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AN ASSESSMENT OF FACTORS INFLUENCING THE MANAGEMENT OF COVID-19 PANDEMIC AMONG COUNTY GOVERNMENTS IN KENYA

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Abstract:
The global pandemic of Covid-19 created dramatic challenges for governments worldwide. It led to skyrocketing numbers of deaths and outbreaks, challenged the public and private health systems of many countries and brought many national economies to a halt. Kenya was not an exception and like other countries used a number of strategies to combat the epidemic but equally suffered the same fate. There is little empirical evidence to determine whether the strategies, especially by the county governments were effective in handling the Covid-19 pandemic. Thereby lies the knowledge gap that this study seeks to answer. It is against this background that this study sought to assess the extent to which medical equipment and supplies, personnel and funding influenced the management of the Covid-19 pandemic by county governments in Kenya. The general objective guiding the study was, to assess the factors influencing the management of the Covid-19 pandemic among county governments in Kenya. The specific objectives of the study were: To determine the extent to which medical equipment and supplies influenced the management of the Covid-19 pandemic

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in the county governments, to determine the extent to which the use of personnel resources influenced the management of the Covid-19 pandemic in the county governments and to determine the extent to which funding influenced the management of Covid-19 pandemic in the county governments. Fink's crisis management model guided the study, which reviewed the empirical literature on medical equipment and supplies, personnel resources and funding in the management of the Covid-19 pandemic. This study adopted a descriptive survey research design with a target population of 70,500 employees from the health sector. The research used simple random sampling as a sampling technique and a sample size of 100 respondents was selected using the Yamane formula. Data was collected using questionnaires. The data were subjected to descriptive statistics and analyzed using SPSS. Based on the findings, 79.6% of the respondents agreed that medical equipment and supplies greatly influenced the management of the Covid-19 pandemic in the county governments, 85% of the respondents indicated that personnel resources played a critical role in the management of Covid-19 pandemic among the counties and 74.2% of the respondents agreed that funding greatly influenced management of Covid-19 pandemic in county governments. Based on the findings, the study recommended that a staff audit and workload analysis should be undertaken and a recruitment process initiated to improve staffing levels; an audit of bed capacity of all medical facilities be initiated and a procurement plan for the acquisition of additional beds based on needs undertaken; an audit and analysis of staff training be undertaken to identify training gaps and necessary action initiated; negotiate with SRC on additional medical staff allowances and lastly fast-track legislation on the expenditure of emergency funds.

JEL: H10; H51; H76; I10; I18

Keywords: Covid-19, management, county governments

1. Introduction

The World Health Organization declared the 2019 coronavirus outbreak a Public Health Emergency of International Concern (PHEIC) on 30th January 2020 and a pandemic on 11th March, 2020. Coronavirus disease 2019(Covid-19) is an infectious disease caused by severe acute respiratory syndrome to coronavirus 2(SARS coV-2)(China-WHO joint mission, 2020). The disease was first identified in 2019 in Wuhan, the capital of Hubei China and has since spread globally resulting in the 2019-20 coronavirus pandemic (Hui, *et al*., 2020).

The common symptoms of Covid-19 include fever, dry cough and difficulty in breathing, muscle pain, sputum production, diarrhea and sore throat. The contagion is spread from one person to another via respiratory driblets produced during coughing. It may also be spread by touching polluted shells and also touching one's face (Centre for Disease Control and Prevention, 2021).

The recommended measures to prevent infection include frequent hand washing, social distancing, and keeping hands away from the face (Perlman, 2020). The use of sanitized masks is recommended for suspected persons and their caregivers (Tang *et al*., 2020)

Since the first reports of cases from Wuhan; a megacity in the Hubei fiefdom of China at the end of 2019, further than Covid-19 cases have been reported in China with the maturity of those from Hubei and girding businesses (WHO Media Report, 2020). At present, cases have been reported in all continents except for Antarctica and have been increasing in many countries of the world. By 2020, March 29, the coronavirus had affected 199 countries and territories around the world with a total of 664,590 cases, 30,890 deaths and 142,368 recovered cases (Worldometer, 2020).

The rapid increment in the cases of Covid-19 throughout the world including the United States, most countries in Western Europe (including the United Kingdom) and South East Asia forced these countries to announce a sudden lockdown. As of March 2, 2022, the number of confirmed Covid-19 cases in Africa amounted to 11, 549, 076, which represented around 2.62 percent of the infected around the world. By the same date, nimbus contagion cases encyclopedically were 440.8 million causing nearly 5.99 million deaths while roughly 391.5 million people recovered from the complaint.

A disease is classified as a pandemic when it is prevalent over a whole country or the world. World Health Organization first declared Covid-19 to be a public health emergency of international concern on 30th January 2020 and subsequently declared it a pandemic on 11th March, 2020. The African continent first came into contact with the coronavirus pandemic on February 14, 2020, in the northernmost part, particularly in Egypt. South Africa was the most severely affected country with more than 3.67 million infections. Since then, the different governments took restrictive measures to try to curb the spread of the disease. Although the African countries still have a long way to fully combat the virus, vaccination programs have been rolled out in most countries with a high willingness of people to be vaccinated.

In Kenya, the National Governments deployed a series of severe control measures and a set of public health policies to stop the spread of the Covid-19 pandemic. They included orders to work from home, restricting travel, closings schools and other gathering places and a set of public health policies such as washing hands or using disinfectant gel, using gloves and wearing masks). The preparedness of a country to handle a pandemic depends on its health care system, especially in three major areas; governance, resources and service provision.

In the case of governance, the political system of a country plays a crucial role. Besides, resources are very important in fighting pandemics like Covid-19. Covid 19 has revealed how severely flawed the national and global health care system is. Starting from an inadequate number of hospitals, staff and equipment to misuse of those limited resources. Clinicians are forced to prioritize patients for treatment because of inadequate resources and time. Hospitals have been required to ration ventilators and space in intensive care units (ICUs) based on priority. The continued situation has been

exuberated by the shortage of hospital beds, ICUs, ventilators, and other types of equipment and clinicians and nurses.

In the fiscal year 2020/21, budgetary allocations to county governments fell by 2.3% to KES370 billion (11.6% of the total budget of the government of Kenya) compared with 2019/20. The allocation consisted of conditional grants amounting to KES16.7 billion – an increase of 8.2% compared with 2019/20. These funds were earmarked for leasing medical equipment; support for level 5 (county referral) hospitals; compensation for user fees foregone by rural health centers and dispensaries; and support for universal health coverage (UHC). To implement other healthcare activities (such as expanding health facilities and purchasing medical supplies), counties were expected to allocate additional resources to the health sector, depending on their priorities.

