SANITARY PROVISION AND COMPLIANCE WITH CONTAINMENT MEASURES IN ELDORET MARKETS DURING THE COVID-19 PANDEMIC, UASIN GISHU COUNTY, KENYA

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DECLARATION

I Faith Jepkorir Kemboi hereby declare that this project is my original work and has not been presented as a requirement for the attainment of a master's degree in any other institution or any award. Also, all materials used have been referenced to avoid plagiarism and maintain the required standards.

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Declaration by Supervisor

This project work has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This project is dedicated to my father Mr. Samuel Kemboi and my mother Mrs. Lydia Kemboi for their encouragement to pursue education to the highest level. To my siblings, Caren, Obadiah, Gideon and Caleb for their moral and financial support accorded to me during the entire process.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

ACRONYMS AND ABBREVIATIONS

CBD	Central Business District
CDC	Centers for Disease Control and Prevention
FAO	Food and Agriculture Organization
GFDRR	Global Facility for Disaster Reduction and Recovery
GOK	Government of Kenya
ITC	International Trade Centre
KNBS	Kenya National Bureau of Statistics
MoH	Ministry of Health
PHA	Public Health Act
PPEs	Personal Protective Equipment
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SDG	Sustainable Development Goal
SPSS	Statistical Package for the Social Sciences
UCG	Uasin Gishu County Government
UN	United Nations
UNEP	United Nations Environment Programme
UNICEF	United Nations children's Fund
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

DEFINITION OF TERMS

Covid-19 Pandemic Refers to the global outbreak of the coronavirus disease (Covid-19), caused by the SARS-CoV-2 virus. The pandemic, declared by the World Health Organization (WHO), has led to widespread illness, significant public health challenges, and the implementation of various measures to curb the spread of the virus (UNDP,2021).

Sanitation Facilities Infrastructure and amenities designed to promote cleanliness, hygiene, and the proper disposal of waste in various settings, such as households, public spaces, or institutions. These facilities encompass a range of components, including toilets, hand-washing stations, sewage systems, waste disposal units, and other structures aimed at maintaining a sanitary environment (UNICEF and WHO, 2020).

Hand Sanitization Refers to the process of cleaning and disinfecting the hands using a sanitizer, which is a gel, liquid, or foam containing alcohol or other antiseptic agents. The primary purpose of hand sanitization is to eliminate or reduce the presence of harmful

	microorganisms, including bacteria and viruses, on the hands. This practice is particularly important in situations where traditional handwashing with soap and water may not be readily available or convenient (UNICEF, 2021).
Hygiene	Encompasses practices and conditions that maintain cleanliness and prevent the spread of disease (UNICEF, 2021).
Marketplace	A designated area or facility where goods and services are bought and sold (Hagiu and Wright 2015).
Public Health	Refers to the science and practice of safeguarding and improving the health of communities through education, promotion of healthy behaviors, disease prevention, and the assurance of proper health services (Turnok, 2020).
Containment Measures	Refer to specific strategies implemented to limit the spread of infectious diseases like Covid-19. In market settings, these include mask-wearing, hand hygiene, temperature screening, fumigation, social distancing, and reduced physical contact such as minimizing cash handling (WHO, 2020; Ministry

	of Health Kenya [MoH], 2021).
Compliance	Refers to the degree to which individuals or groups adhere to established public health guidelines and protocols, such as regular handwashing, wearing face masks, and maintaining physical distance in public spaces (CDC, 2020; WHO, 2020).
Market Planning	refers to the design, organization, and spatial structuring of marketplace environments to ensure functionality, safety, and accessibility. It involves considerations such as stall arrangements, ventilation, sanitation infrastructure, circulation paths, and parking spaces, with the goal of promoting economic activity while safeguarding public health (Corburn and Spencer, 2023).
Adequacy (of Sanitation Facilities)	Adequacy describes the extent to which sanitation facilities meet the basic standards necessary to ensure public hygiene, including sufficient quantity, accessibility, functionality, and maintenance (WHO, 2020).

ABSTRACT

Markets play a vital role in developing countries by providing affordable food and serving as key economic hubs. However, their role as public spaces also poses public health risks, particularly during disease outbreaks. This study examined markets in Eldoret, assessing sanitary conditions, Covid-19 compliance, and the extent to which market planning aligns with public health standards, with the goal of identifying areas for improvement to safeguard both traders and customers. A descriptive cross-sectional research design was used, integrating both quantitative and qualitative methods. Data was collected through structured questionnaires from 282 traders, selected using stratified random sampling from three major markets in Eldoret: Main, Municipal, and West Markets. Key informant interviews were also conducted with relevant stakeholders. Quantitative data was analysed using descriptive statistics, likelihood ratio tests, and logistic regression. Results were presented in tables and figures. Qualitative data were analysed thematically to incorporate stakeholder perspectives. Findings indicated that water supply was generally reliable in all markets, toilet and urinal facilities were considered fairly adequate, while showers were notably inadequate in the West Market. Handwashing at entry points and face mask usage were common, but hand sanitizer use was limited, fumigation was infrequent, indicating non-compliance with Covid-19 measures. Temperature checks were rarely conducted, and social distancing proved challenging due congestion, raising concerns about the potential spread of Covid-19. Therefore, compliance with Covid-19 measures was low. The Lack of testing and the predominant use of cash transactions heightened the risk, emphasizing the need for increased adherence to safety measures. Market planning also emerged as a critical issue. While the Municipal and Main market had better security and lighting, the West Market lacked these basic provisions. The overall lack of planning to ensure public health, coupled with market congestion that made social distancing not tenable, highlighted the necessity for strategic interventions. The study concludes that sanitary provision and compliance during the pandemic was suboptimal, and market planning only partially met public health standards. The study recommends infrastructure improvement particularly showers and drainage systems in the West Market, and routine maintenance. To enhance Covid-19 containment, stricter enforcement of hygiene protocols is required, including consistent use of hand sanitizers, regular fumigation, temperature screening, and a shift from cash transactions to mobile money. In relation to market planning, the study calls for increased budgetary allocation by the Uasin Gishu County Government to support public health-oriented improvements. This includes the adoption of flexible design principles in future market development, expansion of parking areas, and reorganize layouts to allow adequate spacing. These measures aim to make Eldoret's markets cleaner, safer, and more resilient to future public health challenges.

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Marketplaces, including open-air markets, fish and meat markets, vegetable markets, and clothing stores play a vital role in fulfilling the financial needs of buyers and small-scale business owners (Kenton, 2021). Despite the rise of commercial retail chains and online shopping, markets remain central to urban life, contributing significantly to local food supply and regional economies. Market places are a typical example of public spaces, offering not only access to fresh produce but serving as key social infrastructures (van Eck *et al*., 2020). Recent studies highlight that cities' resilience during pandemics relies heavily on the functionality of informal market systems and the presence of basic hygiene infrastructure (Thomas *et al*., 2023).

On January 30, 2020, the World Health Organization (WHO) declared the outbreak of Covid-19 a global pandemic, raising concerns about an impending financial crisis and public health emergency (UNICEF and WHO, 2020). The Huanan Seafood Wholesale Market in Wuhan, China, was believed to be the epicentre of the Covid-19 coronavirus outbreak. While some of the initial coronavirus cases had no confirmed connection to this market, its potential role in the virus origin remained under scrutiny (Huang *et al*., 2020). Consequently, On January 1, 2020, the Wuhan municipality government ordered the closure of the

market and banned the sale of live animals in the city's wet markets (van Eck *et al*., 2020). Globally, markets were identified as high-risk environments due to their open-air nature, dense populations, and limited sanitation, raising alarms about the potential for unregulated virus transmission (Munster *et al*., 2018).

Several countries implemented a range of interventions to curb the transmission of the virus and decelerate progression of the pandemic. These included isolating confirmed cases, encouraging hand hygiene, respiratory etiquette, mandating the use of facemasks, and enforcing social distancing measures. Other interventions involved closing schools and universities, banning mass gatherings, restricting travel and public transportation, making the public aware of the need to stay at home, and even implementing total lockdown in which individuals are only allowed out to buy food, seek medical care or access essential services (WHO, 2020). The implementation of these measures varied in timing and scope across countries, often influenced by socioeconomic and cultural contexts, political and healthcare systems, and operational capacities (Aquino *et al*., 2020). In Kenya, the Covid-19 pandemic also led to workforce reductions and the closure of non-essential markets to minimize overcrowding and reduce transmission risks (Irura *et al.*, 2020). Social distancing, in particular, proved effective in limiting community transmission of the virus (Rana *et al*., 2021).

Water, sanitation, and hygiene (WASH) interventions and practices are crucial in

the prevention of covid-19. Basic hygiene interventions such as handwashing with water and soap was the most simple and effective means of barrier for the transmission of infectious diseases (UNICEF, 2020). However, in many low-income countries, weaknesses in WASH systems continue to increase vulnerability to disease outbreaks (Desye, 2021). In Kenya, for instance, over 5,300 public handwashing stations were deployed across counties in 2020, yet a 2024 assessment showed functionality declined from 84% to 61% within eight months, highlighting the need for sustained maintenance efforts (Muchangi *et al.,* 2024). The Covid-19 pandemic emphasized the importance of sanitary measures in marketplaces, which calls for multiple domain - public health, spatial environmental planning and engineering – to respond to particularly in research.

Unsatisfactory hygiene can significantly facilitate the spread, underscoring the need for access to water, sanitation, and hygiene (WASH) facilities (UNICEF, 2020). The WHO recommended the availability of hand sanitization facilities at the entrances of public spaces and transport hubs, including markets, shops, churches, educational institutions, and vehicle boarding stations, to mitigate the spread of Covid-19 (WHO, 2020). Since public health relies on availability of clean water, governments were urged to implement measures that increase water supply and support frequent hand washing with soap, particularly in high-traffic public spaces like markets (UNICEF, 2020)

In Kenya, county governments implemented strategies to improve sanitation in markets, including fumigation, provision of hand-washing facilities, and moving or closing non-essential markets (Omolo and Ayah, 2020). The use of protective masks became mandatory in open-air markets to safeguard public health. However, many markets remained vulnerable due to inadequate infrastructure, insufficient waste and sanitary facilities, and regulatory ambiguities, putting traders at risk of contracting the disease (Wandimi, 2017). Therefore, assessing the adequacy of sanitary facilities during Covid-19 is imperative to determine whether market infrastructure effectively supported containment of the virus.

As the covid-19 pandemic continued to transform lives and ways of living across the globe, it became increasingly clear that adaptations involving both physical and institutional infrastructure are warranted. Researchers have emphasized the need for adaptive and health-centered public space design in response to pandemics. These include improved ventilation, crowd management strategies, and spatial distancing integrated into market infrastructure (Corburn & Spencer, 2023). Cities have been at the forefront of these adaptive changes as dense urban environments are particularly vulnerable to the spread of contagious airborne diseases such as the novel coronavirus (Bereitschaft and Scheller, 2020). For city managers, planners, and other local actors, the pandemic represents a rare opportunity to make cities more resilient and robust by elevating the importance of public health in a variety of land use, transportation, and public space design

decisions (Honey-Rosés *et al.,* 2021). The alignment of market planning with public health standards is essential during a pandemic. Urban marketplaces should be designed to accommodate public health measures such as social distancing and sanitation, to ensure resilience during public health crisis (Comunian *et al*., 2020). According to the United Nations (UN) policy brief on Covid-19 and urban areas (2020), marketplaces should be planned and managed in a way that aligns with public health guidelines to protect traders, customers, and the broader community.

In Eldoret Municipality, these markets are crucial hubs for economic activity and community interaction. Therefore, it is essential to assess the adequacy of sanitary facilities, the level of compliance with Covid-19 containment measures, and the extent to which market planning aligns with public health standards and regulations. Such an assessment is also consistent with global best practices aimed at enhancing the resilience and functionality of urban markets during pandemics.

1.2 Problem Statement

Marketplaces across the world have emerged as critical locations for implementing preventative measures in place to minimize the spread of viruses in response to the Covid-19 epidemic. These spaces are particularly vulnerable to rapid disease transmission due to their open layouts and high levels of human interaction (Munster *et al.,* 2018). Despite these risks, markets remain central to urban life, serving as essential hubs for local food distribution and economic activity (González, 2020).

Since the Covid-19 virus is highly contagious in environments, it is imperative to implement effective water, sanitation, and hygiene (WASH) measures alongside following physical distancing protocols in order to prevent the virus's spread. This points to the significance of these public health interventions in crowded areas such as markets (UNICEF, 2020). The emphasis on WASH practices in managing the pandemic makes it more necessary to determine if the infrastructures of the market currently in place facilitate these actions. This is especially important in cities where unsanitary conditions raise the possibility of unchecked viral spread.

Eldoret Municipality, being one of the fastest-growing urban centres in Kenya and a key commercial hub in the North Rift region, has experienced increasing pressure on its public infrastructure, including markets (KNBS, 2019). The high population density, combined with inadequate sanitation in some of its markets, makes Eldoret a strategic and significant case for examining the adequacy of sanitary provisions and the extent of compliance with Covid-19 containment measures. Ensuring that these markets are equipped with the necessary resources is vital to protecting both traders and consumers.

Market planning and design are essential to the accomplishment of public health initiatives. When the existing market layouts and infrastructure fail to accommodate effective sanitation and distancing measures, they might impede

attempts to curb the transmission of Covid-19. Addressing these infrastructural and spatial shortcomings is therefore essential to ensuring that marketplace environments are both safe and compliant with public health regulations.

Ultimately, the Covid-19 pandemic underscores the critical need for a comprehensive assessment of market infrastructure to ensure its capacity to support sustained public health interventions. As markets remain essential economic and social spaces, their contribution to preventing further viral transmission must be strategically managed through effective planning and the implementation of long-term containment measures (UNICEF, 2020)

1.3 Objectives

The specific objectives of this study were:

1. To assess adequacy of sanitary facilities in Eldoret Markets during the Covid-19 pandemic.
2. To assess compliance with Covid-19 containment measures in Eldoret markets during the Covid-19 pandemic.
3. To evaluate the alignment of market planning in Eldoret markets with public health standards and guidelines during the Covid-19 pandemic.

1.4 Research Questions

The research aimed to answer the following questions

1. How adequate were sanitary facilities in Eldoret markets to facilitate public health measures during the Covid-19 pandemic?
2. How were Covid-19 containment measures complied with in Eldoret markets during Covid-19 pandemic?
3. To what extent did the market planning in Eldoret comply with public health standards and guidelines during the Covid-19 pandemic?

1.5 Justification

Uasin Gishu County, where Eldoret is located, was significantly affected by the Covid-19 pandemic, particularly within marketplaces where large numbers of people converge (vanEck *et al*., 2020). Understanding the specific conditions in this county and its markets is essential for developing effective strategies to curb virus transmission. Eldoret, as a major urban center in Uasin Gishu County, hosts bustling markets that serve as key economic hubs (UCG, 2022). The high concentration of people in these markets heightens the risk of virus transmission. Therefore, it is imperative to study the sanitary provisions and containment measures implemented within these markets to safeguard the health and well-being of traders, customers, and the community at large.

The Covid-19 pandemic has profoundly affected public health systems across the globe. Given the high density and interactive nature of marketplaces, these spaces have the potential to become significant hotspots for virus transmission (Honey-rosés *et al*., 2020). Therefore, assessing the alignment of market planning in Eldoret markets with established public health standards and guidelines is important. Market traders, who frequently interact with large numbers of customers and handle various goods, may face increased vulnerability to Covid-19 exposure. Understanding the specific challenges and needs of this group is essential not only for protecting their health and well-being but also for safeguarding the broader public that depends on these markets.

This study will provide valuable insights to county policymakers, public health officials, and market managers by identifying specific gaps in sanitary infrastructure and compliance with health protocols. Additionally, the study will empower stakeholders to prioritize investments in hygiene infrastructure, public health planning, and awareness campaigns, ultimately fostering safer and more resilient market environments. The research topic aligns with the global effort to combat the pandemic. Understanding the current state of sanitary provisions, identifying existing gaps, and assessing the effectiveness of containment measures are crucial steps in both managing the Covid-19 pandemic and preparing for future health emergencies.

