

Sanitary Provision and Measures in Markets during Covid-19 Pandemic in Eldoret Municipality, Kenya

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Markets are public gathering places for people and provide affordable food for city dwellers, especially in developing countries. On the other hand, markets have been linked to significant disease outbreaks, raising public health concerns. This paper examines the adequacy of sanitary facilities and sanitary measures during Covid-19 pandemic in Eldoret markets. The study employed a cross-sectional research design and collected primary data through questionnaires, interviews, and observations. A total of 282 traders were selected using stratified random sampling. Descriptive statistics were used to analyse the quantitative data, which was then presented through tables and figures. The findings indicate that water supply is adequate and reliable in all three markets, toilet and urinal facilities are fairly supplied, and showers are adequate in the Municipal Market, fair in the Main Market, and inadequate in the West Market. Hand washing was done at the entrance as a coronavirus containment precaution in all three markets, but no hand sanitisers were used. During the period, most traders in the markets donned face masks, and the markets were not fumigated. As a result, market compliance with Covid-19 public health measures was low, posing a danger to Covid-19 spread. In conclusion, this study emphasizes the importance of adequate sanitary facilities, proper sanitisation, and adherence to social distancing measures in marketplaces during the Covid-19 pandemic. The findings call for increased awareness and compliance with public health guidelines among traders, market authorities, and relevant government agencies. By implementing necessary improvements and enforcing stricter measures, marketplaces can contribute to mitigating the spread of Covid-19 and ensuring the health and safety of traders and customers. Further research is recommended to explore the underlying factors contributing to low compliance and to assess the effectiveness of interventions aimed at improving market hygiene and Covid-19 containment measures.

Keywords: Corona virus, fumigation, sanitization, social distance

INTRODUCTION

Marketplaces play a crucial role in meeting the financial needs of buyers and small-scale business owners (Kenton, 2021). In Eldoret Municipality, the marketplaces, including open-air markets, fish and meat markets, vegetable markets, and clothing stores ("mitumba"), serve as important hubs for economic activities (Wandimi, 2017).

However, these marketplaces have been associated with environmental challenges that can lead to major outbreaks of diseases (Naguib *et al.*, 2021). The unsanitary conditions resulting from inadequate waste management, poor water supply, improper sewage disposal, indiscriminate littering, open defecation, and unhygienic practices pose significant risks to public health (Oluwole *et al.*, 2017).

The ongoing Covid-19 pandemic has further highlighted the importance of sanitary measures in marketplaces. The virus can spread through unsanitary behaviours, making access to water, sanitation, and hygiene (WASH) facilities critical in preventing its transmission (UNICEF, 2020). Implementing appropriate waste disposal procedures and maintaining physical distancing are also crucial in reducing the risk of infection (WHO, 2020).

Activities in Eldoret marketplaces generate large quantities of waste and if they are not disposed well they can provide good breeding grounds or vectors of

communicable diseases. Unsanitary condition caused by open urination and defecation is also a challenge in Eldoret markets, this could be due to the inadequacy of sanitation amenities such as water supply, toilets, bathrooms and reuse disposal facilities. In Eldoret Municipality, it is essential to assess the adequacy of sanitary facilities, sanitisation practices, and social distancing provisions in the local marketplaces in response to the Covid-19 pandemic. Understanding the current state of sanitary measures in these marketplaces will help identify gaps and inform targeted interventions to improve public health and prevent the spread of diseases. This study aims to fill this knowledge gap by examining the status of sanitary facilities, sanitisation practices, and social distancing measures in the marketplaces of Eldoret Municipality.

LITERATURE REVIEW

Covid-19 Outbreak and Sanitary Containment Measures

The Covid-19 was first deemed a worldwide public health emergency by the World Health Organization (WHO) on January 30th 2020, and subsequently declared a pandemic on March 11, 2020. Kenya's first official case was recorded on March 13th, 2020 (MoH, 2020). The principal mode by which people are infected with the Covid-19 is through exposure to

respiratory fluids carrying the infectious virus. Exposure occurs in three principal ways (Public Health Ontario, 2022): inhalation of very fine respiratory droplets and aerosol particles; deposition of respiratory droplets and particles on exposed mucous membranes in the mouth, nose, or eye; and touching mucous membranes with hands that have been soiled either directly by virus-containing respiratory fluids or indirectly by touching surfaces with the virus on them.

