DIFFERENT FORMS OF GOVERNMENT REGIMES AND COVID-19 OUTCOMES IN AFRICA

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Abstract

This study examines extent to which the government regime types contributed to explaining the low COVID 19 mortality and infection cases in Africa. The study analyses panel data from 54 countries in Africa across a 2-year period from January 2020 to December 2021. The following factors of demography, GDP per Capital, health expenditure, and government effectiveness were included as control variables in the models. The results of the panel regression analysis indicated that while authoritarian and partially democratic regimes were positively associated with a surge in COVID-19 cases and fatalities compared to fully democratic countries in Africa, the association lacked statistical significance. In contrast, government effectiveness and health expenditure were observed to be negatively associated with reduced COVID 19 mortality and infection rates at the 5 percent significance level. Hence, this result emphasized the role of good governance and increased health spending in managing the pandemic's mortality and infection rates across the different types of government regimes in Africa.

Declaration

I declare that this report is my own unaided work. It is submitted in partial fulfilment of the requirements of the degree of Master of Management (in the field of Governance and Management)) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination any other university.

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Ulemu Vanessa Masiya

28 October 2024

Dedication

To my late Father: Andrew Wilson George Segula

To my Beloved mother: Amy Nyamanda Segula

To my Husband Michael, and Children: Elena, and Ephraim. May you always know that you can achieve anything you put your mind to.

Acknowledgments

I am grateful to my supervisor Prof. Adebayo Olukoshi for his guidance throughout the research process. Mr. Michael Masiya for his assistance with the statistical analysis of the data and editing of the manuscript. Without their assistance, this study would not have been possible.

I am also indebted to my husband for both moral and financial support.

Finally, but most importantly, I thank the Lord my God, who has always carried me through everything. Only His grace makes me pull through. Thank you, Lord!

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List of abbreviations and Acronyms

Africa CDC:	Africa Center for Disease Control and Prevention
ACLP:	Alvarez-Cheibub-Limongi-Przeworski measure of Democracy and Dictatorship
AFRCOR:	African Taskforce for Coronavirus
AU:	African Union
AUTOC:	Autocracy
CFR:	Coronavirus Case Fatality Rates
COVID 19:	Coronavirus disease
DRC:	Democractic Republic of Congo
DEMOC:	Democracy
EM-DAT:	Emergency Events Database
EIU	Economic Intelligence Unit
GDP:	Gross Domestic Product
HIV/AIDS:	Human immunodeficiency virus; Acquired immunodeficiency syndrome
IFR:	Coronavirus Infection Fatality Rates
NGO:	Non Governmental Organizations
OECD:	The Organization for Economic Cooperation and Development
RCCE:	Risk Communication and Community Engagement
UNAIDS:	Joint United Nations Programme on HIV/AIDS
UNDP:	United Nations Development Programme (UNDP)

UNICEF:	United Nations International Children's Emergency Fund
V-DEM:	Varieties of Democracy Institute
WFP:	World Food Programme
WDI:	World Development Indicators
WHO:	World Health Organization

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CHAPTER ONE

INTRODUCTION

1.0 Background

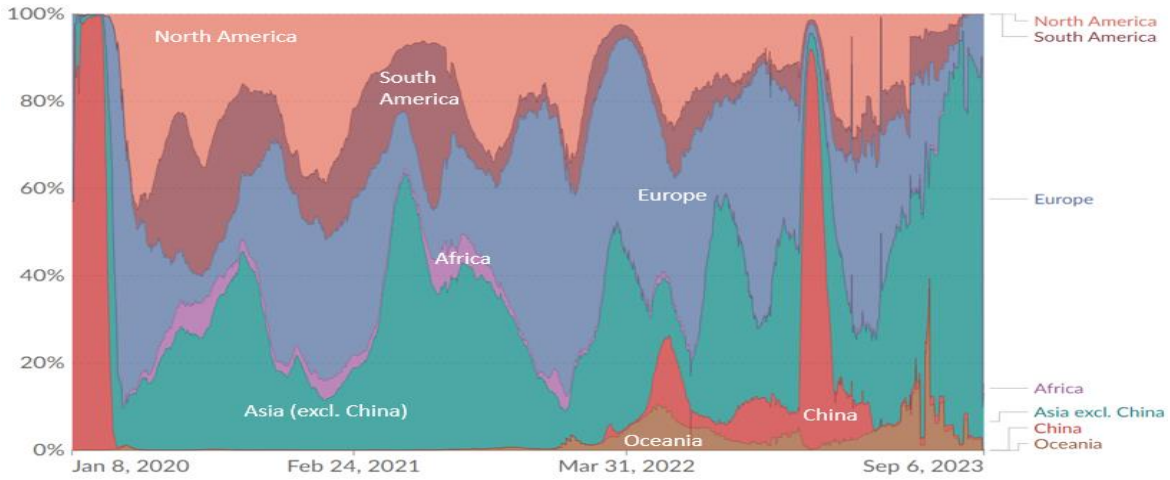
The emergence of coronavirus disease 2019 (COVID-19) had resulted in a worldwide public health and economic emergency, with divergent impacts experienced among countries. The World Health Organization (WHO) declared COVID-19 a pandemic in March 2020, registering over 757.9 million confirmed infections and 6.6 million deaths globally by December 2022. In the absence of a COVID-19 vaccine in 2020 and early 2021, non-pharmaceutical interventions, such as handwashing, wearing face coverings, and staying at home, were used to reduce infection rates. However, the rapid global spread of COVID-19 had necessitated unprecedented and large-scale containment efforts such as lockdowns (World Health Organization, 2020).

While the impact and role of scientific research in developing drugs and treatments aiding the containment of the COVID-19 pandemic are well documented, there is a growing debate on how political factors have influenced responses to the COVID-19 pandemic (Bunyavejchewin & Sirichuanjun, 2021). Piazza and Stronko (2020) highlight that a country's ability to respond effectively to a pandemic depends on various factors, including its existing political regime and governance quality, when implementing policies aimed at containing the spread of the COVID-19 pandemic.

Previous research supports the notion that democracies outperform authoritarian regimes in public health delivery by being more accountable and efficient in communication (Alon et al. 2020; Bunyavejchewin and Sirichuanjun 2021; Cukierman 2021; Guasti 2020; Karabulut et al. 2021). Scholars such as Piazza and Stronko (2020), however, have argued that authoritarian regimes implement strict public health policies faster than democracies and are more effective in containing the spread of pandemics), while others have found no correlation between political regimes and COVID-19 outcomes (Bosancianu et al., 2020; Cassan & Van Steenvoort, 2021).

Nonetheless, the debate on the effect of regime types and COVID 19 outcomes is characterized by two significant gaps. First, prior research was conducted when the pandemic's mortality and infection count in the early years of 2020 and 2021 was ongoing and escalating and before the establishment of confirmed and standardized data. Most econometric models developed by scholars in earlier research aimed at projecting how political and social factors may correlate with COVID-19 infection and mortality rates, rather than systematically evaluating the impact of various social and political factors on the pandemic (McMann & Tisch, 2021) . Second, the scope of most studies undertaken did pay attention to the African context, with most research done on a sample of European and western countries or based on a global context. Despite forecasts that Africa, with its weak healthcare infrastructure and poor clinical and socioeconomic conditions, would see a high prevalence of COVID 19 infections, the continent had lower impact than other continents (Bouba et al., 2021). Africa's COVID-19 infection rates contributed 1.4 percent of the global confirmed cases as of the end of December 2022 with only 9.5 million confirmed infection cases (WHO Coronavirus (COVID-19) Dashboard, 2023). This signifies the paradox of Africa's experience and calls for an inquiry if at all political factors also influenced the COVID 19 outcomes while acknowledging African countries gradual state of democratization, which encompasses a blend of autocratic and democratic regimes, with periodic civil unrest, and ineffective political institutions (Durotoye, 2018).

Figure 1: Daily confirmed COVID-19 cases by world region



Source: OurWorldInData.org (2023) using data from World Health Organization (WHO) COVID-19 Dashboard.

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Hence, amidst ongoing global discussions regarding the impact of a country's regime on COVID-19 outcomes, this study explored and analyzed panel data for 54 countries in Africa to determine the association between government regimes on COVID-19 mortality and infection outcomes. Additionally, the study referred to existing literature for other possible influences on COVID 19 outcomes and extended the objectives to also examine the extent of the influence of socio-economic and demographic factors, on the severity of the pandemic in Africa. The study included in the panel regression, demography, GDP per Capital, health expenditure, and government effectiveness as control variables. The results of the study are essential to assist in repositioning implementation of Africa's Agenda 2063 policy framework to simultaneously identify key drivers of COVID 19 mortality and infection rates and prepare better for other pandemics that may occur in future while guaranteeing more targeted reforms.

1.1 Problem Statement

Existing scholarly discussions have primarily focused on the comparison between democracies and authoritarian regimes and how these different type of government regimes have influenced the number of fatalities and cases of COVID 19 pandemic. Some scholars posit that authoritarian governments were more effective in reducing mortality and infection rates as such governments adopt more stringent measures as necessary (Cepaluni et al., 2020; Piazza & Stronko, 2020), whereas others contend that democratic governance structures demonstrate greater efficacy in managing fatalities and infection rates based on the attributes of higher institutional capacity for effective governance, greater accountability, transparency, and responsiveness to public opinion (Alon et al., 2020; Cukierman, 2021; Guasti, 2020; Karabulut et al., 2021). There is a notable gap within existing literature, that while comparison of different political regimes was made across countries globally, no studies were made within the specific scope of African countries. The relatively low severity of COVID-19 in Africa, despite challenges such as weak healthcare systems, inadequate surveillance and laboratory capacity, a scarcity of public health human resources, and limited financial resources as noted by Nkengasong and Mankoula (2020) raises important questions about whether the type of government regime or other prominent factors are associated with COVID-19 mortality and infection rates in African countries.

Secondly, whilst existing literature would rely on preliminary COVID mortality and infection statistics in the first year of the pandemic to make conclusions on association between variables,

the count of mortality and infections was still ongoing and excluded excess mortality rates and infections that were confirmed in the second year of the pandemic. As such, early studies may have ignored the lagged effect of mortality and infection rates that carried through in the latter years. This study tries to address this gap by use of panel regression covering a two-year period of the pandemic to broaden the scope of earlier studies that used confirmed reported cases.

Overall, the study meets the need of inquiry to understand the extent to which African states characterized by different regime type interplayed with various other factors of public health capacity, government effectiveness, and socioeconomic and demographic factors impacted COVID-19 pandemic mortality and infection rate outcomes on a continental scale.

1.2 Research Purpose and Research Questions

This research examined the relationship between different forms of government regimes within the scope of the African continent and how government regimes were associated with COVID-19 outcomes (mortality and infection rates) and identified what other factors contributed to level of fatalities and cases. The study aimed to address the following research question:

1. What factors contributed to the effectiveness of a country's response to COVID-19 outcomes (mortality and infection rates) based on the country's government regime?
2. To what extent did government regimes affect the ability to respond to a pandemic, as measured by COVID-19 mortality and infection rates?
3. What can policymakers learn from the relationship between governance regimes and COVID-19 mortality and infection rates to devise effective future pandemic response strategies?

1.3 Significance of the study

This study contributes to the current body of knowledge and ongoing discourse on the impact of political regimes on COVID-19 outcomes and pandemic responses in three significant ways.

First, it avoids oversimplified categorizations by acknowledging Africa's unique blend of governance systems. It explores not just democracies and autocracies but also 'partial democratic' states. This three-tier approach allows for a deeper exploration of how different governance systems affect COVID-19 mortality and infection rates. These distinctions enable tailored

interventions to be designed to address the specific needs of each state, thereby enhancing future crisis responses.

Second, unlike existing studies, this research focuses its investigation within Africa. It examines how political regimes affect broad health outcomes related to COVID-19, shedding light on the strengths and weaknesses of regime structures in facing the pandemic. This understanding reinforces the importance of inclusive and transformational democratic regimes, as envisioned by Africa Agenda 2063. It also suggests that all other things being equal, democratic states in Africa are better positioned to manage the spread and impact of the COVID-19 pandemic.

Third, this study delves into other key factors that influence COVID-19 mortality and infection rates in Africa. Despite initial predictions of severe impact due to weak healthcare infrastructure and challenging socioeconomic conditions, the continent reported relatively lower COVID-19 impacts. These factors provide additional insights that are crucial for shaping health policies, socioeconomic interventions, and resource allocations for future crises.

1.4 Outline of Dissertation

The study comprises five chapters that are laid out as follows:

1.4.1 Chapter 1: Introduction to the study

This chapter introduces the background, motivation, problem, and relevance of the study, providing a solid foundation for the research objectives discussed in the chapter.

1.4.2 Chapter 2: Political Capacity and Pandemic Response in Africa: Governance Dynamics and Socioeconomic context

This chapter is based on the rationale that to appreciate the underlying factors surrounding the hypothesized relationship between political factors, pandemic responses and COVID -19 mortality and infection rates, one needs to understand the broader governance and political landscape of African states and socioeconomic and demographic indicators such as poverty rates, education levels, urbanization, and their impact on public health and pandemic responses. This chapter provides insights on government responses to the occurrence of previous epidemics and pandemics, such as HIV/AIDS and Malaria, and the lessons learned from those experiences.

Finally, the chapter provides a synopsis of the trend and global impact of COVID 19 on Africa in comparison to other regions.

1.4.3 Chapter 3: Literature Review

This chapter discusses both the theoretical and empirical literature on political regimes, democracy, and the perceived tangible benefits of democracy. This section discusses the debate on the appropriate classification used to measure political regimes, outlining the merits and demerits of dichotomies, and continuous measures of democracy. This chapter discusses the scale of the influence of democracies and autocracies on COVID-19 mortality and infection rates, drawing from the empirical studies conducted by various scholars.

1.4.4 Chapter 4: Research methodology

This chapter discusses the research approach that examines the relationship between regime types and COVID-19 mortality and infection rates using linear regression analysis. The chapter describes the data sources and explores the validity and reliability of the approach and research methods taken.

1.4.5 Chapter 5: Analysis, Findings and Discussion

Chapter 5 establishes relationships between factors through correlation analysis. It provides a concise discussion of the results and provides a well-documented summary of the linkages between the hypothesis, expected findings, and justification of the decision on the null hypothesis.

1.4.6 Chapter 6: Conclusion and policy recommendations

Chapter 6 not only consolidates the study's outcomes, but also derives broader conclusions and offers policy recommendations that supplement the existing policies pursued by African states under Agenda 2063. Furthermore, this chapter examines how these institutional characteristics may be associated with decreased death and infection rates during a pandemic. By linking these attributes to better pandemic responses, recommendations seek to reinforce the significance of effective governance in public health crises and identify areas for future research.

CHAPTER TWO

POLITICAL REGIMES AND PANDEMIC RESPONSE IN AFRICA: GOVERNANCE DYNAMICS AND SOCIOECONOMIC CONTEXT

2.0 Introduction

This chapter begins with a historical overview of the state of democracy and socio-economic growth in African states since the post-independence era from the 1980s. It then presents an overview of the state of democracy during the COVID-19 years of 2020 and 2021. The outline of the chapter is as follows: Section 2.1 gives an overview of the state of democracy in post-independence era from the 1980, also term as "third wave of democratization" until the COVID-19 years of 2020 and 2021. Section 2.2 presents a country-by-country analysis country-by-country analysis of the economic and demographic growth trends in African countries during the immediate pre-COVID-19 period and the COVID-19 years of 2020-2021, based on observed trends and how they may have influenced pandemic preparedness and response. Finally, Section 2.3 gives an outline of the African countries previously prone to pandemics, epidemics, and lessons learned from such experiences regarding government effectiveness and health outcomes.

2.1 State of Democracy in Africa

2.1.1 Period between 1980-2019

Olukoshi (1998) in his book titled, "The Politics of Opposition in Contemporary Africa," provides a historical yet so modern description of the state of democratization in Africa, beginning with recognition that in the post-colonial period, Africa had undergone a wave of political liberalization in the 1980's and early 1990's characterized by shifts from one party, military led towards multiparty political regime. The timing of political liberation in Africa, as depicted by Olukoshi (1998), synchronized with the global shift in the late 1990s on how countries across the world changed the form of governance from authoritarian systems towards a system where people can freely choose and change their leaders through fair elections. The global shift termed as the third wave of democratization by Huntington (1993) signified the most transformative era of

democracy, starting its evolution pace in Western countries to becoming the most prevalent form of government regime worldwide, and the peak of this democratic expansion was in 2006, with 121 democracies, constituting nearly 63 percent of all countries globally being democratic (Diamond, 2011).

The path to democracy in Africa over the past three decades has been challenging. Olukoshi (1998) theorizes that the major stumbling block to full democratization in African countries is the absence of prerequisites, such as strong contestation or opposition. Several African nations have encountered various vulnerabilities, including elitism, internal divides, ethnocentrism, and purposeful impediments imposed by ruling parties that hinder the development of political opposition and disputes. Consequently, the absence of unified political opposition and a credible alternative to unpopular leaders made it difficult for people to envision a viable replacement, making true electoral democracy seem distant.

