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Effect of COVID-19 Pandemic on Labour Market Outcomes in
Kenya



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Effect of COVID-19 Pandemic on Labour Market Outcomes in Kenya

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Abstract

Purpose: This paper investigated the effect of COVID-19 pandemic on the labour market outcomes in Kenya, using quarterly labour force survey data (2019 to 2021), 2019 census data and COVID-19 wave II of a novel high-frequency phone survey collected from May 30th to June 6th, 2020. The study also estimated the impact of COVID-19 pandemic on unemployment rate by using the quarterly Labour Force Survey data from 2019 to 2022.

Methodology: The study applied probit models because of the non-linearity of the variables. More specifically, the dependent variables are binary terms, hence maximum likelihood estimation techniques are the most appropriate.

Findings: The findings of the study reveal that COVID-19 was associated with a 25-percentage point's increase in the unemployment rate in the country with certain counties witnessing the highest spikes in unemployment. Although there has been some recovery, the unemployment rate remains elevated compared to pre-pandemic levels, signifying ongoing labour market challenges. COVID-19 impact on the labour market varied significantly by sector. The education sector experienced a higher incidence of employment loss, while income losses were more pronounced in sectors such as mining, manufacturing, retail, transport, and construction. Particularly, women workers in the retail and transport sectors faced twice the likelihood of income loss compared to their male counterparts. The pandemic disproportionately affected low-income workers and casual labourers, accentuating income inequalities in the labour market. Casual workers, who often lack labour protections and benefits, were significantly impacted.

Unique Contribution to Theory, Practice and Policy: Considering these findings, the study provides several policy recommendations: Implementing targeted interventions and support programs in counties with the highest unemployment spikes. These interventions can include skill development programs to enhance workers' employability and tailored employment and income support strategies adapted to each county's unique economic circumstances. Prioritize the adoption of Information and Communication Technology (ICT) to enhance resilience and adaptability across sectors. Governments, both at the national and county levels, should prioritize policies aimed at enhancing the incomes of disadvantaged households. Through expanding access to social protection programs, enforcing minimum wage regulations, and improving working conditions, especially for casual workers and low-income households. The study's insights provide valuable guidance for shaping future economic recovery strategies, particularly in the event of economic shocks in the labour market.

Keywords: *Labour, Outcomes, COVID-19 Pandemic*

1 Introduction

The advent of the Coronavirus Disease 2019 (COVID-19), caused by the novel coronavirus SARS-CoV-2, led to the most profound disruption in the labour market in Kenya. What began as a health concern in Wuhan, China, rapidly evolved into a global health pandemic declared by the World Health Organization (WHO) on 30th January 2020 (WHO 2020). As of January 12, 2022, the global infections had reached 314,252,765 cases with 5,522,035 deaths. Similarly, the total number of reported COVID-19 cases in Africa stood at 8,593,983, with 172,062 deaths reported (WHO, 2022). This period bore witness to a convergence of challenges, spanning from widespread job losses and economic contractions to transformative shifts in work dynamics, exemplified by the burgeoning prevalence of remote work arrangements. The globe witnessed a staggering loss of approximately 225 million full-time jobs between the fourth quarter of 2019 and the first quarter of 2021 (ILO 2021). Further, the COVID-19 pandemic had a disproportionately adverse impact on workers who have traditionally faced disadvantages in the labour market (Lee et al., 2021; Fairlie et al., 2020).

With a significant rise in infections, affected countries adopted various containment measures, some of which are country-specific while others were global. Countries across the globe constituted various measures such as introduction of dawn to dusk curfews, quarantine, travel bans, social distancing in public places among others (Fernandes, 2020). Individuals curtailed their mobility and economic engagement, and businesses faced disruptions in their production processes. These overarching changes in economic dynamics influenced both the demand for labour by firms and the capacity and willingness of workers to participate in the workforce (Bhari and Fakir, 2020).

The labour market implications of the pandemic can be dire particularly to low-income households who rely on daily income. Lack of economic safety nets, particularly for workers in the informal sector, combined with increased risk of infection and associated costs, can exacerbate the impact of income loss or job (Peter et al., 2020; Deb et al., 2020 and Gupta et al. 2021). Further, the pandemic had adverse effects on the Kenyan economy causing a contraction of 0.3 per cent in 2020 from a growth rate of 5.6 per cent in the previous year. However, the country experienced rebound growth of 7.5 per cent in 2021 driven largely by easing of lockdown and curfew measures, resumption of supply side services, COVID-19 vaccination drive, and increase in private consumption (KNBS, 2022). In 2022, the economy grew by 4.8 per cent edging above its long-term growth rate of 4.6 per cent and aligned to its pre-pandemic decade average growth of 5.0 per cent.)

While various studies have examined potential impacts of the pandemic on global and national economic indicators such as poverty, government expenditures, GDP growth, budget deficits, and employment (ILO 2020; Nicola et al. 2020; Sumner, Hoy, and Ortiz-Juarez 2020; Lambert et al. 2020), there is limited information on how the pandemic and associated policies and measures

taken during the pandemic affected individuals at the household level, particularly on labour market outcomes in Kenya. Economic effects of a pandemic may disproportionately impact members of society, depending on their income status, livelihood strategies, access to markets. Therefore, it is important to understand the household-level impacts as well as the support mechanisms that could contribute to income smoothing.

The purpose of this paper is therefore, to assess the effects of the COVID-19 pandemic on the labour market in Kenya. Specifically, on labour market participation across various sectors and characteristics of workers. Furthermore, this paper highlights workers in various sectors who are most vulnerable to employment and income shocks in case of major unexpected shocks such as the COVID-19 pandemic. Although the immediate phase of the pandemic has abated, it is imperative not to underestimate the historical resonance of this global health crisis. Delving into its effects can provide insights into Kenya's responsiveness to global emergency, thereby establishing a reference point for future crises. The pandemic prompted a reassessment of Kenya's labor market dynamics, emphasizing the need for research to understand its short-term and long-term impacts.

1.1 The Kenyan Context

In Kenya, the first case of COVID-19 was reported on 12th March 2020 and as at 12th January 2022 the total cases stood at 313,677 with 5,462 deaths and 36,322 active cases (MOH, 2022). Between January and March 2022, COVID-19 positivity rate increased from 2 per cent to 22 per cent, with Nairobi County accounting for nearly 60 per cent of all reported COVID-19 cases.

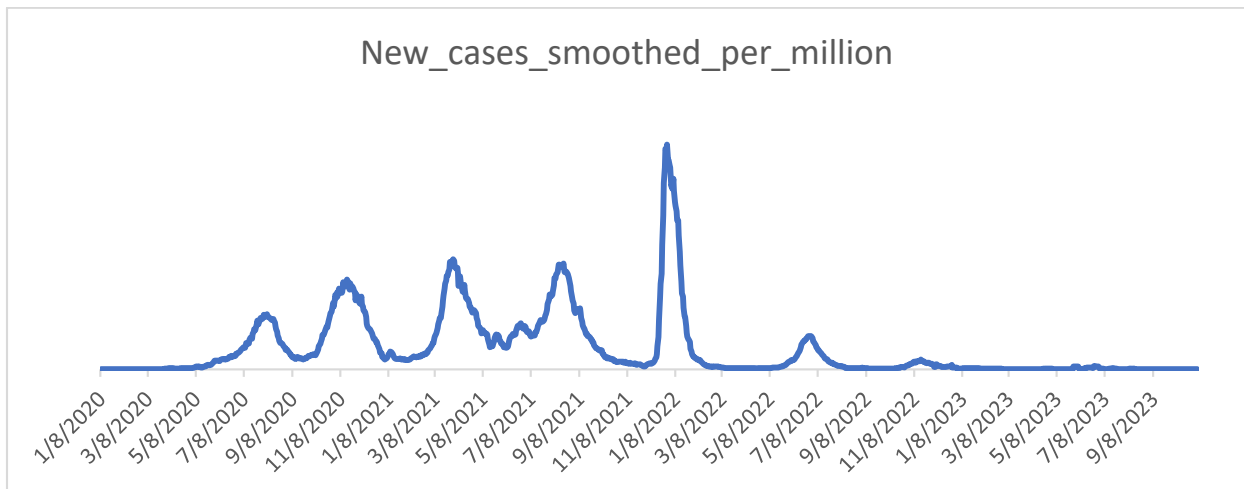


Figure 1: COVID-19 cases and timeline in Kenya

Source: [Kenya: Coronavirus Pandemic Country Profile - Our World in Data](#)

To contain the COVID-19 pandemic, the Kenyan government implemented several control measures, including mandatory wearing of face masks in public places, cessation of movement in

informal settlements regions-mainly in cities and major towns, restrictions on public gatherings, social distancing, and closure of physical learning institutions. The government announced lockdown measures that banned travelling to and from Nairobi and four counties of Kiambu, Machakos, Kajiado, and Nakuru in March 2020. Special passes were granted to people working in essential sectors such as medical personnel, food suppliers, and security forces among others to travel in and out of these five counties. Additionally, the government introduced curfews from 2200 hours to 0400 hours that initiated total movement restrictions in these five counties. Most of these measures were adopted from other countries and based on recommendations from the WHO. Additionally, the Kenyan government cushioned its citizens financially by cutting taxes and providing cash transfers to vulnerable households, mainly those living in slum areas. However, these social supports were not sustainable since they were short-lived and only reached a few people.

The mobility restrictions led to closure of firms and subsequently loss of employment and income.

During the early months of the pandemic, Kenya experienced a significant drop in employment rates, with many workers losing their jobs or experiencing reduced working hours. The Oxford Coronavirus Government Response Tracker (OxCGRT) developed a stringency index to measure the strictness of governments response to the pandemic. Nine metrics were used to construct the index including: school closures; closures of workplaces; public gatherings' restrictions; requirements to stay at home; restrictions of public transport; cancellation of public events; COVID- 19 public awareness campaigns; restrictions of internal movements; and restrictions of international travel (Edouard et al., 2020). Figure 2 below provides confirmed COVID-19 cases in five counties and the mobility stringency index. A higher index score signifies a more stringent policy response. Nairobi County had the highest number of confirmed cases which peaked at 70,908 cases on August 21st, 2021. On the same date, Mombasa County had 12,215 cases while Kiambu County had 11,314 cases. Government response measures were the most stringent on August 23rd 2020 when the mobility stringency index was 70.4 in all the five counties. It is clear that government policy stringency was highest during lockdown period.