Though South Korea suffered from several waves of the Covid-19 pandemic, its public health system was able to combat outbreaks effectively, limiting their spread and duration. It managed the pandemic through restrictions on international travel, school closures, targeted suspensions of public gatherings and closure of public entertainment venues.

South Korea's approach concentrated more on testing, contact dogging and counter blockade supported by mobile technology and data analytics. These were further enabled by effective communication with the public and widespread public compliance with masking, physical distancing and hygiene recommendations.

Throughout the Covid-19 Pandemic, South Korean authorities provided the public with updated data on the virus and clear guidelines on how to avoid infection. They used a variety of media and twice-daily press briefings to ensure public awareness of the threat posed by the virus and actions being taken to mitigate the threat. It however general criticism for its delayed rollout of Covid-19 vaccination efforts, having started vaccination of frontline health workers and long-term care residents only on February 28th, 2021 (Dyer, 2021).

As of March 02, 2022, the number of coronavirus cases in Kenya was 323,002. In early 2020, the Covid-19 pandemic caught Kenya off guard, as it did to every country. This meant that the government had to quickly develop its Covid-19 response plan and budget.

The government had to engage with a range (Dyer, 2021) of stakeholders on urgent response needs and find ways to best allocate scarce resources. At the same time, the government had to identify local solutions to procure essential medical commodities and personal protective equipment (PPEs) in a competitive global market. The Kenyan government was cognizant of the fact that an effective pandemic response would have to strengthen the key health system components, including the use of human resources, medical equipment and supplies and finances through budgetary allocation.

1.1 Problem Statement

Ideally, the healthcare system of any country should be structured in a way that can address any kind of disease including pandemics. The healthcare system should have

adequate medical supplies and equipment such as personal protective equipment, oxygen, ventilators, ambulances, intensive care units and beds, etc. The healthcare system should also be adequately funded with emergency funds set aside for any emergency cases such as pandemics. In addition, all hospitals should have well-trained, adequate and well-remunerated personnel.

In Kenya, however, the healthcare system has faced challenges during the Covid-19 pandemic. Firstly, there were inadequate medical supplies and equipment. Secondly, several hospitals did not have adequate medical personnel, well trained to handle pandemics such as Covid-19. Their response remunerative allowances, especially those hired on contract terms, were not commensurate to the work nor the risk of handling diseases such as Covid-19. In addition, the budgetary allocation especially to the health sector was inadequate, as evidenced by funding gaps. Moreover, timely disbursement of these funds by the National Government remains a challenge.

The Kenyan Government just like other governments the world over, utilized several strategies to combat the pandemic including the use of human resources, medical equipment and supplies and finances through budgetary allocation, however, there is little empirical evidence on whether such strategies supported especially the county governments in effectively handling the Covid-19 pandemic, there is need therefore to address such knowledge gap to support government policy direction on combating the pandemic. It is against this backdrop that this study sought to assess the extent to which medical equipment and supplies, personnel and funding influenced the management of the Covid-19 pandemic by county governments in Kenya.

1.2 Study Objectives

The objective of the study was to assess the factors influencing the management of Covid-19 pandemic among county governments in Kenya. Specifically, the study sought to determine the extent to which medical equipment and supplies, personnel resources, and funding influenced the management of the Covid-19 pandemic in county governments in Kenya.

1.3 Justification of the Study

Covid-19 has burdened an already strained health system in Kenya, much as it has strained health systems in more advanced economies. The Constitution of Kenya 2010 lists the highest attainable standard of health as a constitutional right. The same Constitution also instituted a radical governance reform in Kenya specifically the decentralization of significant government responsibilities from the national government to 47 established counties.

Under decentralization, the responsibility for providing preventive and curative health services lies with the county governments in Kenya. County governments now manage level one to five health care facilities and hence the incidental responsibility to be in the frontline in managing the response to Covid-19.

The Ministry of Health provided guidelines and protocols for the containment of the Covid-19 pandemic. The responsibility for managing the Covid-19 pandemic lies with the county governments. However, there is a knowledge gap on the extent to which such county governments effectively managed the Covid-19 pandemic. This, therefore, necessitated the urgent need to assess the factors that influenced the management of the Covid-19 pandemic among the county governments in Kenya. Failure to carry out this research can result in catastrophic losses such as death because of the nature and effects of this disease.

2. Literature Review

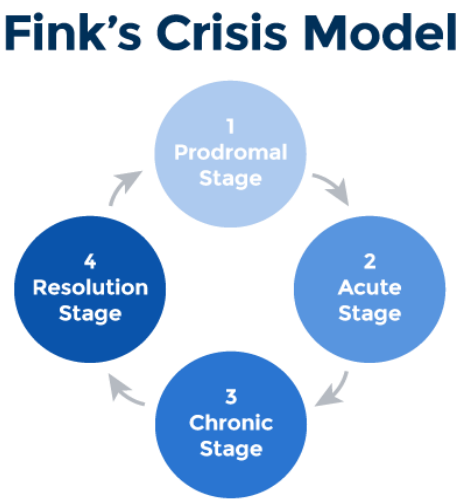
2.1 Theoretical Framework

2.1.1 Fink's Crisis Management Model

A crisis management model is conceptual for all aspects of preparing for, preventing, coping with, and recovering from a crisis. The model enables managers to gain contextual knowledge and can better apply best practices when faced with a crisis. James (2008) lists several delineations of extremity, which are an important precursor to understanding the extremity proposition. The core element in each of them is that an existent is overwhelmed. One of the definitions that fit the study most is; "*People are in a state of extremity when they face a handicap to important life pretensions – and handicap that is, for a time, invincible by the use of customary styles of problem working. A period of disorganization ensues, a period of worried, during which numerous unproductive attempts at a result are made*." (Caplan, 1964). A crisis can also be defined to be an unpredictable or low probability event that can cause significant negative effects on a business. Often the causes, consequences and solutions to a crisis are unclear yet stakeholders must act quickly.

In his influential 1986 book "Crisis Management Planning for the Inevitable", Steven Fink laid out a four-stage extremity model conforming to the prodromal, acute, habitual, and resolution stages. The prodromal stage covers the period between first signs and extremity eruption. During this period, Fink states that extremity directors should be proactively covering, seeking to identify signs of a brewing extremity, and trying to help it or limit its compass. The acute stage begins when a detector unleashes the extremity event. This phase entails the activation of extremity directors and their plans. The habitual stage encompasses the lasting goods of the extremity, similar to after a deluge or a hurricane when brigades repair damage to structures and roads. Eventually, the resolution stage represents the end of the extremity and a time for internalizing what went wrong through root-cause analysis and enforcing changes to ensure there's no reiteration (Fink, 1986). Fink's model, along with other top extremity operation models likens the unfolding of an extremity to a lifecycle with multiple successional stages (Fink, 1986).