Lynch and Crawford (2011) provide an optimistic assessment of the progress of democratization in Africa, noting that overall, there has been more progress than setbacks, and in general, many countries in sub-Saharan Africa are more democratic today than in the late 1980s. Lynch and Crawford (2011) exemplify seven notable achievements amidst setbacks between 1990 and 2010. They note that while military involvement in politics is becoming more unacceptable, it is still happening. Although there were regular elections and sporadic leadership changes, there was a discernible shift from pure democracy toward mixed government systems. Progress in democratic institutions was apparent, but there was still much power concentrated in the hands of presidents and corruption was widespread. Political parties became more organized, but there was a lot of voting along ethnic lines, and exclusionary politics based on identity were rising. Civil societies grew, but at the local level, there was still a lot of violence and insecurity. Despite newfound freedoms and economic growth, governmental control persists, and development remains uneven. Additionally, Lynch and Crawford (2011) highlight the complexities of international supporters of democracy whose conflicting interests would yield unforeseen consequences in their pursuit of advocacy.

Nwosu (2012) argues that the success of democratic transitions in Africa is often hampered by the lack of institutionalization of democratic norms and values, weak state capacity, and the prevalence of neopatrimonialism, thus rendering institutional theories of democracy as having

limited explanatory power for African countries. Instead, Nwosu (2012) suggested a more nuanced understanding of African political systems and the specific challenges in developing effective strategies for democratic consolidation. Durotoye (2018) expresses similar sentiments as Nsowu (2012) and reflects that even though Africa has made progress towards democratic rule, with the introduction of multiparty elections, term limits, and subordination of the military to civilian rule, the assessment of political development in Africa since the 1990s suggests that the progress of democracy has been inconsistent. Some states have achieved "full democracy," while others have "flawed democracy," "hybrid regimes," or even "authoritarian regimes". These classifications of democracies are expounded in literature review under section 3.5.

According to the Economic Commission for Africa annual report (2009), many African countries face obstacles to democratization due to factors such as an authoritarian hangover, where African leaders lack the moral courage to uphold democratic principles. The absence of fundamental requirements, including widespread industrialization, extensive education, and a substantial middle class, can hinder the advancement of democracy. Without these basic conditions in place, it can be difficult for democratic processes and values to take root and thrive in society. Additionally, as later hinted by Lynch and Crawford (2011), African governments are caught in a difficult position where they must balance the expectations and demands of international financial institutions, such as the World Bank and IMF, with the need to maintain political stability and their survival in power. This situation often results in incomplete or partial reforms and slows down progress toward more democratic governance. These challenges hinder the development and stability of democracy (Economic Commission for Africa, 2009).

The progressive nature of the state of democracy in Africa and thriving to full democratization is echoed in African Union Commission's vision of future Africa. One of the aspirations is that by the year 2063, Africa should be a continent with well-established democratic values, culture, practices, universal principles of human rights, gender equality, justice, and the rule of law, with competent institutions and transformational leadership at all levels (African Union Commission, 2015). The agenda usually asserts that member countries of the African union should strive towards transformative leadership, where government institutions at all levels are developmental, democratic, and accountable (Vedaste & Hannah, 2018).

Thus, based on literature review synopsis of state of democracy and borrowing from Durotoye (2018) 's view of political development, this study is inclined to view the state of political regime in Africa as measured on a continuum and heeding on the advice that context matters in choosing research measurement tool for democracy (Collier & Adcock, 1999). Hence, this study adopted the state of regime classification that recognizes the progressive nature of democracy in Africa.

2.1.2 Period between 2020-2021

With the unprecedented eruption of the COVID -19 pandemic in early 2020 and the prolonged effect through to the year 2021 where lockdown measures were still effective, Repucci and Slipowitz (2021) released a Freedom in the World report that reported a decrease in worldwide freedom and democracy because of the deadly pandemic, economic and physical instability, and violent strife. By the end of 2020, countries that were already struggling with democracy or were ruled by authoritarian governments were responsible for most of the world's decrease in freedom. Government regimes repeatedly resorted to excessive monitoring, discriminating limits on freedoms like mobility and assembly, and arbitrary or violent implementation of such restrictions by police and nonstate groups. The number of countries with limited freedom (called "Not Free" countries) reached the highest level in the last 15 years. On average, these countries saw their scores indicating freedom drop by about 15 percent. Additionally, the number of countries worldwide earning a net score improvement for 2020 was the lowest since 2005, suggesting that the prospects for a change in the global downward trend were more challenging than ever. As repression intensified in already unfree environments, greater damage was inflicted on their institutions and societies, making it increasingly difficult to fulfill public demands for freedom and prosperity under any future government (Repucci & Slipowitz, 2021).

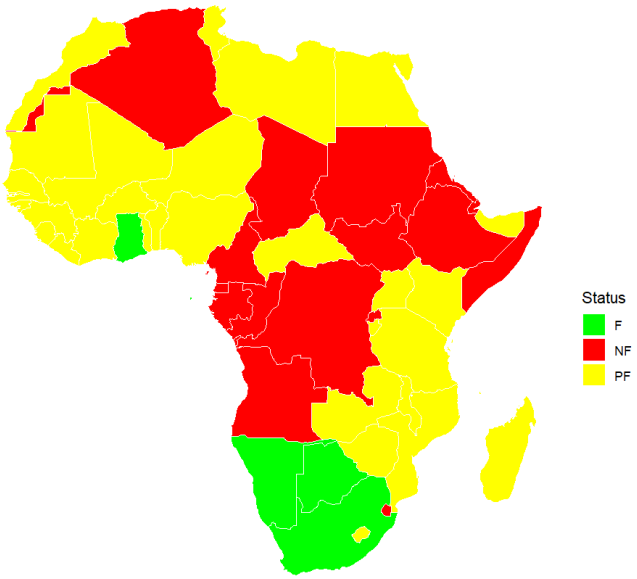
The findings of the Afrobaromer Network (2023) indicate that African citizens remain supportive of democratic principles and institutions, displaying consistent commitment and strong beliefs in accountability, rule of law, and term limits maintaining the hope for democratization in Africa. While there was a continued demand for democracy, actual implementation by political actors failed short. Satisfaction with democracy decreased faster than support, signaling a deficit in delivering democracy's promises. Preference for democracy over other forms of government had declined from 73 percent a decade ago to 69 percent in 2021. Despite these challenges, many Africans had confidence in their election quality. However, specific countries such as Cameroon,

Gabon, Sudan, and Zimbabwe faced significant issues in this regard. Reasons for dissatisfaction with democracy correlated with increased perceptions of corruption, particularly within presidential offices, in contrast to the perceived impact of the COVID 19 pandemic that negatively affected democracy and freedoms on a global outlook. Notably, the COVID-19 pandemic had not severely weakened African democracies as citizens were supportive of temporarily restricting democratic freedom to combat the pandemic (Afrobarometer Network, 2023).

By taking a longitudinal view and basing on metrics used by Freedom House, the state of democracy in Africa declined during the COVID-19 pandemic period in comparison to the previous two decades, (refer to figures 2,3 and 4) with a higher record of countries classified as autocratic and partially democratic in comparison to democratic states. Countries that topped the list as influential to the declining trend of democracy in Africa were Tanzania and the Central African Republic, which experienced government repression and violence; Togo, whose presidential election was marred by fraud accusations; Guinea, whose election was doubtful because of COVID-19 restrictions and election fraud; Côte d'Ivoire's whose election was controversial, with some citizens being excluded from voting and intimidating, and Ethiopia, Cameroon, Mozambique, Burkina Faso, and Rwanda which experienced forced displacement and restrictions on freedom of movement (Repucci & Slipowitz, 2021). It is worth noting that African coups were on the rise as economic conditions deteriorated and corruption levels increased. Williamson (2023) and Elischer (2022) provided illustrations of Guinea's coup in September 2021 and Mali Coup in 2021. In their assessment, poorer African countries with less stable democracies were more prone to takeovers and transformation into autocratic regimes, with 15 of the 20 countries on the 2022 Fragile States Index including countries such as Somalia, the Democratic Republic of Congo, Central African Republic, Chad, and Sudan, having at least one successful coup, compared to richer countries,

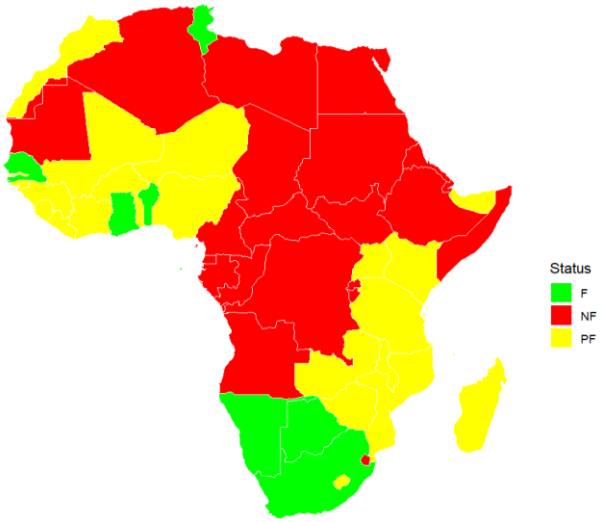
Using data from Freedom House, heatmaps were constructed to show a visual illustration of changes in the state of democratization of African states over the past decade. The heat maps indicate the proliferation of partial democratic regimes in comparison with democratic and authoritarian regimes. Overall, the percentage of fully democratic states in Africa is significantly low.

Figure 2: Freedom House Heatmap of Africa (Year 2013- Year 2022)



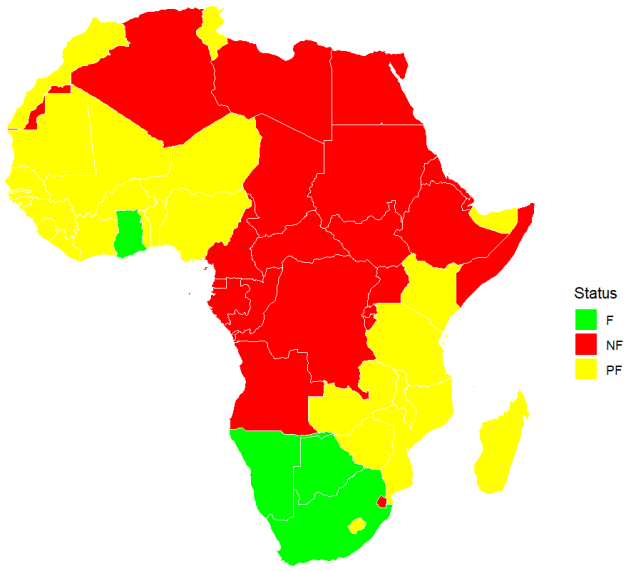
Notes: In the legend, F=Free, NF=Not Free, and PF=Partially Free. The data used in the heatmap is sourced from Freedom House (2023) (https://freedomhouse.org/report/freedom-world.)

Figure 3: Freedom House Pre-COVID Heatmap of Africa (Year 2017- Year 2019)



Notes: In the legend, F=Free, NF=Not Free, and PF=Partially Free. The data used in the heatmap is sourced from Freedom House (2023) (https://freedomhouse.org/report/freedom-world.)

Figure 4: Freedom House Post-COVID Heatmap of Africa (Year 2020-Year 2021)



Notes: In the legend, F=Free, NF=Not Free, and PF=Partially Free. The data used in the heatmap is sourced from Freedom House (2023) (https://freedomhouse.org/report/freedom-world.)

2.2 Socio-economic trends in Africa

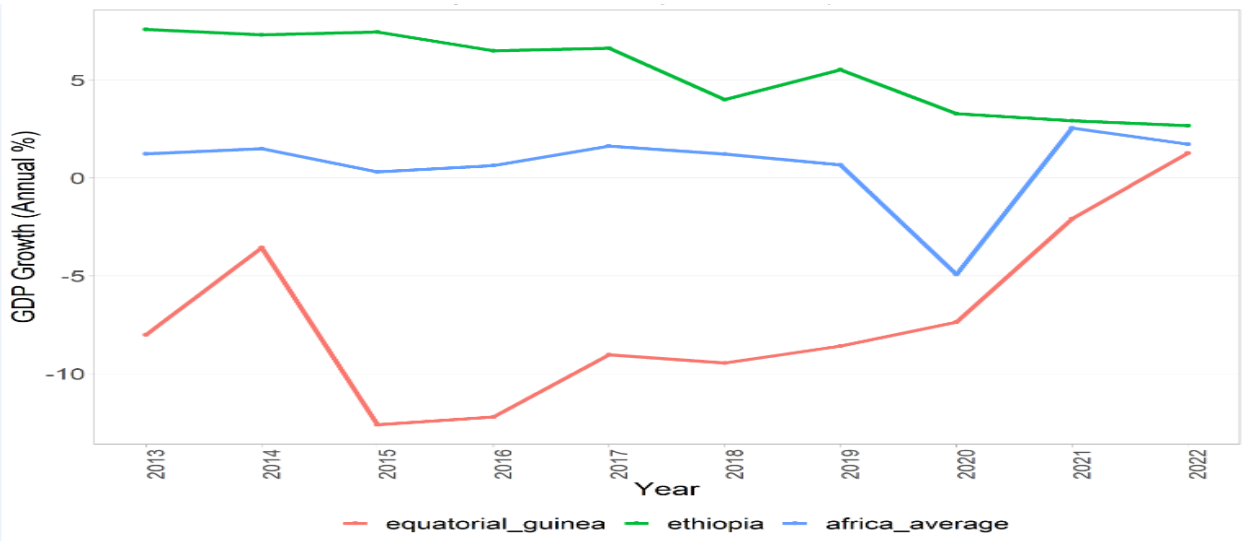
Wong and Michalos (2014) explained the rationale for using both social and economic indicators by quoting Baur (1996), who emphasized that integration of social and economic indicators provides an inclusive view of society and enhances policy decisions based on the interrelationship of indicators. Despite various indicator options for measuring socioeconomic status, this study focused on a concise set: Gross Domestic Product per Capita (GDP) and health expenditure as a share of GDP. The rationale behind these choices is detailed in the literature review Section 3.7 and Data Methodology in Section 4.0. Nonetheless, based on the sphere of public health and governance in which the chosen topic of study is grounded, this research extends the use of demographic population health measures, such as population density and the proportion of the population over the age of 65, to examine the impact of these factors on COVID-19 mortality and infection rates. As Gold and Field (1998) noted that in the study of population health metrics, age, mortality, and population density cannot be ignored. The following section provides an overview of the trends of selected socio-economic indicators in African states.

2.2.1 GDP trends in Africa

Africa's slow economic growth in the 20th century was attributed to factors such as low return investment products, low education, poor health, geography, closed economies, wasteful expenditure, and military conflict. Despite rapid growth in many African economies, it slowed down in 2016 due to decreased commodity prices and a less favorable global economic situation, reaching its lowest level in over 20 years (International Monetary Fund, 2016). The COVID-19 pandemic had also significantly impacted Africa, causing a 2.1 percent economic contraction in 2020, according to the African Development Bank. Economic growth was predicted to increase gradually to 3.4 percent in 2021 and then increase to 4.6 percent in 2022 (African Development Bank Group, 2021).

Figure 5 shows the trends in the annual GDP per capita growth in Africa. Over the ten-year period, Ethiopia was the fastest-growing economy, with consistent gains. The success of Ethiopia's growth and transformation plans were closely linked to the performance of the industrial and manufacturing sector, which had received significant attention and investment (Shiferaw, 2017). Equatorial Guinea, on the other hand, faced a sharp decline in 2014. This downturn was linked to post-election protests in 2013, which led to political instability and impacted economic activities. In addition, the economy, being heavily reliant on the overseas sale of oil and gas, experienced a setback in the shutting down of ExxonMobil's Zafiro oilfield in September 2022, causing the economic downturn to persist (Martino, 2023).

Figure 5: Trend of GDP per Capital Growth (Annual %)



Source: (World Development Indicators | Databank, 2022)
https://databank.worldbank.org/source/world-development-indicators

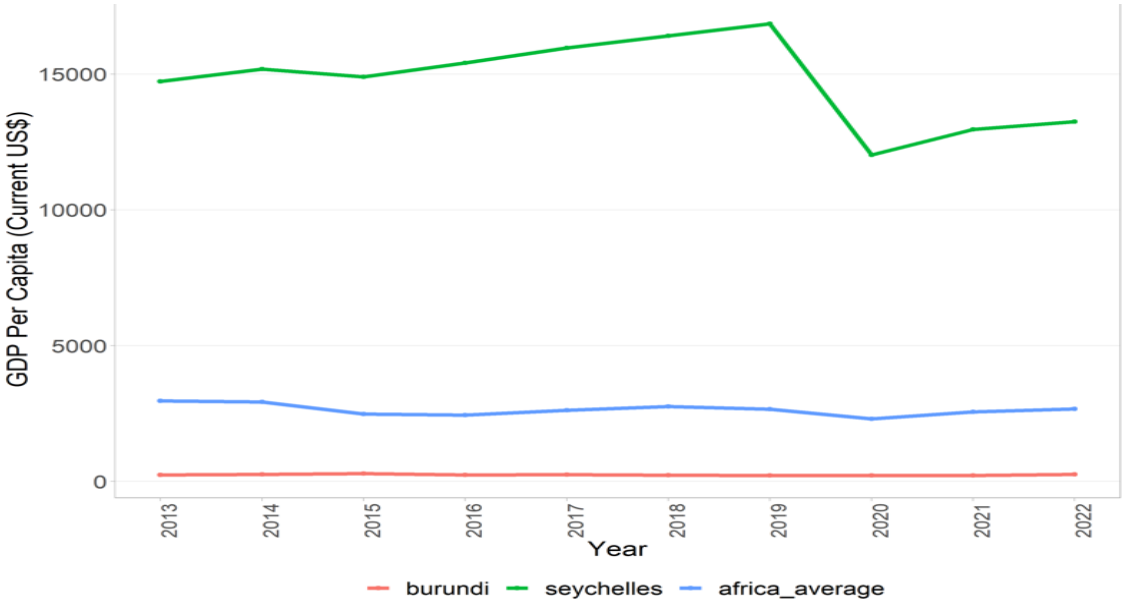
In monetary terms, the average real GDP per capita for Africa shows a slight increase, indicating overall economic growth across the continent. The differences in GDP per capita reflected the varied economic situations of the African countries.