1.6 Significance of the Study

The study aims to enhance public health by evaluating and improving sanitary provisions and measures within densely populated marketplaces, thereby reducing the risk of virus transmission and preventing disease outbreaks. The research is grounded in the local context of Eldoret Markets, recognizing the unique challenges faced by this community and offering tailored solutions to address these challenges. Of particular importance is the protection of vulnerable groups, such as market traders, who are on the frontlines of public interaction and economic activities. By safeguarding their health, the study contributes to the overall well-being of the community and ensures the stability of local economies. Additionally, the research provides valuable guidance for policymakers and planners, offering insights into effective policies and strategies to protect public health and prepare for future health crises. Its findings and recommendations also have global relevance, serving as a model for similar regions and adding to the collective understanding of how to address sanitary challenges in densely populated areas during a pandemic. This study has the potential to make a substantial impact on public health, local economies, and pandemic response both in Eldoret and beyond.

1.7 Scope of the Study

This study focused on assessing the adequacy of sanitary facilities, compliance with Covid-19 containment measures, and the alignment of market planning with

public health standards in Eldoret Municipality, Uasin Gishu County. The research was limited to three major markets: Main Market, Municipal Market, and West Market. Data was collected from traders through structured questionnaires, as well as from key informants including county officials and market masters.

1.8 Limitations of the Study

The findings are context-specific and limited to Eldoret's three major markets. Therefore, they may not be generalizable to other towns, rural markets, or counties in Kenya, especially those with different governance, infrastructure, or enforcement mechanisms.

CHAPTER TWO: LITERATURE REVIEW

2.1 Sanitary Facilities in Markets

The ongoing Covid-19 pandemic has underscored the importance of public hygiene, particularly in densely populated areas such as bus stations and marketplaces (Naguib *et al*., 2021). Effective sanitation not only reduces the risk of disease outbreaks but also significantly enhances overall community well-being. Ensuring that markets are equipped with adequate and properly planned sanitation facilities is a critical component of a comprehensive public health strategy. These facilities should include restrooms, water for handwashing and drying, urinals, sanitary bins, and menstrual hygiene products, among other amenities (Meki, 2015). The availability and accessibility of these features are essential for maintaining hygiene and preventing the spread of infectious diseases in crowded public spaces.

The availability of safe and accessible public restrooms is of the utmost importance in public spaces such as marketplaces (KNBS, 2019). According to the Kenya National Bureau of Statistics, every building should have at least one urinal, one male toilet, and two female toilets. There should be an equal number of male and female restrooms, however this is dependent on the location and how often people use them (MoH, 2014). Additionally, according to the Ministry of Health's standards (MoH, 2014), urinals should adhere to specific dimensions

based on user volume. For example, it's advised to have a 1000 mm urinal basin for every 100 users, and in areas with high congestion during peak hours, additional cubicles may be required to meet demand.

Individuals with disabilities require special consideration, particularly in the provision of accessible facilities that are located on level ground and free from steps or ramps wherever possible (MoH, 2014). The guidelines further recommend the provision of separate restrooms for men and women, with additional facilities constructed as space allows to accommodate increased demand. Implementing effective sanitation measures in public spaces is essential to minimizing the spread of Covid-19 and protecting community health. By adhering to established guidelines and recommendations, decision-makers can create safer, more inclusive environments for all, including persons with special needs (World Bank, 2020).

2.2 Public Health and Markets

Public health is a broad discipline focused on improving quality of life through disease prevention, health promotion, and monitoring of health trends (UNEP *et al*., 2019). Aligning market planning with public health standards is crucial, especially during public health emergencies such as pandemics. The United Nations policy brief on Covid-19 and urban areas (UN-Habitat, 2020) emphasizes the need for markets to be designed and managed in accordance with health regulations. To enhance urban resilience, especially in dense public spaces like

markets, infrastructure should support public health measures such as social distancing, sanitation, and hygiene facilities (Comunian *et al.,* 2020).

Adhering to public health regulations in marketplaces is crucial, as outlined in the *Public Health Act*, Part IX, Section 115, which prohibits any condition deemed harmful or offensive to human health (GoK, 2012). This section emphasizes the importance of water and sanitation in protecting public health. Access to clean and adequate water, along with proper sanitation, is not only a fundamental human right but also essential for promoting hygiene at the individual, household, and community levels, significantly impacting quality of life and health outcomes (WHO, 2019).

Moreover, marketplaces should comply with occupational health standards to ensure the well-being of traders and workers. These standards include adequate space, lighting, ventilation, protective equipment, and climate control systems (WHO, 2006). Facilities such as toilets, handwashing stations, and safe walkways must also be provided to reduce occupational hazards, including slips and falls (WHO, 2006). By integrating public health principles into market planning and operations, markets can continue to serve as vital economic hubs without compromising the health of individuals or the environment.

2.2.1 General Covid-19 Containment Protocols in Markets

Globally, markets were identified as high-risk environments for the spread of Covid-19 due to their layout and the high volume of people interacting within them. In response, various containment protocols were implemented, often following guidance from international organizations like the World Health Organization (WHO 2020). A critical measure was improving market sanitation, with the WHO recommending that public restrooms in markets be equipped with sinks, soap, and hand sanitizers to curb virus transmission (WHO, 2020). Social distancing protocols were also widely adopted, with many countries reorganizing market layouts to allow for greater spacing between vendors and customers (UNICEF, 2020). Hand hygiene was prioritized, with the placement of hand sanitizer stations at market entrances reducing the risk of transmission through contaminated surfaces (Munster *et al*., 2018). In some cases, markets were temporarily closed or fumigated, particularly following outbreaks, as seen with the initial closure of markets in Wuhan (Wu *et al.,* 2020). Furthermore, the enforcement of mask-wearing in these settings became a critical preventive measure to reduce virus spread through respiratory droplets (Gunder, 2021). These global protocols underscored the importance of stringent management and containment efforts in markets during the pandemic to protect public health.

2.2.2 Kenya's Covid-19 Market Protocols

On March 13, 2020, Kenya reported its first official case of the Covid-19 pandemic, prompting swift action from both national and county governments to mitigate the spread of the virus in public spaces, particularly in markets (MoH, 2020). Recognizing the vulnerability of markets due to their high congestion, the Kenyan government introduced several specific protocols to control virus transmission. These included temporary market closures, reflecting similar measures implemented in other countries like China, following the outbreak in the Huwan Seafood Wholesale Market (Wu *et al.,* 2020).

Social distancing became a key focus, with the Ministry of Industrialization, Trade, and Enterprise Development (MoITED) working with county governments to reorganize market spaces, ensuring adequate distance between stalls and pedestrian areas (MoITED, 2020). Additionally, hand sanitizer stations were placed at strategic locations in the markets, and regular fumigation was mandated to maintain cleanliness. To further control market congestion, designated entry and exit points were introduced, along with random temperature checks to monitor for symptoms (MoH, 2021b). The use of face masks in open-air markets was made compulsory, with local authorities and law enforcement ensuring compliance. These efforts represented a collaborative approach involving both national and county governments, local market authorities, and the public, aimed at reducing the virus's spread.

2.3 Market Planning Standards

In the realm of markets, the structural landscape varies from simple, standalone stalls to fully enclosed buildings with open sides and roofs (Sandak *et al.,* 2019). Depending on the nature of goods sold, vendors dealing with vegetables and fruits may require simpler facilities compared to traders dealing with more valuable items such as clothing (FAO, 1999). The allocation of covered space in relation to the overall site area is crucial, with a recommended ratio ranging between 1:4 and 1:3. This implies that for every square meter of covered sales space, an additional three to four square meters of site area is needed, although exceptions can be made based on-site limitations (FAO, 2000).

When planning for the market, it is important to consider accessibility. This helps to make commercial interactions between buyers and sellers smooth and efficient. It also ensures that there are no obstacles in the circulation of goods and services, which leads to the best possible price outcomes (Litman, 2021). Market composition is best achieved by using paved surfaces made of materials such as asphalt, in-situ concrete, or paving units like pre-cast concrete or stone blocks (Kawther *et al.,* 2020). Design choices, including road designs, carriageway widths, parking bay sizes, and sidewalk widths, play a vital role in creating an economic layout that meets turnover standards (FAO, 1999). To ensure the efficient flow of vehicles entering and exiting markets, there must be sufficient

and properly controlled parking facilities (Lebo and Schelling, 2001). All of these factors work together to make markets work well and be financially viable.

Globally, the pandemic highlighted the vulnerabilities in market infrastructures, prompting a re-evaluation of traditional market planning. Effective market planning during health crises involves integrating public health principles with economic considerations. This integration led to the implementation of measures such as social distancing protocols, enhanced sanitation practices, and the restructuring of market layouts to minimize crowding (Kumar *et al.,* 2021). Local authorities in Eldoret undertook several initiatives to improve market planning and compliance. These include the installation of additional handwashing stations, periodic disinfection of market areas, and public awareness campaigns to educate vendors and consumers about the importance of adhering to health guidelines (UCG, 2021).

2.3.1 The Role of Markets in Urban Planning and Development

Throughout history, the exchange of foodstuffs has been predominantly confined to public marketplaces, serving as crucial hubs for interactions and trade (Seale, 2016). Markets play a pivotal role in fostering urbanization, acting as spaces that not only facilitate transactions but also contribute to local growth by bringing people together. They serve as public domains where individuals can forge connections, engage in barter trade, and appreciate the diversity within their

communities (Caramaschi, 2020). In the past, markets were strategically located in urban areas, often around major institutions. The ability to supply food and other essentials was a defining factor in granting administrative functions to a city (Schappo and Melik, 2017).

Beyond being transactional spaces, markets in Africa have played a multifaceted role in city formation. They have served as dynamic arenas for interaction, meetings, and the exchange of goods and services (Onyango and Wagah, 2013). These marketplaces are not just places for economic transactions; they are vibrant spaces that foster creativity and innovation. The scenes of people meeting, conversing, and exchanging ideas within markets contribute significantly to the cultural and social vibrancy of a city (Richards, 2014). Thus, the historical and contemporary significance of markets extends beyond commerce, influencing the social, cultural, and developmental fabric of urban environments.

2.3.2 Alignment of Market Planning with Public Health Standards

The COVID-19 pandemic exposed critical weaknesses in conventional market designs, particularly in rapidly urbanizing regions where traditional layouts failed to support effective health interventions. Recent urban health research emphasizes that inclusive and proactive planning is essential during health emergencies to ensure that public spaces are both functional and safe (Thomas *et al.,* 2023). Urban market layouts must facilitate social distancing, ensure adequate lighting, optimize

crowd control, and integrate sanitation infrastructure such as handwashing stations and public toilets into the physical blueprint of the market (Corburn & Spencer, 2023).

In sub-Saharan Africa and Kenya specifically, there has been a growing institutional focus on improving public health resilience through smarter planning and localized governance (Africa CDC, 2024). These efforts acknowledge that the spatial organization of market stalls, the placement of hygiene facilities, and the control of entry and exit points directly influence the public's ability to comply with containment measures such as social distancing and hand hygiene. However, evaluations of actual implementation remain limited.

A review of local market interventions in Kenya revealed that while strategic guidelines for market reorganization and sanitation exist, their application has been inconsistent often hindered by resource constraints, lack of enforcement, and infrastructural limitations (Nkengasong *et al.,* 2024). In Eldoret markets, it becomes crucial to assess whether planning elements such as stall arrangements, walkways, ventilation, and lighting support public health standards. Without infrastructure that accommodates these measures, containment efforts risk being undermined.

Recent analysis has highlighted the need for flexibility in public space design, recommending adaptive layouts that prioritize health security without sacrificing economic functionality (Brookings Institution, 2024). Therefore, aligning market planning with public health standards is not only necessary for pandemic response but also for building long-term resilience in urban commercial spaces like Eldoret's markets.

2.4 Research Gap

There is a clear need for more focused investigation into the adequacy of sanitary facilities and compliance with public health containment measures in Eldoret marketplaces during the Covid-19 pandemic. While existing literature acknowledges the general importance of sanitation and hygiene in curbing virus transmission (WHO, 2020), there is limited empirical evidence specifically evaluating the sufficiency and functionality of sanitary infrastructure in Eldoret's market settings. This lack of context-specific data restricts our understanding of how effective the implemented interventions were in mitigating public health risks within these markets.

Furthermore, although compliance with containment measures such as handwashing, sanitization, and mask usage, and physical distancing has been widely recommended (UNICEF, 2020), there is inadequate research on how consistently and effectively these measures were followed within the socio-

economic and cultural context of Eldoret. This presents a critical gap in understanding behavioral adherence and enforcement dynamics at the local market level.

In addition, there is a notable gap in the literature regarding the extent to which market planning in Eldoret was aligned with national and international public health standards during the pandemic. While global and national policy documents emphasize the integration of public health principles in urban planning (Gunder, 2021), there is little analysis of whether such integration occurred in Eldoret's market infrastructure. Existing studies have largely overlooked the planning challenges faced by market authorities and how these affected the design and adaptation of marketplaces for health resilience. Therefore, a comprehensive investigation is warranted to examine: the adequacy of sanitary provisions in Eldoret markets, the level of compliance with Covid-19 containment measures, and the extent to which market planning aligned with public health standards during the pandemic. This study aims to fill these critical knowledge gaps and provide localized insights that can inform future public health and urban planning strategies.

2.5 Conceptual Framework

This study is structured around three key independent variables: the adequacy of sanitary facilities, compliance with Covid-19 containment measures and the

alignment of market planning with public health standards. These independent variables collectively influence the dependent variable, which is public health safety, the Covid-19 risk level in Eldoret markets and their levels of compliance with Covid-19 containment measures.

The adequacy of sanitary facilities encompasses factors such as the availability of water supply, functioning toilets and urinals, showers, drainage systems, and general cleanliness. Compliance with containment measures is defined by the implementation and use of handwashing stations, hand sanitizers, temperature checks, mask-wearing, market fumigation practices, and social distancing protocols. The third dimension, alignment of market planning with public health standards, examines aspects such as market layout, crowd control, lighting, security, and overall infrastructure suitability.

The dependent variable in this study centres on traders' overall perceptions of safety within the market environment and their levels of compliance with Covid-19 containment measures. These perceptions were assessed by evaluating adherence to public health guidelines issued by the Ministry of Health (MoH) and the World Health Organization (WHO). Key indicators included perceived risk of infection, feelings of personal security, and general comfort while operating in the market during the pandemic. Additionally, the variable captured the extent to which traders followed recommended practices such as mask-wearing, social

distancing, hand sanitizing, and minimizing physical contact with customers and fellow traders.

The framework also includes intervening variables such as awareness campaigns aimed at keeping markets safe for everyone and enforcement by authorities through health inspections and public notices. These include educating the public on the risks of Covid-19 and the importance of following preventive measures, which may influence the strength or effectiveness of the relationship between the independent variables and the desired public health outcomes.