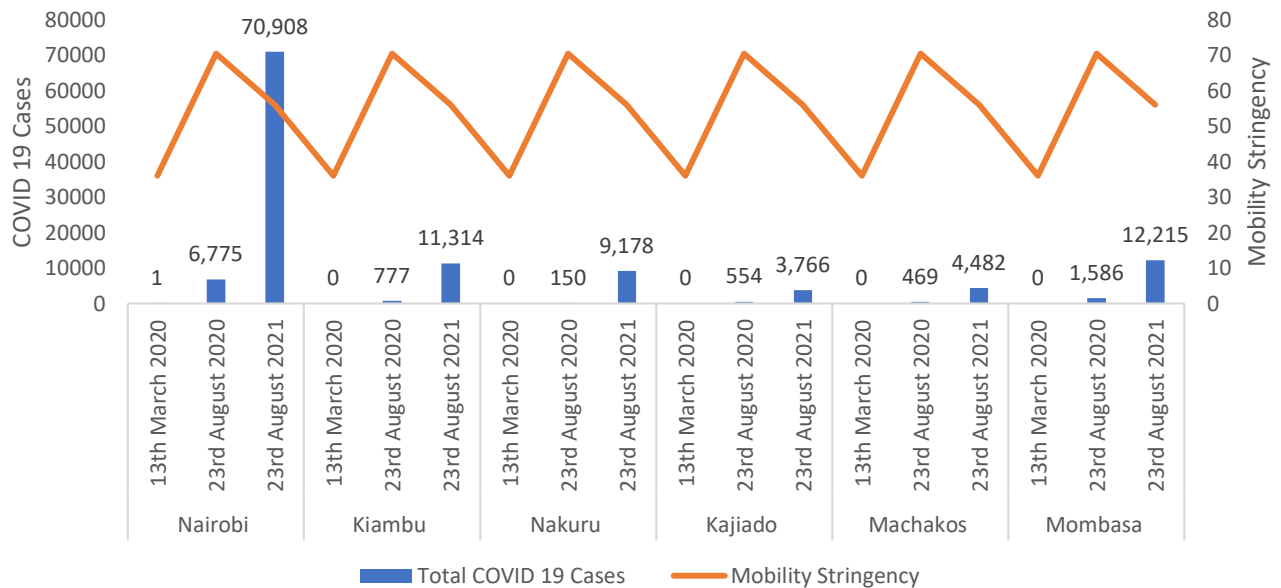


Figure 2: Confirmed COVID-19 Cases and Mobility Stringency Index in Five Counties

Source: OxCGRT (2022)

Kenya faces significant challenges in job creation and utilization of its labour. The Labour Force Participation Rate (LFPR) measures the proportion of the working age group that engages in the labour market either by working or looking for work. The LFPR has been relatively high (74.2 per cent in 2021) in Kenya across the national surveys (linked to poverty and absence of widespread social protection). The relatively high levels of LFP rate (Figure 3) indicate a large supply of labour available to engage in the productive activities. The consistent LFPR suggests that a relatively constant portion of the working-age population has been engaged in economic activities over the years. The employment-to-population ratio, which reflects the proportion of the total population aged 15 and above that is employed, exhibited more fluctuations. The ratio was 70.8 per cent in 1991, decreased to 70.4 per cent in 2001, increased to 71.7 per cent in 2011, and then declined again to 69.7 per cent in 2021. The most significant shift occurred in 2021, with the employment-to-population ratio dropping to 69.7 per cent. This decline could be attributed to the economic disruptions caused by the COVID-19 pandemic, which impacted job availability, workforce participation, and overall economic activity. Since the drop, the employment-to-population ratio is yet to improve to its 2019 levels (corresponding quarters) indicating that the economy is struggling to create jobs.

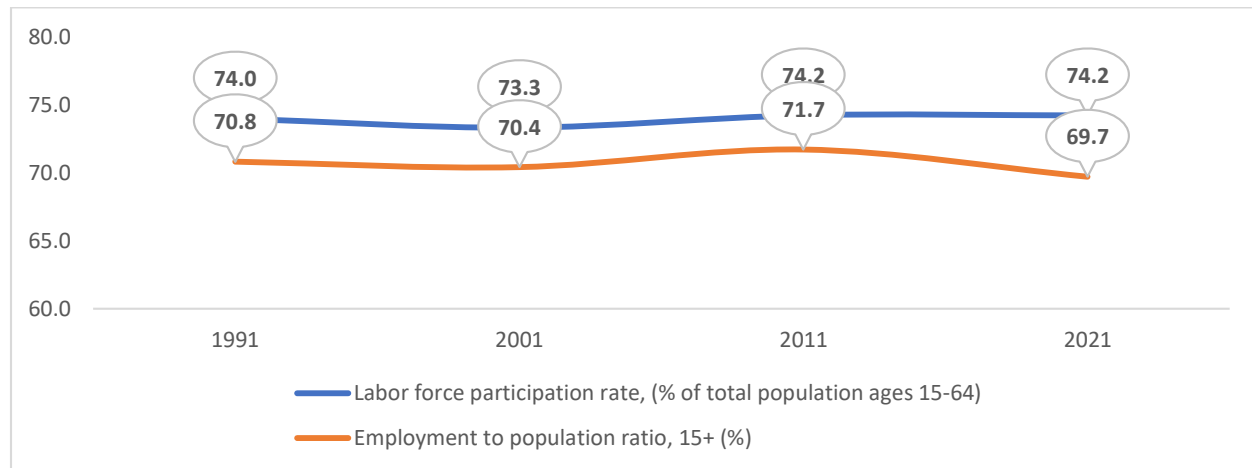


Figure 3: Employment to population ratio and labour force participation rate (1991-2021)

Data source: World Bank Development Indicators (Job structure tool)

While the immediate health threat may have waned, the economic and labor market repercussions of COVID-19 may endure. By studying these consequences, policy makers can provide a roadmap for Kenya to navigate future crises and build a more resilient labor market.

1.2 Objectives of the Study

The general objective of this study is to examine the effect COVID-19 pandemic had on the labour market in Kenya. This general objective is broken down to specific objectives as follows:

- I. To estimate the effect of COVID-19 on unemployment rate (UR) in Kenya
- II. To examine factors influencing vulnerability to employment losses due to the COVID-19 pandemic.
- III. To examine the effect of COVID-19 pandemic on income.

2 Literature Review

2.1 Theoretical Literature

The study utilizes the classical competitive labour market equilibrium theory as the theoretical framework. The framework assumes a perfectly competitive labour market where equilibrium is achieved when the supply of labour matches the demand for labour at a given wage level. Equilibrium in the labour market occurs when the supply of labour, the number of hours employees allocate to the market, equals the labour demand, the number of employee hours that firms demand at a given wage level Mankiw (2021). The equilibrium level generates the market clearing wage and employment levels. Firms in the industry then hire workers up to the point where the employees' value of marginal product of labour equals the market competitive wage rate. In reality, stable equilibrium in the labour market is a rarity due to various shocks to the economy. In most cases, especially in developing countries, labour supply far exceeds the demand resulting to high

chronic levels of unemployment. Contrary to the theory, in the real-world wages do not always adjust downwards when there is high unemployment rate due to minimum wage legislations, bidding wage contracts, trade union agreements and other institutional factors.

The competitive labour market theory has been used to successfully explain the impact on government policies such as taxation and subsidies on labour demand and supply. Payroll taxes and subsidies may shift labour demand and supply either upwards or downwards (Kolmar, 2017); (Mankiw, 2021). Factors such as immigration shift the labour supply outwards, particularly when immigrants and natives are perfect substitutes in the labour market. In this simple model, an increase in immigration reduces wages and increases employment. The adverse effect is a decline in the employment of native workers. However, the assumption that native workers and immigrants are perfect substitutes is not always true. In the event that native workers and immigrants do not compete for the same jobs, an increase in immigration may free up skilled native workers to specialize in jobs that better suit their skills, increasing the labour demand as well as wages and employment of native workers. However, in his famous paper, Card (1990) did not find any substantial increase in the unemployment of native African-Americans in Miami following the Mariel boatlift by Fidel Castro in 1980 that increased the influx of Cuban immigrants to Miami.

How did COVID-19 impact the labour demand and supply curves in Kenya? The study adopts competitive labour market theory to postulate the impact of the pandemic on the labour market. We postulate that COVID-19 and the subsequent lock down measures were a negative shock on both the labour demand and supply sides. On the supply side, firms and businesses were forced to close down to contain the spread of the pandemic, which depressed the demand for labour. As a matter of fact, businesses laid out workers while others were forced to take wage cuts. On the supply side, workers were not applying for jobs as no firms were hiring. We hypothesize that COVID-19 and the lockdown measures caused a downward shift in both the labour demand and supply curves resulting in both decline in employment and wages. It is expected, therefore, that most workers, depending on the economic sector, experienced increase in unemployment and decreases in wages.

Additionally, of particular focus for this paper are the effects of labour supply shocks on the Beveridge curve. This curve shows the relationship between the number vacancies that firms are willing to open and the unemployment rate. The Beveridge curve is downward sloping meaning as the number of vacancies falls, the unemployment rate increases. Reallocation shocks such as structural changes and sectoral shifts in creation of new job opportunities cause a shift to the Beveridge curve (Schiman, 2020). On the hand, aggregate activity shocks cause a movement along the Beveridge curve. Moreover, exogenous shocks in labour supply affect the position of the Beveridge curve (Elsby, Michaels and Ratner, 2015). Empirical evidence shows that labour supply shocks have counterclockwise effects on the Beveridge curve. While on one hand an increase in labour supply increases matching and reduces the number of vacancies posted, the increase in

matching stimulates labour demand causing the number of vacancies to increase and unemployment to reduce in the medium term (Blanchard and Diamond, 1989). This study hypothesizes that COVID-19 and the subsequent lockdown measures were an activity shock rather than a labour supply shock because vacancies declined first, which led to an increase in unemployment.

2.2 Empirical Literature Review

Studies on impact of COVID-19 pandemic on the labour market differ on the approach: while some examine the supply side, others examine the demand of labour by firms. One such study is by Webster et al. (2022) who used firm-level data in Honduras, El Salvador, Guatemala, and Nicaragua. Data used were obtained from enterprise surveys conducted by the World Bank on 1427 firms in the four countries. Using regression analysis, both OLS and Seemingly Unrelated Regression Equations (SURE), Webster et al. (2022) analysed COVID-19 effects on change in sales, employment, share of females in employment, and firms' chances of survival. The study found firms that were surviving had high risks of closure due to the pandemic. Furthermore, firms' ability to employ and retain workers was dependent on their sales that was affected by both the pandemic and government lockdown measures. Employment losses occurred due to permanent closure of firms while surviving firms limited employment due to risk of closure as sales plummeted.