Figure 6 shows a clear economic gap in Africa between Seychelles, with the highest real GDP per capita, Burundi, with the lowest, and the continent's average. Seychelles' GDP per capita is much higher but has shown a drop in recent years, while Burundi's GDP per capita is consistently low and barely changes over time. Seychelles remained politically and economically stable, with Seychelles having the greatest per capita GDP. The economy was strongly dependent on tourism and the export of tuna but remained more volatile than other countries with greater diversification. The economy remains at risk owing to the ongoing challenges and impacts of climate change (Van Nieuwkerk & Abbink, 2018).

Historically, South Africa has been one of Africa's most industrialized economies despite facing significant levels of inequality and unemployment (Francis & Webster, 2019). Conversely, Burundi experienced prolonged periods of conflict, especially since the 1990s, and had not yet reached a lasting peace agreement. Burundi was estimated to experience an average annual decrease of around USD138 in GDP per capita compared to the hypothetical scenario without

conflict. The average annual loss is 34 percent of the hypothetical GDP per capita (Ndoricimpa & Ndayikeza, 2023).

Figure 6: Trend of GDP Per Capital (Current US$)



Source: (World Development Indicators | Databank, 2022)
https://databank.worldbank.org/source/world-development-indicators

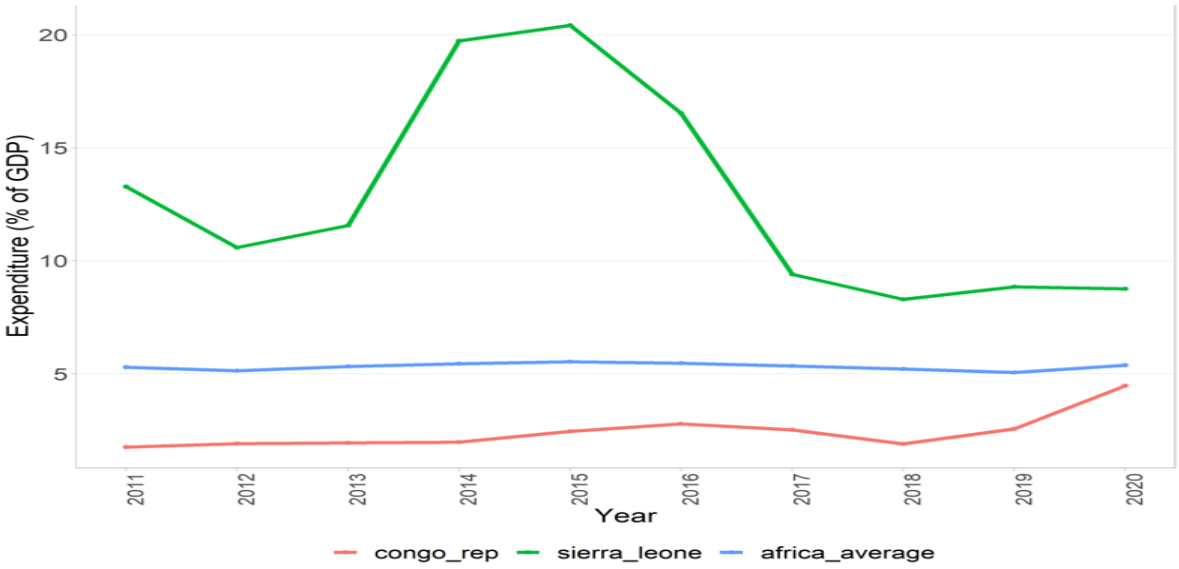
2.2.2 Health Expenditure

Figure 7 illustrates the trend of current health expenditures as a percentage of GDP from 2011 to 2020 for the Republic of Congo, Sierra Leone, and the average for 54 African states. Sierra Leone showed a significant spike around 2014 and 2015, which likely corresponded to the Ebola outbreak during that period, necessitating increased health spending. After 2015, Sierra Leone's health expenditure as a percentage of GDP declined sharply, possibly reflecting the end of the Ebola crisis. The Economic Commission for Africa (2015) reported that impacted nations allocated significant funds to healthcare and illness prevention initiatives. Guinea paid USD 26 million, and Sierra Leone spent USD 67 million in 2014. The Central African Republic, Democratic Republic of Congo, Senegal, and Nigeria combined spent approximately USD 23.4 million to prevent the spread of Ebola to their nations.

The Republic of Congo and the average of African states exhibit relatively stable health expenditure trends, with the Republic of Congo consistently spending a lower percentage of its GDP on health than the average. The stability of the African average suggests a consistent investment in health relative to the size of economies across the continent.

Furthermore, Coccia (2021) and Wildman (2021) illustrate that income inequality and a low proportion of public healthcare expenditure to Gross Domestic Product (GDP) further exacerbate the fragile situation of the health system in Africa. For instance, compared to OECD members, health spending in African countries was substantially lower on average over a 20-year period from 2000 to 2020. Current health spending in Africa amounts to 5.05 percent of GDP and on average USD70.41 per person. In comparison, OECD countries spent a higher percentage of their GDP—11.36 percent—on health spending and much more per person (USD3,832.29). This discrepancy emphasizes the limited financial resources available for healthcare in Africa, which may impact the region's accessibility and quality of healthcare services (World Development Indicators,2022).

Figure 7: Trend of Current Health Expenditure (% of GDP)

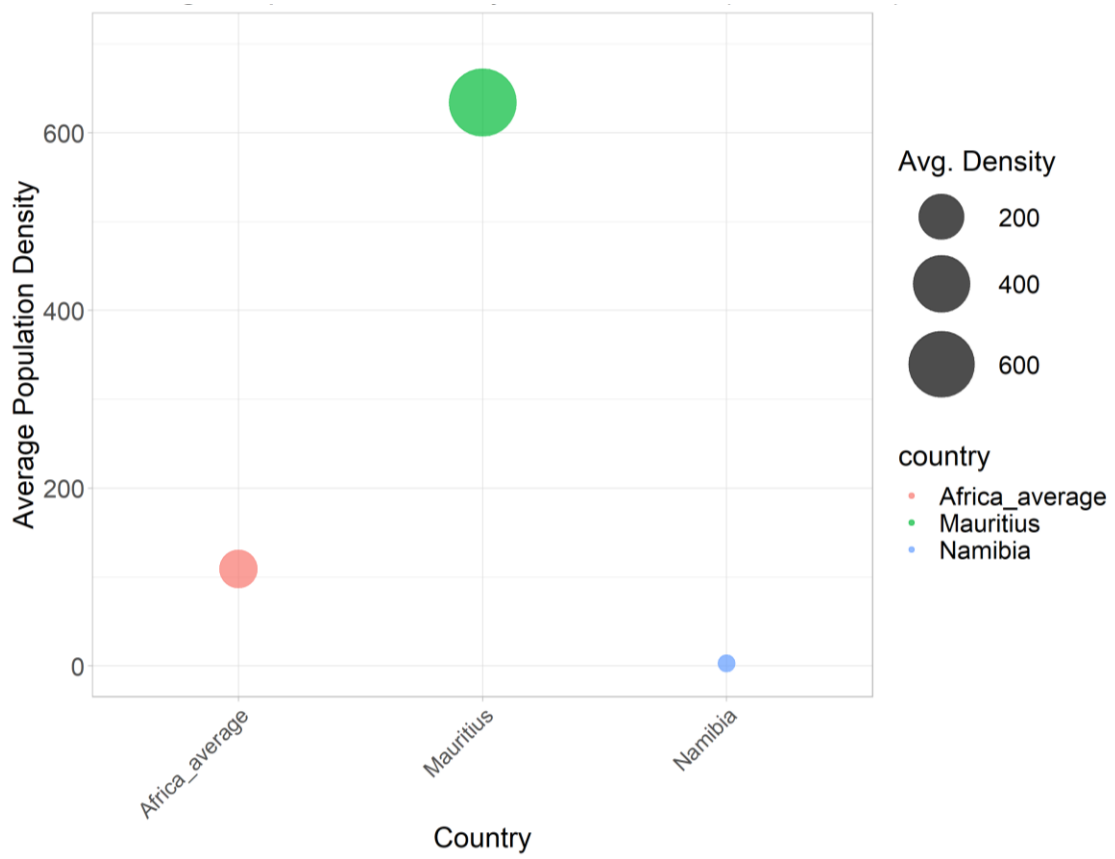


Source: (World Development Indicators | Databank, 2022)
https://databank.worldbank.org/source/world-development-indicators

2.2.3 Population density and Population Age

Figure 8 shows the significant differences in population densities across select countries, with Mauritius being densely populated, Namibia having a sparse population, and the African average falling in the mid-range. The bubble chart visualizes the population density of Namibia, Mauritius, and the African average. The size of each bubble corresponds to the average population density for the COVID period 2020 to 2021.

Figure 8: Average Population Density Bubble of Selected African Countries (2020-2021)



Source: https://databank.worldbank.org/source/world-development-indicators

From the Chart and source data, Mauritius, with its bubble size, shows the highest population density, ranging from 633 to 634 people per square kilometre. On the other hand, Namibia reflects lower density, ranging between 3.02 to 3.07 people per square kilometre in the two years 2020 and 2021, thereby indicating a vast land with a sparse population. The African average density is

represented by a bubble size between that of Namibia and Mauritius, with a population density ranging from approximately 108.19 to 110.35 people per square kilometre. Further statistics on people per square kilometre of land area are provided in Table A3:Population Density (People per Sq. km of land Area).

Regarding aging of the population, Africa's age distribution was predominantly children and youth below the age of 35 years. Figure 9 illustrates the age distribution in comparable to Asia's age distribution as of December 2020.

Figure 9: Age demographic Pyramid of Africa and Asia

Source: (*Population Pyramids of the World*, 2023)
https://www.populationpyramid.net/africa/2020/

2.3 Pandemics and Epidemics in Africa-HIV/AIDS, Cholera, and Malaria

According to McMann and Tisch (2021), several infections such as dengue, meningococcal disease, and diarrheal diseases had been identified as significant contributors to numerous

epidemics. More than 50 percent of the documented epidemics occurred in 2000 or later. From a geographical standpoint, epidemics have exhibited a notable concentration in sub-Saharan Africa, with approximately 59 percent of recorded epidemics globally occurring in this region in comparison to regions in Asia and Latin America, wherein countries within these regions have also witnessed a higher incidence of fatalities compared to other nations. (World Health Statistics ,2022). It is stated that the statistics of epidemics in question may despite economic progress and advancement in medicine and technology after World War II, have been as a result of, but not limited to, a growing global population, intensified urbanization, enhanced human interconnectedness and mobility, heightened exposure to zoonotic diseases transmitted by wildlife, and the effects of climate change. Fenollar and Mediannikov (2018) further pointed out that sub-Saharan Africa has the lowest per-capita health spending and healthcare worker availability in comparison to other continents, which exacerbates health problems and makes emerging infectious disease outbreaks difficult to manage.

Talisuna et al. (2020) examined the regional and temporal distributions of epidemics, disasters, and other possible public health crises in the WHO African region between the year 2016 and 2018. They highlighted that epidemics of viral hemorrhagic diseases, such as Ebola and Marburg Virus Diseases (MVD), which were previously thought to be uncommon, have recently caused severe epidemics in Liberia, Guinea, and Sierra Leone, as well as in Uganda and the Democratic Republic of the Congo (DRC). A comprehensive regional risk assessment and mapping for all epidemics reported in Africa between 1970 and 2016 revealed that the Ebola and Marburg virus disease epidemics were primarily in East and Central Africa.

Certain countries have a high frequency of infectious disease epidemics, as well as a high frequency of other public health emergencies such as drought, flooding, cyclones, and humanitarian crises caused by conflict. Between 2016 and 2018, the DRC, Kenya, Uganda, and South Sudan experienced more humanitarian crisis incidents than other countries. Most of these nations have endured recurring civil, social, and political strife, often resulting in refugees and internally displaced populations living in overcrowded conditions with inadequate access to clean water, food, shelter, healthcare, and other social services. Furthermore, many have inadequate healthcare systems with limited access to high-quality care. Governance and leadership issues in several of these countries have led to insufficient political and financial commitment to

establishing resilient health systems. This, along with past disasters in southern Africa, demonstrates the harmful effects of humanitarian crises and infectious diseases.

Strong healthcare systems with universal coverage are essential for efficient emergency preparedness and response. Countries with inadequate health systems, on the other hand, experience difficulties in appropriately responding to health emergencies, resulting in poor outcomes. It is critical to integrate health security into initiatives to strengthen health systems and avoid redundancy and inefficiency in health emergencies, leading to inferior outcomes (Talisuna et al, 2020)

Nonetheless, McMann and Tisch (2021) conclude that democracies have the advantage of addressing epidemics more effectively, revealing that democracies reduce approximately 70 percent of fatalities from epidemics within countries compared to other forms of government regime, holding other factors constant. The study done by McMann and Tisch (2021) also suggests that the higher effectiveness of democracies in mitigating epidemic-related fatalities can be attributed to the motivations and limitations placed on government executives, prompting them to act in the interest of the general population. However, whether the same theory applies to pandemic fatalities and infections, such as COVID-19 in the African context is a hypothesis that this study aimed to test.

2.3.1 Cholera

Among the various epidemics, cholera has emerged as the most prevalent, constituting approximately one-third of all recorded epidemics documented by Varieties of Democracy (VDem) and the Emergency Events Database (EM-DAT). Cholera is a bacterial disease that typically spreads via contact with contaminated water. Consequently, economically disadvantaged individuals, particularly those who depend on nearby rivers and streams or poorly built and unprotected wells for their drinking water, and who have only basic sanitation facilities, are the most vulnerable. Undoubtedly, contaminated water has a tendency to disperse, resulting in the transmission of cholera outbreaks that originated in Asia in the early 1960s (Nations & Monte, 1996). This outbreak subsequently traveled to Europe and eventually became firmly established in Africa, where it reached an endemic state. Sub-Saharan Africa has a significant cholera burden, with an estimated occurrence of over 140,000 probable cases per year, in both endemic and epidemic settings. Around 55.9 million people live in areas with predictable, steady

cholera (endemic), while 31.0 million live in areas with more unpredictable, outbreak-driven cholera classified as an epidemic (Lessler et al., 2018). To substantiate the point, from 2010 to 2019, 1.08 million of the 4.4 million (24 percent) cholera cases reported to the World Health Organization came from sub-Saharan Africa (World Health Organization, Cholera, Weekly Epidemiological Record, 2020).

Healthcare specialists universally concur that the primary remedy for cholera, as well as for other diarrheal diseases, is remarkably simple, yet crucial: guaranteeing access to uncontaminated drinking water and implementing improved sanitation and hygiene measures. However, sub-Saharan countries in Africa, especially the lowest-developed countries, have been faulted to have infrastructure deficiencies in sanitation and provision of portable clean water. Anbarci et al. (2012) conducted an empirical study focusing on 55 poor countries in Africa, Asia, and South America that reported at least one cholera outbreak between 1980 and 2002, resulting in 1,032 observations. The study concluded that the results consistently support the notion that income and income equality, which influence the availability of clean water, are the pivotal factors influencing the severity of cholera outbreaks in a country. Importantly, the positive impact of clean water provision remains significant, even when considering other development-related factors, such as enhanced education on disease transmission and improved access to medical services, which could also contribute to lessening the impact of cholera.

Although there was no existing literature at the time of writing the results of this study on the extent to which types of government regimes influence cholera infection and mortality rates in Africa, some conclusions can be inferred from existing literature based on the linkages of democracy to economic development. Acemoglu et al. (2019) observed that democracy is better for economic development. Since the most effective way to promote the eradication of cholera is to enhance the local water and sanitation infrastructure, empirical evidence indicates that such enhancements require significant financial resources and may take many years to be fully actualized (Lessler et al., 2018). Furthermore, the achievement of desired outcomes may be contingent upon political or economic will, which may be more favorable for democracies than for any other regime type.

Conflict and war have also been identified as catalysts for cholera outbreaks in Africa. Charnley et al. (2022) used a self-controlled case series method and determined that conflict increased the risk of cholera by 3.6 times in Nigeria and 2.6 times in DRC. Conflicts disrupt services, cause income loss, and displace populations, all of which contribute to the spread of infectious diseases. Additionally, they found that approximately 19.7 percent of cholera outbreaks in Nigeria and 12.3 percent in the DRC were linked to conflict. Their findings emphasized the importance of conflict resolution and addressing preexisting vulnerabilities, such as poverty and healthcare access, which are crucial for effective intervention of cholera. Their findings support Zheng et al. (2022) finding that over the course of 10 years to 2019, the majority of this risk of Cholera in Sub-Saharan Africa was concentrated in four countries: the DRC (27.8 percent), Ethiopia (27.1 percent), Cameroon (6.3 percent), and South Sudan (3.2 percent). In simpler terms, the common elements in these countries are recurring conflicts and political unrest (Arnould et al., 2016; Folefac, 2022).