The goal of the framework is to establish how improvements in sanitary provisions, compliance with health protocols, and proper market planning contribute to mitigating the spread of Covid-19 and ensuring a safer market environment. The relationships between these variables were visualized in a conceptual diagram;

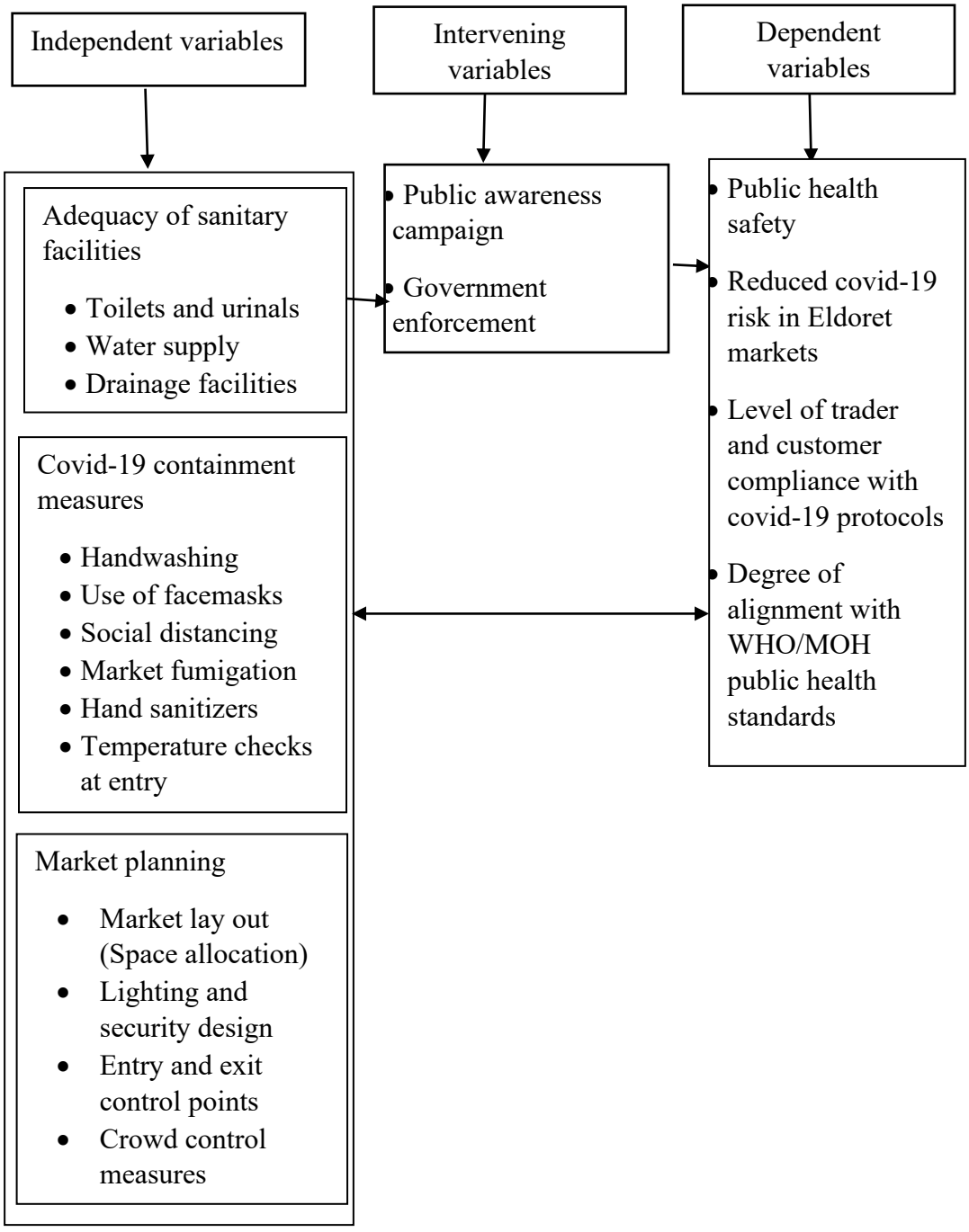

Figure 1.1: Conceptualizing sanitization in markets against the Covid-19 pandemic

CHAPTER THREE: METHODOLOGY

3.1 Study Area

The study was conducted within Eldoret Municipality, located in Uasin Gishu County in Kenya's Rift Valley region. Eldoret serves as the administrative and commercial hub of the county and is the fifth most populous urban area in Kenya (KNBS, 2019). The municipality has witnessed rapid urban growth and commercial expansion, making it a strategic site for investigating public health infrastructure and market-related compliance with Covid-19 containment measures.

Eldoret enjoys a temperate climate, with annual temperatures ranging between 7 degrees Celsius and 29 degrees Celsius, and consistent rainfall varying between 624.9 mm and 1,564 mm per year. These conditions support diverse agricultural activities and a thriving agribusiness economy. The dominant soil types ranging from red to brown clay further contribute to the area's agricultural productivity and economic significance (KNBS, 2021). This favourable environment has attracted increased human settlement and intensified commercial activities, particularly in the town's marketplaces, which serve as focal points for food distribution, retail trade, and socio-economic interactions.

The study specifically focused on three key markets within Eldoret Municipality: Municipal Market, Main Market, and West Market each of which plays a unique role in local trade and urban organization. Municipal Market, established in 1966,

is situated at 0°31'08.34" N, 35°16'20.41" E. It was built to provide residents with access to essential goods such as food, clothing, footwear, and cereals, and remains a central hub for the municipality's food retail sector (UCG, 2022). Main Market, positioned centrally at 0°30'59.70" N, 35°16'22.49" E, was established in 1986 to decongest the Municipal Market and to address unregulated street vending within the CBD. Following renovations in 2015, it now accommodates a broader range of traders and consumers, contributing significantly to the town's commercial vibrancy (UCG, 2022). West Market, located at 0°31'19.13" N, 35°15'44.8" E, was established in 1998 and is renowned for its concentration of second-hand clothing and footwear vendors. It primarily serves low to middle-income residents seeking affordable apparel (UCG, 2022).

These markets were selected because they attract large populations daily, making them critical public spaces where issues of sanitation, compliance with containment protocols, and public health planning are most visible. Their strategic relevance to the municipality and variation in physical structure and function made them ideal sites for evaluating how sanitary provision and Covid-19 containment measures were implemented during the pandemic.

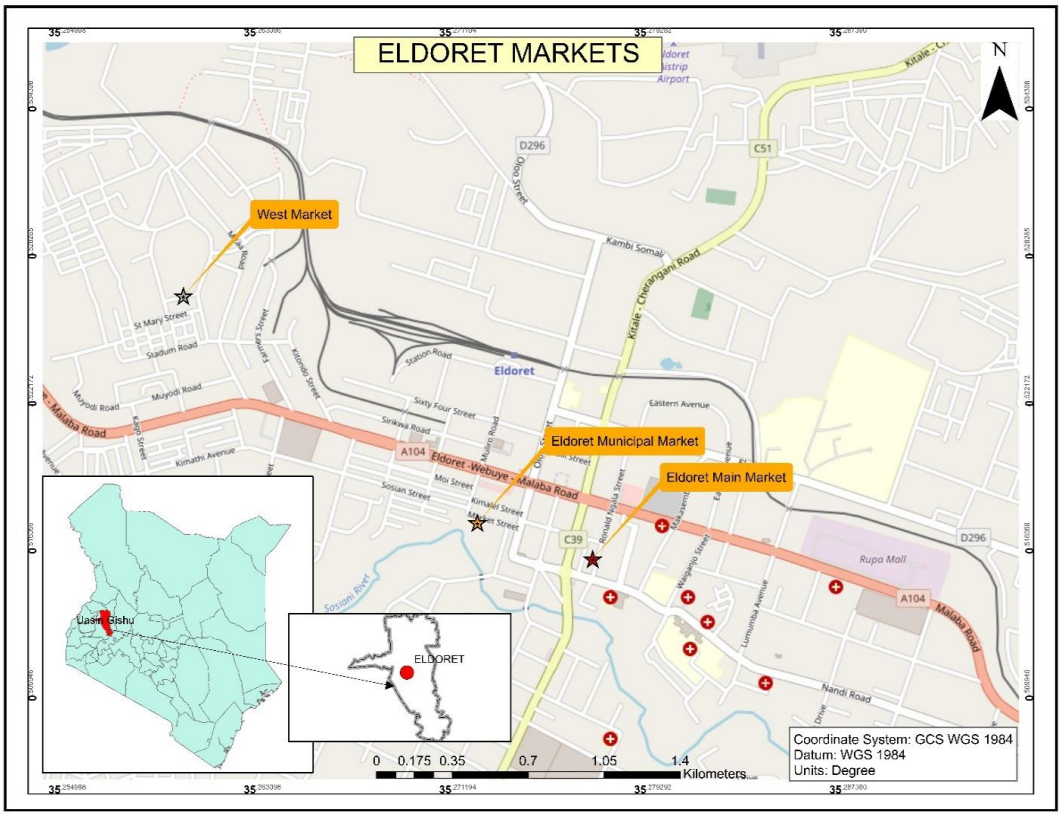

Figure 3. 1: Location of markets within Eldoret Municipality.

3.2 Research Design

Using a descriptive cross-sectional research approach, the study assessed the level of sanitary facilities and measures in Eldoret Municipality's marketplaces during the Covid-19 pandemic. The research was able to capture a moment in time with this approach, giving a snapshot of the market conditions (Omair, 2016). This design was particularly suitable as it enabled the study to examine the existing situation without manipulating variables, thus offering a clear picture of market preparedness and challenges during the pandemic. Eldoret markets' sanitary provision and compliance with Covid-19 containment measures were assessed

through quantitative research, which aimed to collect numerical data related to key aspects of the study objectives. This included evaluating the availability of restrooms, handwashing stations, hand sanitizers, temperature screening points, and regular fumigation, as well as the enforcement of physical distancing protocols and mask usage. Measurements such as the number of restrooms, distance between stalls, and frequency of fumigation were used to quantify the level of preparedness. These critical variables were then statistically analysed to provide a clear, measurable understanding of the hygiene and compliance status within the marketplaces.

To better understand how the Covid-19 pandemic affected market planning and public health compliance, qualitative research methods were employed to capture non-numerical data that revealed contextual nuances, perceptions, and lived experiences. This approach allowed for an in-depth exploration of the subjective aspects of market planning and its alignment with public health guidelines. Data was collected through open-ended survey questions and key informant interviews, enabling the study to uncover stakeholders' insights on challenges, opportunities, and compliance with Covid-19 containment protocols. The qualitative findings thus enriched the analysis by offering deeper perspectives on the planning dynamics within Eldoret's markets during the pandemic. Therefore, the use of a descriptive cross-sectional design, incorporating both quantitative and qualitative methods, was justified as it enabled the study to measure sanitation and

compliance levels while also exploring the contextual and planning dynamics critical to public health during the Covid-19 pandemic.

3.3 Sampling Size and Sampling procedure

The target population for this study comprised all traders operating within the three main markets in Eldoret Municipality: Eldoret Main Market, Eldoret Municipal Market, and West Market. These markets represent the core commercial landscape of Eldoret town and are characterized by varied trading activities that reflect different consumer and vendor needs.

The study population was drawn from active, physically present traders in these markets during the data collection period and who agreed to participate in the study. Customers were excluded as they did not form part of the target population under investigation. This ensured that data was gathered from individuals with direct, sustained involvement in the market's operation and Covid-19 containment compliance. Each market served a distinct commercial function: Eldoret Main Market, located centrally, was a key hub for numerous trading operations and housed approximately 420 traders dealing primarily in cereals and fresh produce. Eldoret Municipal Market functioned as a mixed market for both food and apparel, accommodating about 200 vendors. West Market, situated in the western part of Eldoret, specialized in second-hand apparel and footwear, with a trader population of approximately 600 (UCG, 2022).

With these population sizes established, a representative sampling frame was developed to capture the diversity and unique dynamics of each market. The Yamane formula (Yamane, 1999), using a margin of error (e) of 0.05, was applied to calculate the required sample sizes per market stratum:

$n = N / (1 + Ne^2)$

Where: n = Sample size, N = Population size, e = Margin of error

The sample size for each market was calculated as follows:

- Eldoret Main Market (Stratum 1): $n1 = 420 / (1 + 420 * 0.05^2) = 98$.
- Eldoret Municipal Market (Stratum 2): $n2 = 200 / (1 + 200 * 0.05^2) = 45$
- West Market (Stratum 3): $n3 = 600 / (1 + 600 * 0.05^2) = 139$

The study adopted a stratified random sampling technique, whereby each of the three markets formed a distinct stratum based on its commodity specialization. This allowed for systematic and proportionate sampling from: Stratum 1: Traders of cereals and fresh goods at the Eldoret Main Market, Stratum 2: Vendors of both food and clothing at the Eldoret Municipal Market and Stratum 3: Traders of pre-owned clothing and footwear at the West Market. This approach ensured that the sample accurately reflected the demographic and economic diversity of each market.

In addition to traders, key informants were purposively selected based on their expertise and institutional roles. These included officials from the Uasin Gishu

County departments of Trade and Industrialization and Public Health, as well as market masters. Their insights enriched the study by providing qualitative context on market planning, public health compliance, and challenges faced during the Covid-19 pandemic.

3.4 Data Collection

In order to accomplish the research goals, data collecting involved a range of techniques. Traders from markets in Eldoret Municipality were surveyed with structured questionnaires. Market masters and government officials from Uasin Gishu County's trade and industrialization and public health ministries were interviewed as key informants. Market planning and public health measures benefited qualitatively from their responses during these in-depth interviews. Direct observations of the marketplaces were made, to assess the physical conditions of the sanitary facilities, level of cleanliness, presence of hand sanitization stations and adherence to social distancing measures, as well as the market lay out. Secondary data was collected through a review of literature journals, books, and document reviews of the County Integrated Development Plan (CIDP) for Uasin Gishu County, public health guidelines, market regulations, and reports on Covid-19 measures. This secondary data offered valuable background information and context for the study, enhancing the overall understanding of the topic.

Confidentiality was enhanced by assuring the interviewees that the information provided would be used for academic purposes only. A research permit was obtained from National Commission for Science Technology and Innovation (NACOSTI) to carry out the research.

3.5 Data Analysis

The initial steps of data analysis involved ensuring the correctness of completed questionnaires and the creation of a coding sheet using the Statistical Package for Social Science (SPSS) computer software. This facilitated the coding and entry of data. Summary tables were then prepared, summarizing responses and presenting them in the form of charts, tables, and graphs. The second phase of analysis focused on descriptive analysis, generating cross-tabulations, means, percentages, ranges, and standard deviations. These findings were visualized to provide a clear understanding of the data.

For the first objective, the study employed descriptive statistics. The analysis started with data verification and the creation of a coding sheet using SPSS software. The key aspects assessed included the availability and adequacy of sanitary facilities, and to do this, likelihood ratio tests were used to determine if there were significant associations between these factors and traders' demographics, such as age, monthly income, and education levels.

Data analysis for the second objective involved descriptive statistics and cross-tabulations. The study measures included handwashing, hand sanitization, temperature testing, masking by traders, fumigation, and social distancing. By presenting this data in the form of charts, tables, and graphs, the research assessed the level of adherence to these measures within the marketplaces during the Covid-19 pandemic.

The analysis for the third objective utilized logistic regression to delve into traders' perceptions regarding whether market planning considered public health measures and contributed to the prevention of Covid-19 transmission. Logistic regression models the probability of a binary outcome, in this case, traders' perceptions, based on predictor variables such as containment measures, sanitary provision, and sanitization practices. The logistic regression equation, which models the log odds of the outcome, is expressed as $\log(p/1-p) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n$ where p is the probability of the outcome occurring, β_0 is the intercept term, and β_1, β_2…, β_n are the coefficients associated with each predictor variable X_1, X_2,…, X_n Logistic regression helped identify significant predictors and determine the strength and direction of their associations with traders' perceptions of market planning's effectiveness in preventing Covid-19 transmission.

By incorporating likelihood ratio tests and logistic regression alongside descriptive statistics and cross-tabulations, the study achieved a comprehensive analysis of the

sanitary provisions and compliance measures in Eldoret markets during the Covid-19 pandemic. These statistical techniques provided valuable insights into the associations between various factors and contributed to a deeper understanding of the effectiveness of market planning and compliance measures in mitigating the spread of Covid-19.

Additionally, qualitative data from key informant interviews were analysed thematically. Interview transcripts were reviewed and coded to identify recurring patterns and themes aligned with the study objectives. The process involved open coding followed by axial coding to structure data into coherent thematic categories. This approach revealed insights related to institutional responses, planning challenges, and implementation of public health measures within the markets. Thematic analysis added contextual depth to the quantitative findings by capturing stakeholder perspectives and the broader planning environment in which sanitary and containment efforts occurred.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter discusses the results and key findings from the study. The sections are based on the objectives, which are:

1. To assess adequacy of sanitary facilities in Eldoret Markets during Covid-19 pandemic.
2. To assess compliance with Covid-19 containment measures in Eldoret markets during the Covid-19 pandemic.
3. To evaluate the alignment of market planning in Eldoret markets with public health standards and guidelines during the Covid-19 pandemic.