Figure 1: Fink's Crisis Model



Source: Adapted from (Fink S. L., 1971).

This model relates to our study in several ways. Covid -19 pandemic was an unpredictable event that caused significant negative effects on organizations, countries, regions and the World at large and for quite some time, it was insurmountable by the usage of regular approaches to problem-solving. The pandemic also went through a lifecycle with numerous sequential stages as stated by Fink's model.

When the virus was first reported from Wuhan, China, on 31 December 2019 and most countries started taking precautions which included restrictions on planes from China landing in their countries-this can be likened to the prodromal stage. The acute stage of the model can be likened to when it was realized that the virus had already permeated most countries and its effects were visible through the loss of many lives. Scientific researchers went on an overdrive to manage the pandemic during this stage. The chronic stage can be likened to when vaccines had been discovered and were in use and most people had also developed herd immunity. We are in the resolution stage as the crisis is coming to an end and World leaders are in discussion of coming up and implementing strategies to ensure there is no repetition of such a pandemic.

2.2 Medical Supplies, Equipment and Management of Covid-19 in County Governments

In the wake of community coronavirus disease 2019 (Covid-19) transmission, there was a growing public health concern regarding the adequacy of resources to treat infected cases. Hospital beds, ferocious care units (ICUs), and ventilators are vital for the treatment of cases with severe illnesses. The dramatic increase in suspected Covid-19 cases in Africa in the year 2020 placed an enormous burden on medical facilities. Various country reports indicated that the increasing number of suspected cases far outweighed the capacity of most health facilities. Acute shortages of essential medical devices and

personal protective equipment caused fear and fundamental concerns among frontline health workers about the sustainability of the health system.

The coronavirus disease 2019 (Covid-19) pandemic has inflicted severe shortages of acute healthcare materials, equipment, and resources such as personal protective equipment (PPEs), intensive care unit (ICU) beds, hand sanitizers, and mechanical ventilators (Sonu, *et al*. 2020). In the early months of the year 2020, both Australia and The United States faced major shortages of masks when they were needed most. The shortage was exacerbated by the extraction of the millions of masks held in the national strategic stockpile during the 2009 H1N1 pandemic, as none of these extracted masks was subsequently restocked.

The demand for critical care, including hospital beds and intensive care units, was expected to increase with the rising number of cases in the United States. Normally, in the absence of a public health emergency, more than half of 97,776 intensive care units in the country would be in use and this, therefore, meant that in the face of a pandemic, then the system would be overwhelmed. (Seyed, *et al*., 2022)

In an article titled "Challenges Faced by Healthcare Professionals during the Covid-19 Pandemic: A Qualitative Inquiry from Bangladesh by Shaharior, *et al*. (2021), noted that lack of sufficient healthcare workers, knowledge about the virus, and basic training were some of the reasons leading to excessive workload, which consequently gave rise to psychological stress. This finding is harmonious with some of the previous literature. A previous study also showed that excessive work pressure was responsible for mental distress, insomnia, physical weakness, as well as fear of infection of the healthcare professionals and this, affected the management of the pandemic.

According to Abdul-Aziz, *et al*. (2020), in his article titled "The role of testing in the fight against Covid-19: Current happenings in Africa and the way forward" developing vigorous testing capacities was an unmet need in dealing with the Covid-19 outbreak. Therefore, there was an urgent need to establish Covid-19 testing capacities in each country. Countries with the minimal testing capacity needed to be quickly equipped to refer samples of suspected cases to a WHO reference laboratory for Covid-19 testing through inter-laboratory collaboration.

A study in Kenya showed that health facilities had limited surge capacity due to a lack of ICU beds and ventilators. Indeed, when these tools were available, there were also concerns about the lack of accompanying apparatus or managing the tools duly. Studies also noted resource gaps, particularly the incompatibility between infection rates and the facilities available to give Covid-19 testing, given the size of the population in the region (Gizachew, 2021).

Kenya encountered significant gaps in ICU beds and ventilator capacity. A total of 22 from the 47 counties in Kenya had installed at least 1 ICU unit. The country would require an additional 1,511 new ICU beds and 1,609 ventilators upscaled to 374 ICU beds and 472 ventilators to take care of caseloads due to Covid-19 (Barasa, Ouma & Okiro, 2020).

2.3 Personnel and Management of Covid 19 in County Governments

As a society, we depend heavily on frontline staff handling different care and service functions. However, fear and uncertainty about how to act and the apparent risk of transmission of contagion may affect their readiness to work. During the epidemics, apparent personal protection, the consciousness of pandemic risk and medical knowledge of influenza epidemics, role-specific knowhow, epidemic response training and assurance in personal skills were linked to better willingness to work among healthcare workers. (Nabe-Nielsen, *et al*., 2021).

Specifically related to Covid-19, training, experience and knowledge among medical staff at hospitals were associated with willingness to work. In addition, nonclinical staff was found to be more stressed than clinical staff due to a lack of access to personal protective equipment, and hence, lack of knowledge and awareness of the pandemic virus amongst non-clinical workers is vital during the management of influenza epidemics. Thus, also non-clinical staff should be addressed when implementing guidelines aiming at controlling a virus outbreak (Nabe-Nielsen, *et al*., 2021).

In a research study conducted in New York and Illinois, it was found that the findings were consistent with what much of past research has shown, that chronic nurse understaffing has persisted in a significant share of US hospitals for decades, and poses a significant risk to patients even without the presence of a pandemic (Karen & Lasater, 2021). Previous research has also shown that public health implications of nurse understaffing for patients with Covid-19 found that countries with higher workforce concentrations of registered nurses had lower Covid mortality rates, which indicates that vigorous nursing staff is vital for covering current and imminent epidemics.

Complete knowledge of a disease can lead to certain changes in attitudes and practices of health care workers and incorrect attitudes and practices have been proved to be directly proportional to the increase in infection (Sushama, Subhash, Ashok, *et al*., 2020). In a research study conducted to evaluate the effectiveness of Covid-19 training of tertiary health care workers, it was found that adequate knowledge about the epidemiology of the disease played a major role in the management of the disease.

In Bangladesh, the healthcare professionals worked around 17 hours per day including long tele-counseling shifts each day as a result of understaffing among the healthcare staff. The number of doctors in Bangladesh government healthcare facilities was scarce (5.26 doctors/10,000 people) and this forced the government to appoint an additional 2,000 doctors in May 2020 (Shaharior, *et al*., 2021). Participants in the study indicated that the health sector faced a shortage of medical workers.