In Ghana, Schotte et al (2023) investigated the impact the COVID-19 lockdown measures had on the employment and earnings in districts that had stringent lockdown regulations. They utilize and difference-in-difference specification where districts with less stringent lockdown regulations formed the treatment group, while those with less stringent regulations formed the control group. The study found a significant negative impact of the lockdown policies on employment and income in the treated districts, particularly among workers who were self-employed and in the informal sector. Furthermore, the gap in employment between the treated and control districts declined four months after the lockdown was lifted. However, Schotte et al (2023) found that decline in employment and incomes persistent in the entire country even after the lockdowns were lifted, signalling adverse negative outcomes of the lockdowns on small-scale workers in the informal economy.

Labour demand by firms is a derived demand since it depends on consumption spending by households on different products and services. Consumption spending affects demand of labour which then affects labour market outcomes among households. To capture, the derived demand of labour, Kim, Koh and Zhang (2020) examined the effects of COVID-19 on both consumption spending and labour market outcome in Singapore. Using Difference-in-Difference (DiD) model, the study found that consumption spending and labour market outcomes decreased significantly due to COVID-19. Total consumption spending decreased by 22.8 per cent in April 2020. In regard to labour market outcomes, the probability of working full-time declined by 6 percentage points

in May 2020, while monthly labour income decreased by 5.9 per cent in April 2020. Heterogeneity analysis shows that decrease in consumption spending was higher among households with high net worth above the median, whereas reduction in labour market outcomes was greater among low net worth households (below the median net worth amount).

Some studies analysed the initial impact of COVID-19 on the labour market, particularly changes in employment and aggregate hours worked. Lemieux et al. (2020) used Labour Force Survey data collected in the week of April 12th-18th 2020 to examine the pandemic impact on the Canadian labour market. The study found a 32 per cent decline in aggregate weekly hours worked and a 15 per cent drop in employment between February and April 2020. Job losses were prevalent among young workers who were paid hourly and did not belong to any unions. Additionally, most job losses occurred to workers in the lowest earning quantile. The effects of COVID-19 on employment is heterogeneous not only among sectors but also within countries (Fana et al., 2020). That is, countries that were most affected by the pandemic were the ones that suffered the worst negative employment effects due to restrictions measures. Within countries, workers that were the most affected were those in low productive services.

The effects of COVID-19 and the subsequent containment measures to curb the spread of the pandemic seemed universal among advanced and developing economies. In South Africa, using Wave I of a survey of 6000 adults between the ages of 18 and 59 years, Ranchhod & Daniels (2021) found a significant decrease in employment from 57 per cent in February 2020 to 47 per cent in April 2020. The employment rate decreased further to 38 per cent when workers who were temporarily absent were excluded. Just like in other studies, Ranchhod & Daniels (2021) reveal that the effects of COVID on the labour market was heterogeneous among different groups. Groups that were vulnerable prior to the COVID-19 pandemic such as Africans, women, and those with low education levels were disproportionately affected by the pandemic. Unemployment rate was almost three times higher among black respondents than whites; the unemployment rate for women was 45 per cent higher than for men; urban respondents were less likely to be unemployed than those who lived in traditional rural areas; and those with post-matric level of education were less likely to be unemployed than those who did not finish high school or with only matric level of education.

Some studies, notably by Kansime et al. (2020) assessed implications of the COVID-19 pandemic on not only labour market outcomes such as household income, but also on food security in Kenyan and Uganda. The study used online survey data from 442 respondents from both countries. They found that more than two-thirds of the respondents experienced income shocks due to the COVID-19 crisis. Food security and dietary quality worsened: the proportion of food-insecure respondents increased by 38 per cent and 44 per cent in Kenya and Uganda, respectively. Further, the study showed that low-income households and those solely dependent on labour income were more vulnerable to income shock caused by the pandemic. Further, these groups had poorer food

consumption during the pandemic, while participation in national social security schemes did not reduce the likelihood of an income shock during the pandemic. To the contrary, membership to a saving and loan schemes reduced the likelihood of an income shock and reduction in food consumption. Some studies have shown profound impacts of the COVID-19 pandemic on economic activities. McKibbin and Fernando (2020) argue that pandemics can affect households, governments, and businesses through increased business costs, increased public healthcare expenditures, changes in labour supply due to mortality and morbidity. COVID-19-related restrictions have obstructed all stages of the food supply chain, including production, distribution, processing, and consumption (Siche 2020; Torero 2020), and have caused damage to perishable agricultural commodities such as meat and vegetables (Nicola et al. 2020).

The heterogeneity of COVID-19 impacts was also evident among small-holder farmers in India. Ceballos, Kannan, and Kramer (2020) and Harris *et al.* (2020) studied the impacts of COVID-19 and related restrictions among smallholders on agricultural activity, income, and food security. Ceballos, Kannan, and Kramer (2020) analyzed data from phone-based surveys on disruptions to agricultural production and food security administered to 1,515 smallholder producers in the states of Haryana and Odisha, India. They found substantial heterogeneity in the effects of lockdown on farmers in these two states, which was likely related to existing structural differences in market infrastructure and to differences in state-specific COVID-19-related policies. Harris et al. (2020) investigated effects of the COVID-19-induced shock on the production, sales, prices, incomes, and diets of vegetable farmers in India as both producers and consumers of nutrient-dense foods. They undertook a rapid telephone survey of 448 farmers in four states. They found that a majority of farmers reported negative impacts on production, sales, prices, and incomes. Over 80 per cent of farmers reported some decline in sales, and over 20 per cent reported very large declines (sold almost nothing). Price reductions were reported by over 80 per cent of farmers, and reductions of more than half by 50 per cent of them. Similarly, farm income reportedly dropped for 90 per cent of farmers, and by more than half for 60 per cent of them. The data also showed a higher level of vulnerability among female farmers in terms of both livelihoods and diet, and differential effects on smaller and larger farms, which suggests that different farms may require different types of support in order to continue to operate. Farms reported diverse coping strategies to maintain sales, though often with negative implications for reported incomes. The ability to consume one's own produce may help to support diets.

Overall, there are various studies that have examined the short-term and medium-term effects of COVID-19 pandemic on labour market dynamics. Most of these studies have concentrated on effect on employment across various sectors and demographic groups. Others examined the effect on labour participation including the hours worked and labour outcomes, particularly income. Some have analysed the impact COVID-19 had on labour demand from firms given the lock-down measures implemented by most governments across the world to contain the spread of the pandemic. Literature reveals that COVID-19 effects on the labour market was heterogeneous

among gender, income groups, education level, and ethnic groups. There was a sharp decline in labour participation and outcomes in most countries as the pandemic wreaked havoc. While extant studies have made valuable contributions by investigating the short-term and medium-term effects of the pandemic on labor market dynamics, the unique context of Kenya, characterized by diverse economic sectors and demographic structures, warrants a comprehensive and sectoral approach to understand the pandemic's ramifications.

However, none of the reviewed studies have adopted a sectoral approach in examining the COVID-19 effects on the labour market. This study builds on the existing literature which indicates that COVID-19 had diverse effects across different workers and economic sectors. More specifically, by studying COVID-19 effects across sectors, this study will guide sector specific policy guidelines to mitigate the effects of the pandemic in the labour market.

Indeed, the existing body of research has primarily concentrated on the effects of COVID-19 on employment across various sectors and demographic groups, and some studies have explored its influence on labor participation, hours worked, and income outcomes. These studies have proven the heterogeneous nature of the pandemic's impact, revealing disparities based on factors such as gender, income, education levels, and ethnic backgrounds. A common thread among these studies is the documented decline in labor market participation and outcomes in the wake of the pandemic.

However, it is noteworthy that none of the reviewed studies have adopted a sectoral approach to examine the COVID-19 effects on the labor market, especially in the Kenyan context. Kenya's economic landscape encompasses a wide array of sectors, each with its own unique characteristics and vulnerabilities. By bridging this research gap and delving into the sectoral intricacies, our study aims to build on the existing literature, providing a nuanced understanding of how COVID-19 has differentially affected labor market dynamics within various economic sectors in Kenya.

The significance of our research becomes evident in the context of Kenya's specific labor market landscape. The nation's economy is characterized by a diverse array of sectors, including agriculture, manufacturing, services, and informal employment. Understanding the sector-specific implications of the pandemic is crucial for devising tailored policy interventions and mitigation strategies. By examining COVID-19's effects across these sectors, our study intends to offer policymakers and stakeholders sector-specific guidelines to bolster the labor market's resilience and foster recovery in the face of future crises.

In essence, our research fills a critical void in the existing literature by providing a detailed sectoral analysis of the COVID-19 pandemic's impact on Kenya's labor market. This approach offers valuable insights that can facilitate targeted policy responses and fortify the nation's capacity to navigate the complex challenges posed by a global crisis like the COVID-19 pandemic.

3 Methodology

3.1 Description of the of variables

This study adopts three dependent variables to measure COVID-19 effects on the labour market. The first dependent variable is employment status at the time of the survey. Change in hours worked as a measure of labour force participation is the second dependent variable used in the study. The third dependent variable is change in incomes earned caused by the COVID-19 pandemic. The variables are described in detail in the table one below:

Table 1: Description of the Variables

VARIABLE NAME	DESCRIPTION
Employment status (excluding absentee workers)	Those who engaged in any economic activity within seven days before the survey was administered.
Change in hours worked	Difference between hours usually worked and hours actually worked due to the pandemic.
Income loss	A dummy variable that measure whether income decreased due to the pandemic.
Gender	A dummy variable that measured the sex of respondents.
Age	A continuous variable in years. Age included those aged from 18 years to 64 years. Though the legal working age in Kenya begins from 15 years, the data used does not include those aged between 15 to 18 years.
Urban residence	A dummy variable that shows whether a respondent is located in an urban setting or not.
Education level	Dummy variables indicating level of schooling: no schooling; primary; secondary; TVET; university
Household size	Continuous variable measuring the number of people living in a household at the time of the survey.
Income groups (Low and Middle and High Income)	Dummy variable that indicates whether one belongs to the lowest income quintiles and Middle and High income quintiles.
Casual workers	A dummy variable for casual workers.
Sectors of employment	Dummy variables for different economic sectors.
Nairobi City County	A dummy variable for respondents in Nairobi County.

Regressors include gender, age, urban residence, education level, household size, income groups, casual workers, sectors of employment, and a location variable for Nairobi. The location variable for Nairobi is included because the region was the worst hit in the country and faced the most stringent lockdown measures.