The Covid-19 outbreak is believed to have started at the Huwan Seafood Wholesale Market in Wuhan, China. (Wu *et al.*, 2020). The Wuhan Government resolved to close the market and prohibit the sale of live animals in the city's wet marketplaces on January 1, 2020. When it came to preventative corona-related actions, markets stayed the focus of concern in many parts of the world. The crowded, public, and open layout of markets is considered to face a significant risk of unchecked virus spread (Wu *et al.*, 2020). WHO (2020) advocated for the availability of hand washing and hand sanitisation facilities at all public structures and transportation platforms, including markets, shops, churches, educational institutions, and vehicle boarding stations.

Buyers and small-scale merchants in Kenya were threatened as a result of the government's restrictions on public gatherings in the face of Covid-19 (International Trade Center [ITC], 2020). In response to the Covid-19 emergency, the Kenyan government created standardised guidelines to increase market operational efficiency and create order in market operations so that necessary goods reach the final consumer safely (Ministry of Industrialization, Trade and Enterprise Development [MoITED], 2020). Fumigation, designating and managing entrance and exit points, establishing hand sanitising facilities at

gates for vendors to routinely wash or sanitise their hands, random temperature tests on market patrons, and social distancing were among the measures implemented (MoITED, 2020; Ministry of Health [MoH], 2021b). People attending an open-air market were required to wear a protective mask that covered their mouth and nose in order to prevent the virus from spreading (WHO, 2021). These steps were to be enforced in the markets by market commanders, public health officials, security, and the market committee.

STUDY AREA

The Main, Municipal, and West Markets are all in Eldoret Municipality, Kenya, at 0030'59.70" N 35016'22.49" E, 0031'08.34" N 35016'20.41" E, and 0031'19.13" N 35015'44.8" E, respectively. Main Market was given this name because it was located in the heart of the municipality and was readily accessible to many residents. West Market gets its moniker from its location in the western part of Eldoret. Municipal Market was called after the municipality that built it. Eldoret is a major town in the Rift Valley area and the county seat of Uasin Gishu, it is Kenya's fifth most populous urban region and the country's fastest growing town (Kenya National Bureau of Statistics [KNBS], 2019). The Municipal Market was founded in 1966 to provide goods such as clothing, shoes, fresh foods, and cereals for the people. The Main Market was established in 1986 to address the problem of hawkers in the Central Business District (CBD) and to decongest the Municipal market. Uasin Gishu County (UGC) subsequently renovated the market in 2015. West Market is an open-air market that opened in 1998 and specialises in used clothing and shoes (UGC, 2022).