4.1.1 Socio-economic Characteristics of Markets Traders

The socio-economic characteristics comprised of the age and average monthly income of the traders. About 94% of the respondents participated effectively and thus the response rate is high. A high response rate of over 85% is related to strong data collection instrument dependability (Brick and Williams, 2013).

The age distributions were: 18-26 (19.9%), 27-35 (22%), 36-44 (34.8%), 45-53 (16%), and over 53 (7.3%). Traders benefit from people between the ages of 36 and 44 because they are active, energetic, and can work for extended periods of time. They can persuade, take risks, and endure because they are mature

individuals with sophisticated communication skills and the appropriate language for persuasion.

Table 4.1 shows the monthly earnings of market traders. Approximately 58.5% of traders make less than KES. 20,000, 34% earn less than KES. 40,000, and 6.8% earn more than KES. 40,000. In 2021, the gazetted monthly minimum wage for the wholesale and retail trade industry was KES. 8,681.8 (KNBS, 2021). The majority (32.3%) of traders in the Eldoret market made less than KES.10, 000 per month, indicating that the majority of traders' earnings were less than the gazetted minimum wage. This was attributed to Covid-19, which reduced business activity and thus prevented most traders from performing their usual functions while adhering to social distancing and other prudent public health practices.

Table 4.1: Socio-economic attributes of traders in Eldoret markets

Age bracket	Frequency	Percentage
18-26	56	19.9
27-35	62	22
36-44	98	34.8
45-53	45	16
Above 53	21	7.3
Total	282	100
Average Monthly Income		
Income Category (KES).	Frequency	Percentage (%)
<10,000	91	32.3
10,000≤20,000	74	26.2
20,000≤30,000	55	19.5
30,000≤ 40,000	43	15.2
40,000≤50,000	12	4.3
>50,000	7	2.5
Total	282	100

The educational level of traders emerges as a critical factor influencing their adaptability to Covid-19 guidelines, reflecting their awareness and exposure levels to the regulations. According to the data presented in Figure 4.1, a significant portion of traders, constituting 41%, had completed secondary school. This suggests that this group may possess a moderate level of education, potentially enabling them to comprehend and adhere to the Covid-19 guidelines more effectively. The research also shows that 30% of traders had completed college,

which highlights a considerable number with a higher education. This certainly helps them understand and comply with the requirements better.

A sizeable percentage of traders had obtained postsecondary education, with 17% having done so. Their extensive education may give them one step ahead when it comes to understanding and following the covid-19 protocols. Conversely, a smaller percentage of traders (8%) had finished primary school, indicating a lower level of education. It is worth mentioning, though, that a mere 4% stated they had never attended college. In general, the fact that traders come from a variety of educational backgrounds is indicated by the distribution of traders across different levels of education. The market community's adaptability to covid-19 regulations may be impacted by this variation; individuals with more education may respond more intelligently and flexibly.

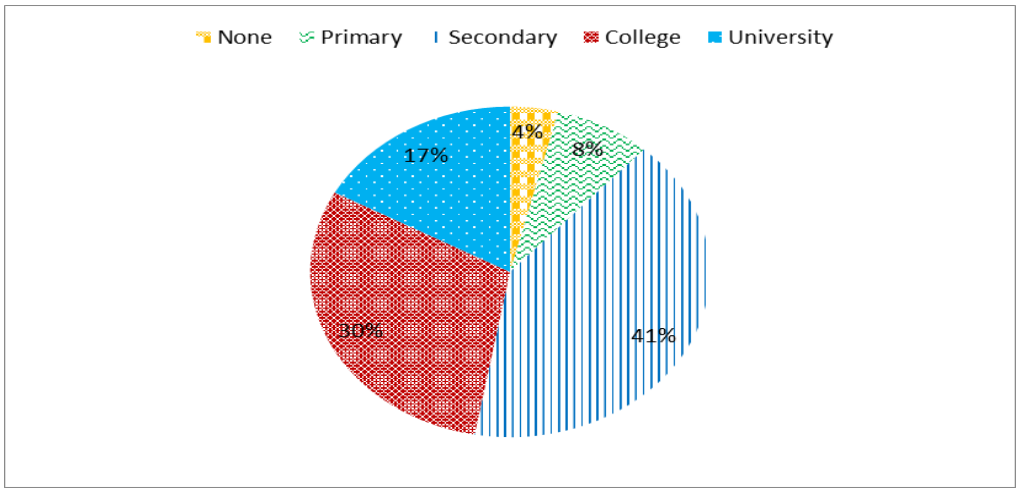

Figure 4.1**:** Education level of traders in the markets

4.1.2 Goods Sold in Eldoret Markets

Traders in the three markets analysed offer a wide variety of goods, as seen in Table 4.2. The sale of tubers, potatoes, and fruit cereals is a speciality for a considerable number of dealers (64.3%) in the Main Market. While 20% of the vendors at the Municipal Market specialize on selling apparel and footwear, 53.4% sell a wider variety of goods, including fruits, vegetables, cereals, tubers, and potatoes. A striking feature of the West Market is that nearly all vendors there specialize in the sale of footwear and apparel. The variety of goods sold in each of the three marketplaces highlights their distinct characteristics. The Main Market is characterized by specialized food vendors, the Municipal Market offers a diverse range of products, while the West Market is predominantly occupied by apparel and footwear traders. This variation is crucial to consider when assessing sanitary provision and the implementation of Covid-19 containment measures, as each market's unique composition may present different challenges and needs

The adequacy of sanitary facilities and the effectiveness of Covid-19 containment measures can be significantly influenced by the type of commodities sold within a market. Markets dealing in essential or high-demand items often attract larger crowds, making physical distancing more difficult to maintain. Additionally, different types of goods may require varying levels of interaction between traders and customers, further complicating compliance with public health protocols. A

nuanced understanding of these differences can help authorities, market organizers, and vendors tailor sanitary provisions and containment strategies to the specific demands of each market type. Such targeted planning ensures safer, cleaner environments that support both public health and economic activity (Mogendi *et al.,* 2022).

Table 4.2**:** Types of goods sold by traders in Eldoret markets

Goods	Main market		Municipal market		West market	
	n	%	n	%	n	%
Vegetables	35	35.7	8	17.9	1	0.7
Fruits	21	21.5	5	11.1	2	1.4
Cereals	36	36.7	9	20	3	2.2
Tubers	2	2.0	2	4.4	1	0.7
Potatoes	4	4.1	3	6.7	2	1.4
New clothes	0	0	6	13.3	41	29.5
Second hand clothes	0	0	6	13.3	79	56.8
Shoes	0	0	4	8.9	8	5.8
Toys	0	0	2	4.4	2	1.4
Total	98	100	45	100	139	100

4.2 Adequacy of Sanitary Facilities in Eldoret Markets

Table 4.3 presents detailed information on the Main Market, Municipal Market, and West Market in Eldoret, highlighting their unique characteristics and the adequacy of their sanitary facilities. In the context of covid-19 containment efforts, these facilities are especially important for the safety and comfort of traders and consumers. In terms of hygiene, the Eldoret Municipal Market is equipped with

four well-maintained restroom facilities, two for women and two for men, alongside a urinal and a shower room. These amenities are managed by a private individual contracted by the county government to ensure cleanliness and maintenance in accordance with Ministry of Health standards.

Plate 4.1: Toilets and hand washing stations at Eldoret municipal market

The Main Market is equipped with five toilets for women, three toilets for men, a urinal, and one shower room. These facilities are regularly cleaned and maintained by a private individual contracted to oversee cleanliness within the market. The market has fairly adequate sanitation facilities for both genders, in line with the recommendations of Ministry of Health (MoH).

Plate 4.2: Eldoret Main market toilets and hand washing station

The West Market boasts two toilets for women, one toilet for men, a urinal, and one shower room. These facilities align with the guidelines set by the Ministry of Health, ensuring that traders and customers have access to adequate restroom facilities, a crucial aspect of modern urban planning (WHO, 2020).

Plate 4.3: West market toilets and hand washing station

In terms of sanitation only 10.2% of vendors at the Main Market were satisfied with the restroom facilities, making it the market with the lowest percentage. While 33.7% thought the restrooms were insufficient, 56.1% said they were fair. The proportion of traders who thought the restrooms were adequate was higher at 26.7% in the Municipal Market, compared to 60.0% who thought they were fair and 13.3% who thought they were inadequate. The West Market, where 18.0% found the restrooms adequate, 56.8% found them fair, and 25.2% found them inadequate. The necessity for market-specific changes is underscored by these discrepancies, which demonstrate the various responses regarding restroom facilities across markets. Traders expressed diverse experiences regarding the adequacy and cleanliness of toilet facilities.

Similar trends are observed for urinals. In the Main Market, 15.3% found them adequate, 59.2% fair, and 25.5% inadequate. The Municipal Market stands out with a higher percentage (77.8%) considering urinals fair, while 13.3% found them adequate, and 8.9% inadequate. The West Market's urinals received the least approval, with only 8.6% deeming them adequate, 62.6% as fair, and 28.8% as inadequate. These findings underscore that traders in the Municipal Market seem more satisfied with urinals compared to the other two markets.

Showers are perceived as insufficient across all markets. In the study, each of the three markets examined is equipped with a single shower room, which is

maintained and cleaned by a private contractor hired by the Uasin Gishu county government. In the Main Market, 45.9% of respondents found the showers inadequate, 38.8% rated them as fair, and only 15.3% considered them adequate. Similarly, in the Municipal Market, 31.1% of respondents found the showers inadequate, 48.9% rated them as fair, and 20.0% deemed them adequate. The West Market followed a similar pattern, with 61.2% of respondents considering the showers inadequate, 18.0% rating them as fair, and 20.9% finding them adequate. These results suggest that the showers across the markets are generally in need of substantial improvements. According to WHO (2020), access to sufficient and clean bathing facilities in public markets is critical in reducing environmental contamination and improving disease control. The inadequacy of showers could therefore contribute to increased risk of virus transmission among traders and customers in these congested settings.

Each of the three markets evaluated had a handwashing basin installed in each ablution block, enabling vendors to cleanse their hands after using the restroom facilities. Nevertheless, there are significant deficiencies in the availability of handwashing facilities. Within the Main Market, a mere 4.1% of participants considered the basins to be sufficient, while 72.4% saw them as fair, and 23.5% judged them to be insufficient. In the Municipal Market, 13.3% of respondents judged the basins to be sufficient, 22.2% ranked them as fair, and a substantial 64.4% deemed them to be insufficient. Within the West Market, 15.1% of

participants deemed the handwashing basins to be sufficient, 30.9% evaluated them as average, and 54.0% considered them to be insufficient. These percentages emphasize the need for increased provision of hand washing facilities, particularly in the Municipal and West Markets.

Varying perceptions of cleanliness exist among different markets. In the Main Market, 12.2% regarded it as clean, 56.1% rated it as fair, and 31.6% found it dirty. The Municipal Market had 17.8% perceiving it as clean, 48.9% as fair, and 33.3% as dirty. The West Market had 18.0% perceiving it as clean, 61.2% as fair, and 20.9% as dirty. Notably, the West Market had the highest percentage of fair ratings, indicating that cleanliness is a concern in all three markets.

These statistics highlight significant differences in the adequacy and condition of the facilities in the three markets. Consequently, upgrades are necessary to meet the specific demands of merchants and consumers in each market, particularly in light of the importance of public health and the need to comply with the World Health Organization's (2021) covid-19 containment protocols.

Table 4.3: Adequacy of sanitary facilities in Eldoret markets

Facilities	Adequacy	Main market		Municipal market		West market	
		n	%	n	%	n	%
Toilets	Adequate	10	10.2	12	26.7	25	18.0
	Fair	55	56.1	27	60.0	79	56.8
	Inadequate	33	33.7	6	13.3	30	25.2
Urinals	Adequate	15	15.3	6	13.3	12	8.6
	Fair	58	59.2	35	77.8	87	62.6
	Inadequate	25	25.5	4	8.9	40	28.8
Showers	Adequate	15	15.3	9	20	29	20.9
	Fair	38	38.8	22	48.9	25	18.0
	Inadequate	45	45.9	14	31.1	85	61.2
Hand washing basins	Adequate	4	4.1	6	13.3	21	15.1
	Fair	71	72.4	10	22.2	43	30.9
	Inadequate	23	23.5	29	64.4	75	54.0
	Clean	12	12.2	8	17.8	25	18.0
	Fair	55	56.1	22	48.9	85	61.2
Cleanliness	Dirty	31	31.6	15	33.3	29	20.9

4.2.1 Likelihood Ratio Test for Adequacy of Sanitary Facilities in Eldoret Markets

The Likelihood Ratio Test results presented in Table 4.4 offer valuable insights into the factors influencing the adequacy of sanitary facilities in Eldoret markets. The analysis reveals that the adequacy of showers and the cleanliness of sanitary

facilities are significant predictors, with p-values less than 0.05, indicating that these factors play a crucial role in determining the overall sanitary conditions in the markets. Specifically, the adequacy of showers showed a -2 Log Likelihood of 44.309 with a Chi-Square value of 41.173 and a significance level of 0.000, underscoring its importance. Similarly, the cleanliness of sanitary facilities had a -2 Log Likelihood of 12.134, a Chi-Square value of 8.997, and a significance level of 0.011, highlighting its critical role in maintaining sanitary standards.

On the other hand, several other variables, including the adequacy of toilets, urinals, and hand washing basins, as well as the cleanliness of drainage facilities, monthly income, education level, and age, were not found to be significant predictors. For instance, the adequacy of toilets and urinals both had a -2 Log Likelihood around 3.137 and non-significant p-values of 1.000, indicating these factors do not substantially impact sanitary adequacy in the studied markets. The adequacy of hand washing basins approached significance with a p-value of 0.071, suggesting it may still be an area of concern but is not as crucial as showers or overall cleanliness.

The variables of monthly income and age, despite being potential factors influencing market sanitation, also showed no significant impact with p-values of 1.000. The education level had a near-significant p-value of 0.066, indicating it

might have some influence on sanitary perceptions or practices, but not enough to be a critical factor in this study.

The findings suggest that improving the adequacy of showers and maintaining high cleanliness standards of sanitary facilities should be prioritized to enhance sanitary conditions in Eldoret markets. These aspects significantly influence the market's sanitary adequacy, whereas other factors like the adequacy of toilets, urinals, and drainage facilities, along with demographic factors such as income, education, and age, appear to have less impact. This information is vital for market planners and public health officials in Eldoret as they develop and implement strategies to ensure safe and hygienic market environments, especially in the context of public health crises like the covid-19 pandemic.

Forecasting the log chances of traders' assessments of the sufficiency of Eldoret markets' sanitary facilities during the covid-19 epidemic is the goal of the multiple logistic regression model. There is a direct correlation between the dependent variable's log chances and each of the independent variables in the equation. The perceived sufficiency of these facilities is captured by the urinals ($\beta 2 = 3.137$) and toilets ($\beta 1 = 3.136$) among traders. According to the positive coefficients, people are more likely to have a positive impression of overall sanitary conditions when they think that toilets and urinals are adequately maintained. The significant positive coefficient for sufficiency of showers ($\beta 3 = 44.309$) indicates that there is a strong correlation between an increase in the perceived adequacy of shower

facilities and the likelihood of favourable views of sanitary conditions. For traders to perceive sanitary circumstances, it is essential that handwashing basins be adequate (β4 = 8.415). A higher total log odds of good opinions regarding sanitary facilities is contributed to by an increase in the perceived adequacy of handwashing basins, as indicated by the positive coefficient.