Nonetheless, the relationship and effect of regime type on cholera mortality rates in Africa remains understudied, and the proposed hypotheses are grounds for further research.

2.3.2 HIV/AIDS

Other public health issues, such as Human immunodeficiency virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS), remain significant in Africa. Sub-Saharan Africa bears a disproportionate burden of HIV infection, accounting for more than 51 percent of new global HIV infections by 2021(UNAIDS, 2022). African countries still struggle to reduce the significant inequalities in HIV treatment access among districts within the same country attributed to the urban-rural divide as well as political, economic, cultural, or other distinctions, implying that people in some sections of the country do not benefit from antiretroviral drugs and HIV prevention remedies. While such disparities are pronounced in countries such as the Central African Republic, Gabon, Guinea, Ethiopia, Haiti, Nigeria, and Sierra Leone, countries such as Lesotho, Malawi, and Rwanda have achieved some of the largest reductions in new HIV infections and AIDS-related deaths (UNAIDS, 2022). Reliance is still placed on international donors and governments to make significant HIV investments in low- and middle-income countries to alleviate inequalities that many low- and middle-income nations are facing, as well as to avoid counterproductive austerity programs.

Existing literature on the impact of political regimes on HIV/AIDS follows a dual approach. Scholars differ in their choice of dependent variables, with one group linking democracy to broad public health social outcomes, such as life expectancy and mortality rates, while the other focuses on the direct influence of political regimes on specific policy decisions regarding the medical treatment of HIV-positive individuals, particularly through antiretroviral medicine. The latter approach distinguishes social outcomes from policy choices, particularly in the context of HIV/AIDS. The notion presented here is that governments cannot directly dictate HIV/AIDS infection rates. Studies such as Barnett and Whiteside (2002) and Epstein (2007) believe that controlling individual exposure to infection risk is challenging owing to various behavioral, cultural, social, and economic factors, although HIV/AIDS educational campaigns may mitigate the prevalence of the disease. Their argument is that the government has more influence over the accessibility and extent of coverage for HIV treatment as well as the availability and range of public health services. Hence, studies should focus on how political regimes influence specific policy decisions related to the medical treatment of HIV patients using antiretroviral medicine (Justesen, 2012). However, Gizelis (2009) quoted the works of Lake and Baum (2001) to explore the impact of political regimes on broad public health outcomes, such as HIV/AIDS mortality and infection rates, reflecting the correlation and causation effect of political regimes on broad economic and development outcomes that can be extended to mortality and infection outcomes.

Regardless of the approaches taken, Gizelis (2009) in her study on 117 states in the world concluded that government effectiveness plays a crucial role in curbing the spread of HIV/AIDS. Although variations exist within countries, the state capacity remains pivotal in driving and executing necessary policies to combat communicable diseases. State capacity and political will is especially significant when addressing cultural beliefs and misconceptions regarding epidemic transmission. Additionally, Gizelis (2009) suggested and proved an inverse U-shaped association between political regimes and HIV/AIDS infection rates. She noted that full democracies and autocracies were more responsive in reducing HIV/AIDS mortality and infection rates whilst partially democratic regimes were least efficient. In other words, as one moves along the continuum of classification of political regime from fully democratic regimes to nondemocratic regimes, the level of efficiency of government follows a u-shaped curve, with lowest level of efficiency being with partially democratic regimes.

Justesen (2012) provides granular insights into the different types of democracies and autocracies, and how such regimes influence HIV/AIDS management through provision and access to antiretroviral treatment for HIV patients. In his findings, covering the scope of 143 developed and developing countries, including African countries, supports the idea that democracies generally outperform autocracies in providing access to antiretroviral treatment for HIV patients. Without establishing causation, his study aligns with earlier research on the impact of political systems on public health and AIDS policy. However, caution was given not to conclude that democracies prevent the spread of HIV/AIDS; rather, they seem more effective in managing the disease, particularly in terms of treatment access. The differences between democratic and autocratic regimes appear to be influenced mainly by the electoral system design. Democracies with proportional electoral systems tend to offer significantly better access to antiretroviral drugs optimization (ARV) treatment than autocracies and democracies with plurality voting systems. The study suggests that electoral systems that enhance proportionality led to greater representation of minority interests, including those affected by HIV/AIDS. In contrast, plurality electoral systems, which are more common in democracies, may not show significant differences from autocracies in terms of ARV treatment.

Focusing specifically on Africa, Parkhurst and Lush (2004) conducted a comparative case study of the implementation of HIV prevention programs in Uganda and South Africa during the 1990s. This study examined interventions to change sexual behavior amongst citizenry and the management of sexually transmitted infections (STIs) through syndromic approaches. They illuminated the significance of political actors and their impact, which should not be disregarded when dealing with public health emergencies. Although South Africa had a well-established and technically functional health system, with a network of hospitals and approximately 56 doctors per 100,000 people according to the 1996 WHO health indicators, Uganda faced shortages of funds, human resources, and medications, as well as limited access to health services for many amongst its population. However, the success or failure of broad HIV/AIDS initiatives in both countries was significantly influenced by the role of political leadership within the respective governments. In this regard, Uganda was more effective than South Africa in managing and preventing HIV/AIDS.

Parkhurst and Lush (2004), citing the research conducted by Schneider and Stein (2001) and Campbell and Williams (1999), and examining the reports of the Uganda AIDS Commission, demonstrated how President Museveni's approach differed from President Mbeki's position, whose position was seen as more controversial, frequently questioning western medical viewpoints on prevention and treatment of HIV/AIDS and considering opposing viewpoints to demonstrate South Africa's autonomy and self-reliance, distancing itself from any excessive influence. The discussion surrounding HIV/AIDS in South Africa was intertwined with larger conflicts about the state's power and the regulation of information. President Mbeki's political agenda did not prioritize HIV/AIDS, although it made notable pronouncements on the issue. This lack of prioritization is believed by some to have led to wasted opportunities for prevention throughout the country's democratic reform (Spence, 1999).

In contrast, in Uganda, Museveni adopted a proactive stance, openly recognizing AIDS as a substantial problem and pressing public awareness and action. The government prioritized the issue of AIDS at the national level, encouraging all sectors to actively tackle it (Uganda AIDS Commission, 1995). Synergistic collaboration between governmental and non-governmental initiatives resulted in a reduction in the prevalence of HIV. The Ministry of Health implemented extensive awareness campaigns and created testing facilities bolstered by a network of organizations, such as non-governmental organizations and community groups. Conversely, due to lack of political will, South Africa's endeavors to diminish AIDS transmission rates via the national AIDS initiative encountered confusion and misadministration, including sudden budget cuts and ineffective coordination at the political level. There was limited knowledge of AIDS within the community, and the government's attempts to encourage local activities were unsuccessful.

Lessons can be drawn from the work of Parkhurst and Lush (2004) to introspect how the role of political actors influence the creation and implementation of public health policies in confronting epidemics.

Finally, the discussion of HIV in Africa ends with the discovery of Iqbal and Zorn (2010), who explored the connection between HIV/AIDS and large-scale violent conflict, focusing on the period and location where both were prevalent. Armed conflict is frequently mentioned as one of the causes contributing to the global HIV/AIDS epidemic. Initiating the discussion on the

influence of conflict on HIV/AIDS, a speech was delivered at the United Nations General Assembly Special Session on HIV/AIDS in 2001, where issues of migration of individuals, such as refugees and those forcibly displaced, the persistent poverty experienced by populations, , and instances of sexual assault perpetrated by armed personnel in occupied regions were mentioned as contributors to higher HIV infection rates in the DRC. Iqbal and Zorn (2010) concluded that beyond the case study of DRC, the impact of international conflict is notably substantial and significant in nearly all instances, while the influence of internal conflict is consistently smaller (about half the magnitude of international war, where, on average, a one-unit increase in international conflict leads to a 5.7 percent increase in predicted HIV/AIDS rates.

Ultimately, countries in Africa that were labeled as less democratic with an incidence of domestic conflict (coups) and regional conflicts with neighboring countries were likely to have higher HIV/AIDS infection and mortality rates.

2.3.3 Malaria

Malaria remains a significant burden in Africa. The World Health Organization (2022) reported that there were approximately 247 million malaria cases globally across 84 endemic countries. Out of the global malaria cases, the African region accounted for 87.8 percent as of end December 2021. 29 countries in Africa accounted for 96 percent of malaria cases globally. Nigeria represented 27 percent of the total, the DRC for 12 percent of Uganda (5 percent), and Mozambique (4 percent). Collectively, these four countries represented approximately 50 percent of the total global malaria cases as of December 2021. Nonetheless, progress was observed in the reduction of malaria mortality rates in the African region in the past two decades from 841,000 in 2000 to 599,000 in 2020, despite the Covid 19 pandemic derailing and diverting the provision of essential health services, resulting in 63,000 deaths caused by malaria between 2019 and 2020.

Unlike the European region, which has had no malaria cases since 2015, Africa still falls short of meeting its milestones target, as defined by the African Union and United Nations, of decreasing malaria mortality rates and case incidence by 40 percent by the year 2020, eliminating transmission in at least 10 endemic countries, and preventing the re-establishment of malaria in malaria-free countries in Africa as of 2015 (World Health Organization, 2021). The World Health Organization (WHO) visions a world free of malaria by 2030 and outlined 5-year milestones to track progress, with reviews pegged for 2020 and 2025.

At the United Nations General Assembly meeting in September 2023 staged in New York, African politicians, global health figures, and development partners issued a pressing plea for immediate action to tackle a critical malaria crisis in Africa. The risk of achieving the African Union's objective of eradicating malaria in Africa by 2030 and the aim of eliminating malaria epidemics by 2030 were emphasized. Leaders attributed reasons for the malaria crisis to climate change, increasing resistance to insecticides and antimalarials, and inadequate finance worsened by the global financial crisis. The financial crisis was stated to have resulted in an increase in expenses associated with necessary interventions and a deficit of USD 1.5 billion earmarked for malaria programs, while climate change had broadened the geographical regions impacted by malaria. They cautioned that a lack of prompt action could result in a resurgence of malaria outbreaks. The leaders emphasized the urgency of securing money, providing instances of rising expenses and difficulties, and encouraging the World Bank to pledge support for a fresh malaria bolster program. They also emphasized the importance of maintaining political dedication and transforming promises into tangible measures. According to their analysis, combating malaria necessitates the implementation of comprehensive strategies, augmented funding, and collaborative endeavors to safeguard the progress achieved in the previous 20 years and to attain the objective of eradicating malaria from Africa by 2030 (RBM Partnership to End Malaria, 2023).

Boiling down to whether factors such as types of government regimes, levels of health expenditure, and government effectiveness mediate the influence on the reduction of malaria mortality and infection cases, and ultimately the achievement of malaria eradication goals, a study conducted by Chang (2020) concluded that resource-rich democracies in Africa outperform their resource-rich autocratic counterparts in malaria management. This is based on the finding that democracies are more likely to provide public health goods, address corruption, and diversify their economies.

Quoting the selectorate theory proposed by Mesquita et al. (2005), Cheng (2020) explains that leaders have two options to maintain their political standing: they can provide public goods such as infrastructure, improved education, and enhanced healthcare or they can offer private goods, like exclusive licenses for imports and exports, control over specific industries, or franchise opportunities. In democratic systems, political leaders find that providing public goods to secure

public approval and votes is a more cost-effective and streamlined strategy for ensuring their political survival.

As an illustration, Botswana, renowned as one of the most committed democracies since gaining independence, had successfully eradicated malaria. In 2016, the number of malaria cases per 1000 people dropped from 42.52 in 2000 to 0.33. Botswana, also known for its abundance of diamonds, has been recognized as one of the least corrupt governments in Africa. The country's dedication to eliminating malaria has played a significant role in improving its efforts to control and manage the disease (World Health Organization, 2017).

By contrast, authoritarian systems emphasize the provision of private goods over malaria control because the survival of a few coalition members has a greater impact on political survival of incumbents than reliance on the wider population. Needless to say, Chang (2020) maintained that authoritarian regimes still invest in public goods, particularly healthcare, such as cost-free medical care, as provided in Venezuela or Saudi Arabia. Nevertheless, research indicates that some oil-rich Gulf monarchies continue to allocate less funding per capita to healthcare compared to the Organisation for Economic Cooperation and Development states. For instance, since 2011, Kuwait, the UAE, and Qatar have spent USD1,500, USD1,640, and USD1,776 US per person, respectively, on healthcare. This is lower than the average spending of USD4,593 per person in OECD countries (World Development Indicators | Databank, 2022).

Regarding government effectiveness, Chang (2020) compared democracies and autocracies and depicted rampant corruption and rent-seeking traits as common weaknesses in autocratic and partially democratic countries in Africa, compromising government efforts in disease control and improvements in health care. Boseley (2011) also writes that 200 million euros of donor funds earmarked to fight malaria as well as other endemics and epidemics such as HIV/AIDS and Tuberculosis, in Africa channeled through the Global Fund[1], was suspended in 2011, paving the

[1] The Global Fund, established in 2002, is a unique financing mechanism designed to swiftly raise and distribute funds to combat HIV/AIDS, tuberculosis, and malaria in low- and middle-income countries. It operates as a partnership involving developed countries, developing countries, the private sector, civil society, and affected communities. Unlike many other donors, the Global Fund provides funding based on proposals from countries themselves. It has become a major aid source, contributing significantly to global funding for these diseases. The Fund's principles emphasize country-led programs, additional funding, transparency, and partnerships. Its structure includes a Board of Directors, a Technical Review Panel, and in-country operations through Country Coordinating Mechanisms, Principal Recipients, and Local Fund Agents. The Fund relies on partnerships with

way for an investigation into allegations of fraud and financial misuse in four countries: Mauritania, Mali, Zambia, and Djibouti. Uganda also struggled to contain malaria as a major health concern in 2016, with millions of donor funds being misused and donors pulling out citing corruption and government inefficiency concerns (The Observer, 2016).

In summary, Chang (2020) offers empirical support for the idea that affluent democracies outperform their autocratic counterparts in Africa in terms of managing and containing malaria, resulting in significantly lower malaria death rates. Chang (2020) further emphasized that it is crucial not to misinterpret this as implying that democratic countries affected by malaria can eliminate the disease. However, it underscores effectiveness of democracy in substantially reducing malaria mortality rates. Acemoglu and Robinson (2006) considers autocracies as a dictatorship of the wealthy and democracies as a dictatorship of the poor or middle classes, which aligns with this conclusion regarding the prioritization of public health outcomes for the masses in democracies compared to autocracies. This underscores the plausible link between political power dynamics and health outcomes (Besley & Kudamatsu, 2006). Nevertheless, caution is warranted, acknowledging that public health issues are complex and require coordinated efforts at the local, national, regional, and international levels to combat malaria, considering factors such as climate change and environmental degradation.

This study builds upon the arguments presented by Chang (2020) and tests his findings in the context of the COVID-19 pandemic. This study aimed to determine whether a generalizable pattern can be identified regarding the relationship between GDP and pandemic- mortality and infection rates in democracies and autocracies.

2.3.4 COVID 19 Pandemic in Africa

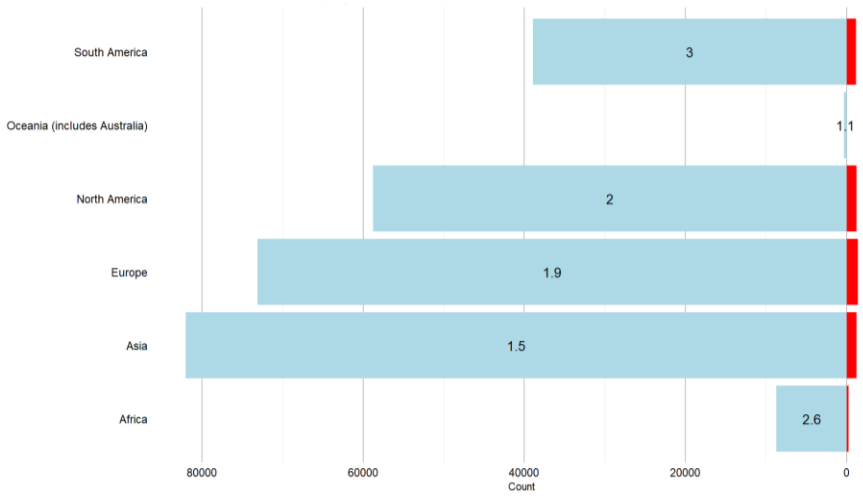
According to a report from the WHO Regional Office for Africa (2022), SARS-CoV-2, the virus responsible for COVID-19, was designated a global public health emergency on 30 January 2020, and declared a pandemic by the WHO on 11 March, 2020. It was initially identified in Wuhan, China, in November 2019. The primary mode of SARS-CoV-2 transmission is exposure to respiratory fluids that contain the virus. This exposure typically occurs in three main ways: (1)

various organizations and has received pledges of $8.6 billion, with ongoing efforts to raise additional funds for existing and new grants (Schocken, 2024) www.theglobalfund.org.

inhalation of very fine respiratory droplets and aerosol particles; (2) direct contact with respiratory droplets on mucous membranes in the mouth, nose, or eyes; and (3) touching mucous membranes with hands contaminated by virus-containing respiratory fluids or by touching virus-contaminated surfaces (Baselga et al., 2022).