In a study conducted in Iran by Ali, *et al*. (2022) noted that one of the challenges was the restricted financial resources for the personnel's compensation. An Iranian study also showed that the nurses complained of the delay of their services compensation and the little payments they received comparing their huge unbearable tasks. The study further noted that although the healthcare systems all over the world, increasingly face the challenges of shortages in the human resources and the inappropriate distribution of

their skills, applying optimal management along with applied plans for quality improvement of these recourses can lead to improving the competencies as well as increasing the quality of services and decreasing the related challenges.

In the United States, it was noted that it was morally reprehensible during a pandemic for the health care support, service and direct care workers to continue earning extremely low pay. Though lawmakers offered proposals for federally funded hazard pay it was not passed into law. In Canada, however, the Prime Minister announced a $4 billion commitment to increasing pay for essential workers who were risking their health during the pandemic (Kinder, 2020).

In a study conducted in the United States, it was noted that in the presence of high community prevalence of Covid-19, nursing homes with low workforce vaccination coverage had greater figures of cases and mortality compared to those with high workforce vaccination coverage. These discoveries indicate the degree to which workforce vaccination shields nursing home residents, predominantly in societies with high Covid-19 transmission (McGarry, Barnett, Grabowski & Gandhi, 2021).

2.4 Funding and Management of Covid 19 in County Governments

The Covid-19 pandemic created histrionic challenges to government administrations globally. It led to a rapid increase in numbers of deaths and outbreaks, tested the public and private health systems of many nations and brought many national economies to a standstill. It has generated severe political, social and financial challenges in many countries. Due to this, there arose a need to undertake drastic fiscal measures to counter and manage its effects.

In a research study titled "Budgetary responses to a global pandemic: international experiences and lessons for a sustainable future", it was noted that many governments introduced supplemental appropriations and special budgets to offer additional expenditure on public health and social programs and further support for unemployment and companies. Tax respites for individuals, workers, households and businesses, as well as loans and debt respites for companies and some industrial sectors, were provided as a buffer against the antagonistic financial and social effects of the epidemic (Giuseppe & Ho, 2020).

Few studies have appraised the resources required for effective epidemic response. After the Ebola outbreak, the Commission on a Global Health Risk Framework for the Future was set up and it estimated that annually $4·5 billion was needed globally for pandemic preparedness, in contrast with an expected annual loss of more than $60 billion from potential pandemics (Angela E Micah, 2021). An article "Tracking development support for health and Covid-19, estimated that the supplementary cost of responding to the Covid-19 epidemic was between $33 billion and $62 billion.

In a research study titled "Burning the buffer: New Zealand's budgetary response to Covid-19'' the government initiated a $5.1 billion wage subsidy scheme, a $2.8 billion income support package for the most vulnerable and a $2.8 billion package of business tax changes. Such measures were followed by a raft of measures declared by the

Government on 14 May in her wellbeing Budget 2020. As part of the Budget for the year 2020, Government established the Covid-19 Response and Recovery Fund (CRRF) and appropriated $50 billion to support response and recovery efforts. The government also initiated a monetary policy initiative of quantitative easing as a management measure (Ball, 2021)

Ghana announced both financial and fiscal policies including a reduction in the policy rate and extra-budgetary expenses for food relief and other direct communal assistance to individuals, families and small and medium-sized businesses. International financial support buoyed Ghana's monetary and fiscal policy responses to the coronavirus pandemic. For instance, in April, World Bank decided to provide $100 million to boost emergency response in Ghana's coronavirus mitigation struggles. Further, IMF approved the disbursement of approximately $1 billion as a rapid credit facility and direct budget support to Ghana to mitigate the coronavirus crisis (Pathak, 2020).

South Africa had access to up to R35bn in emergency relief from the National Treasury Fund. This fund was to capacitate the sectors dealing with the national response to Covid-19 for the purchase of mobile testing units, establishing testing sites and deployment of community healthcare workers across the country. Additionally, the main budget spending was adjusted downwards by removing funds from projects delayed due to the lockdown, capital and other departmental projects that could be delayed, programs with a history of poor performance and re-directing spending towards Covid-19 responses. Social support and economic relief fund amounting to R500bn was also approved and this package would be partly funded by borrowing from the World Bank and the International Monetary Fund (IMF) (Villiers, 2020).

The Kenyan government created a Covid-19 contingency plan to facilitate preparedness, early detection and response to the pandemic. The cost of implementing the plan was estimated at US$82 million (KES8.7 billion). Of the costed need, 61% was funded by the World Bank (US$50 million). In May 2020, the IMF also ratified the disbursement of US$739 million (KES78.3 billion) to Kenya under the Rapid Credit Facility to support the country to cover her urgent balance of payment needs resulting from the pandemic (Owino, 2022).

County governments took various actions and recommendations geared toward combating the Covid-19 pandemic. These included; the establishment of a task force –the County Emergency Response Committee comprising county officials and the county commissioner tasked with the role of monitoring the risk posed by the rapidly spreading coronavirus and advising the department of health on suitable means of response. Other measures were identification of hot spot areas, social distancing and contact tracing; health education; expansion and enhancement of testing capabilities; isolation and quarantine centres; Covid -19 emergency response fund; training of health care workers by the national government on case definition, triage, sample collection and transportation and preparation of isolation and quarantine facilities; prioritization of

testing in high-risk areas; better public health messaging and better co-ordination between the national and county governments.

2.5 Critical Analysis of Empirical Literature and Research Gap

Figure 2: Conceptual Framework

The empirical studies reviewed collectively provide a snapshot of the early pandemic responses by countries and regions, detail some of the key struggles faced by policymakers, public financial managers and auditors and suggest foreseeable fiscal and governance challenges in the post-Covid-19 era but do not cover the effectiveness of

financial resources earmarked for Covid-19 programs in the counties or regions within the countries.

Given the existing empirical literature mostly covers the response of the governments in the initial stages of the pandemic; there exists, therefore, a knowledge gap specifically on the effectiveness of the strategies deployed by the governments in the management of the Covid-19 pandemic in African countries and specifically by county governments in Kenya.

3. Materials and Methods

Adopting a descriptive survey research design, the study *Targeted public officers working deployed to* county governments in Kenya, counties, therefore, provided a sampling frame for the study. However, the study purposely zeroed on respondents from the health department; the medical practitioners including anesthetists, clinical officers, health care workers, Kenya registered clinical health nurses (KRCHN), medical laboratory technologists, medical officers, student nurses, and public health officer (who also handles administrative/financial matters).

Geographically, this research focused on all the Forty-Seven (47) counties in Kenya. Covid-19 was a pandemic and therefore its effects were felt across all the counties. It was therefore prudent to consider all the counties in this research since each county took the necessary action in the management of the Covid-19 pandemic. 95% confidence level that the response received would be + or –10% of the true state of the management levels of the Covid-19 pandemic by counties was chosen. Yamane's (1967) sampling formula was utilized.