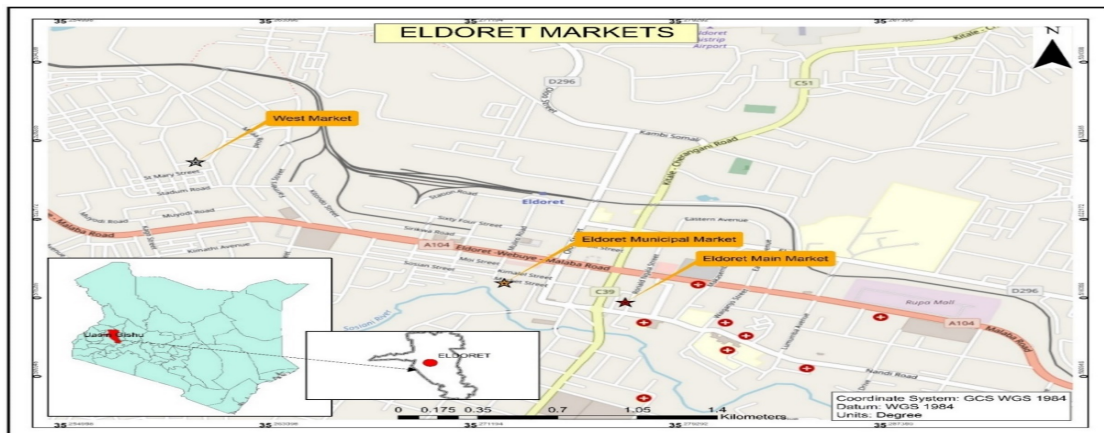


Figure 1: Location of markets within Eldoret municipality
Source: Reseacher 2022

RESEARCH METHODOLOGY

Study Design

This study utilized a cross-sectional research design to assess the adequacy of sanitary facilities, sanitisation practices, and social distancing provision in the marketplaces of Eldoret Municipality. The cross-sectional design allowed for data collection at a single point in time, providing a snapshot of the current state of these factors in the marketplaces.

Sampling Size Determination

The sample frame included traders from Eldoret Municipal Market, Eldoret Main Market, and West Market. The population size for each market was determined to be 420 traders in the Main Market, 200 traders in the Municipal Market, and 600 traders in the West Market (UGC, 2022). The sample size was calculated using the Yamane formula (Yamane, 1973) with a margin of error (E) set at 0.05. The resulting sample size was 282 traders. The distribution of samples for each market was as follows: 98 traders from Eldoret Main Market, 45 traders from Eldoret Municipal Market, and 139 traders from West Market. The population was stratified into three groups based on market types: food market (Eldoret Main Market), a mixture of food and clothing markets (Eldoret Municipal Market), and clothing market (West Market). Stratified random sampling was employed to select a representative sample from each stratum.

Data Collection

Data collection involved multiple methods, including questionnaire administration, and observation. A structured questionnaire was developed to collect quantitative data on the availability and adequacy of sanitary facilities, implementation of sanitisation practices, and adherence to social distancing measures. The questionnaire consisted of both closed-ended and open-ended questions and was administered to the selected traders. Direct observations of the marketplaces were made, to assess the physical conditions of the sanitary facilities, level of cleanliness, and adherence to social distancing measures.

Data Analysis

The data analysis process started with ensuring that the questionnaires were properly filled out, and a

Table 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 (n)	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

coding sheet was made using the Statistical Package for Social Science (SPSS) computer software to aid in coding and data entry. Following that, summary tables were created for all answers. Descriptive statistics such as frequencies, percentages, means, and standard deviations were calculated to summarize the quantitative data. Qualitative data from open-ended questions were analyzed thematically to identify common themes and patterns related to sanitary measures, sanitization practices, and social distancing provision.

RESULTS AND DISCUSSION

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 & 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 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 the 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.

Education level is an indicator of the adaptability of traders to the covid-19 guidelines. Their awareness and exposure levels will help them adapt to the covid-19 regulations easily. The majority of traders (41%)

had completed secondary school, 30% had completed college, 17% had completed university, and 8% had completed primary school, leaving only 4% without formal education (Figure 2).