Table 4.4: Likelihood ratio test for adequacy of sanitary facilities in Eldoret markets

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	3.137[a]	.000	0	.
Adequacy of toilets	3.136[b]	.	2	1.000
Adequacy of urinals	3.137[b]	.000	2	1.000
Adequacy of showers	44.309[b]	41.173	2	.000
Adequacy of hand washing basins	8.415[b]	5.278	2	.071
Cleanliness of sanitary facilities	12.134[b]	8.997	2	.011
Cleanliness of drainage facilities	3.138[b]	.001	2	.999
Monthly Income	3.137[b]	.001	10	1.000
Education	8.326[b]	5.439	2	0.066
Age	2.887[b]	0.000	2	1.000

Emphasizing the significance of cleanliness is the cleanliness of drainage facilities ($\beta 6 = 3.138$) and sanitary facilities ($\beta 5 = 12.134$). Positive coefficients indicate that an increase in perceived cleanliness positively influences the log odds of positive perceptions regarding overall sanitary conditions. Monthly income ($\beta 7 = 3.137$) serves as a socioeconomic factor. The positive coefficient suggests that an increase in traders' monthly income is associated with a positive change in the log odds of positive perceptions regarding sanitary facilities. Education ($\beta 8 = 8.326$) serves as an indicator of traders' awareness. A higher level of education, as indicated by the positive coefficient, is associated with a positive change in the log odds of positive perceptions regarding sanitary conditions. Age ($\beta 9 = 2.887$), as a demographic factor, suggests that an increase in age is associated with a positive change in the log odds of positive perceptions regarding sanitary conditions. Each variable contributes uniquely to traders' perceptions of the adequacy of sanitary facilities, and the coefficients provide insights into the direction and strength of these influences during the Covid-19 pandemic in Eldoret markets.

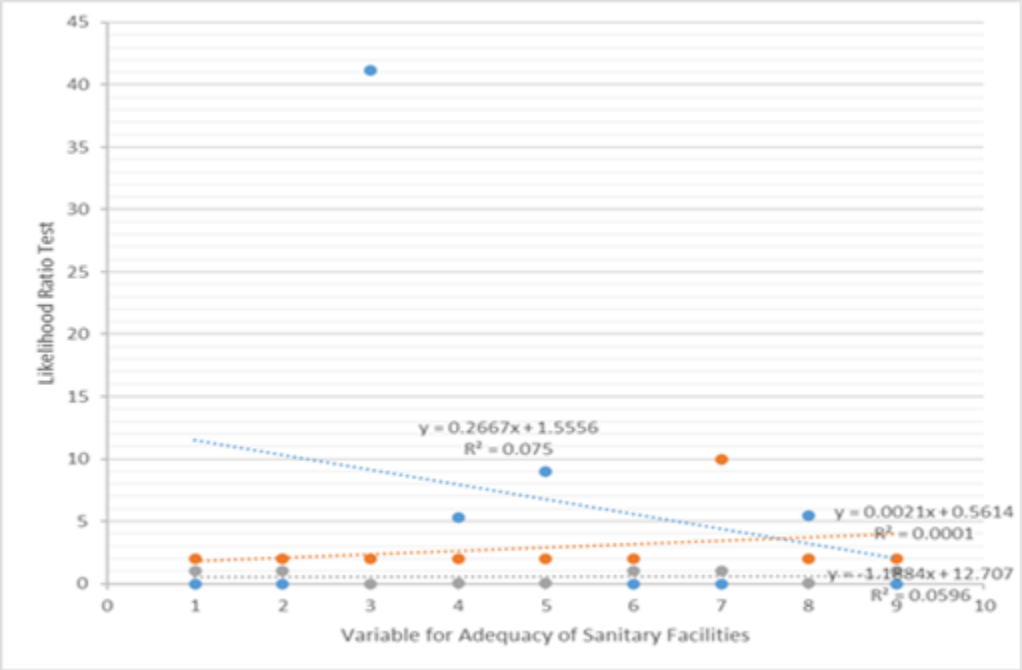

Figure 4.2: Likelihood ratio test on Adequacy of Sanitary Facilities

4.2.2 Status of Water Provision in Eldoret Markets

Investment in fundamental public health infrastructure, such as water and sanitation systems, is one of the most cost-effective strategies for increasing pandemic preparedness, especially in resource-constrained settings (Baker *et al.,* 2020). The status of water provision in Eldoret markets is a critical factor in ensuring the health and safety of traders and customers, particularly during the covid-19 pandemic. The analysis indicates that water is supplied to the markets regularly through a piped system operated by the Eldoret Water and Sanitation Company (ELDOWAS). This aligns with the recommendations set by the World Health Organization (WHO) to protect public health from the spread of covid-19

(WHO, 2020). The county administration of Uasin Gishu is responsible for paying the water bills. Nevertheless, the markets are equipped with water storage tanks to provide a sufficient water supply for trading activities in the event of scarcity. The West market is equipped with two storage tanks, each with a capacity of 1000 litres. In contrast, both the Municipal and Main markets have a single storage tank with a capacity of 1000 litres.

Table 4.5 reveals that piped water is the predominant source in all markets, with 92.9% in the Main Market, 77.8% in the Municipal Market, and 88.5% in the West Market. However, it is notable that a certain percentage relies on water vendors, with 7.1% in the Main Market, 22.2% in the Municipal Market, and 11.5% in the West Market. While piped water is the primary source, the reliance on water vendors suggests potential areas for ensuring a consistent and centralized water supply. Effective water management is crucial for maintaining hygiene and sanitation, especially during a pandemic. Within the Main Market, 52% of participants utilize water for the purpose of hand hygiene. Within the Municipal Market, 55.6% engage in similar activities. Furthermore, in the West Market, the percentage is at 30.2%. Flushing toilets has a significant influence on water use, emphasizing the various functions of water in maintaining cleanliness in markets.

While a considerable proportion of respondents perceive water provision to be reliable, a notable percentage see it as unreliable. The Main Market has the greatest level of dependability, with a rating of 83.7%. It is followed by the West

Market, which has a reliability score of 64%, and the Municipal Market, which has a reliability rate of 62.2%. In order to ensure that all participants in the market have reliable and uninterrupted access to water, it is crucial to address any issues related to the perception of unreliability. The supply of water differs from one market to another. The West Market has the greatest daily access, with a percentage of 64%. The water supply at the Municipal Market has greater variability compared to the Main Market, where water is predominantly received on a daily basis. Especially during a pandemic, when having a dependable water supply is extremely important, it is crucial to understand these distinctions in order to assess sanitation and hygiene standards.

The study highlights the importance of having piped water for maintaining sanitary practices. It also underlines the crucial function of water in markets and identifies opportunities for improvement, such as resolving concerns about water dependability and ensuring equitable access to water in all markets. These data are vital for market authorities and policymakers to improve water-related infrastructure and services in urban markets.

Table 4.5: Status of water provision in Eldoret markets

Quality indicators	Main market		Municipal Market		West Market	
	n	%	n	%	n	%
Sources of Water in the market						
Piped	91	92.9	35	77.8	123	88.5
Water vendors	7	7.1	10	22.2	16	11.5
Uses of water service provision in the market						
Flushing toilets	41	41.8	12	26.7	76	54.7
Hand washing	51	52.0	25	55.6	42	30.2
Shower	6	6.1	8	17.8	21	15.1
Reliability of water provision in the market						
Reliable	82	83.7	28	62.2	89	64.0
Not reliable	16	16.3	17	37.8	50	36.0
Availability of water service provision in the market						
Daily	62	63.3	18	40	89	64.0
Thrice a week	10	10.2	5	11.1	13	9.4
Twice a week	12	12.2	9	20.0	22	15.8
Once a week	5	5.1	10	22.2	2	1.4
Intermittent	9	9.2	3	6.7	13	9.4

4.2.3 Water Drainage System Functionality

Properly constructed drainage systems should be designed to satisfy the specific requirements of diverse markets (Wambui, 2012). Proper management of rainwater or sewage is crucial to avoid harm to valuable resources, establish a

secure environment for occupants, and reduce water stagnation and associated health and safety issues (Larose, 2020). Within the Main Market, a majority of respondents (50.1%) said that the drainage system is operational. Conversely, 48.9% expressed that it lacks functionality. The virtually equal divide of opinions indicates that the effectiveness of the drainage system in the Main Market is a subject of disagreement and worry among dealers. One vendor in the Main Market remarked: *"When it rains, the place near the maize stalls floods completely. You have to stand on crates to sell your goods."* At the Municipal Market, 10.5% of individuals report that the drainage system is functional, indicating a concerning issue. A larger majority, including 24.6% of the population, highlighted the ineffectiveness of the matter. A vegetable seller shared: *"Sometimes, waste just sits in the trenches for days. The smell is unbearable, and it attracts flies."* This revelation reveals a significant issue with the Municipal Market's drainage system, since it fails to adequately meet the demands and expectations of the vendors.

In the West Market, the condition is even more critical, since 77.6% of people report that their drainage system is non-functional. Conversely, 22.4% reported having a functional drainage system. A clothing trader at the West Market explained: *"We've complained so many times. During heavy rains, customers avoid the market because they can't even walk through the mud."* These results indicate that the West Market has a distinct drainage system, and a significant proportion of respondents in that area are experiencing issues with it.

Various marketplaces possess distinct water drainage systems. The Main Market has a rather even distribution of viewpoints about functionality. However, the Municipal Market is noticeably plagued by a drainage system issue, while the West Market faces significant issues in this regard. This research emphasizes the need of properly-functioning drainage systems in urban markets for reducing water-related health and safety concerns, as well as maintaining cleanliness and safety.

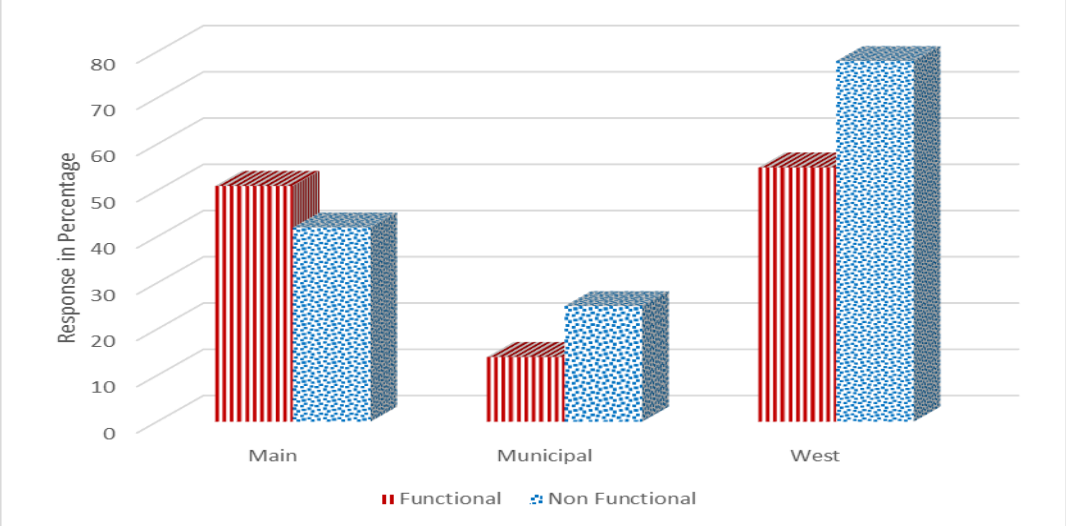

Figure 4.3: Water drainage system functionality

4.3 Compliance with Covid-19 Containment Measures in Eldoret Markets

4.3.1 Compliance with Ministry of Health Regulations in Eldoret Markets

The safety of Eldoret market traders and customers depends on their adherence to Covid-19 containment protocols (Irura *et al.*, 2020). Participants were asked to

specify the kind of measures used in their local markets as part of the research. Compliance with Ministry of Health guidelines within Eldoret markets, aimed at preventing the spread of covid-19, this however, varies among traders as reflected in the following data.

The Uasin Gishu County Government, through their market masters, has installed hand washing facilities at the gates of every market to cater to the needs of the vendors. Water and soap were made available at the handwashing stations for dealers and buyers to cleanse their hands before entering the market during Covid-19 pandemic period. The supervision of this activity was conducted by market masters who hired individuals to oversee and control the gates. Within the Main Market, a significant majority of dealers, specifically 89.8%, followed the protocol of handwashing before entering as a measure to restrict the spread of covid-19; whereas 10.2% did not comply with this practice.

In the Municipal Market, 62.2% of respondents stated that they comply with handwashing at the entry, while 37.8% indicate that they do not. Within the West Market, 56.8% of individuals adhere to the practice of handwashing, while 43.2% do not. This indicates that a portion of traders and vendors continue to enter the market without washing their hands during pandemic period, disregarding the containment measures. Consequently, this poses a risk to both traders and vendors, suggesting a lack of effective enforcement of the guidelines. The World Health

Organization (WHO) has urged all partner states to prioritize the establishment of a comprehensive public hand washing service that emphasizes the right use of soap. This is crucial in the global effort to combat the Covid-19 pandemic (WHO, 2020).

The utilization of hand sanitizers at the entry is less widespread, with 33.7% in the Main Market, 35.6% in the Municipal Market, and 31.7% in the West Market practising hand sanitizing; whereas the majority, however, do not employ hand sanitizers at the entry. One trader in the West Market commented: *"They never brought sanitizer. We used water when it was there, but sanitizer is expensive."* Therefore, use of hand sanitizers is not as widespread, indicating potential areas for improvement in promoting additional hygiene measures.

The county government supplied Covid-19 temperature test kits, and market masters assigned people to stand at the entrances of the three markets and test both traders and buyers before they entered. Temperature testing at the entry point is more prevalent in the Municipal Market, where 66.7% of respondents confirm this practice. In the Main Market, 25.5% of traders undergo temperature testing, and in the West Market, 59.7% partake in this measure. Despite this, the majority do not engage in temperature testing, with 74.5% in the Main Market, 33.3% in the Municipal Market, and 40.3% in the West Market reporting its absence.

The wearing of masks by traders is relatively high across all markets. In the Main Market, 72.4% of respondents affirm mask usage, while 27.6% do not. In the Municipal Market, 68.9% comply with masking, with 31.1% not adhering to it. One vendor from the Municipal Market said: *"We wore masks when the county people came around. After that, people removed them because it was hot and uncomfortable."* The West Market reports 69.1% of traders wearing masks, while 30.9% do not. This demonstrates a positive trend in adhering to one of the fundamental preventive measures against the spread of the virus.

In contrast to the recommended practice of regular fumigation to minimize possible Covid-19 contamination, the markets were only fumigated once according to the Ministry of Industry, Trade, and Entrepreneurship (MoITED, 2020). The Main and Municipal markets were temporarily closed for a duration of three months following the onset of the Covid-19 pandemic. Upon reopening, there were restricted activity due to the implementation of curfews and county-wide lockdowns mandated by the national government. Following the reopening of these markets, the county administration conducted a single fumigation at the market gates. The West market was temporarily shut down for a period of six months since it operates in an open-air setting. The county authorities made the decision to shut down the market in order to mitigate the transmission of the virus.

The prolonged closure of the West market was also attributed to apprehension among traders who frequented the market, as well as their perception that selling garments and shoes was not a necessary endeavour during that period. Market fumigation is infrequent since most respondents reported its absence. The study findings indicated that in the Main Market, 28.6% of individuals acknowledge the occurrence of market fumigation, while 71.4% state that it does not happen. Within the Municipal Market, 26.7% of respondents indicate the presence of fumigation, while 73.3% report its absence. In the West Market, 26.6% of individuals noted there was fumigation exercise while 73.4% noted it never occurred. One shoe vendor in the West Market stated: *"They closed us for six months, but we only saw fumigation once. We thought they forgot about us."*

The adherence to social distancing measures among traders is limited, since the majority fail to practice it due to the packed nature of the markets, which poses challenges in complying with this guideline. The overpopulation in the Municipal and West market was a result of invasion by hawkers. In order to alleviate this crowding, the market authorities took the proactive step of ousting unlicensed sellers who did not have their own booths. Results indicate that in the Main Market, 76.5% do not maintain social distancing, while 23.5% observe it. In the Municipal Market, 71.1% do not engage in social distancing, while 28.9% adhere to it. In the West Market, 68.3% of traders do not practice social distancing, while 31.7% do. Therefore, there's a significant gap between recommended social

distancing practices and actual implementation among traders in these markets. According to WHO, maintaining a safe distance of at least 1 meter (about 3 feet) between individuals is crucial to reduce the spread of infectious diseases like covid-19 (WHO, 2020).The inability to implement this measure may be attributed to the spatial limitations of the market design and overpopulation, which calls for a re-evaluation of spatial planning in line with pandemic preparedness guidelines (UN-Habitat, 2021).