Africa's encounter with COVID-19 diverged from that of other continents, as the continent documented a lower number of cases than other regions. In Africa, the initial wave of the pandemic occurred between June and August 2020 mainly because of the spread of imported cases within communities. The second wave, which occurred from December 2020 to February 2021, was primarily fueled by the reopening of airports across many African nations from July to November 2020. Factors such as the partial reopening of schools, increased travel, and lax adherence to social distancing regulations during the December holidays likely contributed to a surge in cases. The third wave, hitting between June and August 2021, was linked to the introduction of the delta-strain variant of SARS-CoV-2 into Africa. Some countries, such as Angola, Congo, and Kenya, experienced a fourth wave in September 2021, followed by an earlier third wave in March and April 2021. Notably, Africa reported the lowest cumulative number of cases globally. As of 29 November 2021, COVID-19 has resulted in 259,502,031 confirmed infections and 5,183,003 deaths globally, with Africa registering only 223,365 confirmed deaths. (see Figures 10 and 11).

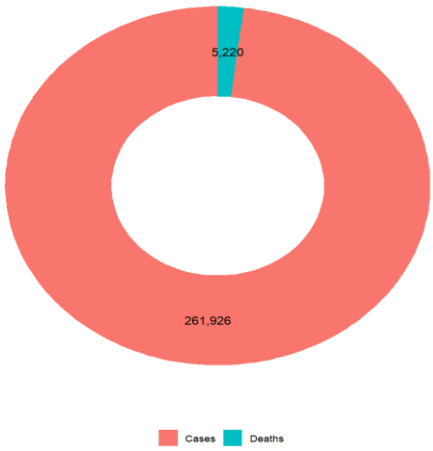
Figure 10: COVID 19 Cases and Death by Region (In Thousands)



Source: (WHO Regional Office for Africa, 2022) https://www.afro.who.int/health-topics/coronavirus-covid-19

Numbers reported as at 21 November 2021

Figure 11: Global COVID 19 Cases and Deaths (In Thousands)



Source: (WHO Regional Office for Africa, 2022) https://www.afro.who.int/health-topics/coronavirus-covid-19

Numbers reported as at 21 November 2021

2.3.4.1 Africa's Experience: COVID 19 Epidemiological Snapshot

The virus was initially discovered in Egypt on 14 February 2020, and subsequently spread throughout all African nations. The countries that have been most significantly affected in terms of mortality and infection cases by the end of 2021 were South Africa, Egypt, Morocco, Algeria, Nigeria, Senegal, and Cameroon (WHO Coronavirus (COVID-19) Dashboard, 2023). However, there was skepticism regarding the estimates of the reported cases. According to the WHO Regional Office for Africa (2021), Africa officially reported only one in seven (14.2 percent) of the total COVID-19 cases. The primary reason for this is that COVID-19 detection measures in Africa were mostly focused on those seeking medical attention in hospitals or travelers at key immigration points or vocational facilities, leading to a significant lack of reporting. This problem was reported as exacerbated by the substantial prevalence of asymptomatic African patients. According to this assessment, it was estimated that the true number of individuals who contracted COVID-19 in Africa from the beginning of the pandemic until November 2021 might be approximately 61.2 million, which is considerably greater than the recorded 8.7 million.

In contrast, it was also hypothesized that there would be no underreporting of infection and mortality rates in Africa, as evidenced by the lack of excess cases of hospitalizations or deaths at the community level across the continent. One potential explanation is the presence of a significant number of asymptomatic patients, which is attributed to enhanced immunity acquired from previous encounters with other coronaviruses, resulting in partial cross-protection against SARS-CoV-2. Recent research indicates that the occurrence of COVID-19 antibodies in Africa is comparatively high, at a rate of 51.1 percent, and has escalated in tandem with an increase in documented cases with seroprevalence being the highest in studies conducted in Central Africa compared to Southern Africa, West Africa, North Africa and East Africa respectively (Chisale et al., 2022).

2.3.4.2 Early Responses in Africa: Successes and Challenges

The strengths of Africa's COVID-19 response included the timely implementation of containment measures facilitated by multinational emergency response committees chaired by heads of states. African countries had preparedness and response plans in place prior to the first case, benefiting from the lag in the spread of the pandemic to Africa, giving African states an advantage in learning early containment strategies employed on other continents. The African Task Force for Coronavirus (AFCOR) was established by the Africa Centers for Disease Control and Prevention (Africa CDC) in collaboration with the African Union (AU) and WHO, with the aim of enhancing preparedness measures for COVID-19 (Africa CDC, 2020). AFCOR focuses on laboratory diagnosis, surveillance including screening at entry points and cross-border activities, infection prevention and control in healthcare settings, clinical management of severe COVID-19 cases, risk communication, and supply chain management and stockpiling. A significant advancement in preparedness has been the expansion of laboratory tests for SARS-CoV-2 across Africa. By March 2020, Africa CDC reported that 43 African countries were equipped to conduct COVID-19 testing, compared to only two countries (Senegal and South Africa) in February 2020 (Africa CDC, 2020).

Africa also benefited from additional funding from the World Bank to build on its capacity to provide medical supplies and establishment COVID 19 medical centers. In 2020, an initial amount of USD 82 million and USD 47 million was allocated to Ethiopia and the Democratic Republic of Congo respectively for COVID 19 preparedness efforts. Ghana, Kenya, Djibouti,

Cabo Verde, Senegal, Sierra Leone and The Gambia received a total of USD 165.5 million in implementing containment strategies, training medical staff, providing equipment, and other measures to ensure rapid case detection and response to the COVID-19 pandemic (The World Bank, 2020). Nevertheless, numerous organizations, non-governmental organizations (NGOs), philanthropists, financing agencies, and banks are providing substantial support to all African states to help them adequately prepare for the ongoing COVID-19 pandemic (Lone & Ahmad, 2020).

A notable additional strength of African countries was the use of innovative local solutions to address the challenges posed by the pandemic. To enhance the laboratory capacity for COVID-19 testing, many countries opted to use GeneXpert machines, which are already available, cost-effective compared to other screening methods, require less specialized personnel to operate, and provide faster results. This facilitated quicker diagnosis and management of the disease. In addition, there was an increase in the local production of cloth masks that were cheaper and reusable as an alternative to surgical masks. Although cloth masks were found to be less effective than surgical masks in preventing COVID-19 transmission, they still contributed to slowing the spread of the disease. Moreover, countries initiated large-scale production of hand sanitizers at a significantly lower cost than imported options (WHO Regional Office for Africa, 2022).

As African countries progressed in their early pandemic responses, the biggest challenge for many countries was to sustain momentum in the implementation of containment measures. Over time, in 2020, there was a notable decline in compliance with containment measures, a phenomenon termed “pandemic fatigue” by the World Bank. Pandemic fatigue was driven by factors such as misinformation and socioeconomic impact (WHO Regional Office for Africa, 2022).

A study conducted by Africa CDC covering 15 countries in five regions in Africa[2] observed that disinformation and misinformation were the main causes of low COVID -19 vaccine uptake and tendencies of individuals to re-engage in social activities as they did before the COVID-19 pandemic, disregarding the recommended public health guidelines. A larger proportion of the

[2] **Northern region countries: Morocco and Tunisia , Eastern region countries Sudan, Ethiopia, Kenya and Uganda, Central region :Gabon and DR Congo, Southern region: South Africa and Malawi; Western region: Nigeria, Niger ,Cote d’Ivoire, Burkina Faso and Senegal

population in selected countries believed that the threat posed by the virus was overstated (Africa CDC, 2021).

As much as pandemic fatigue was a result of individual perceptual factors, it was also challenging for much of the population in low-income African countries to maintain lockdown measures while compromising their economic position (Ilesanmi et al., 2020). In areas where complete lockdown measures were enforced, individuals were mandated to remain in their residences, leading to subsequent consequences, such as financial hardship, particularly for those employed in the informal sector and reliant on daily wages. Ultimately, the advantages of implementing containment measures ought to be carefully evaluated in relation to their socio-economic consequences.

CHAPTER THREE
LITERATURE REVIEW

3.0 Introduction

This chapter provides a comprehensive examination of the conceptual, theoretical, and empirical literature on the subject matter being investigated. The analysis begins with an examination of the theoretical aspects pertaining to political regimes and the state of democracy in the context of the African Continent. The existing theoretical and empirical literature provides a brief overview of studies examining the relationship between government effectiveness, demographic, and socioeconomic characteristics of African countries, and their impact on COVID-19 mortality and infection rates. However, it also identifies gaps in the current body of empirical research in this field.

3.1 Definition of Government Regimes

More than often, a concept is defined in relation to what it is not, or by analyzing the different components that make up the whole. government regimes are often linked to government systems, governance systems, and the state (Kjaer,2023). However, Skaaning (2006), by quoting the work of scholars such as Collier and Collier (2015), Fishman (1990), Lawson (1993), and Munck (1996), attempts to reconstruct the definition of government regime and state that the concept of government regime extends beyond the simplistic view of political regimes as composed of political actors in charge or political groups supporting them. Instead, political regimes should be considered as a set of rules and institutions that shape how those in power behave. Two consecutive governments operating within the same institutional framework may occasionally share the same interests but frequently do not. This means that regimes are not just about who is in charge, but also about the rules that guide their actions. These rules can be formal, such as written laws, or informal, such as unwritten customs. Ignoring these informal rules would often have a significant impact on how things work in practice.

As such, the concept of political regime in the words of Munck (1996) should be viewed as a two-dimensional concept, with one hand defined by procedural rules that determine the number and type of actors who can hold key government positions, the methods of accessing these positions, and the rules followed in making binding decisions, and the other hand characterized by the strategic acceptance of these rules by all major political actors and the absence of any major political actor rejecting these rules normatively.

These two dimensions can be further disaggregated into four distinct characteristics that define political regimes, as summarized by Skaaning (2006): their ability to access political power, the manner in which they organize interactions within the political power center (horizontal relations), their relationships with the wider society (vertical relations, specifically the method of accessing key political positions), and the character of the ruler(s), enabling us to distinguish between autocratic and democratic regimes and their respective behaviors. Ultimately, Skaaning's definition of a political regime encompasses formal and informal rules that establish holders of political power and decision-making authority. It also governs the appointment of key political positions, the extent and nature of political rights, and the scope and nature of civil liberty. Additionally, it includes the extent and nature of the division of powers, including control and autonomy (Van den Bosch, 2013).

3.2 Distinction between Types of Regimes, Government Authorities and The State

More often, the terminology of government regime is assumed to be synonymous with the types of authority. In the context of Africa, scholarly discussion on power dynamics, authority, and politics in society more often refers to Weber's concepts of patrimonialism, a term used to describe the phenomenon in which a few exercise authority and gain legitimacy over others based on the provision of fiefs and benefits (Weber, 2009). The comparison extends to concepts of neopatrimonialism, a modern terminology of patrimonialism in which patrimonial personal relationships and rent-seeking behaviors exist alongside rational legal bureaucratic systems and rent-seeking structures of the government (Englebert, 2000).

Pitcher et al. (2009) provide a cruder interpretation of patrimonialism and neo-patrimonialism, highlighting their influence on trust, reciprocity, and material exchanges. They argue that patrimonialism can distort power, corrupt authority, and fuel personal aggrandizement within larger political institutions such as bureaucracies and states. This phenomenon is particularly

pronounced in third world economies. Political scientists have recently used Weberian patrimonialism to explain political co-optation and control in the absence of coercive authority (Crouch, 1979). Again, Rudolph and Rudolph (1979) argued that patrimonialism is prevalent in all bureaucracies, although they differ in the degree of dominance. Theobald (1982) states that many societies classified as patrimonial exhibit, to varying degrees, the characteristics of the pre-modern empires described by Weber and others as having disarticulated economies with sizable non-monetized sectors, poor communications, high levels of illiteracy, and a general scarcity of resources (including skilled labor).

Nonetheless, Pitcher et al. (2009) calls out the misinterpretation of Weber's definitions of power by previous scholars and the distorted view of third-world economies, and more specifically, the description of African states as patrimonialism or neo-patrimonialism. In their view, based on the case study of Botswana, they provide a distinction between regime type and authority, stating that Botswana is patrimonial and yet democratic, and there is no cause-and-effect relationship between authority and regime type, as patrimonialism in the country does not directly lead to any one regime type and does not prevent the creation of a democracy by leaders determined to do so. Pitcher et al. (2009) further noted that Weber's patrimonial concept also denoted legitimate authority, involving reciprocity and voluntary compliance between rulers and the ruled. This approach allows subjects to check rulers' actions, which most scholars of (neo)patrimonialism have overlooked. In other words, different types of authority can exist within various regime types and the presence of a particular type of authority does not necessarily determine the nature of the regime. Furthermore, Diamond (2002) earlier provides a simplified explanation that authority refers to the different authority that individuals or groups may have in each state or society whose sources can vary widely, including legal authority (based on laws and regulations), traditional authority (based on customs and historical legitimacy), and charismatic authority (based on the personal appeal and charisma of a leader). Political regimes relate to how positions of power are filled within a state and the extent to which citizens are allowed to participate in that process.

On the other hand, a government is just one component of the regime and has a more limited definition as a public institution comprising a select number of decision-makers who oversee and organize the implementation of authoritative political choices. Regimes determine the

organization and decision-making processes of governments as well as how they exercise their authority. Various governments can replace each other under the same regime if they adhere to the established rules for exercising state power. Regimes have a similar relationship with the state: regimes can change, but the state remains a relatively permanent collection of public administrative, enforcement, and judicial organizations that assert and typically hold a monopoly on the authority to make legally binding decisions for a particular territory (Fishman, 1990).

Thus, this study adopts the thinking that the concept of authority (patrimonialism) and government is different from political regimes and conceptualizes the authority and system of government as a subset within the broader elements of a political regime. The primary focus is on how the broader nature of political regime had influenced COVID- 19 mortality and infection rates in Africa.

3.3 Definition of Democratic and Nondemocratic Regimes

Przeworski et al. (2000) and Alvarez et al. (1996) define democracy based on Joseph Schumpeter's minimalist view as a regime in which leaders are chosen through contestation and where incumbent political actors have lost to those in opposition. For a regime to be classified as democracy, contestation should therefore meet the following conditions: (1) ex ante uncertainty, (2) irreversible consequences after the fact, and (3) the possibility of repetition. Ex-ante uncertainty refers to the likelihood, however small, that at least one member of the current ruling group will be defeated in a specific election cycle. Uncertainty does not have the same meaning as unpredictability, as electoral chances are often characterized by a specified probability distribution. Uncertainty in outcomes arises when there is a possibility for incumbent political actors to experience defeat. Thus, anything else that does not satisfy the definition of democracy and contestation is a nondemocracy, without worrying about the many terms and forms that nondemocracies or regimes may take, as noted by Larry Diamond in his paper *Thinking About Hybrid Regimes,* which stipulates that there are cases of ambiguous regimes that have sprung out during the third wave of democratization (Diamond, 2002).

3.4 Theories of Political Regime Change- (Dependent and Independent Variables)

Brandvoll (2002) explains that when examining the development of political regimes, it is essential to consider two separate time periods characterized by unique processes: the acquisition

of power and the retention of power. Put simply, there are two branches of theories; on one hand, regimes are interpreted as independent variables perceived in the form of political elites who consists of members from the executive and legislative branches, as well as key figures from political parties. who play a crucial role in shaping the political agenda, proposing solutions, and influencing policy decisions and their implementation (Steen,2019). Other scholars also project political regimes as autonomous variables that influence other socio-economic human development and public health factors (Krasner, 1982). On the other hand, political regimes are regarded as dependent variables formed based on other factors. Therefore, the transition and consolidation theories that arose and became popular during the third wave of democratization post-World War II during the 1980's that explain what causes and facilitates a shift from a dictatorship regime to a democracy regime based on the fundamental normative stance that democracy is the most desirable form of political regimes. This chapter discusses both aspects of political regimes as influencers and as a result.

3.4.1 Functionalist and Genetics Theories

According to the functionalist view, democracy is associated with the level of socioeconomic growth due to its emphasis on structures. The more economically developed a country, the more likely it is to be democratic and sustain democracy. These assertions were made in Seymour Martin Lipset's book *Political Man: The Social Bases of Politics*. Lipset (1960) discovered a strong association between socioeconomic development indices and the degree of democracy, a finding that was subsequently confirmed and elaborated upon by other researchers (Huntington, 1993; Smith, 1969). According to Cutright and Wiley (1969), economic development has precedence over social development and democracy. The level of socio-economic development is measured by the proportion of a country's population that is classified as middle class, educated, and actively engaged in civil societies. These factors help balance the concentration of political power and foster collaboration and participation, which are essential elements of a democratic regime.

However, functionalist theory is subject to criticism because not all countries that rank highly in economic development indicators are democratic. The cases in point are countries in the Middle East, Africa, and Asia. Countries such as India, Costa Rica, and Botswana have maintained democracy for extended periods by emphasizing tolerance, participation, and inclusion in their

political cultures. They have also developed strong civil societies and delivered significant improvements in human development (Diamond, 1992). In addition, criticism of functionalist theory was highlighted in the context of the lack of change in political regimes in Russia. In contrast to past revolutions where independent economic factors have frequently been seen as catalysts for democratic transformation, in Russia, for example, these economic interests have frequently served as catalysts for the perpetuation of authoritarianism (Brandvoll, 2002).