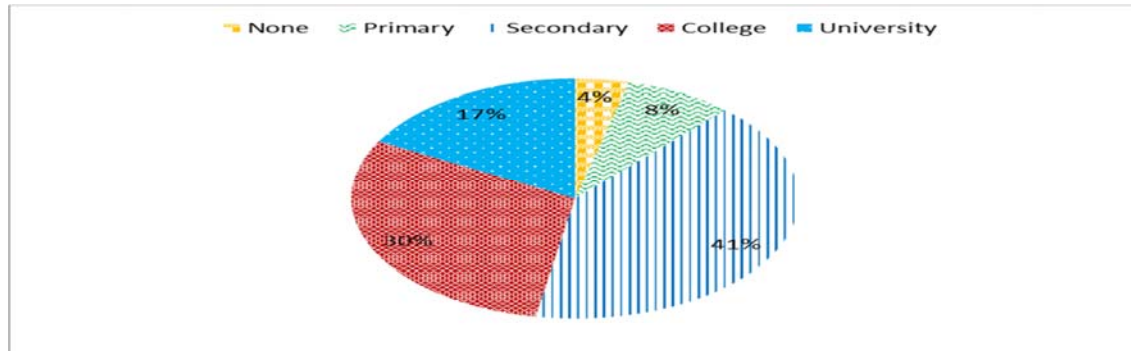


Figure 2: Education level of traders in the markets

Table 2 depicts the various kinds of goods sold by market traders. Approximately 64.3% of Main Market traders offer fruit cereals, tubers, and potatoes. 53.4% of traders in Municipal Market offer vegetables, fruits, cereals, tubers, and potatoes, while 20% sell clothes and shoes. The majority of traders in West Market (92.1%) offer clothing and shoes. In terms of items sold, the three markets are not homogeneous, with traders in the Main market selling vegetables, cereals, and fruits; in the Municipal market, most traders sell all items on average; and in the West market, most traders sell second-hand clothes, new clothes, and shoes. The dominant products sold in each market define the market.

The type of goods sold in the markets can impact sanitary provision and implementation of covid-19 measures. Markets selling essential food items or high-demand products may attract larger crowds, making it challenging to maintain physical distancing. Different types of goods may require different levels of contact during purchasing. By considering the specific requirements and challenges associated with different types of goods sold in markets, authorities, market organizers, and vendors can tailor their sanitary provision and COVID-19 measures to promote a safe and hygienic environment for both traders and customers (Mogendi *et al.*, 2022).

Table 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

Adequacy of Sanitary Facilities in Eldoret Markets

The adequacy of sanitary facilities in Eldoret markets is an important aspect to consider in ensuring a safe and hygienic environment for both traders and customers. According to Table 3, the majority of traders in Eldoret markets considered toilet facilities to be reasonably sufficient (56.1, 60, 56.8%) in the Main, Municipal, and West markets, respectively. Toilets were deemed inadequate by (33.7, 13.3, and 25.2)% of respondents from the Main, Municipal, and West markets, respectively, with similar patterns observed in the adequacy of urinals and cleanliness of sanitation facilities across the three markets, which

were deemed reasonably adequate. In the Main, Municipal, and West markets, 59.2%, 77.8%, and 62.6% of respondents, respectively, stated that urinal adequacy was acceptable. The majority (48.9%, 56.1%, 61.2%) stated that the market cleanliness is reasonable, while approximately (31.6%, 33.3%, 20.9%) stated that the markets were dirty. This demonstrates that Eldoret's marketplaces are relatively clean.

Showers are viewed as insufficient by the majority in the Main (45.9%) and West (61.2%) markets, but adequate in the Municipal market (48.9%). Handwashing basins are regarded as fair by the

majority in the Main market (72.4%), but inadequate by the majority in the Municipal (64.4%) and West (54%) markets. This demonstrates that Municipal and West markets lacked sufficient hand washing basins, **Table 3:** Adequacy of sanitary facilities in Eldoret markets

as required by WHO (2021), which states that markets should have washing facilities to avoid slip and trip hazards.

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
Cleanliness	Fair	55	56.1	22	48.9	85	61.2
	Dirty	31	31.6	15	33.3	29	20.9

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). Water was made available in the market on a daily basis via piped **Table 4:** Status of Water provision in Eldoret Market

supply supplied by the Eldoret Water and Sanitation Company (ELDOWAS), in accordance with WHO guidelines for ensuring people's health against covid-19. The expense of a toilet visit is KES 10 for a urinal or toilet without tissue paper and KES 20 for a toilet with tissue paper and a shower.

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

Compliance with Covid-19 Containment Measures in Eldoret Markets

Compliance with COVID-19 containment measures in Eldoret markets is crucial in preventing the spread of the virus and ensuring the safety of traders and customers. In the study, the respondents were required to indicate nature of measures practiced in their respective markets. Table 5 shows, that the majority (89.8%) of traders from the main market reported that hand washing is done upon entry, while in the Municipal market, the majority (62.2%) reported that hand washing is done upon entry and in the west market most traders (56.8%) also said they wash their hands when entering the market as a measure to limit the spread of the coronavirus