There is a relatively low rate of Covid-19 testing among dealers, with just a fraction choosing to participate. The county administration, through the ministry of health, urged traders to receive vaccinations. To facilitate this, the county provided vaccination facilities at the county headquarters and selected hospitals, coupled with designated testing and vaccination centres by national government at the Moi Teaching and Referral Hospital. Traders were informed and educated about the Covid-19 pandemic and the significance of receiving vaccinations. In the Main Market, 10.2% reported Covid-19 testing, in the Municipal Market, 33.3% undergone testing while in the West Market 14.4% said Covid-19 testing occurred. Therefore, about 66.7% to 89.8% of market traders noted that there was no Covid-19 testing at Eldoret markets, which compromised Covid-19 containment measures.

There is a lack of extensive awareness efforts about Covid-19 control measures in these marketplaces, and the majority of dealers are not involved in these activities. However, the county administration participated in disseminating informative posters to educate traders and purchasers about the Covid-19 pandemic. In the Main Market, 33.7% mention awareness campaigns, while 66.3% do not. An elderly trader in the Main Market remarked: *"They put posters, but most of us didn't even understand them. No one came to explain anything."* In the Municipal Market, 20% confirm awareness campaigns, while 80% report their absence. In the West Market, 18% participate in awareness campaigns, while 82% are not involved, indicating that awareness campaigns on Covid-19 containment measures were limited in the market during the time.

Generally, the findings suggest a mix of positive compliance and notable gaps in the adoption of Covid-19 containment measures. While some measures, such as mask-wearing, show high compliance, others like fumigation, social distancing, and awareness campaigns reveal areas that require attention and improvement. The varied practices across markets underscore the importance of targeted interventions to address specific challenges faced by each market in enhancing Covid-19 preventive measures. This information is crucial for local authorities (County Governments), health agencies, and market organizers to develop tailored strategies to improve overall compliance and mitigate the risk of Covid-19 transmission within these marketplaces.

Table 4.6: Compliance with Ministry of Health Guidelines in Eldoret markets

Quality indicators	Main market		Municipal Market		West Market	
	n	%	n	%	n	%
Hand wash at entry as corona virus containment measure in the market						
Yes	88	89.8	28	62.2	79	56.8
No	10	10.2	17	37.8	60	43.2
Hand sanitisers is done at entry as corona virus containment measure in the market						
Yes	33	33.7	16	35.6	44	31.7
No	65	66.3	29	64.4	95	68.3
Temperature testing at entry point						
Yes	25	25.5	30	66.7	83	59.7
No	73	74.5	15	33.3	56	40.3
Masking by traders						
Yes	71	72.4	31	68.9	96	69.1
No	27	27.6	14	31.1	43	30.9
Market fumigation is done at the market						
Yes	28	28.6	12	26.7	37	26.6
No	70	71.4	33	73.3	102	73.4
Social distancing by traders						
Yes	23	23.5	13	28.9	44	31.7
No	75	76.5	32	71.1	95	68.3
Corona virus testing by traders						
Yes	10	10.2	15	33.3	20	14.4
No	88	89.8	30	66.7	119	85.6
Awareness campaigns						
Yes	33	33.7	9	20	25	18.0
No	65	66.3	36	80	114	82.0
Medical examination for public health						
Yes	29	29.6	12	26.7	40	28.8
No	69	70.4	33	73.3	99	71.2

4.3.1.1 Chi-square Tests on Compliance with Ministry of Health Regulations

The statistical analysis reveals a compelling and statistically significant association between the implemented safety measures, hand washing, hand sanitization, social distancing by traders, and market fumigation, and the observed outcomes. The Pearson Chi-Square tests yielded substantial values across all measures, indicating a strong relationship. For instance, in the case of hand washing, the χ^2 value was 70.964 with 2 degrees of freedom (df) and a p-value less than 0.001. Similarly, hand sanitization exhibited a χ^2 value of 122.535 ($df = 2$, $p < 0.001$), social distancing by traders had a χ^2 value of 123.079 ($df = 2$, $p < 0.001$), and market fumigation showed a χ^2 value of 173.427 ($df = 2$, $p < 0.001$).

The Likelihood Ratio tests further emphasized the significance of these measures, with substantial χ^2 values-80.757, 139.532, 156.905, and 206.843 for hand washing, hand sanitization, social distancing by traders, and market fumigation, respectively (all with $df = 2$ and $p < 0.001$).

The Linear-by-Linear Association test results add nuance to the analysis. While hand washing did not exhibit a significant linear trend ($\chi^2 = 0.122$, $df = 1$, $p = 0.726$), the other measures - hand sanitization ($\chi^2 = 26.577$, $df = 1$, $p < 0.001$), social distancing by traders ($\chi^2 = 97.868$, $df = 1$, $p < 0.001$), and market fumigation ($\chi^2 = 164.179$, $df = 1$, $p < 0.001$) - showed clear and significant linear associations.

These statistical findings underscore not only the individual significance of hand washing, hand sanitization, social distancing by traders, and market fumigation but also the collective association between these sanitary and safety measures and the observed outcomes. The strong association emphasizes the significance of executing and prioritizing such measures in appropriate situations to guarantee favourable results and the health of the public.

The results reveal that when these practices, including hand washing and sanitization, social distancing, and market fumigation, are implemented, they contribute significantly to adhering to public health regulations. These measures are essential for ensuring a healthy and safe environment in the markets. Since the p-values are far lower than the conventional significance level, it is clear that these behaviours are essential for reducing health hazards and maintaining public health standards in these market contexts. This ultimately promotes the welfare of both traders and customers.

Table 4.7: Chi-square test on association between public health regulations in Eldoret markets

	Hand washing			Hand Sanitization			Social distancing			Fumigation		
	Value	df	*Significance (2-sided)	Value	df	*Significance (2-sided)	Value	df	*Significance (2-sided)	Value	df	*Significance (2-sided)
Pearson Chi-Square	70.964[a]	2	.000	122.535[a]		.000	123.079[a]	2	.000	173.427[a]	2	.000
Likelihood Ratio	80.757	2	.000	139.532	2	.000	156.905	2	.000	206.843	2	.000
Linear-by-Linear Association	.122	1	.726	26.577	1	.000	97.868	1	.000	164.179	1	.000
N of Valid Cases	282			282			282			282		

* Asymptotic significance

4.3.2 Payment of Goods in Eldoret Markets

One of the containment methods used to help mitigate the spread of the virus was the use of mobile money, which allowed money to be transferred with minimal physical contact (MoITED, 2020). The mode of payment for goods in Eldoret Markets was cash; 66.3% in the Main Market, 62.2% in the Municipal Market, and 56.8% in the West Market; this was followed by payment via phone (M-Pesa) in the Main Market (21.4%), Municipal Market (33.3%), and West Market (25.2%), respectively. Mobile banking payment option was used by 4.4% of respondents in Municipal Market, 12.2% and 18% in Main Market and West Market, respectively, while none used Visa Card for transactions. Compliance with the use of mobile money was low in all three markets, leaving traders vulnerable and at high risk of acquiring the Covid-19 disease. A fruit vendor in the Municipal Market shared: *"I tried to ask people to pay with M-Pesa, but they insisted on giving cash.* (Table 4.8), This data provides insights into the payment methods used by traders, which can be relevant for understanding potential points of contact and transmission of diseases like Covid-19, as digital payment methods can minimize physical interaction and contribute to public health measures. However, the data also indicates that a significant portion of traders still rely on cash transactions, which may have implications for the spread of contagious diseases. This is a critical concern, as studies show that physical currency can act as a vector for viruses, including SARS-CoV-2, especially in environments with

high contact rates (van Doremalen *et al*., 2020). Promoting mobile money usage not only reduces direct contact but also supports safer, cashless transactions that align with WHO guidelines for markets during pandemics.

Table 4.8**:** Payment of goods in Eldoret markets

	Main Market		Municipal Market		West Market	
Payment mode	N	%	N	%	N	%
Cash	65	66.3	28	62.2	79	56.8
M-pesa	21	21.4	15	33.3	35	25.2
Mobile banking	12	12.2	2	4.4	25	18.0
Visa card	0	0.0	0	0.0	0	0.0
Total	98	100	45	100	139	100

4.3.3 Handling of Goods to Avoid Spread of Corona Virus between Buyer and the Vendor

The responses elicited by the study participants revealed in Figure 4.4 that approximately 36% of the respondents across the three markets indicated that they hand wash before handling goods, social distance and wearing of masks were the measures taken to avoid the spread of coronavirus between buyer and the vendor. A respondent from the Municipal Market remarked: *"Customers trust you more if they see you using soap or sanitizer. It makes them feel safe."* Proper display of goods for easy assessment was mentioned to a great extent by traders from the West market as the market is considered an "open market". A vendor in the West

market noted: *"I arrange my shoes on the mat and tell customers to just point-no need to touch everything."*

Some of the traders stated that the provision of M-Pesa as an alternative payment method was a containment measure against the spread of the corona virus pandemic. The findings in Figure 4.4 highlight the proactive steps taken by a substantial portion of traders in Eldoret markets to create a safer shopping environment and reduce the risk of coronavirus transmission between buyers and vendors.

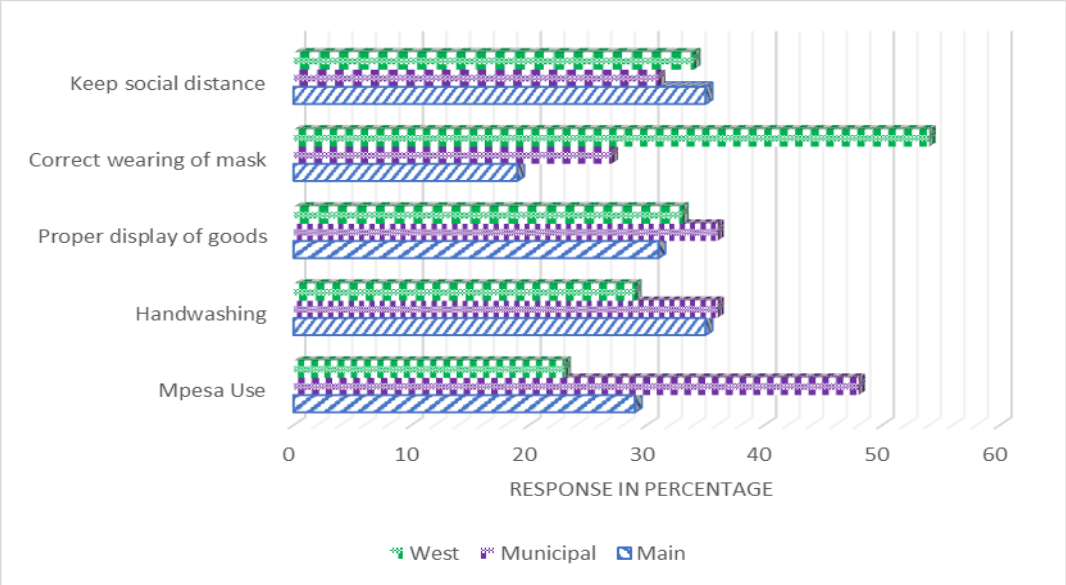

Figure 4.4: Handling of goods to avoid the spread of coronavirus between buyer and vendor

4.4 Alignment of Market Planning in Eldoret Markets with Public Health Standards and Guidelines during the Covid-19 Pandemic

The study's third objective was to assess the conformity of market planning in Eldoret marketplaces with public health standards and guidelines amid the Covid-19 outbreak. The participants were requested to express their viewpoints regarding the effectiveness of market planning in ensuring public health and safety.

4.4.1 Planning in Eldoret Markets

4.4.1.1 Municipal Market

The Eldoret Municipal Market, located next to the main stage and off Oloo Kimalel Street, has been an essential component of the Eldoret community since its inception in 1966. Over time, it has adapted to meet the varied requirements of the local community, providing a selection of products, such as apparel, footwear, fresh fruits and vegetables, and grains. Being one of the first markets in Eldoret Municipality, it has played a crucial role in fulfilling the shopping needs of the municipal and catchment population. Accessible markets play a crucial role in urban planning by fostering economic activity, mitigating transportation-related emissions, and relieving urban congestion (Maksimovic *et al.,* 2014). This vibrant marketplace is strategically constructed to prioritize consumer accessibility, boasting four gates that offer quick access and egress. The market initially featured 99 stalls arranged in six rows, with a central office to streamline its operations. However, due to the town's growth and increased population, the market's capacity

has gradually expanded to accommodate around 200 traders (UCG, 2022).

The Eldoret Municipal Market follows a multifunctional layout, with distinct areas allocated for different types of merchandise. External stores are designated for clothing and footwear, while inside the market, there are 99 permanent stalls where traders offer cereals, potatoes, onions, fruits, vegetables, and fish. These stalls are carefully designed, ensuring that they are appropriately spaced for vendors to display their goods effectively while allowing for easy customer circulation. Each stall is approximately 3 meters in length, 2 meter in width, and 0.9 meters in height, providing storage space, display areas, and pathways for shoppers. This approach aligns with land use planning principles that enhances the organization of commercial activities within the market as well as maximizes the market's functionality, improves the customer experience, and optimizes land use (UN-Habitat, 2009).

The market benefits from good access and circulation, complying with the standards set by the Food and Agriculture Organization (FAO) (FAO and WFP, 2020). Visitors can reach the market via the Nakuru-Eldoret Highway, accessing it through a well-connected access road leading to the primary entrance. The layout of the market includes interconnected paths, facilitating smooth movement through its four entrances and exit gates. Although the market's design is efficient, it is currently confronted with a dilemma concerning parking space due to the growing

number of traders, which has resulted in encroachment on the parking area. This matter exemplifies the market's widespread appeal and its expanding customer base.

The market is thoughtfully designed to allow natural light to illuminate its premises, and it is equipped with ample security lighting to support daily activities. Adequate ventilation is ensured through well-placed openings, creating a comfortable shopping environment for both traders and customers. The Eldoret Municipal Market continues to be a central hub for commerce, serving as an essential component of the local economy and community life. The Eldoret Municipal Market embodies effective urban planning principles that emphasize accessibility, efficient land use, infrastructure, and adaptability to population growth. This alignment with urban development goals contributes to the creation of sustainable and vibrant urban spaces that support economic activities and enhance the quality of life for residents (UN-Habitat, 2019).

4.4.1.2 Main Market

The main market was started in 1986 to solve the menace of the hawkers that was plaguing the central business district (CBD), Trocadero, and also to decongest the Municipal market. This facility was a brainchild of the Eldoret Municipal Council who envisioned a facility that would help to solve the menace of the hawkers that was plaguing the CBD, which caused an increase in garbage and generally poor

sanitation and pollution in the CBD (UCG, 2022). It was thus put up to relocate the hawkers at the time to decongest the CBD. It was felt that constructing the market here will add value to this location by bringing people to the hawkers rather than having the hawkers following the people. This development emphasizes the market's role in mitigating overcrowding and enhancing urban living conditions, which is a central goal in contemporary urban planning (UN-Habitat, 2016).

The market was refurbished in 2015 by the county government after devolution making it more conducive for doing business and attractive to more customers. In response to population growth and increased demand, the market expanded from its original capacity of 200 traders to accommodate 420 traders. This flexibility in urban development mirrors the market's ability to evolve to meet the community's changing needs, a fundamental aspect of modern urban planning (UN-Habitat, 2019).

The stalls are fixed and are spaced at a minimum of 1.2m and a maximum of 1.8m excluding the standing space, measuring 3m in length, 2m in width, and a height of 0.9 m stalls that also possess storage space, display, and circulation alleys as required by Food and Agriculture Organization (FAO 2000). The market has good access and circulation. The market is lit naturally and also has enough security

lights which are used for daily work. Ventilation of the market is well done since there are adequate ventilation openings allowing air circulation.