3.2 Model Description

We estimate simple probit models because of the non-linearity of the variables. More specifically, the dependent variables are binary terms, hence maximum likelihood estimation techniques are the most appropriate.

A Probit model is estimated to show the impact on status of employment as shown below.

$$P(Y = 1|X_n) = \phi(\beta_0 + \sum_{i=1}^n \beta_i X_i + \varepsilon_i) \dots \dots \dots 1$$

Where:

β_0 refers to the intercept term

$P(Y = 1|X_n)$ is the probability that an individual is employed given a set of covariates.

ϕ refers to a cumulative standard normal distribution function.

$\sum_{i=1}^n \beta_i X_i$ refers to a vector of estimated parameters and a set of covariates that includes: gender, age, residence, household size, sector of employment, income group.

ε_i refers to the idiosyncratic error term.

The second equation is also a probit model used to examine the effects of individual and sectoral factors on the probability of income losses caused by the pandemic.

$$P(Y = 1|X_n) = \phi(\beta_0 + \sum_{i=1}^n \beta_i X_i + \varepsilon_i) \dots \dots \dots 2$$

Where:

$P(Y = 1|X_n)$ is the probability that a worker reported income loss conditional on the explanatory variables.

$\sum_{i=1}^n \beta_i X_i$ is a vector of estimated parameters and a set of covariates estimated in equation one

ε_t is the random error term.

3.3 Data and Sources

In the wake of the pandemic, the Kenya National Bureau of Statistics (KNBS) collected COVID-19 Wave I and Wave II data to examine the effects of the pandemic on households across the country. The datasets are longitudinal where randomly selected individuals who represent households were interviewed using Computer Assisted Telephone Interviews (CATI) approach in the first and second waves. In the first wave, 15,840 individuals from all the 47 counties were interviewed between May 2nd and May 9th, 2020. The second wave of data collection was done from May 30th to June 6th 2020 where 14,616 individuals were interviewed. This study uses Wave II data which contained additional questions compared to wave one data. To estimate UR before COVID-19, this study used 2019 Census data. The map below shows UR in all the 47 counties in Kenya before outbreak of the pandemic in the country. We estimate the average UR in 2019 among

workers between the aged of 18 to 64 to be 14 per cent. Northern counties of Garissa, Turkana, Wajir, and Mandera had the highest UR of 49, 40, 38, and 33 per cent respectively, while Kericho, Narok, Bomet, and Nyandarua Counties had the lowest UR of 6,6, 5, and 4 per cent respectively.

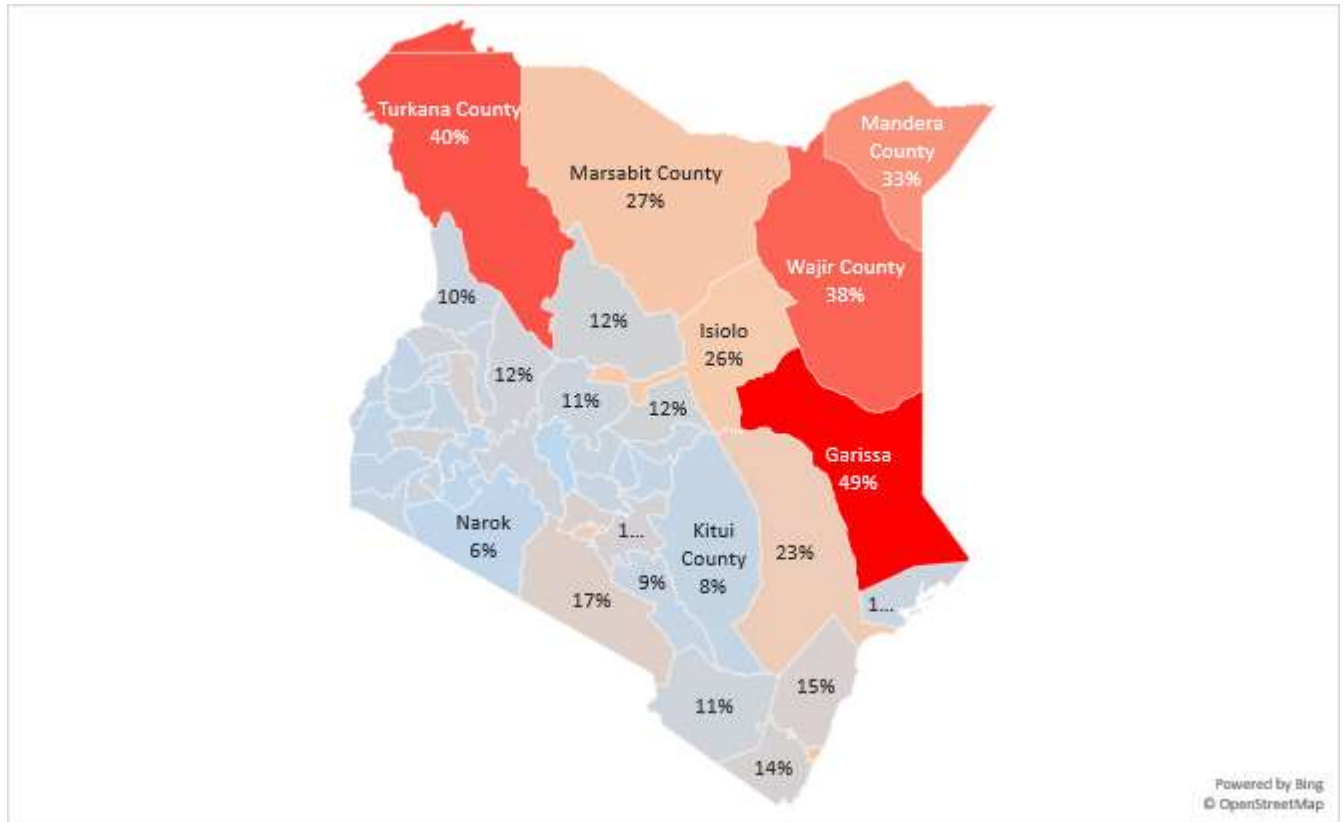


Figure 4: UR in Kenya among Workers Aged 18-64 Years in 2019

Source: KNBS 2019 Census

3.4 Descriptive Analysis

The study sample size includes 13,863 individuals from all the 47 counties in Kenya out of which 52 per cent are males while 48 per cent are females (table 2). The mean age of study participants is 36 years while the median age is 35 years. 61 per cent of the sample reported to be employed, resulting in an unemployment rate of 39 per cent. In terms of hours of change, the average decrease in hours worked in a week was 17 hours. However, there was variation in change in hours worked across sectors with the maximum decrease being 130 hours while in some sectors hours worked increased by 60 hours. 75 per cent of the workers experienced a decrease in income, while 15 per cent were casual labourers. The mean monthly income is approximately KES, 11,000, with a huge disparity in reported monthly income of KES 800,000.

Table 2: Summary Statistics

	Variable	
	n	M (SD)
Age	13,863	36.16 (10.79)
Gender	13,863	0.52 (0.50)
Monthly Income	6,311	10,911 (24,934)
Employment Status	13,863	0.61 (0.49)
Change in Hours Worked	4,585	17.06 (16.40)
Decrease in Income	8,831	0.75 (0.43)
Casual Workers	8,667	0.15 (0.36)

Source: KNBS COVID-19 Wave 2 Survey

61 per cent of the respondents reported to be engaged in any form of employment, while only 39 per cent said that they were unemployed (Table 3:2). Among those employed, 58 per cent were males while 43 per cent were females as presented in figure 5 below. 58 per cent of those unemployed were females with 42 per cent being males.

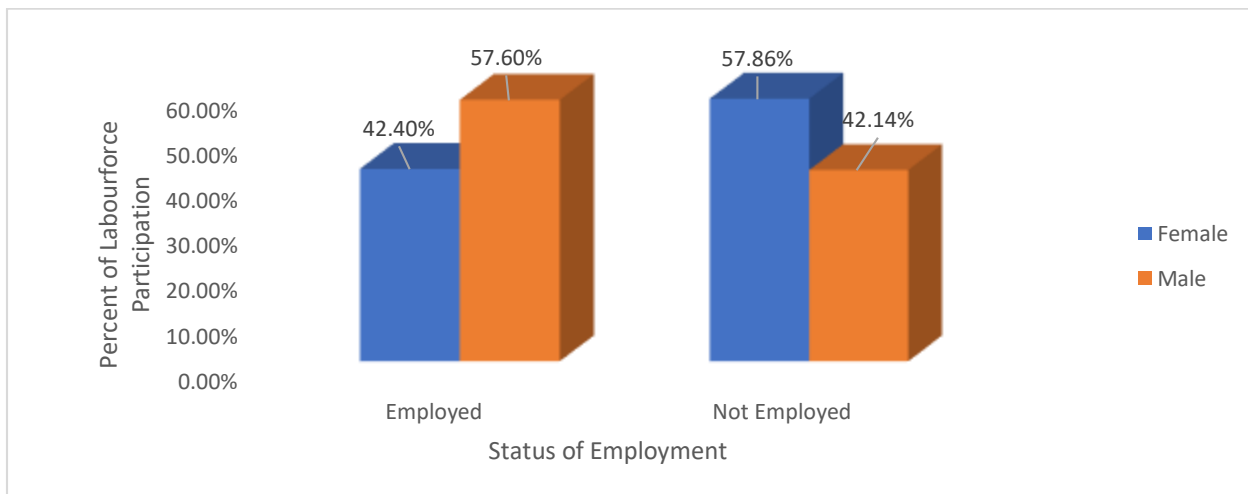


Figure 5: Status of Employment by Gender

Source: KNBS COVID-19 Wave 2 Survey

56 per cent of the sampled respondents work in the agricultural sector, 15 per cent in the retail sector, 13 per cent in service industries, and 6 per cent in the transport sector. Only one per cent of respondents worked in construction and housing, financial, and ICT sectors.