However, about 10.2%, 37.8%, 43.2% of respondents from Main, Municipal and West Markets noted that there was no handwashing at the entrance, which depict that some traders and vendors still entered the market without washing their hands as per the guidelines and thus posing a danger to traders and vendors as well implying a weak enforcement of the guidelines. WHO called for all partner nations to ensure common gain to public hand washing service through proper washing of hands using soap, which is essential in fighting Covid-19 (WHO, 2020). Nevertheless, if handwashing is not accessible, hand sanitiser can be used instead. The majority of respondents (66.3%, 64.4%, and 68.3%, respectively) at the Main Market, Municipal Market, and West Market did not have hand sanitisers at the entryway. The markets had temporary hand washing facilities at the entrance and departure, with permanent handwashing facilities inside the washrooms. Temporary washing facilities demonstrate the transiency of covid-19 containment measures, whereas permanent structures within the washrooms

demonstrate standard design practice. Hand sanitising was not a common practice due to a lack of enforcement, as well as individualised costs to traders (Table 5).

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 entrance was more common in the Municipal (66.7%) and West (59.7%) markets, but was less common in the Main market (25.5%). Masking was used by the bulk of traders (72.4%, 68.9%, 69%, 1%,) in markets where they catered for themselves without the assistance of the county.

Contrary to the recommendations, which suggest routine fumigation as a disinfection practice to reduce potential contamination by the Covid-19 virus, the markets were only fumigated once (MoITED, 2020). On the other hand, 71.4%, 73.3%, and 73.4% of interviewees stated that the Main, Municipal, and West markets had never been fumigated since the start of Covid-19.

The majority of market traders (76.5%, 71.1%, and 68.3%) did not practice social distancing, as suggested by the Ministry of Health, because the markets are overcrowded, making it difficult for them to follow this rule. Moreover, the majority of traders (89.8%, 66.7%, 85.6%,) stated that testing for Covid-19 was not done, in the same way that the standard public health medical examination was not done, as noted by (70.4%, 73.3%, 71.2%, of respondents. There were few awareness campaigns in the three markets, according to (66.3%, 80%, 82%) of respondents, indicating that awareness campaigns on Covid-19 containment measures were limited in the market during the time (Table 5).

Table 5: 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

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. (Table 6).

Table 6: Payment of goods in Eldoret markets

Payment mode	Main Market		Municipal Market		West Market	
	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

CONCLUSION AND RECOMMENDATIONS

The study found that the sanitary facilities in Eldoret markets were reasonably adequate in terms of handwashing facilities. However, compliance with COVID-19 control measures in the markets was poor. The primary measures used, such as handwashing and temperature testing, were implemented to some extent, but other important measures like market fumigation and distribution of hand sanitisers were uncommon. Social distancing was challenging due to overcrowding in the markets, as the population exceeded the planned capacity. This poor compliance with sanitary measures poses a significant risk for the spread of COVID-19 within the markets. The method of payment being predominantly cash also presented a risk for virus transmission among traders and buyers. The response of municipal authorities and the national government to COVID-19 was characterized by lax enforcement, leaving traders to take care of their own safety. This highlights the need for improved coordination and proactive measures from the government to ensure the safety of marketplaces during future outbreaks.

Based on the findings of this study, there are several recommendations for future studies and interventions: Future studies can focus on exploring the reasons

behind poor compliance with COVID-19 sanitary measures in Eldoret markets. This could include understanding the barriers and challenges faced by traders and customers, as well as their perceptions and knowledge regarding the importance of sanitary practices. Municipal authorities and the national government should develop and implement contingency plans that include public health measures for marketplaces. These plans should address issues such as crowd management, hygiene practices, waste management, and infrastructure improvements to enhance the safety and resilience of the markets during outbreaks or emergencies. Municipal authorities should actively monitor and enforce compliance, imposing penalties or sanctions for non-compliance. Regular inspections, monitoring of crowd density, and provision of resources for proper sanitisation should be prioritized. Encouraging and facilitating cashless transactions in the markets can reduce the risk of virus transmission through physical currency. By implementing these recommendations, market authorities and government agencies can work towards improving compliance with COVID-19 sanitary measures in Eldoret markets, mitigating the risks of virus transmission, and ensuring the safety and well-being of traders and customers.

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