Thus, critics of functionalist theories allude to the fact that economic factors and structures alone cannot influence changes in political regime. The functionalist approach hinges on the deterministic view that socio-economic components alone should be stable and conducive elements for democracy to develop while ignoring the importance of contingency and the dynamic features of political players involved and their aims, strategies, and alliances (Karl & Schmitter, 1991). The focus of the role of political actors coined the development of genetic theories based on the work of O'Donnell et al.(1986) highlighted that political leaders are more likely to consciously choose to initiate democratization at times of intense regime crisis. When political leaders understand that they risk losing power unless they compromise, they decide to include the democratic aspects. This compromise is perceived as the second-best choice by those involved, yet it happens when no single group can dominate decision making.

3.4.2 Democracy causes growth

Acemoglu et al. (2019) used empirical evidence based on a panel data set of 183 countries in the world spanning the years 1960 to 2010, observing and classifying them as 45 democracies, 45 non-democracies and the rest fluctuating transition between democracy and non-democracy. They concluded that countries that were democratic and partially democratic experienced about 20 to 25 percent growth in real GDP per capita over the course of the following 25 years, compared to countries that continued to be non-democratic. The impact of democracy was not contingent upon the starting degree of economic development; however, there is some indication that democracy was more favorable for economic growth in nations with higher levels of secondary education.

Acemoglu et al. (2019) highlight the temporal dimension of democracy and economic growth, recognizing that the effect of democracy on economic growth may not be immediate and can evolve over time. This finding underscores the limitations of this study, as changes in democracy

and economic conditions can influence each other across various time frames, rather than being viewed in isolation or at a single point in time. The use of cross-sectional time-series data, including lagged democracy and other independent variables in the regression model, further emphasizes this complexity. Therefore, researchers should not only control the immediate determinants of growth but also consider the broader effects of democracy on these intermediate variables.

3.4.3 Democracy and Human Development

Democracy, unlike any other political regime type, is believed to improve the social well-being of its populace, including aspects of increased life expectancy. For a considerable while, scholars have held the belief that improvement in human development indicators and public health have been a joint result of economic development and democratic regime, where democracy provides an upper incentive for growth of public sector in response to voters' demand for services, unlike autocracies, where growth in the public sector remains small (Besley & Kudamatsu, 2006 ; Boix, 2001; Lake & Baum, 2001;Lipset, 1993; Przeworski ; 2000; Wickrama & Mulford, 1996).

Previous research has also indicated that wealthier democratic countries tend to have more robust populations, longer life expectancies, and allocate greater resources to healthcare (Cutler et al., 2006; Hall & Jones, 2007; Baltagi et al., 2017; Mackenbach et al., 2013).

3.4.4 Democracy and COVID 19 Outcomes

Recent empirical studies on the association between regime type and COVID-19 Response indicate mixed findings, showing that each system of governance has distinct strengths and shortcomings in handling external calamities. Autocracies concentrate on authority, enabling swift decision-making, although their capacity for secrecy enables them to withhold information and overlook issues. Enhanced transparency in a democracy can make it difficult to conceal a threat, although the dispersion of power within a democracy may result in a delayed and possibly inadequate response (Stasavage, 2020).

A research done by Alon et al.(2020) explored how different types of government regimes responded to the COVID-19 pandemic. They analyzed data from 150 countries and found that democracies generally had more effective responses than authoritarian regimes. Democracies

were quicker to respond to, more transparent, and better at implementing measures such as testing and contact tracing. This could be because democracies are more accountable and responsive to public opinion and have stronger governance institutions. Overall, this study asserts that regime type plays a significant role in shaping countries' responses to the pandemic.

A preliminary analysis conducted by Bunyavejchewin and Sirichuanjun (2021) explored the relationship between regime type, governance quality, and policy response to the pandemic. They analyzed data from 32 countries and found that the type of regime influences how governments handle the pandemic, particularly in terms of general policy responses. While regime type did not directly affect public health or financial measures, it significantly affected governmental communication and accountability during the pandemic. However, this did not mean that democracies were inherently better at managing the pandemic; rather, certain characteristics of the regime played a role. Democratic countries with higher governance quality tend to have more effective responses. These countries implemented policies earlier, were more transparent, and had better implementation of COVID-19 measures, such as testing and contact tracing. Even non-democratic regimes, such as China, prioritize public health interventions to demonstrate their efforts to protect citizens from the virus to maintain legitimacy during the outbreak. Overall, it was noted that the aspect of good governance and government effectiveness played a more significant role in shaping outcomes. However, the impact of governance quality varies across different aspects of a pandemic response.

Similarly, Piazza and Stronko (2020) examine the relationship between political regime type and the effectiveness of public health policies in response to COVID-19 Pandemic. Their results showed that, regardless of the type of political regime, there is no significant relationship between the type of government and the strictness of the public health policies adopted. This means that neither democratic nor authoritarian governments consistently had more stringent policies. Additionally, their study suggested that efficacy should be viewed in two ways: policy stringency and policy responsiveness. Specifically, it was observed that “Free” countries, according to Freedom House's classification, tend to have slower policy responsiveness compared to partly free or not free countries and stronger civil society traditions (indicating participatory elements of democratic governance) are associated with slower policy responsiveness. In summary, Piazza and Stronko (2020) concluded that while political regime type does not consistently predict the

strictness of public health policies, it does affect how quickly governments respond to pandemics. Authoritarian regimes tend to adopt stringent policies more quickly after notable virus exposure than democratic countries do.

Conversely, a study by Karabulut et al. (2021), based on data analysis from 191 countries worldwide, found that when examining the correlation between five democracy metrics and the impact on COVID-19 infection rates, revealed that infection rates tend to be higher in more democratic countries. However, their case fatality rates were lower.

Cukierman (2021) provides insight into the relationship between regime type, population age, and stringent measures. An analysis across 160 countries revealed that democracy might contribute to higher COVID-19 death rates, implying that less democratic regimes handle the pandemic more effectively. However, upon closer examination and when accounting for the proportion of older individuals in the population, democracy's influence on deaths becomes insignificant, while age emerges as a significant factor that positively impacts mortality rates. This indicates that the apparent association between democracy and death is primarily driven by a larger proportion of elderly individuals in democratic countries.

Matuszak (2021) added to the discourse on the health impacts of democracy by utilizing excess mortality rates as an indicator of the seriousness of the COVID-19 outbreak. Utilizing this method, his study demonstrated that the magnitude of the pandemic is significantly underreported in authoritarian nations when relying on confirmed COVID-19 fatalities. Democratic countries have notably lower excess mortality rates than non-democratic countries. However, no significant disparities were observed among political regimes when analyzing confirmed COVID-19 deaths. Mutuszak (2021) highlighted the need to choose suitable markers to assess the severity of the pandemic between regime types.

The literature on democracy and the COVID 19 pandemic lack specific analysis or mention of how different types of governance have affected the COVID-19 response specifically within African countries. While various studies have explored the relationship between regime type and COVID-19 response globally, there is no specific discussion about the African context.

3.5 Categorization of Political regime

There are numerous discourses on how to assess political regimes, the dimensions that constitute the definition of regimes, whether measures of regime types should be continuous or categorical, and whether inputs into distinguishing political regimes should be observable or normative elements. One pertinent topic is whether the classification of political regimes is simply a dichotomous system, distinguished between dictatorship and democracy or a polytomous system by varying the intensity of a regime type on a continuum scale (Cheibub et al., 2010).

One of the earliest definitions of a democratic political regime was provided by Joseph Schumpeter in his work on *Capitalism, Socialism and Democracy* in 1942. Schumpeter provided a simplified and empirical view of democracy (political regime) as a way of selecting rulers through disputed elections (Schumpeter, 2013). This definition continued to evolve further to define the circumstances operationalizing the state of the term democratic regime as only when three electoral procedural conditions are met: uncertainty in election outcomes, winner-entering office, and regular, known elections (Przeworski, 1991).

Notwithstanding the empirical and procedural definitions of a democratic regime founded on political contestation, Dahl (2008) in his book. *Polyarchy. Participation and Opposition* argue that political regimes should not only be defined by one dimension of political rights, which focuses on periodic public contestations and elements that measure fairness in elections, similar to Schumpeter's view of democracy, but should also include attributes that measure political liberties and inclusiveness. This notion is further supported by Bollen (1990), who states that the evaluation of political rights commonly involves an analysis of several attributes of the election system. Political rights encompass various aspects of the democratic process, such as the choice of leaders by electoral means, equitable distribution of voting power, inclusivity of the franchise, transparency of candidate selection procedures, fairness of elections, representation of diverse interests in elected positions, and punctuality of electoral cycles. On the other hand, political liberties encompass the degrees of freedom possessed by individuals within a given political system. It involves attributes such as the autonomy of the press, the liberty of individuals or political factions to express dissent towards governmental policies or officials, and the nonexistence of political censorship. Bollen (1990) states that political rights and political liberties are both mutually reinforcing elements of a political regime, and that one cannot exist without the other.

3.5.1 Dichotomies versus Continuous Concepts of Political Regimes

How do we distinguish a democratic regime from any other type of regime? Scholars conceptualize that if it is not democracy, then it is simply an autocracy (Alvarez et al.1996; Cheibub et al. 2010; Huntington, 1991; Przeworski et al. 2000). Political regimes, therefore, should be approached as a binary construct, characterized by a dichotomy between democracy and autocracy. According to Przeworski et al. (2000), democracy cannot exist in a partial or incomplete state but can vary in its level of advancement. They argue that there is a definitive starting point for democracy that serves as a natural baseline. Cheibub et al. (2010) also refute the notion of a partial democratic political regime or the middle ground existing between democracy and dictatorship; however, they concur that many sub-forms of both systems can be identified. Sartori argues that approaching the differentiation of democracy and nondemocracy in a continuum is an intellectually limiting endeavor, referred to as degreeism. This approach fails to acknowledge the fundamental concept that political systems are cohesive bundled wholes with defined boundaries (Giovanni, 1987). Additional researchers have embraced the duality concept of political regimes in their respective studies (Linz, 2000; Geddes,1999; Huntington, 1993).

On the other hand, Bollen (1990) contended that democracy should be viewed as a continuum rather than a binary concept. Building on the polyarchy views of Dahl (2008), Bollen (1990) states that dichotomy unnecessarily compromises the measurement of countries that are near borderline and ignores the various degrees of democratization in comparing countries. Bollen (1990) further states that grading and ranking systems are more appropriate for assessing the varying degrees of democracy or nondemocracy, as opposed to dichotomous categorization. Other scholars, such as Elkins (2000) and Hadenius (1992), support the idea that the adoption of a continuum measure implies that continuous measures generally exhibit higher levels of validity and reliability, and reveal interesting incremental effects that are sometimes obscured in lumping-up classification in the form of a dichotomy. Similarly, Midlarsky (1997), quoted and built on the work of Coppedge and Reinicke (1990), observed that when conducting cross-national assessments to evaluate the factors influencing levels of polyarchy, varying outcomes arise based on the specific threshold used to establish a binary measure of polyarchy. Thus, limiting the analysis to a singular dichotomous cutoff point may conceal possible conclusions.

Amidst the debate on the right measurement of political regime, dichotomous versus continuous, Collier and Adcock (1999) point out that there may not be a consensus on the single best way of defining and measuring democracy and the concept of political regime; however, they argue that the decision to use continuous or dichotomies is often inherent in the conceptual framework adopted by researchers. The selection of a concept is crucial, as it can significantly influence empirical research outcomes, and as such, the responsibility for providing evidence of choice of measurement should be placed on more targeted arguments connected to research objectives.

Collier and Adcock (1999) advocated the use of underlining theoretical justifications to support the achievement of study objectives. Among other justifications, they outline the following cases, which supports my inclination towards a dichotomous or continuous approach to studying political regimes:

a) Context Specific Approaches

Bollen and Jackman (1989) suggest that the method of classification of political regimes should be in tandem with the definition of democracy as conceptualized within the period in which the research covers, noting that what constitutes full democratization has changed over time. For instance, the comparison of regimes between full democratization and no democratization differed between the 19th and 20th centuries in relation to the norms relevant in those times. In the late 20th century, the inclusion of universal suffrage and safeguarding of civil rights for the entire population of a nation was commonly regarded as a fundamental component of democracy. Conversely, during the 19th century, these aspects were not considered essential (Huntington, 1993). Russet (1994) also explains that to solve the problem of equivalence when comparing democratization across countries and historical periods, the adoption of norms relevant at those specific times allows for the inclusion of inconvenient facts that would otherwise be ignored.

b) Empirical Distribution of Cases

The empirical distribution of the research subjects can influence the choice of concepts and methods. In each context, a gap may exist between democracy and nondemocracy, with observed political regimes having or lacking the most defining attributes of democracy. The dichotomy approach may provide a summary of these contrasts. However, the use of a dichotomy does not necessarily reject a graded approach, but rather evaluates the hypothesis that regimes cluster in

this manner (Collier & Adcock, 1999). Huntington (1993) illustrates that an increasing number of countries are situated in an intermediate position. Therefore, there has been an increased emphasis on the concept of a "democratic-nondemocratic continuum," wherein a rising proportion of nations find themselves positioned within the intermediate range. Diamond (2002) presents a similar point, stating that hybrid regimes, characterized by the amalgamation of democratic and authoritarian components, are more common phenomena, as much as they have a historical precedent. Diamond (2002) illustrates instances of political regimes such as Mexico, Singapore, Malaysia, Senegal, South Africa, Zimbabwe, and Taiwan, which have electoral processes in place; however, these electoral processes are characterized by a lack of democratic principles, evident in restricted party competition primarily involving the elite and limited suffrage. Thus Diamond (2002) perspective on democracy suggests that it is more advantageous to conceptualize democracy as a continuum with a diverse array of degrees and manifestations.

c) Sharper Differentiation and Use of Sub Types

Collier and Adcock (1999) explored the significance of achieving a higher level of precision and nuanced differentiation in the comparative analysis of democracy. To accomplish this objective, the authors proposed two strategies.

The initial approach involves employing an ordinal scale that encompasses a restricted range of categories, wherein each category is assigned a distinct designation. The author provides an illustration of Coppedge and Reinicke (1990) utilization of the Coppedge-Reinicke scale modified from Dahl (2008) polychoral concept, wherein terms such as "dominant party regimes" and "multiparty nondemocratic regimes" are employed to classify categories that possess only limited democratic characteristics. The utilization of these names provides a greater amount of information than numerical scores, thereby augmenting the ability to distinguish and discern the specific nature of "more of what." The Alvarez, Cheibub, Limongi, and Przeworski (ACLP) index uses a nominal measurement of democracy, classifying countries as autocracies or democracies, and further subcategorizing them into presidential, parliamentarism, bureaucracies, autocracies, and mixed. The ACLP index covers 141 countries between 1950 and 1990 (Alvarez et al., 1996).

The second strategy emphasizes categorization while also incorporating gradations through the utilization of diminished subtypes. The subtypes, such as semi democracy, serve to illustrate a continuum departing from complete democracy by emphasizing the absence of certain

characteristics. An instance of male democracy can be understood as a situation where women's suffrage is absent, while controlled democracy refers to instances where contestation is restricted. Similarly, "illiberal democracy" suggests a condition in which civil liberties are weakened. The names of these subtypes offer explicit information on the absence of attributes (Collier & Adcock, 1999).

However, Collier and Levitsky (1997) acknowledge a potential downside of the second strategy: the risk of creating too many subtypes, which could lead to conceptual confusion and negate the benefits of sharper differentiation. They state that the phenomenon of democratization on a global scale has resulted in researchers enhancing analytic differentiation, involving the creation of democracy with adjectives such as authoritarian democracy, neo patrimonial democracy, military-dominated democracy, and prodemocracy to capture diverse forms of democracy and risk conceptual stretching, away from Schumpeter (2013) and Dahl (2008) conceptual validity and standardization of the procedural definition of democracy .

In summary, since democratization indices are subject to considerable measurement differences, the study adopted a more minimalist approach to categorization, taking into account the context and state of democracy of African states and the distribution of cases as provided by Collier and Adcock (1999). The concept of the extent of democratization in Africa is summarized in Section 2.1.

3.6 Measures of Democracy

Högström (2013) provided a chronological description of how scholars have developed various methods to measure democracy. The Högström (2013) analogy began in the late 1950s, when democracy was measured in the form of the dimension of stable democracies and unstable dictatorships by Lipset (1993), classifying 48 countries from European- and English-speaking countries and Latin American countries into two categories using factors such as economic development, political legitimacy, democratic institutions, civil liberties, political stability, and rule of law. During the initial years of the 1960s, Cutright (1963) expressed criticism of Lipset's failure to design a continuous scale measure of political regimes and consequently designed the Index of Political Development that operates on a continuous scale using data from the legislative and executive departments of government of 77 countries in which African countries were excluded. In subsequent decades, various indicators and measures were invented to measure

democracy based on different dimensions and variables on dichotomous and continuous scales, including Jackman (1973), who focused on four variables of voter turnout: competitiveness of the party system, electoral irregularity, and freedom of the press as democracy indices; Bollen (1979) on political liberties and popular sovereignty as the only measurement for political democracy; the Polyarchy Scale, which draws upon Dahl's (1971) notion of polyarchy: The Alvarez, Cheibub, Limongi, and Przeworski (ACLP) index used a nominal measurement of democracy, focusing on contestation; Economist Intelligence Unit's (EIU) Democracy index developed in the 2000s, consisting of five dimensions: electoral process and pluralism, civil liberties, the functioning of government, political participation, and political culture. Högström (2013) concluded that for all the measures developed in the past two decades, Polity IV and Freedom House measures remain the most widely used measures today.