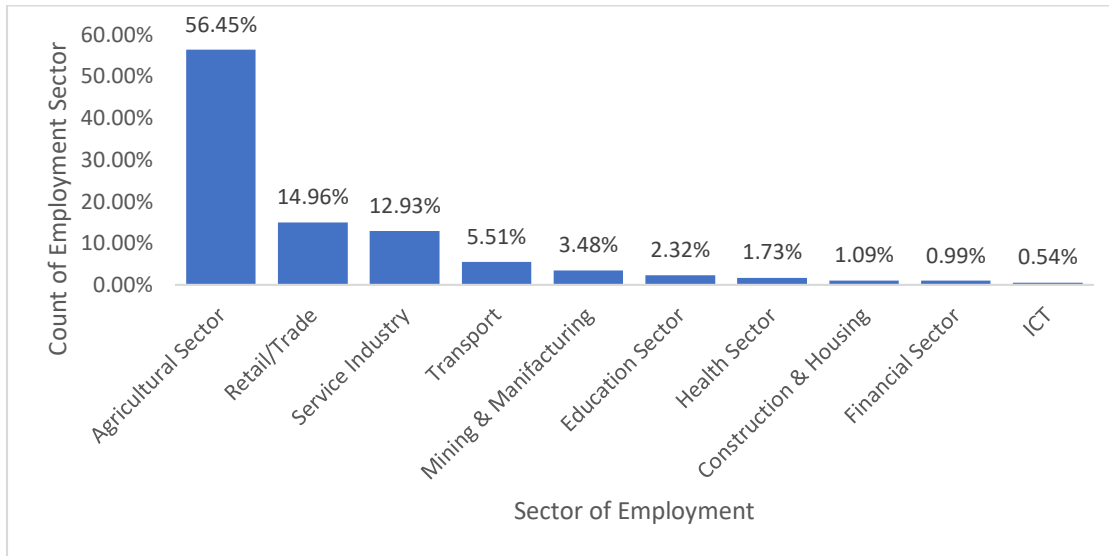


Figure 6: Sample Representation by Sector of Employment

Source: KNBS COVID-19 Wave 2 Survey

Change in hours worked per week was calculated by obtaining the difference between hours usually worked in a week and those actually worked. In all the sectors of, the average hours worked decreased with the highest decrease (33 hours) experienced in the education sector. Hours worked declined on average by 21 hours in the transport sector, 19 hours in the service sector, and 18 hours in the retail sector. Decline in hours worked was lowest in the health sector (6 hours) mainly because workers in this sector were at the forefront in fighting the COVID-19 pandemic. Similarly, in the agriculture sector hours worked per week declined by 14 hours.

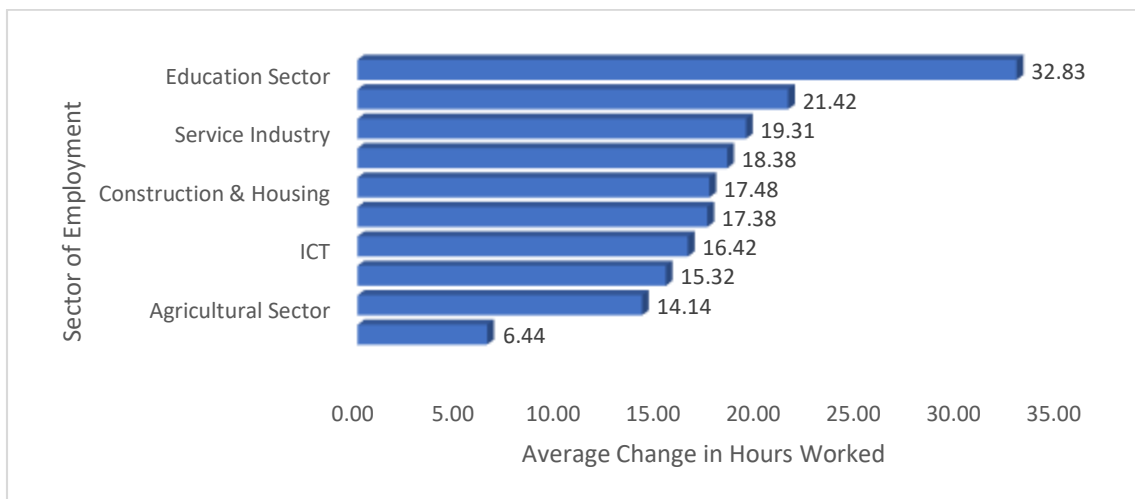


Figure 7: Average Change in Hours Worked per Week by Sector of Employment

Source: KNBS COVID-19 Wave 2 Survey

Results and Analysis

3.5 Effect of COVID-19 Pandemic on Unemployment Rate

We estimate the impact of COVID-19 pandemic on unemployment rate by using the quarterly Labour Force Survey data from 2019 to 2022. Kenya faces significant labour market challenges in the forms of unemployment, time-related underemployment, and long-term unemployment. Labour underutilization is when the workforce is not fully employed, either due to unemployment, underemployment, or mismatch between skills and job opportunities. Underutilization leads to misallocation of resources, as workers may be in jobs that do not fully utilize their abilities. In 2019, the unemployment rate was 5.3 per cent. This relatively low rate suggests a stable labour market environment. The year 2020 saw a notable increase in unemployment, with the rate rising to 7 per cent. This significant jump can be attributed to the global economic disruptions caused by the COVID-19 pandemic. While there was a slight decrease in 2021 to 6 per cent (Figure 8), the unemployment rate remained higher than pre-pandemic levels. By 2022, the unemployment rate further decreased to 5.4 per cent, indicating a gradual recovery from the pandemic's impact.

Time-related underemployment, measures the portion of employed individuals not working as many hours as they desire, was 4 per cent in 2019. The year 2020 witnessed an increase to 5.7 per cent, reflecting the pandemic's adverse effects on work hours and job availability. This rate remained constant in 2021, indicating a sustained challenge for workers seeking sufficient working hours. In 2022, time-related underemployment slightly decreased to 5.3 per cent, suggesting a modest improvement but still indicating persistent issues in labour market stability. The increases in this indicator are linked to an increase in casual labour, part-time work, and seasonality for work.

The long-term unemployed are people with continuous periods of unemployment for one year or longer. Long-term unemployment poses significant challenges, including skill degradation, and increased difficulty in re-entering the workforce. A workforce with a significant portion of long-term unemployed individuals has negative implications on overall growth of the economy, limiting its growth potential. Moreover, increases the fiscal burden on the economy and diverting resources from more productive investments to provide social assistance programmes.

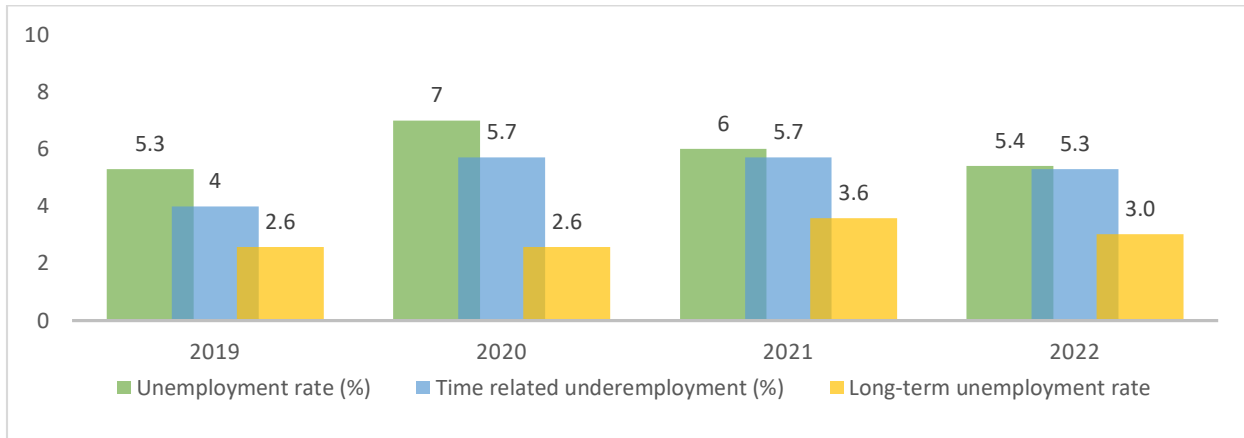


Figure 8: Unemployment, time related underemployment and long-term unemployment rates, 2019-2022

Data source: Quarterly Labour Force Surveys (various)

To estimate the impact of COVID-19 pandemic on unemployment rate across counties, we use two different datasets to obtain the difference in unemployment rate during pre-COVID (2019) and during COVID-19 among workers aged 18 to 64 years. Using Wave II COVID data, we estimate an average UR of 39 per cent in 2020 during the pandemic. Figure 9 below shows UR across the counties in 2020. The following counties had the highest UR in 2020: Marsabit (69%); Mombasa (69 %); Wajir (60%); Isiolo (57%); and Mandera (57%). On the other hand, Murang’a (18 %); Tharaka-Nithi (18%); Nandi (13%); and Kericho (10%) counties reported the lowest UR in 2020 (Table 3).

