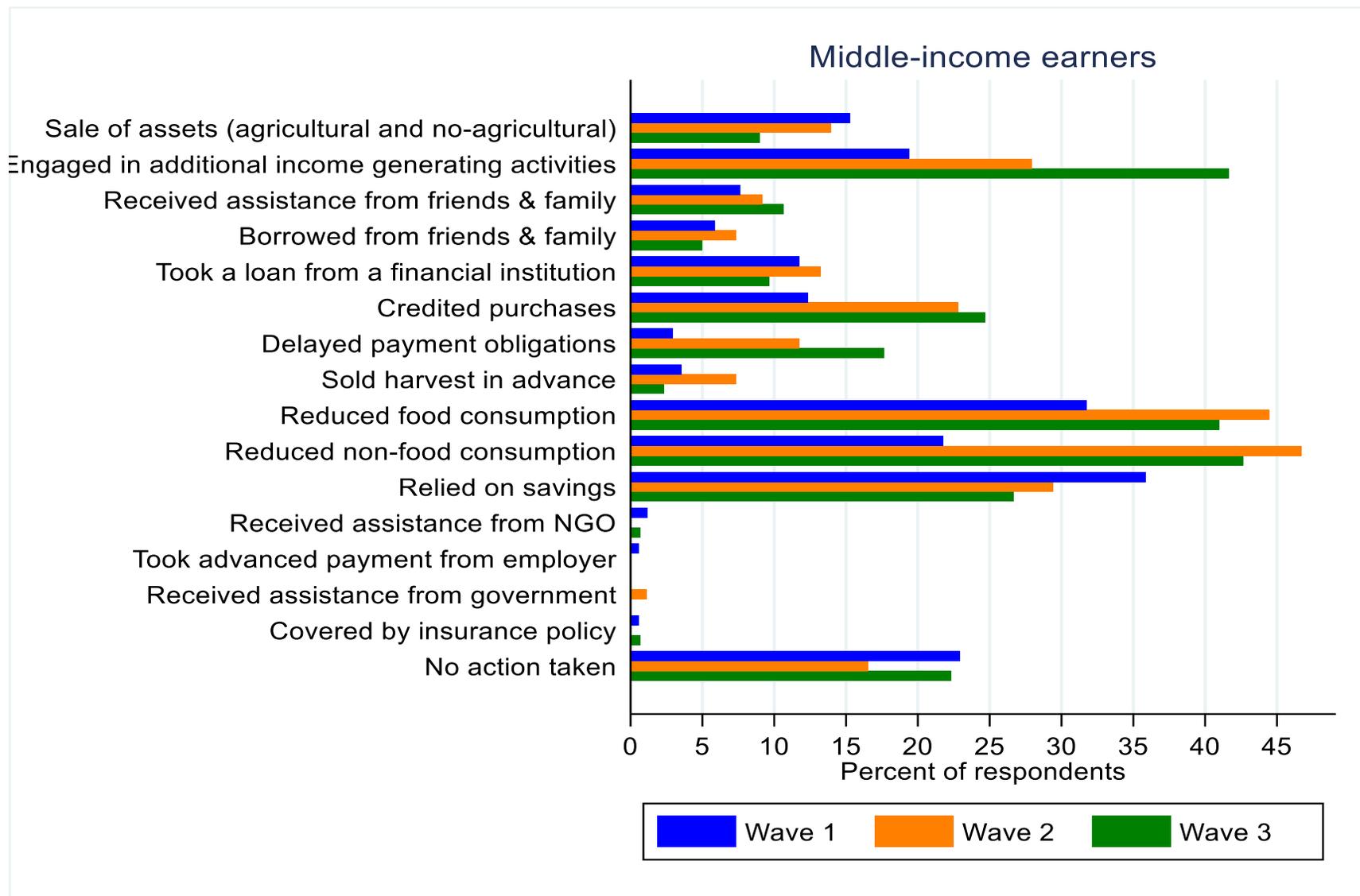