3.6.1 Freedom House, Polity IV and Economist Intelligence Unit Democracy Measures

Freedom in the World (2022) states that Freedom House has been a comprehensive assessment tool used to evaluate the level of democracy in different countries on an annual basis since 1972. This measure consists of two primary dimensions: political rights and civil liberty. Political rights are derived from three distinct subcategories: electoral processes, political plurality and participation, and the functioning of the government. Civil freedoms encompass four distinct subcategories: freedom of expression and belief, associational and organizational rights, rule of law, personal autonomy, and individual rights. The Freedom House index has a numerical scale ranging from 1 to 7, where the maximum score for political rights is 40, and the maximum score for civil liberties is 60. The classification of freedom status encompasses three distinct categories: free, partly free, and not free. This categorization can also be employed to assess the level of democracy using the same three-tier framework. Nations exhibiting a collective mean average ranging from 1.0 to 2.5 on indicators measuring political rights and civil freedoms are categorized into three classifications: free, partially free, and not free. The Freedom House index can be used as a metric ranging from 2 to 14 by aggregating the scores assigned to political rights and civil liberties (Högström, 2013).

The Polity IV dataset is a comprehensive compilation of data concerning the political characteristics of independent states with populations above 500,000 inhabitants, encompassing the period 1800 to the present. The dataset consists of two main indices, democracy (DEMOC)

and autocracy (AUTOC), which are evaluated on an ordinal scale using five categorical variables. The indicators contain several key aspects, including the competitiveness and openness of executive recruiting, the limitations placed on the chief executive, the regulation of participation, and the level of competitiveness in participation. The Polity variable is often derived by subtracting the autocracy index from the democracy index, yielding a spectrum of values ranging from 210 (indicating a high degree of autocracy) to 110 (indicating a high degree of democracy).

According to the Economist Intelligence Unit website, EIU democracy index is divided into five dimensions: the election process and pluralism, civil freedoms, government performance, political involvement, and political culture. The index is based on ratings of 60 indicators across five dimensions. The EIU index of democracy ranges from 0 to 10, and the 2010 index includes 165 independent nations and two territories. This measure also employs an ordinal scale to classify regimes into four categories: full democracies (scores of 8–10), imperfect democracies (6–7.9), hybrid regimes (4–5.9), and authoritarian regimes (scores of 4 or below). The EIU index covers 165 countries (Economist Intelligence Unit, 2022).

Scales for Freedom House and EIU can be reclassified as dichotomous or trichotomous measures; democratic countries are considered free, while partially free and not free countries are categorized as nondemocratic. According to the Freedom House categorization of the trichotomous scale, free countries are labeled as democracies, partly free countries as semi democracies, and not free countries as nondemocracies. In reference to EIU, full democracies with scores ranging from 8 to 10 and imperfect democracies with scores from 6 to 7.9, are classified as democracies, while hybrid regimes with scores from 4 to 5.9, and authoritarian regimes with scores below 4, are classified as nondemocracies based on the EIU index coding of a dichotomous measure. When creating the trichotomous measure with the EIU, full democracies and imperfect democracies with scores between 6 and 10 were labeled as democracies, hybrid regimes with scores between 4 and 5.9 as semi democracies, and authoritarian regimes with scores below 4 as nondemocracies.

It is noteworthy the dataset supplied by Freedom House (2010a) includes a comprehensive collection of data on 54 African countries from 1972 to 2022. In contrast, the dataset used for the Polity IV index in 2018 covers a smaller number of countries, specifically 42 African countries concentrated in the sub-Saharan area, and spans 1955 to 2018. Given the extensive breadth of this

study, which encompasses all 54 member countries in Africa, and the longitudinal approach that specifically examines the period from 2020 to 2022, it is evident that the Freedom House is a more suitable choice as a metric for assessing democracy.

Högström (2013) states that there is a strong correlation between measures of democracy indices. By comparing the three indexes using correlation matrices, Högström (2013) found that significant association exists between EIU and Freedom House, with a correlation coefficient of .931. The relationship between Freedom House and Polity IV was the second strongest at .878, while the weakness association was between EIU and Polity IV at .840. It is reasonable to anticipate that EIU and Freedom House yield comparable outcomes when employed in empirical investigations, but nonetheless note that there may be notable differences in the outcomes pertaining to statistical significance and the explanatory capacity of cross-national statistical analyses. Some scholars have criticized Freedom House as a potentially biased assessment, suggesting that it may exhibit a tendency to perceive countries with political affiliations to the United States as more democratic than those without such affiliations (Steiner, 2016). Therefore, conducting a replication and comparisons of the study findings using an alternative measure of democracy within the same group of nations can provide reassurance regarding the validity of the results obtained in this study (Cheibub et al., 2010). Hence, this study aimed to strengthen the findings of Freedom House by utilizing the EIU (2023) for robustness of results.

3.7 State Capacity and Government Effectiveness

Serikbayeva et al. (2021) equates state capacity with "governance" and stresses its significance in effectively addressing crises like natural disasters and pandemics, as well as mitigating the impact of strained health systems on mortality rates.

Their article, "State Capacity in Responding to COVID-19," examined various independent variables associated with state capacity, including bureaucratic quality, government efficacy, regulatory quality, rule of law, and control of corruption. Bureaucratic quality relates to civil service competence, covering recruitment, retention policies, merit-based promotions, and staff competency. Government effectiveness assesses the quality of public services, policy implementation, and political stability. Regulatory quality evaluates a government's ability to formulate and enforce effective policies and regulations. The rule of law measures the extent to which the government and individuals adhere to the law, along with the effectiveness of the law

enforcement and justice systems. The control of corruption gauges the extent to which public power is used for private gain and the effectiveness of anti-corruption measures. Data from the World Bank's Worldwide Governance Indicators were used to analyze these variables and their correlations with COVID-19 pandemic outcomes (Kaufmann et al., 2011; Kraay et al., 2010).

State capacity and government effectiveness are often used interchangeably, as they both indicate a state's ability to adopt successful and efficient policies. According to scholars, such as Lee and Whitford (2009) and El-Taliawi and Van Der Wal (2019), government effectiveness is a subjective construct evaluated as part of the World Bank's Government Effectiveness Index, reflecting the perceptions of various respondents.

Painter and Pierre (2004) defined state capacity as the ability to effectively mobilize resources to make informed collective decisions, particularly in setting strategic objectives for resource allocation toward public goals. Some individuals have also maintained this relatively limited emphasis but have incorporated supplementary abilities and assets, such as those related to obtaining and employing policy-relevant knowledge, the capacity to formulate alternatives, the utilization of both qualitative and quantitative research techniques for policy issues, the proficient use of communication, and strategies for managing stakeholders (Howlett, 2009).

Scholars such as Holmberg and Rothstein (2012) emphasize systemic and structural factors such as honesty, rule of law, societal trust, and legitimacy as crucial elements of policy capacity and effective governance.

Fukuyama (2013) defined state capacity as the government's capability to create and implement regulations and provide services, regardless of its democratic status. Hanson (2015) suggests a positive correlation between state capacity and development outcomes, regardless of regime type, indicating that even non-democratic regimes can benefit from high state capacity and enhance their legitimacy.

3.7.1 Linkages between State Capacity, Government Effectiveness and Public Health Outcomes

Ciccone et al. (2014) provide a comprehensive review of the scholarly literature on the connections between governance processes and health outcomes in low-income and middle-income countries. Several studies have shown that governance has a moderating effect, meaning

that governance mechanisms influence other systemic processes or structures that enhance health. Some notable studies are summarized in this section.

A study conducted by Strand et al. (2008) on the influence of several governance parameters on HIV/AIDS outcomes and measles immunization for children in 42 sub-Saharan African countries revealed that government effectiveness and quality of institutions accounted for around the strongest association at 31.3 percent of the improvements in the provision of Antiretroviral therapy (ART) coverage for children and measles immunization among other control variables such as degree of democracy and AIDS governance.

Atkinson and Haran (2004) studied the influence of decentralization on the performance of health systems in Brazil and noted that decentralization and less formal systems are not by themselves linked to enhanced patient satisfaction, increased vaccine coverage, higher attendance of antenatal care, improved clinical productivity, and greater consumption of healthcare services, but are not associated with worse performance. Nevertheless, implementing decentralization without considering local political culture, which encompasses the level of community involvement and attitudes that align with the promotion of well-being, may prove unsuccessful. Formal systems such as bureaucracy or decentralization alone are insufficient to improve the performance of local health systems. Instead, there is a need to address the management culture and the relationship between the local health system and local political culture.

Olafsdottir et al. (2011) tested the correlation of governance variables defined by the World Bank Governance Index and the Mo Ibrahim Index of African Governance, and their effect on public health outcomes as measured by infant mortality rates in 46 African countries in the WHO African region. Aspects of accountability, control of corruption, political stability, and sustainable economic opportunities were modeled against infant mortality rates, and it was found that even though all the governance variables were positively associated with lower infant mortality rates, the extent to which the government provided sustainable economic opportunities to citizens had the strongest association with reduced infant mortality rates.

Ortega et al. (2017) and Hu and Mendoza (2013) concluded that countries with lower margins of income inequalities and overall effectiveness of governance, as assessed by the level of corruption control and the competence of bureaucratic processes, significantly contribute to diminished rates of mortality among infants and children.

Other studies focused more on how the effectiveness of health regulation implementation by decision-making bodies is influenced by the degree of participation, transparency, and use of key actors termed as policy entrepreneurs who in facilitating the uptake of policy or in moving the policy-making process forward. Policy entrepreneurs play a significant role in determining the extent to which policymaking contributes to better health outcomes (Hutchinson et al. 2011). Harries et al. (2011) discovered that effective translation of research on cotrimoxazole preventive therapy into national policy led to decreased HIV-related mortality and improved TB cure rates in Malawi through policy entrepreneurship and successful implementation. Taylor et al. (2009) conducted a case study comparing South Africa's responses to tobacco and AIDS epidemics, attributing the divergent outcomes to differences in policy approaches and lack of policy commitment in issues related to HIV/AIDS. While South Africa significantly reduced national per capita cigarette consumption and implemented effective tobacco control measures, its response to HIV/AIDS remained fragmented and gradual and hindered by issues such as gender inequity, sexual violence, poverty, and stigma.

The capacity of governments to demonstrate political dedication to combating the AIDS epidemic was influenced by both political determination and the requisite competencies to effectively address the issue. Thid highlights the primary function of the state as to effectively organize and implement various initiatives and policies, including those that may potentially challenge prevailing local perspectives and beliefs, such as the introduction of safe sex education and social marketing of condoms in Uganda, which were contrary to cultural norms (Green et al., 2006).

3.7.1.1 Impact of Governance Structures on COVID-19 Public Health Outcomes

The COVID-19 pandemic has highlighted the importance of decision-making processes, accountability mechanisms, and the distribution of power and resources in shaping responses to public health emergencies. This section reviews studies that explain how different governance structures affect pandemic outcomes.

a) Role of Decision-Making Processes: Boin et al.(2020) highlighted the variation in decision-making processes across countries during the COVID-19 pandemic. While some countries relied on politicians to make decisions, others mostly relied on scientists and public health experts. Similarly, Hatcher (2020) emphasized the dangers of misinformation regarding the COVID-19 pandemic and the need for accurate and

science-based decision-making processes. Gonsalves and Yamey (2020) argued that political interference in public health science, as exemplified by the Trump administration's science denialism, leads to delays in implementing effective pandemic responses.

b) Role of the Distribution of Power and Resources: Shvetsova et al. (2021) found that decentralization and federalism are associated with a stronger overall public health pandemic response. However, Del Bo (2021) claims that higher degrees of political decentralization can be associated with higher deaths, as unitary systems with more centralized systems are better able to design effective containment policies and consolidate public responses. Knaul et al. (2021) highlight the impact of populist leadership on public health outcomes in India, the United States, Turkey, Russia, the United Kingdom, and Canada. The authors argue that the distribution of power and resources is critical in determining the response to public health emergencies, and that populist leadership can undermine effective pandemic responses.

c) Personality and Gender of the head of State: Park (2022) found that higher levels of gender representation in legislatures and executive branches of government are associated with better COVID-19 outcomes in terms of infections and deaths. The authors caution that the results have some caveats, including lack of external validity and small sample size, but the findings suggest that women leaders perform better in countries where they hold majority positions in either the legislative or executive branches. However, Aldrich and Lotito (2020) did not find reliable evidence of policy differences between men and women in response to the pandemic. Interestingly, they found a negative relationship between the share of women in legislatures and school closures, indicating that women policymakers may place a higher social and economic value on keeping schools open. For each percentage increase in the proportion of women in the legislature, the risk of school closure decreased by 0.98 percent.

Yamanis et al. (2023) stated that one significant factor was the change in the head of state personality and ideologies from a president who denied the effectiveness of vaccines to a president who embraced them and promoted transparency. This shift in leadership stance

has influenced public perception and acceptance of vaccines. Similarly, Hatcher (2020) conducted a study in the United States of America that examined how political figure like President Trump's perception and, consequently, communication on the pandemic response was dangerous and misleading. The study analyzed The Washington Post's database of over 10,000 misleading statements by President Trump and found that they had problems factually discussing the pandemic. Statements such as "The problem is going to disappear" caused delays in response to the pandemic, while statements like "Democratic Hoax" made it less likely for people to comply with public health safety measures. In Africa, President Magufuli's decision to suspend all COVID -19 surveillance activities in Tanzania in May 2020 and the promotion of traditional remedies and prayers as alternative mitigation of the pandemic disrupted effort by district medical officers to advance WHO containment measures and public reception of such measures (Saleh, 2020).

Thus, we see that decision-making processes, accountability mechanisms, and the distribution of power and resources are critical factors in determining the response to public health emergencies. While decentralization and federalism can be associated with a stronger pandemic response, higher degrees of political decentralization can lead to higher mortality rates. Populist leadership and political interference in public health science can undermine effective pandemic responses. Gender representation in the government is another important factor that can impact public health outcomes, but not in all settings. Effective governance structures are needed to ensure that public health emergencies are managed effectively.

This study adopts a comparable line of reasoning on the impact and tests the hypothesis of the extent to which state capacity and government effectiveness as measured by African countries influence COVID-19 infection and mortality rates measured by efforts to reshape potential human behavior and reestablish societal norms during the pandemic period.

3.8 Other Factors That Contribute to Effective COVID-19 Pandemic Response

3.8.1 Economic Development: Health Spending and GDP per Capital

According to Van den Bergh (2009), real GDP per capita, measured in purchasing power parities, plays a crucial role in assessing the economic status of a country over time or in comparison with

others. It is often used as a proxy for social welfare, as indicated by the commonly used term "standard of living." Despite the lack of solid support from macroeconomic theories regarding the welfare implications of GDP and rising criticism of its shortfall as a measure of social welfare[3], its utilization has become a customary practice and nevertheless received significant global emphasis as a measure of comparable economic growth with international agencies such as the IMF and the OECD, highlighting its importance.

However, there have been some empirical studies that broadly link GDP per capita and health expenditure as proxies of economic status to improvements in public health outcomes. Lago-Peñas et al. (2013) discovered that health spending is elastic to changes in GDP of a country. By examining how income relates to health spending across 31 OECD countries, specifically looking at short-term and long-term effects, as well as how health care spending adjusts to changes in per capita GDP their findings suggest that health spending tends to move in tandem with income (GDP), especially during economic ups and downs, and this effect is more pronounced in countries with higher private health expenditures.

Çevik and Taşar (2013) conducted a granular study of the link between health spending, GDP, and infant mortality rates. Their study investigated the impact of government healthcare spending on health outcomes in OECD countries. Using cross-sectional regressions, researchers assessed the relationship between child and infant mortality rates and public health expenditures. The findings reveal statistically significant and consistent results across the various model

[3] Gross Domestic Product (GDP) is the total value of goods and services produced inside a country's borders by its residents and foreigners. Van den Bergh (2009) summarizes key broad criticism of GDP as a proxy of social welfare raised by scholars since 1960's as mainly for not adhering to principles of proper accounting, as it fails to differentiate between costs and benefits and neglects changes in stocks and supplies. Additionally, GDP was never intended for welfare measurement, but rather as an estimate of costs associated with economic activities. Intertemporal considerations suggest that GDP growth does not necessarily correlate with social welfare over time. Lexicographic preferences emphasize that GDP growth and material consumption do not adequately compensate for the lack of satisfaction of basic needs. Empirical studies of happiness indicate that GDP does not accurately reflect individual welfare or happiness levels. Income distribution, relative income, and rivalry for status are overlooked by GDP, leading to an overestimation of social welfare. The formal versus informal economy is not adequately captured by GDP, resulting in an overestimation of welfare impact. Lastly, environmental externalities and depletion of natural resources are not factored into GDP calculations, further questioning its validity as a measure of social welfare or progress.

specifications. Specifically, they observe that higher government health spending as a percentage of GDP is associated with lower levels of under-5 mortality, with elasticity values ranging from -0.17 to -0.22. For infant mortality, the elasticity was estimated to be -0.20. Moreover, when government spending is measured as a share of total health expenditures, the elasticities for under-5 mortality range from -0.33 to -0.32, and for infant mortality, they range from -0.23 to -0.32. Additionally, this study identifies several socio-political factors, including law and order, education level, population size, and income level, as significant determinants of health outcomes. Notably, researchers find that while income level remains an important factor, government health spending has a slightly greater empirical significance compared to previous studies.