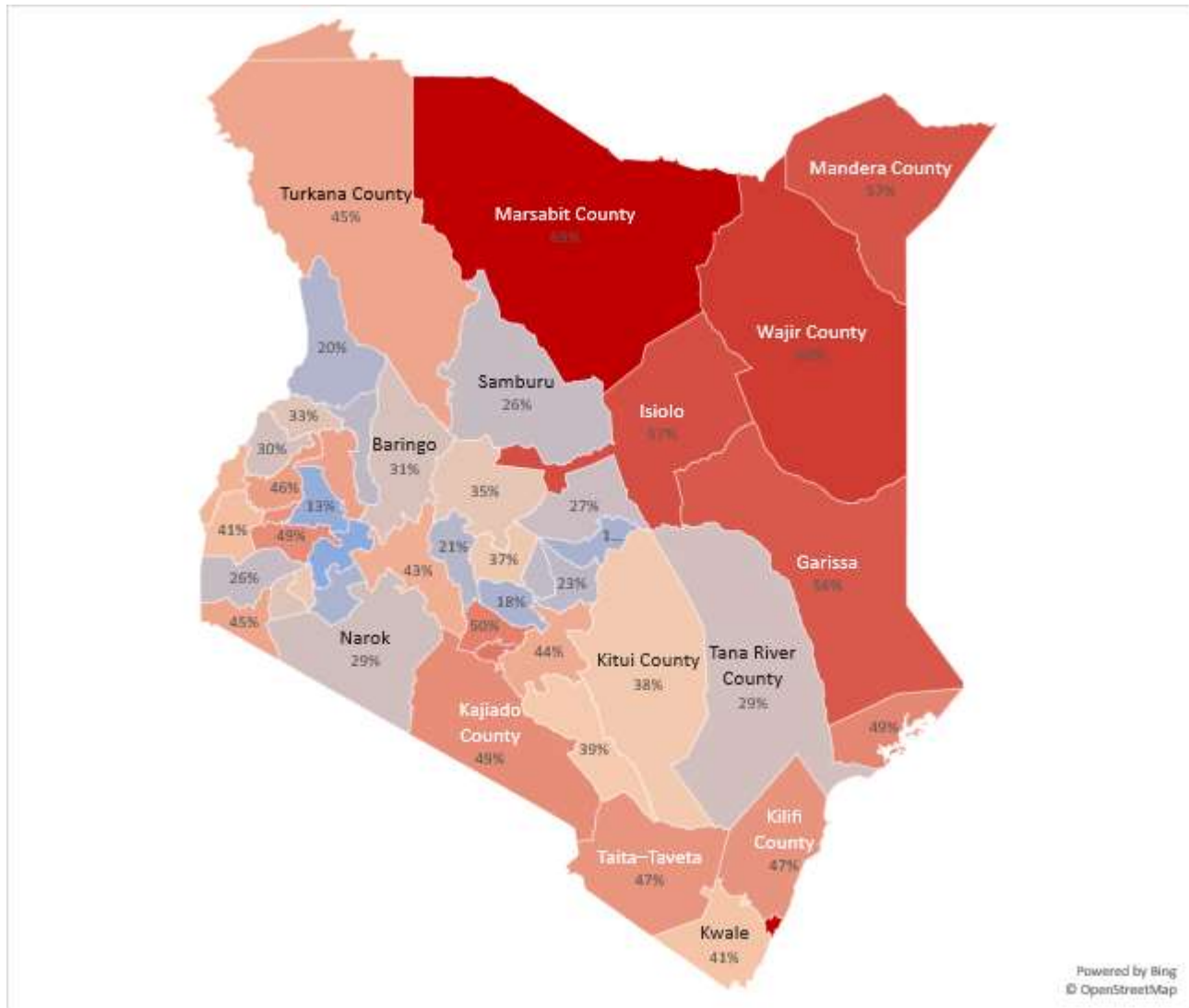


Figure 9: UR in 2020 Among Workers Aged 18-64 Years

Source: Author’s calculation

Using a back-of-the-envelope approach by obtaining the difference between UR before COVID and after during the pandemic, our estimates show that the COVID-19 pandemic was associated with a 25-percentage points increase in unemployment from 14 per cent to 39 per cent (Table 4.1). The highest increase in unemployment was witnessed in Marsabit, Mombasa, Lamu, Vihiga, and Kakamega counties. Nairobi County that had the highest reported cases of COVID-19 experienced a 30 percentage points increase in unemployment rate. The smallest increase in (UR) was experienced in Garissa, Tana River, Turkana, Nandi, and Kericho counties.

Table 3: Unemployment Rate Among Workers (18-64 years) Pre and During COVID-19 (in %)

County	Unemployment Rate During COVID-19 (%)	Pre-COVID (2019)	Change in Unemployment Rate
Marsabit	69	27	42
Mombasa	69	27	42
Lamu	49	10	39
Vihiga	47	8	39
Kakamega	46	8	38
Migori	45	9	36
Taita/Taveta	47	11	36
Kisumu	49	13	36
Busia	43	7	35
Siaya	41	7	35
Kiambu	50	15	35
Kilifi	47	15	33
Nakuru	43	11	32
Kajiado	49	17	32
Isiolo	57	26	31
Machakos	44	13	31
Nairobi City	51	21	30
Uasin Gishu	45	15	30
Makueni	39	9	30
Kitui	38	8	30
Nyeri	37	9	28
Nyamira	36	9	28
Kwale	41	14	27
Kenya	39	14	25
Laikipia	35	11	24
Mandera	57	33	24
Kisii	32	9	23
Narok	29	6	23
Bungoma	30	7	23
Wajir	60	38	23
Trans	33	12	22
Baringo	31	12	19
Homa Bay	26	7	18
Kirinyaga	24	7	17
Nyandarua	21	4	17
Embu	23	8	16
Meru	27	12	15
Elgeyo Marakwet	24	10	14
Bomet	19	5	14
Samburu	26	12	14
West	20	10	10
Murang'a	18	9	10
Tharaka-Nithi	18	9	9
Garissa	56	49	7
Tana River	29	23	7
Turkana	45	40	5
Nandi	13	8	5
Kericho	10	6	4

Source: 2019 KNBS Census and COVID-19 Wave II Data

3.6 Probit Regression Results

The second objective was to examine factors influencing vulnerability of workers to employment losses due to the COVID-19 pandemic. Using probit model, the results show that only gender, urban location, working in the education sector, middle- and high-income group, being in Nairobi and Mombasa counties were significant in influencing the probability of employment (figure 10). The results show that female workers were 1.3 per cent more likely to be unemployed due to the COVID-19 than male workers. Those residing in urban areas were 1 per cent more likely to be employed than those in the rural areas. In terms of the economic sector, workers in the education sector were 11 percent more likely to be unemployed. Workers in the middle- and high-income groups were 2 per cent more likely to be employed. In terms of counties of residence, those in Nairobi and Mombasa counties were 4 per cent and 5 per cent respectively less likely to be employed or more likely to report a loss of employment due to the COVID-19 pandemic.

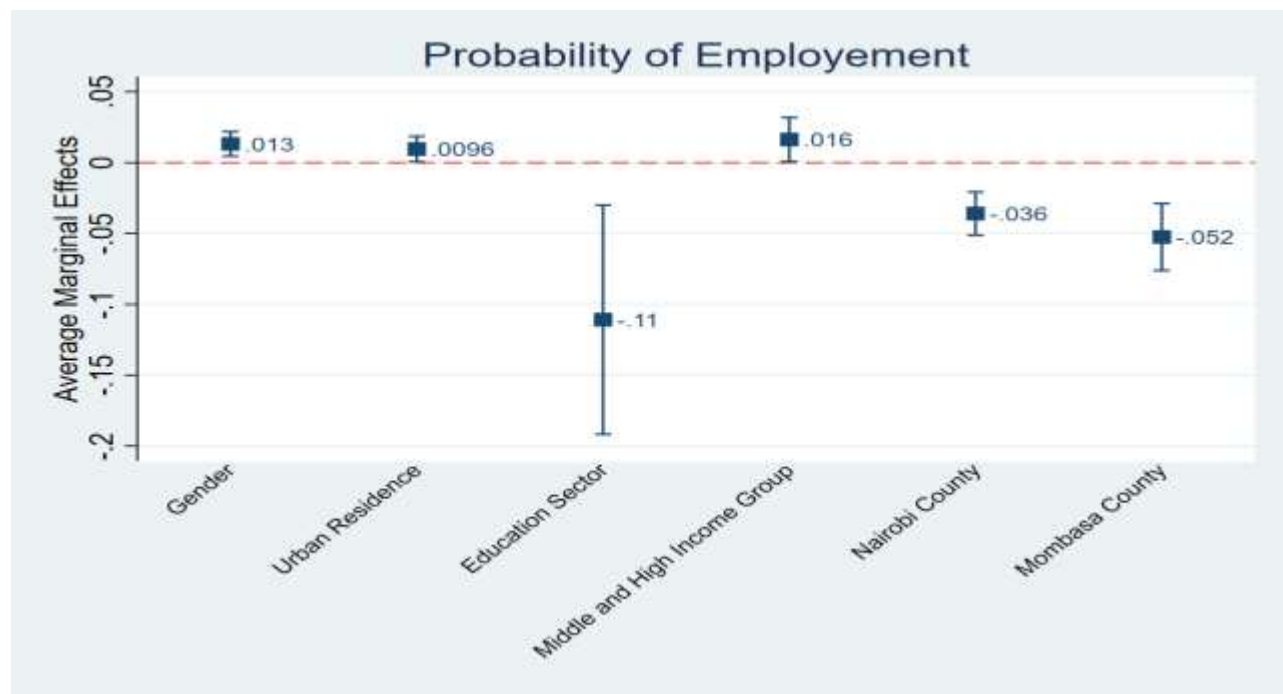


Figure 10: Average Marginal Effects of Probability of Employment during COVID-19

The third objective of this paper was to examine the impact of COVID-19 pandemic on income. Figure 11 below shows the average marginal effects of likelihood of experiencing income loss. The probability of income loss increased by 0.1 per cent with a unit increase in age. The level of education had a significant effect on the probability of income loss with workers with primary and secondary education 10 per cent and 9 per cent more likely to experience incomes loss due to the pandemic. Those with TVET/vocational training were 8 per cent more likely to experience income

losses compared with those with no schooling. In terms of the sectors of employment, workers in the retail/trade and transport were the hardest hit in terms of income loss as they were 29 per cent and 27 per cent more likely to experience income loss. The probability of income loss in the mining and manufacturing as well as construction & housing sectors were estimated at 18 per cent. Income loss for workers in the health sector was unlikely. In fact, Health workers were 29 per cent more likely to experience an increase in income during the pandemic. Casual and low-income workers were 11 per cent and 6 per cent likely to experience income loss. To the contrary, middle- and high-income workers were 5 per cent less likely to incur income losses.

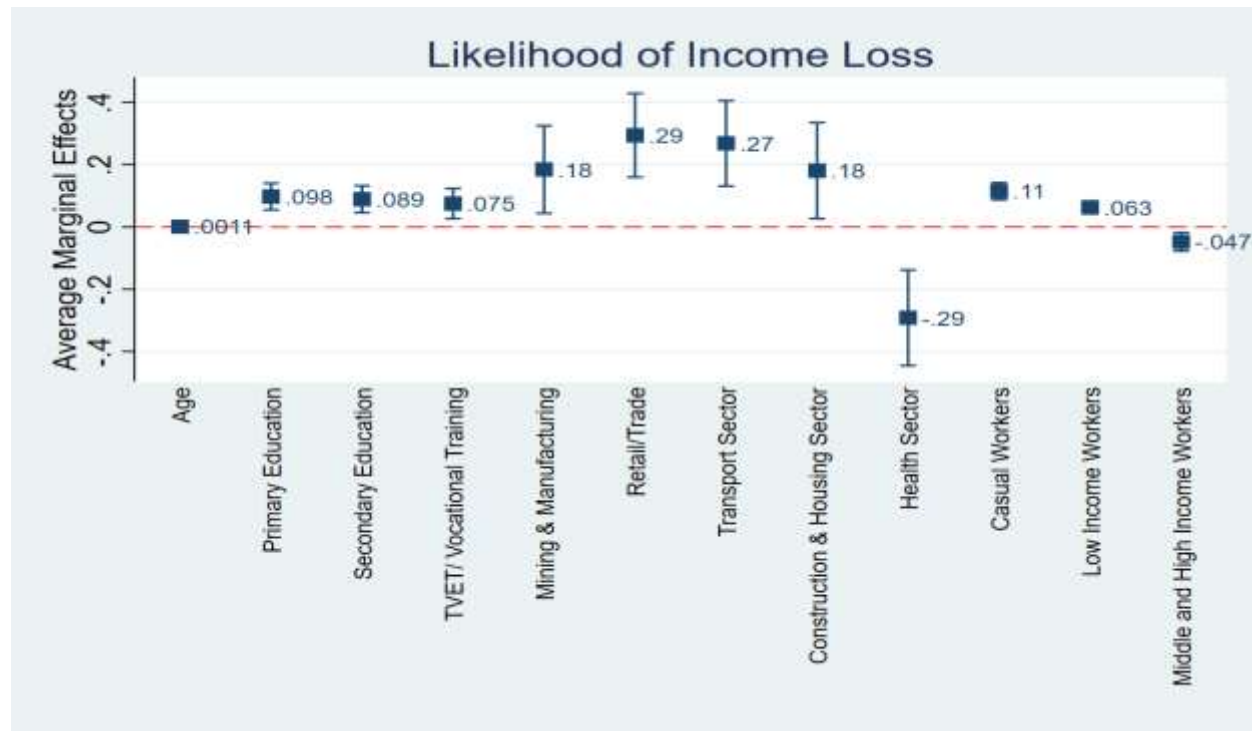


Figure 11: Average Marginal Effects of Vulnerability to Income Losses during the Pandemic

3.7 Robustness Checks

To ensure that our results are robust, we conducted endogeneity tests for suspected endogenous covariates such as monthly income. However, we find no evidence of endogeneity in any our independent variables.