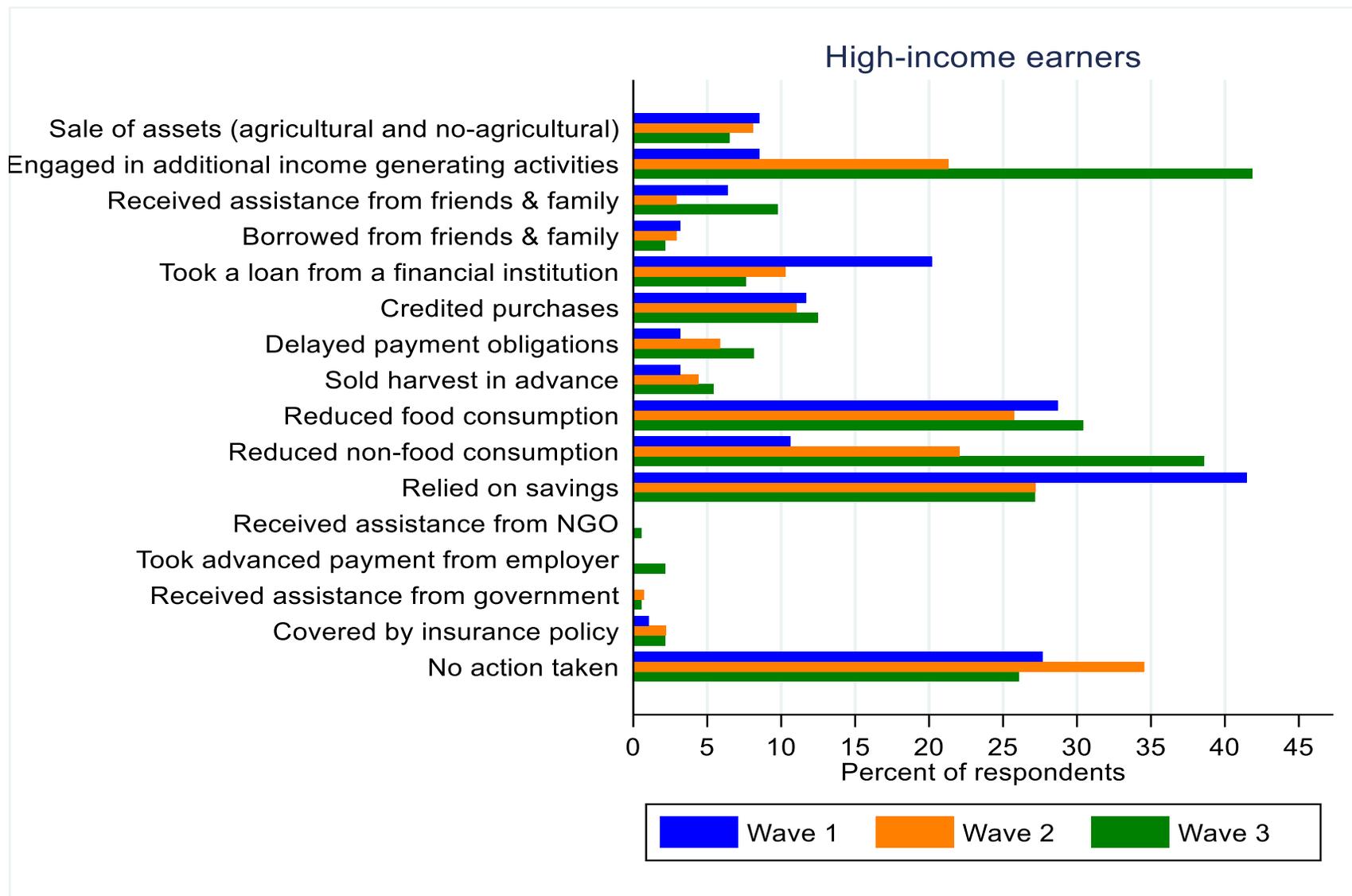