4.4.1.3 West Market

West Market, also known as the 'Mitumba Market', is a bustling open-air market situated along the Malaba-Eldoret Highway, towards Mwanzo estate, approximately 1km from the CBD of Eldoret. Its strategic location adjacent to the highway ensures easy accessibility for both vendors and customers, contributing to its popularity. Established in 1998 by the Municipality, West Market was initially conceived to bring services closer to the local population and alleviate congestion within the town. Originally designed to accommodate 400 traders, the market has witnessed substantial growth over the years, now hosting approximately 600 traders due to the expansion of the town and increased demand for trading spaces.

The market layout is designed for efficient circulation and accessibility. It boasts four entrances strategically positioned around its perimeter, facilitating convenient entry and exit for both pedestrians and vehicles. The market's characteristic open-air design allows for a vibrant atmosphere, with natural light and ventilation permeating the space. Stalls are predominantly temporary structures, with approximately 160 stalls arranged in four rows along the sides of the market. Additionally, traders often display their merchandise directly on the ground,

further contributing to the dynamic nature of the market. West Market is renowned for its specialization in second-hand clothing and shoes, commonly referred to as 'Mitumba'. Vendors offer a diverse array of garments and footwear, catering to various tastes and preferences. The market serves as a hub for bargain hunters seeking quality clothing at affordable prices, attracting shoppers from the local community and beyond.

4.4.2 Perceptions on whether Market Planning Considers Public Health Measures

Table 4.9 reveals significant insights into traders' perceptions of market planning in Eldoret, particularly focusing on the Main Market, Municipal Market, and West Market. When evaluating whether the market is well planned to ensure public health, the Main Market received relatively positive feedback, with 46.9% of traders agreeing and 12.2% strongly agreeing. Conversely, the Municipal Market had only 11.1% agreement and the West Market just 18.7%, with a substantial 64.0% of traders at the West Market disagreeing. A market master from the Main Market explained: *"We've been trying to keep handwashing stations operational and manage crowding, especially since this market has permanent structures and more regulated movement."* This indicates that while the Main Market fares better in public health planning, the West Market significantly lags, reflecting a need for substantial improvements in this area.

In terms of safety planning, perceptions were predominantly negative across all markets. At the Main Market, 60.2% of traders disagreed and 20.4% strongly disagreed that the market is well planned for safety. Similarly, the Municipal Market showed 57.8% disagreement and 22.2% strong disagreement. The West Market had a unique distribution, with 64.0% of traders expressing neutrality, suggesting either indifference or lack of awareness about the safety measures in place. One market master stated: *"We only had one or two exits open during the pandemic, and this created pressure, but we had no choice due to enforcement constraints."* This overall dissatisfaction underscores the necessity for enhanced safety protocols in these markets to ensure a secure trading environment.

The evaluation of security planning showed diverse responses. The Main Market had 75.5% of traders feeling neutral, indicating uncertainty or a lack of clear security measures. In contrast, the Municipal Market had a more favourable view, with 57.8% agreeing that the market is well planned for security. However, the West Market displayed significant discontent, with 63.3% of traders disagreeing. A public health official shared: *"We've had repeated cases of theft and vendor disputes in the West Market, especially during early closures when security was minimal."* This highlights critical security concerns in the West Market, necessitating immediate attention to bolster security measures and restore trader confidence.

Regarding adequate lighting, the Main Market again received positive feedback, with 53.1% agreeing and 13.3% strongly agreeing that lighting is adequately planned, with the Municipal Market mirrored this positivity with 64.4% agreement. On the other hand, the West Market showed substantial dissatisfaction, with 56.1% of traders disagreeing and 15.1% strongly disagreeing. A trader at West Market noted: *"By 6:30 pm, most of us are rushing out. There's no security and no lights."* This disparity highlights significant issues with lighting in the West Market, which could impact both safety and efficiency, emphasizing the need for infrastructural upgrades.

Overall, the findings from Table 4.9 indicate a stark contrast in perceptions of market planning across the three markets. The Main Market generally received better evaluations, especially in public health and lighting, though safety and security still present concerns. The Municipal Market displayed mixed results, with some positive perceptions but notable areas for improvement, particularly in safety. The West Market consistently reflected the highest levels of dissatisfaction across all aspects of planning, suggesting an urgent need for comprehensive interventions to address deficiencies in public health, safety, security, and lighting. These insights highlight the critical need for targeted efforts to enhance market conditions, especially in the West Market, to ensure a safe, healthy, and efficient trading environment.

Table 4.9: Perceptions of whether market is planned per public health regulations

	Main market		Municipal Market		West Market	
Level of agreement	n	%	n	%	n	%
Market is well planned to ensure public health						
Strongly Agree	12	12.2	3	6.7	3	2.2
Agree	46	46.9	5	11.1	26	18.7
Neutral	10	10.2	26	57.8	16	11.5
Disagree	22	22.4	9	20.0	89	64.0
Strongly disagree	8	8.2	2	4.4	5	3.6
Market is well planned to ensure safety						
Strongly Agree	2	2.0	1	2.2	5	3.6
Agree	5	5.1	6	13.3	10	7.2
Neutral	12	12.2	2	4.4	89	64.0
Disagree	59	60.2	26	57.8	12	8.6
Strongly disagree	20	20.4	10	22.2	23	16.5
Market place is well planned to ensure security						
Strongly Agree	6	6.1	5	11.1	9	6.5
Agree	9	9.2	26	57.8	20	14.4
Neutral	74	75.5	9	20.0	12	8.6
Disagree	6	6.1	3	6.7	88	63.3
Strongly disagree	3	3.1	2	4.4	10	7.2
Market place is well planned to ensure adequate lighting						
Strongly Agree	13	13.3	2	4.4	5	3.6
Agree	52	53.1	29	64.4	10	7.2
Neutral	10	10.2	1	2.2	25	18.0
Disagree	20	20.4	11	24.4	78	56.1
Strongly disagree	3	3.1	2	4.4	21	15.1

4.4.2.1 Likelihood Ratio Test on Whether Markets are Planned as per Public health Regulations

Table 4.10 presents the results of the likelihood ratio tests conducted to determine whether markets in Eldoret are well planned according to public health regulations. The table evaluates various effects, including perceptions of public health, safety, security, adequate lighting, and demographic factors such as education, gender, age, and monthly income.

The likelihood ratio test evaluating whether the market is well-planned to safeguard public health yields a -2 Log Likelihood score of 6.961. When determining if the market is well planned for safety, the test yields a Chi-Square score of 7.720 with a significance level of 0.021. This indicates a statistically significant association, suggesting that traders perceive market safety planning as an important factor influencing their views on market adequacy per public health regulations. The significance level below 0.05 confirms that this relationship is not due to chance, highlighting the necessity of focusing on safety improvements to align market planning with public health standards.

The analysis of whether the market is well planned to ensure security also shows significant results, with a Chi-Square value of 10.670 and a significance level of 0.005. This strong statistical significance underscores the critical role that security planning plays in the overall perception of market adequacy with public health

regulations. It suggests that enhancing security measures could positively impact traders' views and compliance with health guidelines.

For adequate lighting, the test reveals no significant association, with a Chi-Square value of 0.000 and a significance level of 1.000. This result indicates that perceptions of lighting do not significantly influence traders' views on whether the market is planned according to public health regulations. Therefore, while lighting is an important factor for overall market functionality, it may not be directly tied to public health planning in the context of Covid-19.

The demographic variables present mixed results. Education shows a Chi-Square value of 9.186 but is not statistically significant ($p = 0.327$), suggesting that education level does not significantly affect perceptions of market planning adequacy. Gender also shows no significant effect, with a Chi-Square value of 0.000 and a significance level of 1.000, indicating that perceptions are consistent across genders. However, age reveals a significant association with a Chi-Square value of 18.413 and a significance level of 0.000. This finding highlights that different age groups perceive the adequacy of market planning differently, suggesting that age-specific considerations might be necessary when designing and implementing market health regulations. Monthly income does not show a significant association, with a Chi-Square value of 0.000 and a significance level

of 1.000. This suggests that income levels do not significantly influence perceptions of whether the markets are well planned per public health regulations.

The findings from the likelihood ratio tests highlight that safety and security are critical components influencing traders' perceptions of market planning adequacy concerning public health regulations. The significant impact of age suggests that targeted interventions might be necessary to address the concerns of different age groups. Conversely, factors such as education, gender, monthly income, and adequate lighting do not show significant associations, indicating that these factors may not directly influence perceptions of public health planning adequacy in Eldoret markets. These insights can guide policymakers and market planners in prioritizing safety and security enhancements to better align with public health standards during the Covid-19 pandemic and beyond.

Table 4. 10: Likelihood Ratio Test on whether markets well planned as per public health regulations

Effect	-2 Log Likelihood of reduced model	Chi-Square	d.	Sig.
Intercept	6.961[a]	.000	0	.
Market is well planned to ensure pı health	6.961[b]	.	2	.
Market is well planned to ensure safety	14.681[b]	7.720	2	.021
Market place is well planned to ensure security	17.631[b]	10.670	2	.005
Market place is well planned to ensure adequate lighting	6.961[b]	.000	2	1.000
Education	16.147[b]	9.186	2	.327
Gender	6.567[b]	.000	2	1.000
Age	24.980[b]	18.413	2	.000
Monthly Income	6.567[b]	.000	2	1.000

The scatter plot illustrates the relationship between variables in market planning and their corresponding likelihood ratio test results, including Chi-Square values, degrees of freedom (df), and significance levels (Sig.). The Chi-Square values, represented by blue dots, show a weak negative linear trend with an equation of $y=-0.2741x+7.6661y=-0.2741x+7.6661$ and $R2R2$ value of 0.0071, indicating a slight decrease in Chi-Square values across variables but with a weak overall relationship. The degrees of freedom, represented by orange dots, display an

almost flat trend line (y=0.0045x+0.0609y=0.0045x+0.0609, $R2$=0.2038$R2$=0.2038), suggesting that df remains relatively constant across different variables. The significance levels, depicted by grey dots, remain constant with an equation of y=2y=2, indicating uniform p-values across variables. This analysis reveals that there is no strong linear relationship between the market planning variables and the likelihood ratio test metrics, suggesting that the impact of these variables on the statistical outcomes is minimal. The findings highlight the need for a more detailed analysis to uncover any deeper insights into the effectiveness of market planning in ensuring public health and safety during the Covid-19 pandemic.

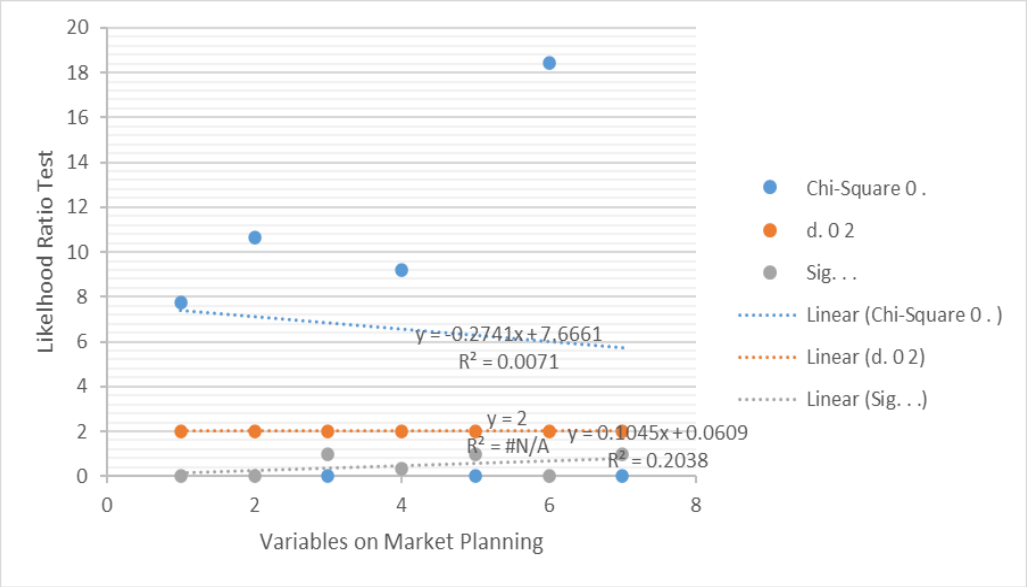

Figure 4.5: Likelihood ratio test on market planning per the public health regulations.

4.4.3 Market Planning against Covid-19 Spread

The data reveals significant variations in traders' perceptions of market planning across the Main Market, Municipal Market, and West Market, particularly concerning social distancing, Covid-19 prevention, and the provision of hand washing facilities. In the Main Market, there is a notable dissatisfaction with social distancing measures, as 59.2% of traders disagree that the market is well planned for this purpose, and 64.3% express similar dissatisfaction regarding Covid-19 prevention efforts. A trader in the Main Market quoted: *"The market is too crowded; there's no space to keep distance. We are just praying not to get sick."* Conversely, only small percentage strongly agree with the adequacy of these measures, indicating a widespread belief that the market's planning falls short in these critical areas. Furthermore, while 74.5% of respondents are neutral about the provision of hand washing facilities, suggesting either indifference or a lack of awareness, there remains a minority (8.1%) that outright disagrees with the adequacy of these provisions.

In the Municipal Market, there is a mix of agreement and neutrality regarding market planning. Approximately 22.2% of traders believe that social distancing is adequately planned, yet a significant 55.6% are neutral, indicating uncertainty or indifference. When it comes to Covid-19 prevention, a high neutrality (68.9%) is observed, which could be due to a lack of clear communication or visible measures. About 37.8% of traders feel that hand washing facilities are not

adequately provided, which underscores a need for better implementation of hygiene measures.

The West Market exhibits slightly different trends. A significant proportion of traders (70.5%) are neutral about both social distancing and Covid-19 prevention measures, reflecting a general uncertainty or lack of strong opinions. Despite this, there is less outright disagreement compared to the Main Market. However, dissatisfaction is more pronounced regarding hand washing facilities, with 66.9% of traders disagreeing that these facilities are adequate, highlighting a critical area for improvement. A public health officer from the County Department of Health acknowledged: *"Provision of facilities was made at the beginning, but maintaining consistency was the issue. Once public fear subsided, usage dropped, and enforcement became difficult."* The findings established that most of the markets did not provide hand washing facilities at the entry and exit. Most traders mentioned that they did not wash or sanitize at least once during a workday. It was not done routinely to prevent corona in situations like handling of refuse, getting rid of used PPEs and touching surfaces. Overall, these findings suggest that while there are efforts to implement public health measures in these markets, there is a notable gap in trader satisfaction and perception. The high levels of neutrality and dissatisfaction point to the need for enhanced communication, better planning, and more effective implementation of health and safety measures to meet public health standards and trader expectations during the pandemic.

Table 4.11: Market planning in the prevention of Corona Virus

	Main market		Municipal Market		West Market	
Level of agreement	n	%	n	%	n	%
Market is well planned to allow social distancing						
Strongly Agree	3	3.1	2	4.4	5	3.6
Agree	22	22.4	8	17.8	23	16.5
Neutral	10	10.2	25	55.6	98	70.5
Disagree	58	59.2	7	15.6	8	5.8
Strongly disagree	5	5.1	3	6.7	5	3.6
Market is well planned to prevent the spread of corona virus						
Strongly Agree	3	3.1	2	4.4	25	18.0
Agree	9	9.2	9	20.0	10	7.2
Neutral	18	18.4	31	68.9	98	70.5
Disagree	63	64.3	3	6.7	2	1.4
Strongly disagree	5	5.1	0	0.0	4	2.9
Provides for hand washing at entry and exit						
Strongly Agree	5	5.1	2	4.4	12	8.6
Agree	12	12.2	5	11.1	19	13.7
Neutral	73	74.5	21	46.7	10	7.2
Disagree	6	6.1	13	28.9	93	66.9
Strongly disagree	2	2.0	4	8.9	5	3.6

4.5.3.1 Logistic Regression on Planning of Markets to Prevent Spread of Covid-19

The table 4.12 provides the results of a likelihood ratio test on the planning of markets to prevent the spread of covid-19. It assesses the effect of various factors, such as education, gender, age, and monthly income, on the planning measures taken in the markets. The likelihood ratio test indicates that education has a significant effect on planning to prevent the spread of covid-19 in the markets. The chi-square statistic is 53.462, with 2 degrees of freedom, and the significance level is very low at .000, suggesting a strong relationship between education and planning. The test shows that gender does not have a significant effect on market planning for covid-19 prevention. The chi-square statistic is 7.001, and it is not statistically significant (p = 1.000). The likelihood ratio test results suggest that age is associated with planning for covid-19 prevention in the markets. The chi-square statistic is 8.119, with 2 degrees of freedom, and the significance level is .017, suggesting a moderate association between age and planning. The likelihood ratio test demonstrates that there is a statistically significant relationship between monthly income and the intention to take preventive measures against the spread of covid-19. The chi-square statistic is 46.320, with 2 degrees of freedom, and the significance level is extremely low at .000, indicating a strong association between income and planning.