Primary data was collected through questionnaires administered through the Google Forms link (https://docs.google.com/forms/d/e/1FAIpQLSeZ_4Ym925-6z_xrerEvuiY1MaBCbDIZ_Y_sUpaWz07Tff88g/viewform?usp=pp_url) to ease the collection and comply with national Covid-19 protocols.

Descriptive Statistics was utilized in analyzing data with the aid of SPSS. Measures of central tendency indices such as frequency counts, percentages, cross-tabulations and mean rankings were utilized. Findings are presented in tables and figures; graphs were used to present frequency and percentage scores.

3.1 Data Analysis and Presentation

3.1.1 Respondents' Summary of Demographic information

Table 2 above depicts the distribution of representation per county. Nineteen counties participated in the study as shown in Table 1. This indicates is critical in improving the validity of the study findings.

Table 1: County of the respondents

County Name	Frequency	Percent (%)
Baringo	4	4.3
Bungoma	3	3.2
Busia	5	5.4
Nairobi	2	2.2
Kericho	16	17.3
Kiambu	2	2.2
Kitui	16	17.3
Machakos	6	6.5
Meru	5	5.4
Migori	1	1.1
Muranga	3	3.3
Nairobi	4	4.3
Nakuru	4	4.4
Nandi	11	11.9
Nyeri	2	2.2
Siaya	1	1.1
Trans Nzioa	6	6.6
Vihiga	2	2.2
Total	93	100.0

Source: Field Survey, April 2022.

The healthcare workers who participated in this study included nurses KRCHN who were the majority comprising 38.2% of the respondents, clinical officers (27.4%), medical lab technologists (9.9%), public health officers (8.8%), medical officers (6.6%), student nurses (5.5%) and anesthetists (4.4%). This indicates that all health workers were well represented in the study.

Table 2: Designation of the respondents

Respondent Specialty/cadre	Frequency	Percent (%)
Anesthetists	4	4.4
Clinical officer	25	27.4
Health care worker	1	1.1
KRCHN	32	38.2
Medical laboratory technologist	9	9.9
Medical officer	6	6.6
PHO	8	8.8
Student nurse	5	5.5
Total	**93**	**100.0**

Source: Field Survey, April 2022.

The majority (49.5%) of the respondents had worked in the facility below 10 years, 25.8% indicated that they had worked for between 11-20 years, 23.7% said that they had worked for over 21 years while 1.1% said they had worked for a period between 10-20 years. This shows that the respondents have experience in the area of study and are therefore reliable

to give information relating to the objectives of the study as they are knowledgeable in the field. The study revealed that over half of the respondents (69.9%) were at the middle level of management, 21.5% were at the low level of management and 8.6% were at the top level of management. All levels of management were well represented in this study.

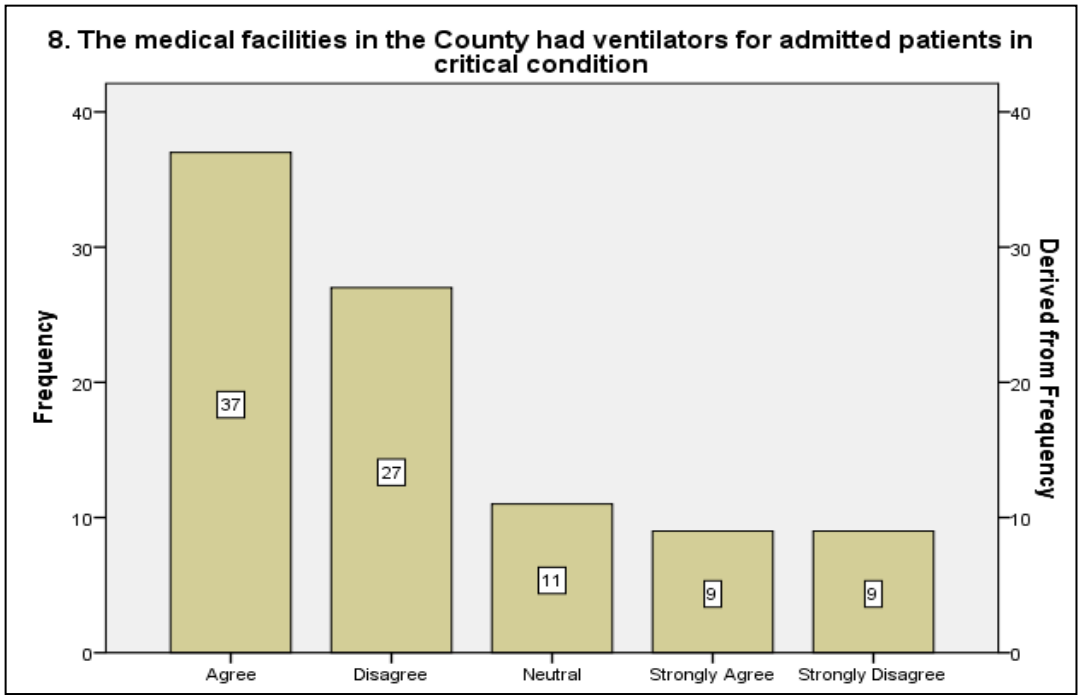
4.2 Medical Equipment and Supplies and Management of Covid-19

One of the objectives of the study sought to establish the extent to which medical equipment and supplies influenced the management of Covid-19 in the counties. To establish this, questions on personal protective equipment, oxygen supplies, ventilators, intensive care units/beds, quarantine & isolation units, testing kits/reagents, bed capacity, ambulances and masks & sanitizers were posed to the respondents.

When asked whether Personal Protective Equipment (PPE) i.e. gowns, goggles, masks, and face shields (complete or semi-complete set) were provided to medical personnel to protect them from Covid-19 infections in the medical facilities in the County. The majority of the respondents (60.2%) agreed that PPEs were provided to the medical officers, 19.4% strongly agreed, 9.7% were neutral, 6.5% disagreed and 4.3% strongly disagreed. The findings indicate that PPEs were actually provided to the medical officers.

On whether there was the availability of oxygen (either piped or not piped) in the medical facilities to support patients in critical condition in the County, slightly over a half of the respondents (54.8%) agreed that oxygen was available in the health facilities, 19.4% were neutral, 15.1% strongly agreed, 6.5% disagreed while 4.3% strongly disagreed with the statement.

Figure 3: Ventilators for admitted patients in critical condition were available in medical facilities



Source: Field Survey, April 2022.