Figure 4.9: Coping Mechanisms for High-Income Earners by Waves



CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1: Introduction

In this chapter, we discuss the study findings in chapter four relating them to findings from similar studies and provide conclusions and recommendations.

5.2: Discussion of results

5.2.1: Households expenditure patterns in the COVID-19 period

In this study, we assessed the socio-economic effects of COVID-19 on household expenditures in the urban areas of Kenya using panel data. We first started by establishing the expenditure patterns of these households using line graphs. On average, urban household's one-week expenditures was high for all income groups from mid-May to mid-July 2020 (wave 1 and wave 2). On the other hand, from mid -July to mid-November 2020 (wave 2 and wave 3), the average one-week expenditures declined for all the income groups but with the drop of expenditures being relatively high for high-income earners. Similarly, from mid-September 2020 to the end of March 2021 (wave 3 and wave 4), the average household expenditures increased for all income groups with the increase being significantly high for high-income earners compared to other income groups.

These results are consistent with those of Chronopoulos et al. (2020) and Nicola et al. (2020) who attributed the initial spike in household spending being as a result of the stockpiling and panic buying behavior of households in anticipation of an increase in prices of goods and lock-down measures. The decline in household expenditures between wave 2 and wave 3 could be that with the stockpiling for many households in the initial period, they were able to transfer their expenditures from one period to the next period hence the expenditures declined. While our study found that the drop was significantly high for high-income earners than low-income earners, Andersen et.al (2020) found that the reverse was true. According to them, the drop in household expenditures for low-income earners was significantly higher than for high-income earners since they were more exposed to the adverse effects of the crisis in the form of job loss and loss of income. However, in our case the difference could be that given that high-income earners could have bought a lot of stock as compared to their counterparts could explain why their

one-week expenditures declined significantly as compared to low-income earners and middle-income earners. An increase in household expenditure between wave 3 and wave 4, could be because, with the reopening of schools, households incurred an additional expense of payment of school fees. Also with the festivities, households could have spent more as compared to when there were no festivities. High-income earners are expected to have spent more on both school fees and during festivities due to their financial capability. In general, the one-week expenditure pattern of households during the COVID-19 –pandemic across the four waves was the same for all the income groups. The difference came only in terms of the magnitude of the decline or increase in the one-week expenditure. This pattern exhibits that consumers behave the same way when it comes to their household expenditures regardless of what income group they belong to when they are faced with an economic shock caused by a pandemic such as COVID-19.

Similar to the findings of the Population Council (2020), the average food expenditure remained high for all income groups compared to non-food expenditures. The same results were found by Carvalho et al. (2020) who suggested that this trend was because of households postponing their expenditures of non-food commodities to a later period. The food expenditure trend was similar to the total one-week household expenditure trend for the period between wave 1 and wave 3. This implies that food expenditure contributed significantly to the variations in household expenditures. Nicola et al. (2020) termed food expenditure as the largest expense incurred by many households'. For low-income earners and high-income earners, the average one-week household expenditure on food rose first between wave 1 and wave 2 and then started declining between wave 2 and wave 4. However, for middle-income earners, the average food expenditure kept declining from wave 1 to wave 4.

Regarding non-food expenditures, the average expenditure on masks was relatively high in comparison to other items in this category. The expenditure on masks kept rising in all four waves for all income groups but remained below the food expenditure. This means that expenditure on masks also significantly contributed to the total one-week household expenditure. This high expenditure on the masks may be attributed to the fact that since it was a must requirement for everyone to wear masks, all households regardless of the

income group had to incur mask expenditure. Personal items expense was the third-largest expense made by all households followed by communication expense. Transport expenses increased for all income groups when people started returning to work and when schools opened. Medical expense remained the least expense made by households in their one-week expenditures.