3.8 Heterogeneity Analysis

We examine factors affecting the probability of income and employment loss across different categories of workers such as based on gender and income quintiles. Figure 12 below compares the probability of being employed between male and female workers. Women workers with primary education had lower probability of employment 4 per cent compared to males 0.3 per cent with the same level of education. This was consistent among workers with secondary education

whereby women workers had 2 per cent lower probability of being employed compared 0.2 probability among men, a difference of 1.8 percentage points. Among those in urban areas, women had a higher likelihood of employment than males by 0.4 percentage points. In Nairobi County, women workers had a lower chance of reporting to be employed than males by 0.1 percentage points. The lower likelihood of employment was also evident in Mombasa County, where women had a 1.1 percentage points lower chances of employment than male workers.

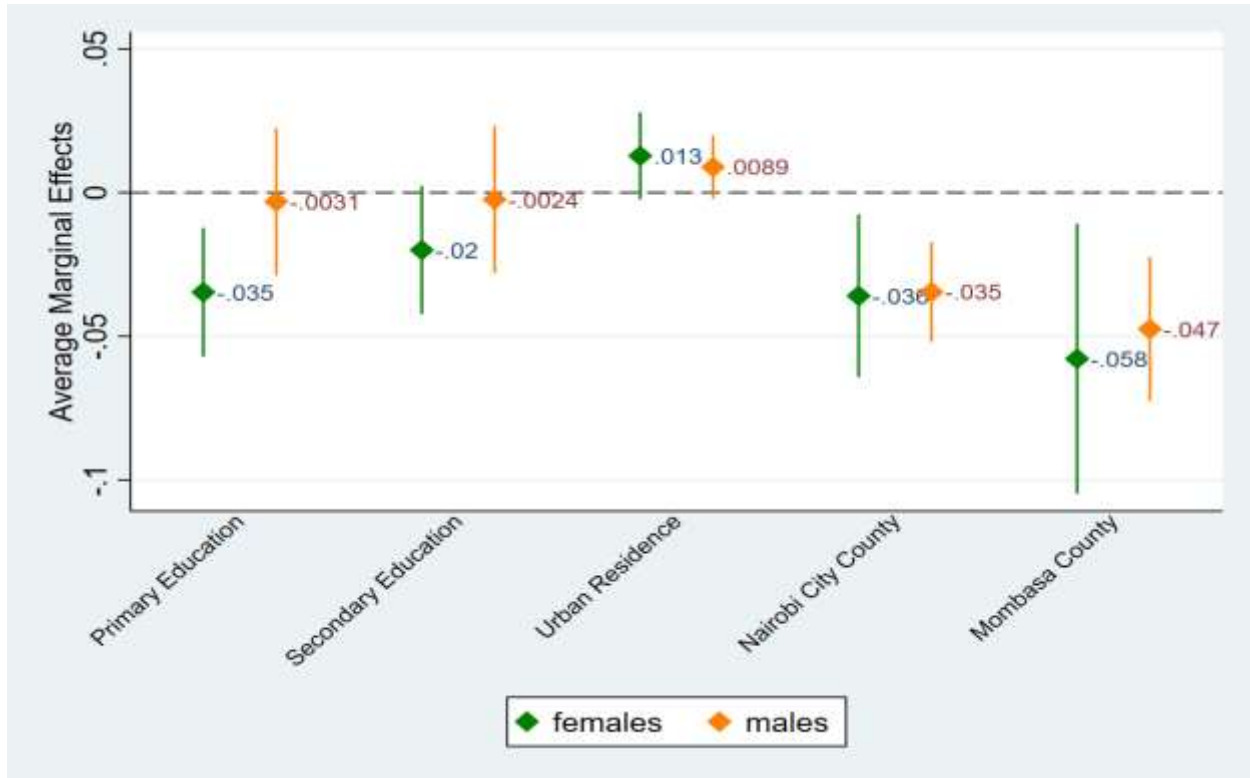


Figure 12 Probability of Employment Between Female and Male Workers

Figure 13 shows the likelihood of employment among low-income workers. Male low-income workers were more likely to be employed than their female counterparts by 2 per cent. The probability of employment among low –income workers differed with the level of education: 2.2 per cent less likely among those with primary education; 1.9 per cent among those with secondary education; and 2.4 per cent less likely among those with TVET/Vocational training. Low-income workers were less likely to be employed in Mombasa County than in Nairobi County by 2.2 percentage points.



Figure 13: Likelihood of Employment Among Low-Income Workers

Cases of income losses during the pandemic differed remarkably between male and female workers. For instance, male workers with primary education were more likely to experience income loss than female workers by 3.9 percentage points (figure 14). In addition, male workers with secondary education were also more likely to experience income loss than female workers by 5.8 percentage points. However, female workers in the retail and transport sectors were more than twice as likely as male workers to experience job losses. Among low-income workers, the incidence of income loss was higher among males than females by 1.2 percentage points. Male casual workers were more likely to experience income loss than females by 2 percentage points. Incidences of income losses were lower among middle and high income workers where males were 1.2 percentage points less likely to experience income loss than female employees.

Figure 14: Likelihood of Income Loss Between Female and Male Workers

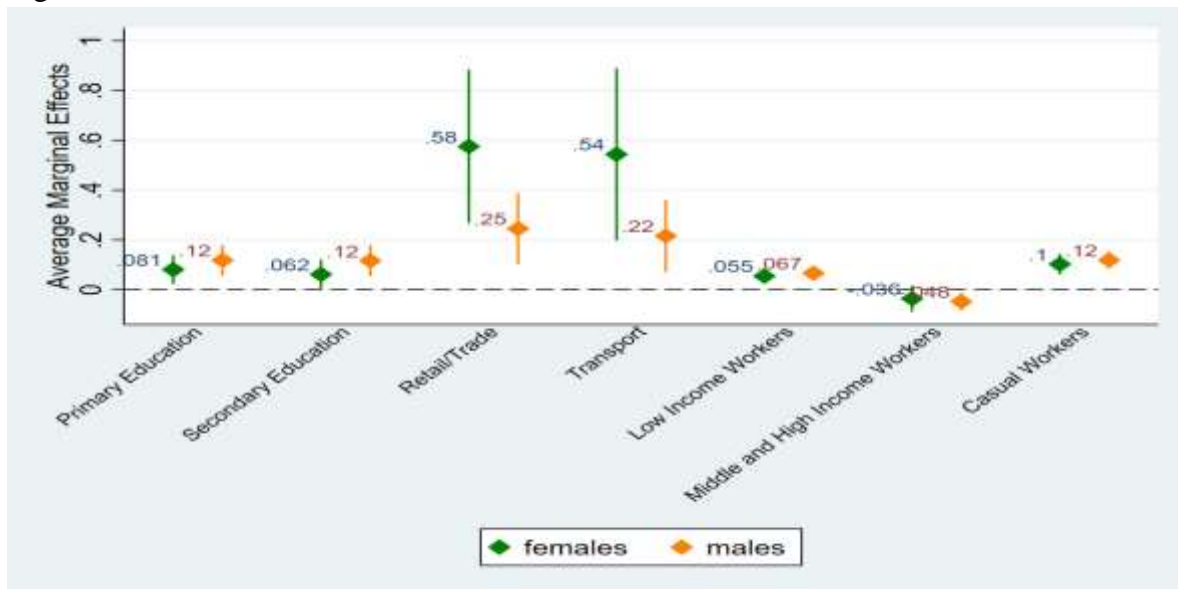


Figure 15: Probability of Income loss Between Female and Male Workers

Figure 16 below shows the probability of income loss among low-income and middle and high income workers. Irrespective of the level of education, workers on were more likely to experience income loss than middle and high income earners. In the service sector, low income workers were 14 per cent less likely to report income loss, indicating some ongoing level of economic activities. We did not find significant results for middle and high income earners. In the retail/trade sector, middle and high income earners were 30 per cent more likely to experience income loss. In both agriculture and education sectors, low income workers were 19 and 20 per cent less likely to report an income loss. In these two sectors, we did not find significant results among middle and high income earners. In the health sector, both low income and middle and high income workers were less likely to report a loss of income. In the financial sector, low income workers were also less likely to report income losses. Low income casual workers were 11 per cent more likely to report an income loss.