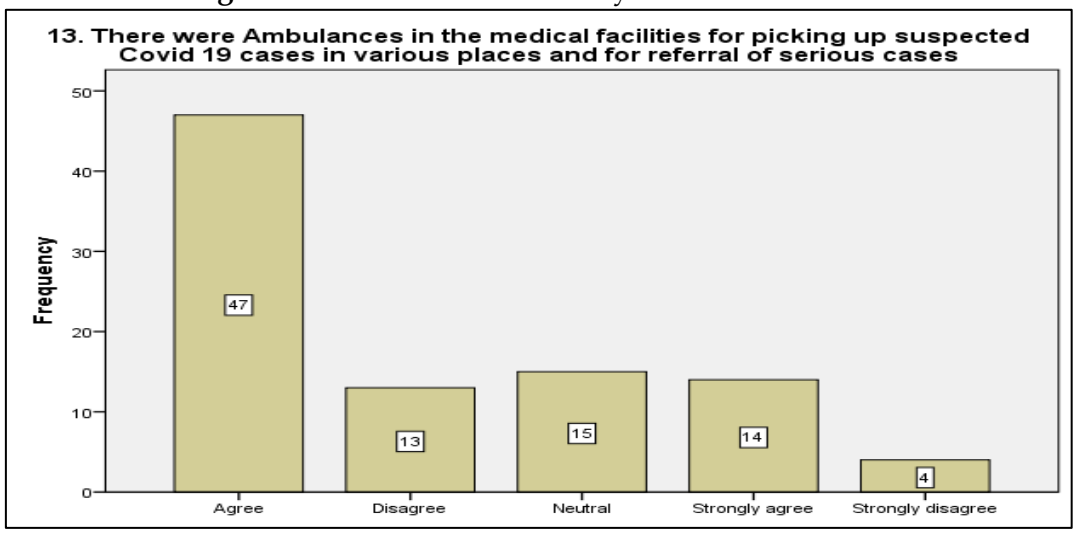
On whether the medical facilities in the county had ventilators for admitted patients in critical condition, 37 out of 93 respondents agreed that the medical facilities in the county had ventilators for admitted patients, 27 respondents disagreed, 11 were neutral, 9 strongly agreed while another 9 strongly disagreed. The findings are shown in Figure 3.

On whether there were ICU Units/Beds to facilitate admission of critical Covid-19 cases at medical facilities in the county, 48.4% of the respondents agreed that there were ICU beds in the facility, 15.1% strongly disagreed, 14% were neutral, 11.8% disagreed while 10.8% strongly agreed. While on if the county provided quarantine units for suspected cases of Covid-19 before testing as well as isolation facilities for confirmed cases to prevent transmission, 60.2% of the respondents agreed, 28% strongly agreed while 6.5% and 3.2% disagreed and strongly disagreed respectively.

On whether the medical facilities had testing kits/reagents, over half of the respondents (52.7%) agreed that medical facilities had testing kits/reagents, 26.9% strongly agreed, 11.8% disagreed, 4.3% were neutral while 4.3% strongly disagreed with the statement. On if the medical facilities had bed capacity to cope with the surge of confirmed Covid-19 cases in the county, over a quarter of the respondents (32.3%) agreed that the medical facilities had bed capacity to cope with the surge of confirmed Covid-19 cases in the county, 28% disagreed, 17.2% were neutral, 14% strongly agreed while 8.6% strongly disagreed.

Ambulances were critical for evacuated on the infected persons. On if there were Ambulances in the medical facilities for picking up suspected Covid 19 cases in various places and for referral of serious cases, out of 93 respondents, 47 who are over 50% agreed that ambulances for picking up suspected Covid-19 cases were available in the medical facilities, 15 were neutral, 14 strongly agreed, 13 disagreed while 4 strongly disagreed. Results are indicated in Figure 4.

Figure 4: Ambulances availability in medical facilities



Source: Field Survey, April 2022

Face masks were one single PPE that was necessary for both medical and ordinary citizens. On whether the county Government provided masks and sanitizers for the medical personnel and the general public to prevent and contain the spread of Covid-19, Almost a half of the respondents (45.2%) agreed that the county government provided masks and sanitizers for the medical personnel to prevent and contain the spread of Covid-19, 29.4% were neutral, 19.4% strongly agreed, 9.7% disagreed while 5.4% strongly disagreed. Results are shown in Table 3.

Table 3: Provision of masks and sanitizers to medical personnel

		Frequency	Percent
Valid	Agree	42	45.2
	Disagree	9	9.7
	Neutral	19	20.4
	Strongly Agree	18	19.4
	Strongly Disagree	5	5.4
	Total	93	100.0

Source: Field Survey, April 2022.

To augment the treatment efforts, a consistent supply of medical supplies was critical, when asked whether medical supplies and equipment were critical in the management of the Covid-19 pandemic in county governments, 44.1% of the respondents agreed that medical supplies and equipment were critical in the management of Covid-19 pandemic in county governments, 35.5% strongly agreed, 11.8% were neutral, 6.5% strongly disagreed while 2.2% disagreed. Results are shown in Table 4.

Table 4: Centrality of Medical Equipment and Supplies in management of Covid-19 pandemic

		Frequency	Percent
Valid	Agree	41	44.1
	Disagree	2	2.2
	Neutral	11	11.8
	Strongly agree	33	35.5
	Strongly disagree	6	6.5
	Total	93	100.0

Source: Field Survey, April 2022.

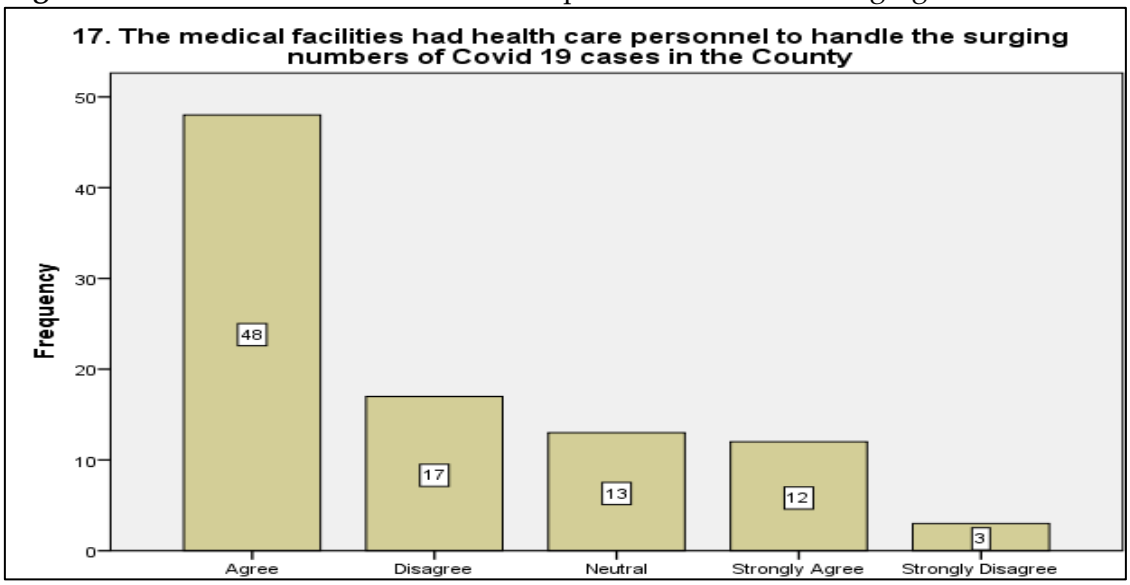
4.3 Personnel Resources and Management of Covid-19

Personnel was hypothetically the greatest resource in the fight against the Covid-19 scourge. Respondents were asked to rank the extent to which personnel resources influenced the management of the Covid-19 pandemic in the county governments using the Likert scale. The responses were as discussed below.