5.2.2: Socio-economic effects of COVID-19 on households one-week expenditures

From the general multivariate regression analysis which was used to determine the socio-economic effects of COVID-19 on household expenditures, we found that gender of the household head and marital status of household head were the only variables included in our model, that did not have a significant effect on a one week-household expenditures. However, for a study conducted by Population Council in 2020, they found that gender of the household head had a significant effect on household expenditures. The variation could be because, for them, they looked at total monthly expenditure while for our case, we referred to one-week household expenditures. The education level of the household head, employment status of household head, and insurance status of the household head had the most effect on the household's one-week expenditures. An increase in one unit in the education level of household head led to a 25.5% effect on one-week household expenditures. On the other hand, a one-unit increase in household heads who are employed and those who have health insurance caused a 25.1% and 16.2% increase in household's one-week expenditure respectively. This was unexpected, as we had hypothesized that the two-week household income would have the greatest effect on household expenditures. From the results, though significant, a two-week household earning had a minimal effect on households one-week expenditures and this was similar to the findings of Baker et al. (2020). This could be because households may have had other income such as savings, which they used to supplement the two-week earnings. In addition, maybe employed individuals relied on monthly income and not bi-weekly earnings. In addition, education level and ability to have insurance could be used as a proxy in the absence of income as it shows financial capability.

Household size was found to have a significant effect on household expenditures. Specifically, a unit increase in the household size led to a 4.5 % increase in household

expenditures. These findings are consistent with those of Kithiia et al. (2020), who attributed to the school closure and people staying at home led to this increase in the household size. Increase in the price of items led to a decline in household expenditures though by a negligible percentage. This could be because with an increase in prices of items, say such as food and masks, households reduced the expenses of these two, however not so much since though expensive, food is essential for survival while wearing masks is a mandatory requirement by the government. Similarly the older the household head, the less they spent though by a small percentage. This finding is similar to Baker et al. (2020) who found that younger household heads tended to cut back on spending by a smaller amount than older household heads.

Variables that affected the household's one-week expenditures differed from one income group to the other except for household size, which had a significant effect on the household's one-week expenditures for all the income groups. A one-unit increase in household size had a greater effect on households one-week expenditures for high-income earners (5.9%) than for middle-income earners (3.2%) and low-income earners (4.9%). Household size was the only determinant of variation in household's expenditures for high-income earners. This could be because high-income earners income or jobs may have not have been affected by COVID-19. After all, they most likely have stable jobs, businesses and/or adequate savings or multiple sources of income and hence their expenditure was not affected by these factors. However for household size, with the restrictions of working at home and school closures, many people were at home and this meant all households had to increase their expenditure to adjust with the increase in household size. On the other hand, apart from the household size, the household head insurance status had also an effect on the household's one-week expenditures for middle-income earners. Specifically, an increase in one unit of household heads who had insurance led to a 17.3% increase in household's one-week expenditures. Regarding low-income earners, a one-unit increase in the number of employed and insured household heads led to a 27.5% and 13.3% increase in one-week household expenditures respectively. However, for every unit increase in prices of items and age of household head, caused a decrease in household's one-week expenditures by less than 1%.

5.2.3: Household's coping mechanisms adopted in the COVID-19 period.

The socio-economic effects of COVID-19 made households to adopt survival strategies to be able to meet or maintain their expenditures. Reduction in food consumption was the main coping mechanism adopted by households in all three waves (wave 1-40%, wave 2= 44.9% and wave 3-42.5%). Ways of reducing food consumption included eating less or skipping meals. This result is consistent with those of Tifa Research Limited (2020) who found that households start with cutting down expenditure on food before they can cut on other areas. Quaife et al. (2020) who also found similar results reported that loss of income was the main cause of adopting such a mechanism. Similar to findings from Josephson & Michler (2020), reduction of non-food consumption was the second strategy adopted by 22% of households in wave 1, 42.5% of households in wave 2 and 40% of households in wave 3. Reliance on savings followed by engaging in additional income generating activities were the fourth and the fifth coping strategies adopted by households respectively. Less than 5% relied on help from the government. This could be explained by the fact that on average only 2.19 % had received assistance from the government in the preceding two weeks before the survey.

Regarding income groups, low-income earners pursued reduction in food consumption as the main coping mechanism in all the three waves (Wave 1-42.5%, wave 2-47% and wave 3-44.4%). This could be that of all the coping mechanisms available to them, this was the most efficient considering their financial situation in ensuring they maintain/meet their expenditures followed by other strategies. On the other hand, for middle-income earners, in wave 1, 36.5% relied on savings as a coping mechanism. In wave, 2 and wave 3, 47.1% reduced non-food consumption and 42.0 % engaged in additional income generating activities respectively. Similarly, for high-income earners, the main strategy adopted as a coping strategy was reliance on savings in wave 1 by 42.0%. In wave 2, about 35% decided to take no action at all. However, in wave 3, 42.0% decided to engage in additional income generating activities. Engaging in additional income generating activities in wave 3 was to restore their savings stock, which had come in handy at the beginning of the pandemic.