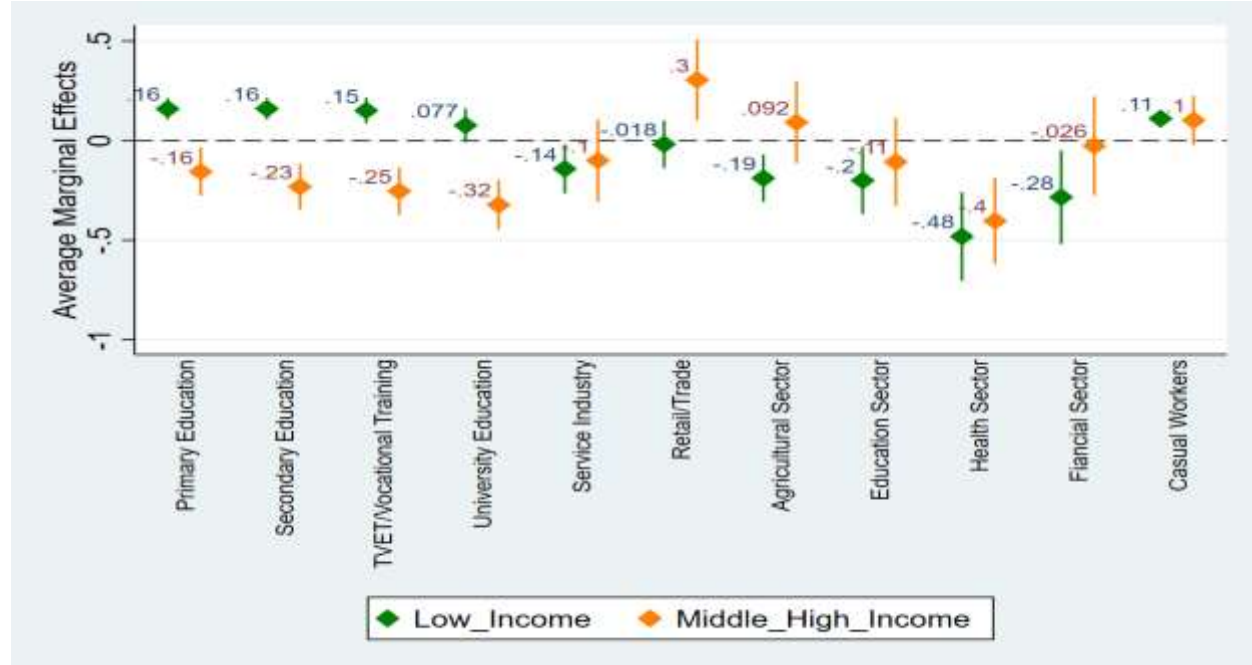


Figure 16: Likelihood of Income Loss Among Low-Income and Middle and High Income Workers

4 Discussion

4.1 Effect of COVID-19 on Unemployment Rate

The first objective of this study was to estimate the impact of COVID-19 pandemic on labour market outcomes, particularly on employment. To achieve this, we used a simple approach of obtaining the difference in unemployment before COVID-19 and during the pandemic. Using pre-COVID 19 data, our estimates show that among workers aged between 18 and 64 years, COVID-19 was associated with an increase in unemployment rate in Kenya of 25 percentage points. The impact on unemployment rate differed across counties. In Nairobi County, COVID-19 was associated with a 30 percentage points increase in unemployment rate. The increase in unemployment rate was higher in Mombasa, Marsabit, Lamu, Vihiga, and Kakamega counties. In contrast, counties such as Garissa, Tana River, Turkana, Nandi, and Kericho recorded the least increase in unemployment rate. This can be attributed to low reported cases of COVID-19 or less stringent mobility restrictions that disrupted economic activities.

4.2 Vulnerability to Employment Loss

The second study objective was to examine vulnerability to employment loss during the pandemic. The study results confirm the effects of COVID-19 pandemic differed depending on demographic characteristics and sector of employment. For instance, gender disparities in employment probabilities were observed, with women workers, especially those with primary and secondary education, facing high likelihood to lose employment and income compared to their male

counterparts, highlighting the need for targeted policies to address these disparities. In addition, notable differences in various categories, such as education levels and sectors of employment, were observed, underscoring the importance of gender-sensitive policies for economic recovery. The chances of employment were higher in urban locations because most job openings are in the urban regions.

In terms of employment sectors, the education sector was the worst hit shown by a significantly lower likelihood of employment. At the height of the pandemic, learning institutions were indefinitely closed. Most teachers, especially in private institutions, and non-teaching staffs in both private and public schools, were laid off. However, teachers on permanent basis (employed by Teacher Service Commission) were less likely to lose employment. Teachers adopted virtual platforms for curriculum delivery during the pandemic. This shift towards online education was a response to the challenges posed by the COVID-19 pandemic, which disrupted traditional classroom learning. It highlighted the adaptability and resilience of educators and the education system in Kenya in the face of a global crisis.

The level of income earning was also a key contributor to employment loss, with low-income workers being more vulnerable to loss employment. Middle- and high-income group workers were less vulnerable to loss of employment. This is unsurprising as these income groups have more resources to invest and engage in different income generating activities unlike low-income group persons. Low-income workers often occupy positions that are more vulnerable to economic shocks, have limited job security, and are engaged in sectors with high levels of informality. These factors make them particularly susceptible to employment loss during crises. In contrast, middle- and high-income workers typically hold more stable and secure jobs, which can provide a level of protection during economic downturns.

Respondents living in Nairobi and Mombasa counties were less likely to engage in employment because these counties were among the most affected by the pandemic and the government responded by imposing curfew and lockdown measures that limited engagement in economic activities. Our heterogeneity analysis reveals that among workers with low levels of education, the incidence of unemployment was higher among females than among males. Women were also less likely to be employed in both Nairobi and Mombasa counties. The pandemic disproportionately affected low-income workers as probability of employment among these workers was lower at all levels of education except university training. Furthermore, low-income workers were less likely to be employed in both Nairobi and Mombasa counties.

4.3 Vulnerability to Income Loss

The third objective of this study was to examine the likelihood of income loss among different categories of workers in diverse economic sectors. The study reveals that income shocks were more prevalent among workers with basic education qualifications (that is primary and secondary education) compared to those workers with TVET/vocational training. That is, the likelihood of

income shocks increased as education level decreased. There was no significant decrease in income among those with university education. This could be due to workers holding university education qualifications, often hold jobs that require specialized skills and knowledge, which may be in high demand even during economic downturns. These jobs may also allow for remote work and adaptability to changing work conditions. Additionally, they tend to have access to a broader range of job opportunities, which can contribute to their job security and income stability.

Those working in the retail and transport sectors were most susceptible to income losses followed by workers in the mining and manufacturing as well as in the construction and housing sectors. Health care workers were more likely to experience income increases since the government prioritized spending to the sector as essential sector to incentivize workers to work for longer hours and help fight the pandemic. Significant decreases in income were witnessed in retail, transport, and manufacturing sectors as these sectors involve more human interactions, hence were most affected by the mobility restrictions and lockdown measures.

Furthermore, our results show that casual labourers, who have no job security, pension scheme, medical cover, and other benefits, had higher incidences of income loss caused by the pandemic. Incidence of income loss was higher among female workers in retail and transport sectors. Low-income workers across all levels of education reported income losses indicating how vulnerable these workers are to labour market shocks. In sectors such as agriculture and education, low-income workers were less likely to experience income loss. This could be attributed to these workers continuing engagement in production, particularly in the agriculture sector, to supply food during the pandemic. Therefore, our study shows remarkably similar results with other studies such as Ceballos, Kannan, and Kramer (2020); Harris *et al.* (2020); Ranchhod & Daniels (2021) that found heterogeneous effects of COVID-19 on the labour market that differed across workers and economic sectors.

5 Conclusion and Recommendations

COVID -19 pandemic was a major shock on the labour market that affected labour demand, through depressed consumer demand of goods and services, and labour supply though lockdown measures implemented to curb the spread of the pandemic. Using COVID-19 wave 2 data collected from May 30th to June 6th, 2020, by the KNBS, quarterly labour force survey datasets from 2019 to 2022, and 2019 Kenya Census data, this study examined the effects COVID-19 pandemic on unemployment rate and vulnerability to employment and income losses among workers in Kenya. Ultimately, our examination reveals that COVID-19 pandemic was associated with a 25-percentage points increase in unemployment rate with some counties, particularly Marsabit, Mombasa, Lamu, Vihiga, and Kakamega counties, witnessing the highest unemployment spikes, while Garissa, Tana River, Turkana, Nandi, and Kericho counties experienced comparatively smaller increases. While there has been some recovery in the unemployment rate from the peak in 2020, it remains above pre-pandemic levels, indicating ongoing challenges in labor market

stability. The study recommends implementing targeted support and interventions in counties with the highest unemployment spikes. This could be through skill development programs to enhance workers' employability and tailor employment and income support strategies to the unique economic situations in different counties.

Using probit regressions, this study shows that the effects of COVID-19 on the labour market in Kenya significantly differed according to sector of employment and workers' characteristics. While the incidence of employment loss was higher in the education sector, income losses were higher in sectors such as mining and manufacturing, retail, transport and construction and housing. In retail and transport sectors, women workers were twice more likely to experience income losses than male workers. In sectors such as agriculture and education we found incidences of income losses were lower among low-income workers, while in the health sector, both low income and middle and high income workers had very low incidences of income loss. To address the challenges brought about by the pandemic and its effect on labour markets, the priority adoption of Information and Communication Technology (ICT) becomes even more critical. With lockdowns and social distancing measures, many workers and students had to adapt to remote work and online learning. ICT supports remote work, enhances economic recovery, strengthens healthcare, and improves government response, among other benefits. ICT serves as a catalyst for resilience and growth across all sectors, helping Kenya navigate the challenges posed by the pandemic and emerge stronger in the post-pandemic era.

The greatest impact of our study findings encompasses the disproportional effect the pandemic had on workers on the lowest income quintiles and casual workers. At all education level qualifications except university, low-income workers had higher incidences of income loss. Casual workers, those with no form of labour protection, were adversely impacted through high cases of income losses. By negatively affecting those at the lowest in the income ladder and workers without any form of labour protections and benefits, we argue that COVID-19 exacerbated income inequalities in the labour market. This underscores the importance of tailored interventions and support for low-income workers to mitigate the economic impact of such crises. It is therefore crucial for policy makers to cushion workers who have low levels of education in the event of similar emergencies and disasters. This includes providing and expanding access to social protection programs for those in the lowest income quintiles, enforcement of minimum wage regulations, and improving working conditions for casual workers.

It is now three years since the first case of COVID-19 was found in Kenya. Furthermore, the WHO declared the end of COVID-19 as a global pandemic in May 2023. However, our findings provide insights that can guide future economic recovery strategies in the event of exogenous shocks of the magnitude of COVID-19 pandemic. In the event of such shocks, for cash transfers to be effective in stimulating economic recovery efforts, they must be geared toward low-income workers or households. Second, we argue that COVID-19 must have enhanced income

inequalities. In the post COVID-19 era, governments both at the national and county levels should focus on policies to enhance incomes of low income and disadvantaged households.

Exploring beyond the scope of this study, we find a few limitations. First, there should be caution in interpreting the results of our study. Our results are not causal. Even though we attribute the increase in unemployment rate in 2020 to COVID, they could be other factors that led to the increase other than COVID. We did not have adequate data to do a diff-in-diff specification to identify causal relationships. Unearthing these causal relationships by examining pre and post COVID data would be interesting for future research.

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