On whether the medical personnel were trained on how to handle suspected as well as confirmed Covid-19 cases in the county, over a half of the respondents (61.3%) agreed that the medical personnel were trained on how to handle suspected as well as confirmed Covid-19 cases in the county, 25.8% strongly agreed, 5.4% were neutral,

another 5.4% disagreed while 2.2% strongly disagreed. Further, on if the medical facilities had healthcare personnel to handle the surging numbers of Covid-19 cases in the county, out of the 93 respondents, 48 agreed that the medical facilities had healthcare personnel to handle the surging numbers of Covid-19 cases in the county, 17 disagreed, 13 were neutral, 12 strongly agreed while 3 strongly disagreed. Results are shown in Figure 5.

Figure 5: Medical facilities had health care personnel to handle surging Covid 19 cases

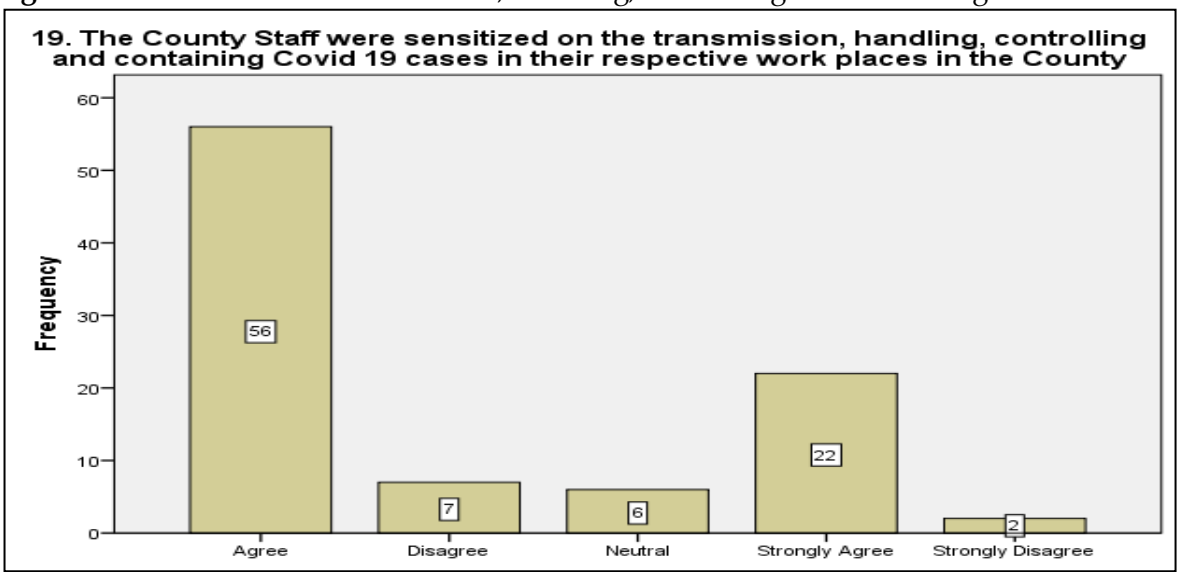


Source: Field Survey, April 2022.

There was a need to either motivate or compensate further the medical personnel handling the treatment of the infected, on whether the county government provided Covid-19 remunerative allowances to medical personnel who were handling Covid-19 cases in the county, over a quarter of the respondents (29%) disagreed that the county government provided Covid-19 remunerative allowances to medical personnel who were handling Covid-19 cases in the county, 23.7% were neutral, another 23.7% strongly disagreed, 20.4% agreed while 3.2% strongly agreed. This generally infers that medical staff's additional allowances are perceived to have lacked or are too inadequate to compensate medical staff.

However, on if the county staff was sensitized on the transmission, handling, controlling and containing Covid-19 cases in their respective workplaces in the county, out of 93 respondents, 56 agreed that the county staff was sensitized on the transmission, control and containing Covid-19 cases in their respective workplaces in the county, 22 strongly agreed, 7 disagreed, 6 were neutral while 2 strongly disagreed. Results are shown in Figure 6.

Figure 6: Sensitization on transmission, handling, controlling and containing covid-19 cases



Source: Field Survey, April 2022.

To protect frontline staff, there was the need to prioritize medical staff on vaccination, on whether the county government prioritized Covid-19 vaccines for healthcare workers to lower the risk of infection and spreading of the virus in the county, Slightly over a half (50.5%) of the respondents agreed that the county government prioritized Covid-19 vaccines for healthcare workers to lower the risk of infection and spreading of the virus in the county, 43% strongly agreed, 3.2% were neutral, 2.2% strongly disagreed while 1.1% disagreed. Further, on if the county government enforced the Ministry of Health protocols and guidelines on containment of Covid-19 cases, over a half (55.9%) of the respondents agreed that the county government enforced the Ministry of health protocols and guidelines on containment of Covid-19 cases, 25.8% strongly agreed, 12.9% were neutral, 4.3% disagreed while 1.1% strongly disagreed.

Psycho-social support was necessary for medical personnel due to intense fear and resultant possible trauma that the treatment of contracting Covid-19 and the possibility of resultant deaths or resultant deaths of some medical staff. On if the county government provided psycho-social support to medical health personnel who handled Covid-19 cases in the county, slightly over a third (33.3%) of the respondents disagreed that the county government provided psycho-social support to medical health personnel who handled Covid-19 cases in the county, 25.8% agreed, 19.4% were neutral, 14% strongly disagreed while 7.5% strongly agreed. This may have been important because lacking support that was highly necessary.

Overall, respondents indicated the centrality of personnel, almost a half (48.4%) of the respondents agreed that personnel were critical in the management of the Covid-19 pandemic in county governments, 36.6% strongly agreed, 8.6% were neutral, 4.3% disagreed while 2.2% strongly disagreed. The results are indicated in Table 5.