5.3: Study limitations

These study findings may be subject to reporting and recall bias. Reporting bias may have occurred in the form of some household's heads under-reporting their expenditures and income to be seen financially unstable in anticipation of getting financial assistance. Recall bias may have occurred to those households who did not track their expenditures and hence could have provided estimates other than the actual amount spent which could be high or low.

5.4: Conclusion

In conclusion, this study assessed the socio-economic effects of COVID-19 on household's expenditures in the urban areas of Kenya. We found that these socio-economic effects of COVID-19 has pushed some households into adopting coping mechanisms such as reduction of food consumption in order to meet their expenditures on items such as masks which are mandatory for one to have. Such coping mechanisms exposes these households to poor nutrition, which has implications on their health. Also, it regresses the country's efforts in reducing/eliminating food insecurity. In addition, some of the coping mechanisms adopted to meet or maintain households expenses might be short term but may have long-term negative consequences. Therefore, there is need for the government to provide financial protection through the provision of cash transfers and other safety nets to the most vulnerable and those with the greatest need in order to cushion them from the socio-economic effects of the pandemic.

5.5: Recommendations

From our findings, we do recommend that the government should employ the following key strategies in their efforts to ensure households are able to meet their expenditures even with the socio-economic effects of the pandemic.

1. Provision of customised interventions based on the needs assessment of the different income groups since COVID-19 may have impoverished other people who were not initially poor before the pandemic struck.
2. Creating a balance between containing the spread of the virus and looking at the welfare of its citizens by tracking the economic wellbeing of its citizens.

3. Expand food assistance to all but most especially the low-income earners as a measure of reducing food insecurity.
4. Provide masks to families in need so that they do not reach a situation where they substitute expenditure on food for masks since it is a mandatory requirement for one to have it.

5.6: Areas for further research

. Areas of further research to in relation to my research include:

- Determining monthly income effect on household expenditures to take into account those households who rely on monthly income.
- Assessing the criteria used by households of different income groups to decide on the suitable coping mechanism.

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Appendix A

Variables definition and measurement

Variables names and labels in data set	Variable codes	Variable definition	Variable measurement
Dependent variable			
Household expenditure (s5_q3a)	Household expenditure includes food expenditure and non-food expenditure It is categorized as follows; a) Food b) Personal c) Durable d) Services e) Communication f) Housing g) Utilities h) Transport i) Medical expenses j) Mask	This variable indicates one-week expenditure made by households.	All the categories of household expenditures are continuous variables and they are expressed in KShs.

Variables names and labels in data set	Variable codes	Variable definition	Variable measurement
Dependent variables			
1.Income			
Income from employment (earningnow)	Continuous variable	This variable indicates household head two-weeks earnings	Continuous variable expressed in KShs
Profit earned from family enterprises (s4_q20_profits)	The category of the enterprises include; agriculture, mining, manufacturing, real estate, accommodation, and food services among others.	This variable indicates the profits that the household made from the family enterprises	Continuous variable expressed in KShs
Income from sale of assets/livestock (s6_q1b_soldamt)	Continuous variable expressed in Ksh	This variable indicates the value of the assets sold.	Continuous variable
2.Prices of food and non-food items/services			
Item prices (s5_q5_price)	Continuous variable expressed in Ksh There were 18 items which included; Maize, beans, rice, tomatoes, onions, sweet bananas, eggs, beef meat, fish(tilapia), sugar, barsoap, charcoal,	This variable indicates the prices of four random items that households purchased. Out of the 18 items, households were asked about	Continuous variable