The data presented in Table 4.12 clearly indicates that variables such as education and monthly income have a substantial influence on the preventive measures implemented to curb the transmission of Covid-19 in markets. Conversely, gender does not have a statistically significant impact on these measures. Age has a moderate effect on planning in this context.

Table 4.12: Likelihood ratio test on planning of markets to prevent spread of Covid-19

Effect	Model fitting criteria	Likelihood ratio test		
	-2 log likelihood	Chi-square	d.f.	Sig
Intercept	7.143[a]	.000	0	.
Planning to ensure social distancing	7.845[b]	.702	2	.704
Planning to prevent spread of covid-19	7.143[b]	.	2	.
	11.444[b]	4.301	2	.116
Provides for hand washing at entry/exit	53.462[b]	46.320	2	.000
Education				
Gender	7.001[b]	.000	2	1.000
Age	15.120[b]	8.119	2	.017
Monthly Income	7.001[b]	.	2	.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Summary of Findings

The findings of the study shed light on several critical aspects of the three markets in Eldoret and their alignment with public health guidelines, specifically during the Covid-19 pandemic. These findings provide valuable insights into the state of infrastructure, hygiene, and pandemic preparedness in these markets.

The first objective, aimed at assessing the adequacy of sanitary facilities in Eldoret markets, reveals several noteworthy findings. Predominantly, traders in the Main Market, Municipal Market, and West Market heavily rely on piped water, underscoring its pivotal role in sustaining urban marketplaces. The practice of handwashing is prevalent, with over 50% of respondents in each market identifying it as a primary use of water services. The perceived reliability of water provision is generally positive, signifying a commendable infrastructure foundation. However, challenges persist, as a substantial percentage of respondents still consider the water supply as unreliable, pointing to areas for improvement. The frequency of water supply variation across markets provides valuable insights into the prevailing hygiene and sanitation conditions. Moreover, the study notes that toilet and urinal facilities are relatively well-provided across the three markets, Main, Municipal, and West; whereas showers exhibit varying degrees of adequacy. The Municipal market stands out with adequate shower

facilities, the Main market follows with fair provisions, and the West market lags with inadequate arrangements. Market cleanliness is reported as fairly clean in all three markets, though drainage conditions differ. Main and Municipal markets are rated fairly clean, while the West market is perceived as dirty. Handwashing facilities, a crucial aspect of sanitation, are fairly adequate in the Main market but inadequate in the West and Municipal markets.

The study's second objective, focusing on the assessment of compliance with Covid-19 containment measures in Eldoret Markets during the Covid-19 pandemic, revealed several key findings. Handwashing at entry points was consistently reported as a Covid-19 containment measure in all three markets, Main Market, Municipal Market, and West Market. However, the utilization of hand sanitizers at entry points was not widespread, pointing to a gap in implementing this particular preventive measure. Temperature testing before entry exhibited variations, with it being rarely conducted at the Main Market entry and done sporadically in the Municipal and West Market entries. Most traders across the markets were reported to adhere to wearing masks as a Covid-19 containment measure, indicating a commendable level of compliance. However, the study highlighted a limited practice of social distancing, attributed to overcrowding in the markets. In terms of market fumigation and Covid-19 testing among traders, the majority reported that market fumigation had not been carried out, and testing for Covid-19 among traders was infrequent. These findings point to potential areas

for improvement in ensuring comprehensive Covid-19 containment measures in the marketplaces. Regarding payment methods, the study observed that transactions in the markets predominantly involved cash, with mobile banking being a minority method. The handling of goods was recognized as a crucial measure to prevent the spread of the virus, and across the three markets, various safety measures such as proper display of goods, handwashing before handling goods, use of M-pesa as an alternative payment method, wearing of masks, and maintaining social distance were identified as key practices to ensure the safety of both traders and buyers.

The study's third objective aimed to evaluate the alignment of market planning in Eldoret markets with public health standards and regulations, during the Covid-19 pandemic. Responses regarding perceived planning for public health, safety, security, and adequate lighting exhibited variations across the three markets, Main Market, Municipal Market, and West Market. The majority of respondents from the West Market and Main Market expressed disagreement with the adequacy of public health planning for the market. In contrast, participants from the Municipal Market had mostly neutral opinions regarding this issue. Regarding safety planning, most respondents from the Main and Municipal Markets expressed disagreement with the notion that the market was designed with safety as a priority, whereas the majority of respondents from the West Market had a neutral stance. Regarding the planning of social distancing, the majority of respondents

from the Main Market expressed disagreement with the notion that the market was adequately designed to facilitate social distancing. In contrast, respondents from the Municipal Market and West Market were mostly neutral on this aspect. When it came to evaluating the alignment of market planning in Eldoret markets with public health standards and guidelines during the Covid-19 pandemic. The findings indicated that all three markets were fairly planned. Similarly, the markets were perceived as fairly planned to allow for social distancing. Notably, both the Municipal and Main Markets were reported to have adequate handwashing stations, while the West Market lacked sufficient facilities at entry and exit points. Market accessibility was generally perceived as fair across all three markets. The feedback from the respondents about market security indicated that all three marketplaces were perceived as reasonably secure. In terms of lighting, the markets generally relied on natural lighting during the day and security lights in the evenings. Nevertheless, certain traders have voiced apprehensions over insufficient illumination during the evening hours as a result of malfunctioning security lights, prompting them to rely on torches as an alternative.

These findings suggest a critical need for improved communication, planning, and implementation of health and safety protocols, especially in the West Market, to enhance market conditions and meet public health standards during the pandemic.

5.2 Conclusion

The results highlighted the crucial importance of piped water as the main water supply in urban marketplaces, facilitating essential hygienic practices. Although handwashing was prevalent, there was a need for enhancements in guaranteeing the reliability of water supply and correcting perceived deficiencies. The findings revealed significant disparities in the provision of toilets, showers, cleanliness, and drainage. While the Municipal Market showed relatively better sanitation infrastructure, particularly in toilet maintenance, the West Market lagged behind, raising hygiene concerns. The disparities observed in different markets have emphasized the need for specific improvements to ensure the highest hygiene standards are maintained in order to meet Ministry of Health standards.

The results unveiled a heterogeneous situation regarding adherence to Covid-19 protocols. Although compliance with handwashing and mask-wearing was considered satisfactory, particularly in the Main market, limited use of hand sanitizers, inadequate temperature screening, and widespread challenges in maintaining social distancing, especially in crowded settings like the West Market revealed significant gaps in protocol adherence. These issues point to the need for stronger enforcement, infrastructure support, and public awareness to mitigate the spread of infectious diseases.

The evaluation of market planning revealed a mixed alignment with public health standards. While the Municipal Market received favourable perceptions regarding lighting and security, safety concerns and poor social distancing implementation were prevalent in the Main and West Markets. The lack of comprehensive planning for drainage and spatial arrangements further weakened pandemic resilience. These variations underscore the necessity of tailored, health-centered planning reforms in urban marketplaces to ensure safety, hygiene, and preparedness for future public health emergencies.

5.3 Recommendations.

1. Uasin Gishu County Government in conjunction with Market Authorities should allocate more space for customer parking, reorganize market layouts for proper spacing, and maintain public facilities like toilets. Prioritize market fumigation with a routine schedule and ensure provision and maintenance of handwashing facilities and sanitizers. Effectively implement social distancing measures, even in markets with limited space. Improve market lighting for safety during evening hours.
2. Uasin Gishu County Government should allocate adequate resources for market infrastructure, sanitation facilities, and the implementation of public health guidelines.
3. The county government of Uasin Gishu, through the Eldoret municipal council, should ensure strict adherence to market planning standards and

public health regulations in planning of markets as preventive measure for future disease outbreak.

4. Municipal authorities should actively monitor and enforce compliance, imposing penalties or sanctions for non-compliance. Regular inspections, monitoring of crowd density.

5.4 Areas for Further Research

The following recommendations are made for further research:

1. To explore the underlying factors contributing to low compliance to Covid-19 containment measures
2. The socioeconomic impact of Covid-19 and how it has impacted the market operations.

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APPENDICES

Appendix 1: Market Traders questionnaire

I am a student at Kenyatta University pursuing a Masters course in Environmental Planning and Management. I am investigating sanitary provision and compliance with containment measures in Eldoret Markets during the covid-19 pandemic. I am kindly requesting some information from you. The information you provide will be used for academic purposes only and will be treated with the utmost confidentiality.

Questionnaire Number:	Date of Administration
Name of market	

Part 1: Socio-Economic Characteristics

Gender	**Age**	**Education**	**Occupation**	**Years as trader**	**Monthly income**	**Type of goods**
Male		None	Trader	<5	<10000	Vegetable
Female		Primary	Civil servant	5-<10	10000-<20000	Fruits
		Secondary	Business		20000-<30000	Cereals
		College	Farmer	10-<15	30000-<40000	Tubers
		University	Other-specify	>15	40000-<50000	Potatoes
					>50000	New clothes
						Second hand clothes
						Shoes
						Toys
						Others-specify

Part 2: Sanitary Facilities and Services

2.1 What is the status of the following toilet service provision quality indicators in the market? Tick what applies

Facility	**Service Quality Indicators**	**Charges per visit (KSh):**
Toilet	1. Adequate 2. Fair 3. Inadequate	a. None b. 10 c. 20 d. 30. e. 40 f. 50 g. Others (Specify)
Urinals	1. Adequate 2. Fair 3. Inadequate	a. None b. 10 c. 20 d. 30. e. 40 f. 50 g. Others (Specify)
Shower 1. Hot 2. Cold	1. Adequate 2. Fair 3. Inadequate	a. None b. 10 c. 20 d. 30. e. 40 f. 50 g. Others (Specify)
Hand washing basins	1. Adequate 2. Fair 3. Inadequate	
Cleanliness	1. Clean 2. Fair 3. Dirty	
Drainage	1. Good 2. Fair 3. Poor	
Accessibility	1. Accessible 2. Fair 3. Inaccessible	
Security	1. Secure 2. Fair 3. Insecure	
Lighting	1. Good 2. Fair 3. Poor	

2.2 State improvements that you would like to be put in place in provision of toilets to enhance the quality of service?

2.3 What is the status of waste collection services in the market? Tick where applicable

Facilities Provided	**Quality**	**Collection frequency**	**Charges**
Dustbins	Very good	Daily	1.0-100
Skips	Good	Thrice/week	2.101-200
Trucks	Fair	Twice/week	3.201-300
	Poor	Once/week	4.301-400
	Very poor	Every 2 weeks	5.401-500
		Others	6.>500

2.4 What is the status of water service provision in this market? Tick where applicable

Source	**Uses**	**Reliability**	**Availability**
Piped	Flushing toilets	Reliable	Daily
Borehole	Hand washing	Not reliable	Thrice a week
Rainwater harvesting	Shower		Twice a week
			Once a week
Water vendors			Intermittent
River/stream			

2.5 Is the water drainage system functional? 1. Yes, 2. No

2.6 If no in 2.5, what can be done to make it better?

……

2.7 In your opinion what can be done to improve sanitation in the Market?

……..

Part 3: Sanitization and Social Distancing Measures

3.1 What is the status of Corona Virus containment measures in the market? Tick where applicable

Nature of Measures	Practiced	Quality of Measures
Hand washing at entry	1.Yes 2.No	1. All the time 2. Once in a while 3. None
Hand sanitizers at entry	1. Yes 2.No	1. All the time 2. Once in a while 3. None
Temperature testing at entry	1.Yes 2.No	1. All the time 2. Once in a while 3. None
Masking by traders	1.Yes 2.No	1. All the time 2. Once in a while 3. None
Masking by buyers	1.Yes 2.No	1. All the time 2. Once in a while 3. None
Market fumigation	1.Yes 2.No	1. Weekly 2. Every 2 weeks 3. Monthly 4. None
Social distancing by traders	1.Yes 2.No	1. All the time 2. Once in a while 3. None
Social distancing by customers	1.Yes 2.No	1. All the time 2. Once in a while 3. None
Testing of traders for	1.Yes	1. Weekly 2. Every 2 weeks 3.

corona virus	2.No	Monthly 4. None
Awareness campaigns	1.Yes 2. No	1. Weekly 2. Monthly 3. Lack schedule 4. None
Medical examination for public health	1.Yes 2.No	Specify and frequency
Payment of goods		Cash 2. M-pesa 3. Mobile Banking 4. Visa card

3.2 What are the Corona virus regulations in this market and are they being followed?

……

3.3 How do you handle goods to avoid spread of corona virus between the buyer and the vendor?

……

3.4 Which medical examination do traders undergo to operate in the market during this corona period?

……

Part 4: Consideration of Public Health Measures in Planning of Markets

4.1 In your own opinion, do you think the market is well planned?

Market Plan/Layout	**Perception**
Ensures public health	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree
Ensures safety	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree
Allow social distancing	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree
Prevents spread of corona virus	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree
Provides for hand washing at entry and exit	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree
Ensures security	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree
Ensures adequate lighting	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly disagree

4.2 In your opinion what should be done to reduce or prevent the spread of Covid-19 at the market?

Appendix 2: Institutional Questionnaire

Department of Public Health

I am a Kenyatta University student pursuing a master's in Environmental Planning and Management. I am researching sanitary provision and compliance with containment measures in Eldoret Markets during the covid-19 pandemic. I am kindly requesting some information from you. The information you will provide shall be used for academic purposes only and treated with the utmost confidentiality.

Name of market……

1. What are your roles at the market regarding public health in the day-to-day running of the markets?
2. Has the market met the required Public Health standards of operation?
3. Do you have a policy on how general cleanliness should be maintained in the markets under your jurisdiction?
4. What would you say about the sanitary condition in the markets, what should be done to improve it?
5. What are the standards of hygiene and sanitation that should be maintained by vendors?
6. How often do you undertake medical examinations of market vendors and for what aspects?
7. Do you have mandatory requirements for traders before they are allowed to sell their goods and services?

8. Since outbreak of Corona virus, what measures have been put in place from time to time in the markets?
9. Are the corona virus intervention measures in markets working, to what extent and why?
10. In your opinion what should be done to reduce or prevent the spread of Covid-19 at the market?

Appendix 3: Market Master

I am a Kenyatta University student pursuing a master's in Environmental Planning and Management. I am carrying out research on sanitary provision and compliance with containment measures in Eldoret Markets during the covid-19 pandemic. I am kindly requesting some information from you. The information you will provide shall be used for academic purposes only and treated with the utmost confidentiality.

Name of Market……..

1. What are the number of stalls and traders in the market and is control of crowding possible to meet Covid-19 requirements?
2. Does the market have adequate toilets/urinals?
3. Since Corona virus started how many times has market fumigated and what happens during fumigation?
4. What is the source of water supply in the market and who pays for the bills?
5. What measures have been taken to ensure Covid-19 regulations are adhered to in the market?
6. What challenges do you encounter in ensuring adherence to Covid-19 regulations?
7. Do you have mandatory requirements for traders before they are allowed to sell their goods and services in the market during this period?
8. How often do you undertake medical examinations of market vendors and for which examination?

9. Explain the adequacy of sanitation and hygiene in the market?
10. What recommendations would you give regarding challenges you encounter in ensuring adherence to Covid-19 regulations in the market?

Appendix 4: NACOSTI Approval

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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Date of Issue: **09/March/2021**

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