Table 5: Personnel resources were critical in the management of Covid-19 pandemic

		Frequency	Percent
Valid	Agree	45	48.4
	Disagree	4	4.3
	Neutral	8	8.6
	Strongly Agree	34	36.6
	Strongly Disagree	2	2.2
	Total	**93**	**100.0**

Source: Field Survey, April 2022.

4.5 Funding and Management of Covid-19 Pandemic

Financial resources were hypothetically considered another critical arm in the fight against Covid-19. Respondents were provided with several issues concerning funding and were requested to give their opinion on how they felt that those issues influenced the management of the Covid-19 pandemic in the county governments. On whether county governments reallocated funds through supplementary budgets to finance Covid-19 response programs, 35.5% of the respondents were neutral on the statement that county governments reallocated funds through supplementary budgets to finance Covid-19 response programs, 31.2% agreed with the statement, 15.1% strongly agreed, 11.8% disagreed while 6.5% strongly disagreed.

On whether the county governments mobilized financial resources from various stakeholders/development partners to support Covid-19 response programs, 37.6% of the respondents were neutral, 29% agreed with the statement, 16.1% strongly agreed, and 11.8% disagreed while 5.4% strongly disagreed. Further, on if financial resources earmarked for Covid-19 programs were effectively utilized by county governments in the management of Covid-19 programs, interestingly, 39.8% of the respondents were neutral on the statement that financial resources earmarked from Covid-19 programs were effectively utilized by county governments in the management of Covid-19 programs, 30.1% disagreed, 14% strongly disagreed, 14% agreed while 2.2% strongly agreed. However, there was consensus on the centrality of finance in the management of Covid-19; indeed, 43% of the respondents agreed that funding the Covid-19 response programs was critical in handling the pandemic, 30.1% strongly agreed, 14% were neutral, 7.5% disagreed while 5.4% strongly disagreed. Results are shown in Table 6.

Table 6: Funding Covid-19 response programs were critical in handling the pandemic

		Frequency	Percent
Valid	Agree	40	43.0
	Disagree	7	7.5
	Neutral	13	14.0
	Strongly agree	28	30.1
	Strongly disagree	5	5.4
	Total	**93**	**100.0**

Source: Field Survey, April 2022.

Since the pandemic hit the country when the budget has already been passed, there was the need for appropriation probably through reprioritization of the budgetary allocations, on whether reprioritizing expenditures was crucial for counties to manage Covid-19 crisis support, a majority (45.2%) of the respondents agreed that reprioritizing expenditures was crucial for counties to manage Covid-19 crisis support, 28% strongly agreed, 19.4% were neutral, 6.5% disagreed while 1.1% strongly disagreed. Further, on enacting temporary decrees or orders by executive authorities or the government was a very useful way of ensuring continued funding in counties where existing budget flexibilities were limited, a majority (40.9%) of the respondents agreed that enacting temporary decrees or orders by executive authorities or government was a very useful way of ensuring continued funding in counties where existing budget flexibilities were limited, 31.2% were neutral with the statement, 18.3% strongly agreed, 7.5% disagreed while 2.2% strongly disagreed.

Besides budget and appropriations, immediate release of funds was so necessary owing to the rapid spread of the virus, on whether, county governments provided immediate funds critical to addressing the Covid-19 crisis to frontline services using budgetary frameworks that were already in place for crisis spending, a majority (30.1%) of the respondents agreed that county governments provided immediate funds critical to address Covid-19 crisis to frontline services using budgetary frameworks that were already in place for crisis spending, 29% disagreed, 25.8% were neutral, 10.8% strongly disagreed while 4.3% strongly agreed.

Overall, respondents were in consensus (74.2%) on the importance of funding in the management of Covid-19. The study established that the majority (37.6%) of the respondents strongly agreed that funding was critical in the management of the Covid-19 pandemic in county governments, 36.6% agreed, 17.2% were neutral, 6.5% disagreed while 2.2% strongly disagreed.

5. Summary of Findings, Conclusions and Recommendations

5.1 Summary of the Findings

Cumulatively, 53.8% of the respondents disagreed that medical facilities had an adequate bed capacity to cope with the surge of confirmed Covid-19 cases in the county. From the analysis, it can be seen that 44.1% of the respondents agreed that medical supplies and equipment were critical in the management of the Covid-19 pandemic in county governments while 35.5% strongly agreed. In summary, 79.6% of the respondents agreed that medical equipment and supplies greatly influenced the management of the Covid-19 pandemic in the county governments.

5.2 Personnel Resources and Management of Covid-19 Pandemic

Cumulatively, 52.7% of the respondents disagreed that the county government provided Covid-19 remunerative allowances to medical personnel who were handling Covid-19 cases in the county. Almost a half (48.4%) of the respondents agreed that personnel was

critical in the management of the Covid-19 pandemic in county governments while 36.6% strongly agreed. In summary, 85% of the respondents were convinced that personnel resources played a critical role in the management of the Covid-19 pandemic among the counties.

5.3 Funding and Management of Covid-19 Pandemic

39.8% of the respondents disagreed that county governments reallocated funds through supplementary budgets using the existing legal framework to finance Covid-19 response programs. A majority (37.6%) of the respondents strongly agreed that funding was critical in the management of the Covid-19 pandemic in county governments while 36.6% agreed. This, therefore, means that 74.2% of the respondents believed that funding greatly influenced the management of the Covid-19 pandemic in county governments.

5.4 Conclusion

Management of Covid-19 was important in the containment of the spread of the virus and in saving lives. From this study, it can be concluded that the majority of the respondents believed that personnel resources were the main factor that influenced the management of Covid-19 among counties with 85%. This was followed by medical equipment and supplies at 79.6% and lastly, funding at 74.2%.

5.5 Recommendations

1) The County Executive Committee member in charge of health services, the hospital board of management and the medical superintendents of the hospitals should carry out an audit of the bed capacity of all medical facilities and prepare a procurement plan for the acquisition of additional beds based on a need basis.
2) The county governments should make proposals on medical staff remunerations allowances on Covid 19 and carry out deliberate negotiations with the Salaries and Remuneration Commission to incorporate them under the existing allowances.
3) County assemblies should ensure that all the legislations on the expenditure of emergency funds as stipulated by the Public Finance Management Act are enacted.

Conflict of Interest Statement

The authors declare no conflicts of interest.

About the Authors

Authors are Public Officers serving in Government Ministries, County Governments, Government departments and State Agencies in Kenya, holding a minimum of a University Degree in various disciplines who undertook Senior Management Course No. SMC/156/2022, KSG Baringo, Kenya during the study with research interests in various areas in Public Administration including but not limited to public policy, human resource management, supply chain management, public finance and strategic management.

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