Variables names and labels in data set	Variable codes	Variable definition	Variable measurement
	calf(local), goat, chicken (hen), Panadol, shaving head and fixing a small hole at a tailor.	4 random items consistently in each wave. Each household was asked different random items but the value of items remained the same for all households regardless of the items.	
3. Household socio-demographic characteristics			
<i>Age (head-age)</i>	Continuous variable	This variable indicates the age of the head of the household in complete years.	Continuous variable
<i>Gender (head-gender)</i>	Female Male	This variable indicates the gender of the head of the household.	Binary variable 1 =female, 0= male
Marital status <i>(marital)</i>	Marital status include; Never married, married, divorced, separated, and widowed	This variable indicates the household head marital status.	Categorical variables
Employment status <i>(whoemployed_)</i>	Yes No	This variable indicates whether the head of the household is in employment or not.	Binary variable 1=Yes 0=No

Variables names and labels in data set	Variable codes	Variable definition	Variable measurement
Household size(hhsize)	Continuous variable ranging from 1 to 27	This variable indicates the total number of people living in a household	Continuous variable
Education level (s2-q2a-hheduc)	The education level categories include; No formal education,pre-primary,primary,secondary,college,university(undergraduate),university(postgraduate) and Madrassa	This variable indicates the highest level of education attained by the household head.	Ordinal categorical variable
Health Insurance (insurance)	Insured Not insured	This variable indicates whether the household head is insured or not.	Binary variable 1= Yes 0= No
Households coping mechanism			
Households going to bed hungry as a form of	Continuous variable ranging from 1-7 days Adults(s5_3_q7a_hungryadult)	This variable indicates the number of days household members (adults and	Continuous variable

Variables names and labels in data set	Variable codes	Variable definition	Variable measurement
coping mechanism for lack of adequate food	Children (<i>5_3_q7b_hungrychild</i>)	children) went to bed hungry in the past 7 days.	
Households skipping meals as a form of coping mechanism for lack of adequate food	Continuous variable ranging from 1-7 days Adults(<i>s5_3_q8a_skippedadult</i>) Children(<i>s5_3_q8b_skippedchild</i>)	This variable indicates the number of days household members (adults and children) skipped meals in the past 7 days.	Continuous variable
Households going entire days without food as a form of coping mechanism for lack of adequate food	Continuous variable ranging from 1-7 days Adults (<i>s5_3_q9a_nofoodadult</i>) Children (<i>s5_3_q9b_nofoodchild</i>)	This variable indicates the number of days household members (adults and children) went without food for the entire days in the past 7 days	Continuous variable
Household sale of assets and livestock to generate income. (<i>s6_q1_soldasset_1</i>)	Yes No	This variable indicates whether the household sold assets to generate income or not	Binary variable 1=Yes 0= No
Assets sold (<i>s6_q1a_assettype</i>)	Assets include; Vehicles, furniture, kitchen and other equipment, electronic equipment, tools	This variable indicates the type of assets sold.	Categorical variable

Variables names and labels in data set	Variable codes	Variable definition	Variable measurement
Household continuation to save <i>(s6_q2a_contsavpract)</i>	Yes No	This variable indicates whether household continued with saving practices	Binary variable 1=Yes 0=No
Household loan uptake to generate income. <i>(s6_q2_tookloan)</i>	Yes No	This variable indicates whether households took a loan to generate income or not	Binary variable 1=Yes 0=No
Type of loan taken. <i>(s6_q2a_loantype)</i>	Types of loan taken include; Loan from a friend/relative Loan from commercial bank Loan from mobile lending Loan from mobile lender Loan from SACCO Loan from Merry go round	Thus variables indicate the type of loan that the households took.	Categorical variable
Household receipt of remittance from other households	Yes No	This variable indicates whether households received remittance or not	Binary variable 1=Yes 0=No
Households sending gifts to others in form of money and goods	Yes No	This variable indicates whether households were able to send gifts to other people	Binary variable 1=Yes 0=No

Variables names and labels in data set	Variable codes	Variable definition	Variable measurement
<i>(s7_q3_sendgift)</i>			
Households receipt of assistance/gifts from the government	Yes No	This variable indicates whether households received government assistance or not	Binary variable 1=Yes 0=No
Households receipts of assistance/gifts from NGO's	Yes No	This variable indicates whether households received assistance from Assistance from NGO's or not	Binary variable 1=Yes 0=No

Source: Author's computation