Arthur and Oaikhenan (2017) limited their study to health expenditure on health outcomes. They investigated the impact of health expenditure on the health outcome variables of life expectancy at birth, infant mortality rate, and under-five mortality rate in sub-Saharan African (SSA) countries by analyzing data from 40 Sub-Saharan countries (SSA) using the Grossman Human Capital Model, focusing on the demand for health. The findings revealed that health expenditure has a significant but somewhat limited effect on health outcomes. While mortality rates were significantly reduced by public health expenditure, private health expenditure played a key role in improving life expectancy at birth.

In regards to COVID 19 pandemic, Pardhan and Drydakis (2021) find a substantial negative correlation (Pvalue = 0.002) between the change in new COVID-19 cases and GDP per capita, even when considering key health indicators such as public health expenditure, life expectancy, tobacco smoking rates, and sanitary conditions in 38 European countries studied from April to May, 2020. The analysis shows that those with higher GDP per capita, such as Luxemburg, had lower increases in new COVID-19 cases, whereas those with lower GDP per capita, such as Ukraine, Bulgaria, and Romania, experienced higher increases in COVID 19 cases. These data indicate that the economic position of a country may be associated with the number of new COVID-19 cases during the early phase of the pandemic in Europe.

In Africa, the results of studies on the relationship between GDP per capita, health expenditure and COVID 19 outcomes are rather mixed. Gaye et al. (2020) estimated that four countries that were first hit by the COVID 19 pandemic in 2020, namely Egypt, Algeria, Morocco, and South Africa, had higher GDP per capita and thus a higher capacity to detect and treat the pandemic

more effectively than other countries in Africa; however, these countries experienced the highest COVID-19 fatalities and cases, signifying that other factors were at play to explain the high incidence of COVID 19 outcomes.

Other studies in Africa looked more broadly at the effects of poverty and economic inequality using the "Gini coefficient as a proxy" against mortality and infection rates during COVID-19 pandemic. Sanusi and Babangida (2023) found that, in Nigeria, states with strong business environments tend to have lower infection rates, while those with greater income inequality experienced more cases. Chitsamatanga and Malinga (2021) explored the impact of the pandemic on South Africa and Zimbabwe and revealed that although there were economic disparities between the two countries, both face similar underlying socio-economic factors such as poverty, unemployment, inequality, slow economic development, inadequate water and sanitation, and food insecurity that have exacerbated mortality and infection rates, making it even more challenging to tackle the pandemic; therefore, both countries' responses to COVID-19 were heavily reliant on their healthcare capacity and favorable socio-economic conditions.

Adopting proxies used by other studies, this study utilizes Gross Domestic Product per capita and health expenditure of a country, as measured by the World Bank Development Indicators (2021), to assess the extent of economic development and compare between countries in Africa and how that influenced and moderated COVID 19 outcomes.

3.8.2 Population Density and Population Age

Earlier studies conducted in Wuhan China on the COVID 19 pandemic revealed that there is a strong age gradient in the risk of death from COVID-19, with older individuals being at higher risk.

Verity et al.(2020) study on COVID-19 focused on various aspects of the disease, such as the duration from symptom onset to death or hospital discharge, the case fatality ratio (CFR), infection fatality ratio (IFR), and the proportion of infected individuals likely to be hospitalized. For confirmed and clinically diagnosed cases from mainland China, the crude CFR was estimated to be around 3.67 percent; however, after adjusting for factors such as demography and under-ascertainment, the best estimate of the CFR in China was lower, at about 1.38 percent It was found that older age groups had higher CFRs, with those aged 80 years or older having the highest

at 13.4 percent. The overall IFR for China was estimated to be around 0.66 percent, meaning that out of all infected individuals, approximately 0.66 percent would die from the disease. Similar to the CFR, the IFR also increased with age, with the highest proportion observed in individuals aged 80 years or older who are more likely to be hospitalized. Succeeding reports indicate that the risk of mortality due to COVID-19 is significantly higher in older individuals, especially those aged 65 years and older (University of Oxford, 2020).

Furthermore, according to WHO (2020) data, 8 out of 10 deaths occurred among adults with at least one underlying comorbidity, especially those with cardiovascular diseases/hypertension and diabetes, as well as other chronic underlying disorders. Many young individuals have pre-existing illnesses, such as asthma, diabetes, and hypertension. This example is relevant in the context of numerous rising economies. Nonetheless, the WHO Regional Office for Africa (2022) states that Africa's demographic composition supports the prevalence of less-severe diseases. The age distribution in Africa primarily consists of children and youth (0-35 years) who have lower susceptibility to COVID-19 which would explain why most cases on the continent are asymptomatic or moderate.

The old population in Africa predominantly resides in rural regions, whereas the largest number of instances in Africa occur in metropolitan areas or cities, where the population is primarily composed of youth. Chronic disorders, such as hypertension and diabetes, which are risk factors for severe COVID-19 outcomes, are less common in Africa.

Population density was another key demographic factor. Rader et al. (2020) noted that COVID-19 outcomes (as measured by the number of cases and deaths per million people) were worse in areas with higher levels of poverty, a larger population of racial/ethnic minorities, and a higher population density in the United States of America. On aggregate, compared to other continents, Africa has a lower population density than other continents. The disease spreads rapidly and efficiently in crowded, cramped, and noisy environments. Nonetheless, Bamgboye et al. (2021) and Chirisa et al. (2022) noted that several settlements on the continent are rural and widely scattered, hindering the rapid spread of the virus. Major cities such as Lagos in Nigeria, Johannesburg, and Cape Town in South Africa; Nairobi in Kenya; and Cairo in Egypt are considered hotspots, with Lagos alone accounting for almost 40 percent of COVID 19 cases in

Nigeria. The highest population densities are observed in densely populated localities, such as Kosofe and Alimosho in Lagos.

Population density is also linked to the rate of urbanization and the risk posed by overcrowding in cities. Sub-Saharan Africa has the lowest urbanization rate globally, with 39.1 percent of its population residing in cities (Møller & Roberts, 2021). The rising urbanization rate is expected to pose challenges in handling health concerns that have a greater impact on vulnerable groups based on the fact that densely populated living environments have restricted healthcare access. Most residents in many major African cities reside in slums that typically lack basic services, have substandard housing, insecure land ownership, segregation, and overpopulation, and are commonly situated in environmentally sensitive areas such as wetlands (Hishan et al., 2019).

According to Nguimkeu and Tadadjeu (2021), a higher population density and a larger proportion of the population aged 65 years and above are associated with higher COVID-19 infection rates. However, sub-Saharan African countries, with their younger population and lower population density, were less affected by these factors than other regions. This notion was also supported by Dzinamarira et al.(2020), who found that a youthful population in Africa provided an advantage against rising COVID 19 infection rates in comparison to other continents. This study recognizes the moderating role of population age and density as control variables and specifically examines whether population age and density are negatively correlated with COVID-19 outcomes among African countries. This study uses data on country size and population from the World Bank Development Indicator to measure population size and age.

3.9 Hypotheses Formulation

From the discussed literature, the following hypotheses and theoretical framework were proposed to explain the independent, moderating, and dependent variables.

Hypothesis 1: Relationship between the governance regime and COVID-19 Outcomes

Ho: Type of governance regime (fully democratic, partly democratic, and authoritarian) influences COVID-19 outcomes (Infection rates and Mortality rates)

Ha: Type of governance regime (fully democratic, partly democratic, and authoritarian) does not influence COVID-19 outcomes (Infection rates and Mortality rates)

Hypothesis 2: Relationship between State's public health capacity and COVID-19 Outcomes

Ho: The strength of the country's public health infrastructure (the amount of funding allocated to public health) does not moderate the relationship between the type of governance regime and COVID-19 outcomes

Ha: The strength of the country's public health infrastructure (the amount of funding allocated to public health) does moderate the relationship between the type of governance regime and COVID-19 outcomes

Hypothesis 3: Relationship between states' Socio-economic factors and COVID-19 Outcomes

Ho: Socio-economic factors (country's level of economic development and urbanization) does not moderate the relationship between the type of governance systems and COVID-19 outcomes

Ha: Socio-economic factors (country's level of economic development, poverty rate, and urbanization) does moderate the relationship between the type of governance systems and COVID-19 outcomes

Hypothesis 4: Relationship between states' demographic factors and COVID-19 Outcomes

Ho: Demographic factors (Population age and population density) does not moderate the relationship between the type of governance systems and COVID-19 outcomes

Ha: Demographic factors (Population age, and population density) does moderate the relationship between the type of governance systems and COVID-19 outcomes

Hypothesis 5: Relationship between Governance effectiveness and COVID-19 outcomes

Ho. Government effectiveness measures (timing, stringency of lockdown measures, and the extent of testing and contact tracing efforts) do not mediate the relationship between the type of governance regime and COVID-19 outcomes.

Ha: Government effectiveness measures (timing and stringency of lockdown measures and the extent of testing and contact tracing efforts) do mediate the relationship between the type of governance regime and COVID-19 outcome.

CHAPTER FOUR
RESEARCH METHODOLOGY

4.0 Introduction

This section presents an in-depth analysis of the methodology employed in this study. This includes a broad overview of the research approach and data analysis methods. Furthermore, the origin and description of the data are outlined along with a panel regression analysis to establish the connection between different government systems and other factors that impact COVID-19 outcomes. The chapter is structured as follows: Section 4.0 to Section 4.5 provides a description of the methodology and research approach. Further, Sections 4.6 and 4.7 discuss the validity and reliability, and ethical concerns, and positionality. Lastly, Section 4.8 concludes.

4.1 Research Approach

This study employed a quantitative secondary data analysis research design to test the hypotheses and generate generalizable findings on the relationship between different government regimes and COVID-19 outcomes within a reasonable probability. Broadly speaking, the study adopted a positivist paradigm, which suggests combining empirical observations and logical reasoning to make reasonable inferences about a phenomenon to gain a better understanding of social reality (Bryman, 2012). The positivist paradigm advocates the use of scientific methods of measurement employing objective and value-free study (Chilisa, 2012) .

The research style and methods employed in this study are summarized based on the onion approach as outlined by Saunders et al. (2007), delineating the essential procedures that as a researcher I adopted to develop a pragmatic methodology for the study. The framework of the research onion and classification is presented in a tabular format in Table 1(Saunders et al., 2007).

Table 1 : The Concept of the Research onion.

Layer of research onion	Classifications	Justification
Research Paradigm	Positivism	Measurement and quantification of data, statistical analysis, and description of results regarding the relationship between governance regimes and COVID-19 outcomes It seeks to establish quantitative relationships between key variables identified in the study.
Research Approach	Deductive Approach	The study develops a hypothesis on factors that relate to governance regimes and COVID-19 mortality rates and infection rates and other determinants may affect COVID-19 outcomes and proceeds to test them to an acceptable level of probability. Thus, the deductive approach pairs well with the positivist approach.
Research Strategy	Secondary Data Analysis Census	Explore the relationship between government regimes/ government effectiveness and COVID-19 Mortality and Infection rates outcomes
Time Horizon	Longitudinal data	The data covers African country variables in the year 2020-2021
Data Collection	Secondary data	Reputable existing secondary data sources.
Research Design	Exploratory research	The study establishes the influence of independent variables on COVID-19 mortality and infection rates outcomes through the quantitative framework adopted by the study.

4.2 Research Tools and their Application

In this study, a panel regression model was used to analyze how government regimes in Africa are related to COVID-19 mortality and infection rates. Specifically, the regression equation had COVID-19 mortality rates and infection rates as the dependent variables, and the independent variables included a vector of covariates that theoretically and conceptually explain government regimes and other factors that influence COVID-19 outcomes, as suggested in the literature. These covariates included dummy variables indicating whether the government regime was fully democratic, partially democratic, or authoritarian, as well as other contextual factors. The statistical models employed in this study incorporate a fixed effect model, which encompasses all latent, time-invariant factors such as demographic factors and state of regime that do not change over time and exert an influence on the outcome of COVID 19 mortality and infection rates (Wooldridge, 2013).

The model is an adaptation of the existing model from a previous study by Karabulut et al. (2021), which tested the relationship between Democracy and COVID-19 mortality, and infection outcomes in a global context. The adaptation of the panel regression model in this study includes new variables for government system types. Appendix Table 2 summarizes the variables' choices.

Panel regression was represented as follows:

$$\text{covid}_{it} = \beta_0 + \sum_{j=1}^{2} \beta_j gov\_type_{it} + \beta_3 share\_65_{it} + \beta_4 Population_{it} + \beta_5 health\_exp_{it} + \beta_6 GDPpercap_{it} + \beta_7 gov\_eff_{it} + \varepsilon_{it}$$

where βs are coefficients, ε_{it} are error terms, and the variables and expected signs and explanations are presented in Table 1 in the Appendix section.

4.3 Data and Data Sources

This study used secondary data previously collected and tabulated by other sources. Data sources for this study included Freedom House (2022) and the Economist Intelligence Unit (2022), which provide annual data on political institutions and regime characteristics for countries. (*See: Table A1: Categorization of African States-Freedom House (2020-2021) in the appendices*.) For economic measures, this study used data from the World Bank databank from 2020 to 2021,

which covers African member states. As in a previous study by Serikbayeva et al.(2021), this study also assumes the inherent temporal trade-offs in the country's democracy between the provision of public health safety and ensuring individual freedoms, as measured by the Freedom House databases for the year 2021. Government effectiveness data was sourced from the World Bank Worldwide Governance Indicators databank. According to Kaufmann et al. (2011), the governance indicators measure perceptions regarding the quality of public services, the competence of the civil service, its independence from political influence, the quality of policy development and execution, and the credibility of the government's commitment to those policies on a scale ranging from -2.5 to 2.5. A score of -2.5 indicates weak governance performance, signifying significant issues such as poor service delivery; 0 represents average governance performance, indicating some strengths and weaknesses; and 2.5 indicates strong governance performance, reflecting effective institutions, and high public trust. Finally, data on COVID-19 mortality and infection rates for the countries were sourced from the World Health Organization (WHO) database.

4.4 Sampling

This study adopted a population of 54 African member states in the African continent, as recognized and defined by the World Bank (Bryman, 2012).

4.5 Data Analysis

This study uses secondary data that have previously been collected and tabulated by other sources, which means that the data are already in a coded form. However, where this study uses dummy variables, it recode the variables to indicate the presence or absence of certain characteristics, such as civil liberties, and how they relate to the extent of lockdowns and COVID-19 tracing. Various indices were analyzed using STATA statistical software. The R software was used to generate graphs and figures. Descriptive statistics were used to summarize the data. Regression analysis was used to estimate the relationship between governance systems and COVID-19 outcomes, while controlling for other relevant factors, and the significance of the coefficients was assessed using t-tests and p-values. Data analysis was performed at 5 percent and 1 percent levels of significance(Stockemer, 2019).

4.6 Validity and Reliability

Internal validity refers to the ext9ent to which a study's design, data collection, and analysis methods accurately measure the intended variables and support causal inferences (Bhattacherjee, 2012). Internal validity was addressed by predicting the potential confounding variables that were identified and controlled for in the analysis. Confounding variables are related to both predictor and outcome variables and can distort the relationship between them. Controlling for these variables can help to ensure that the relationship between the predictor and outcome variables is not spurious. To ensure reliability, the study used data from reliable sources such as the World Bank, World Health Organization (WHO) , and other cited political data sources. Additionally, the study uses established measurement instruments or indices, such as those provided by Freedom House and Economic Intelligence units, to ensure that the same indicators are used consistently across all countries and periods.

4.7 Ethical Considerations and Positionality

Lutabingwa and Nethonzhe (2006) emphasized the ethical considerations that scholars should have during analysis and reporting, noting that the positivist paradigm's idea of a value-free approach to research was no longer widely accepted. It has been recognized that personal values and political beliefs influence the research process. Ethical clearance from the School Ethics Committee was sought to conduct the study. Transparency about the limitations of the secondary data analysis was maintained, along with acknowledgment and respect for ownership of the data, giving appropriate credit to the original data source. Moreover, critical reflection on and documentation of researcher assumptions and biases were conducted, considering how these might have affected the analysis and interpretation of the data. Multiple sources of classification of political regime data were adopted to triangulate the findings, ensuring that the conclusions were not based solely on one source.

4.8 Conclusion

The chapter outlined the research methodology, including the use of secondary data and a panel regression model to explore the relationship between regime types and COVID-19 outcomes. Key data sources included the World Bank and Freedom House, and variables such as health

expenditure and governance effectiveness were discussed. The chapter also emphasized ethical considerations, and the validity and reliability of the data used.

CHAPTER FIVE
ANALYSIS, FINDINGS, AND DISCUSSION

5.0 Introduction

This chapter provides a detailed analysis of regime types, socio-economic factors, and their relationship with COVID-19 outcomes across African countries. It uses descriptive analysis, correlation analysis, and regression modelling with robustness checks, from Section 5.1 to 5.3. The chapter further discusses the findings considering hypotheses, prior predictions, and literature, in Section 5.4, and concludes with the limitations of the study in Section 5.5.

5.1 Descriptive Analysis

5.1.1 Regime Patterns in Africa

The types of regimes were categorized numerically as 1 (fully democratic), 2 (partly democratic), and 3 (authoritarian). On average, the 54 countries scored 2.24, pointing towards a larger number of government types in the "Partially democratic" category depicted in Table 1: Descriptive Statistics.

Table 2: Descriptive Statistics

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
health exp	80	4.504	2.403	.17	11.784
gdppercap	103	2453.288	2668.551	216.827	14653.31
gvt effectiveness	105	-.78	.677	-2.383	.942
pop 65	108	3.719	1.825	1.665	12.294
pop density	108	109.133	135.615	3.023	623.517
fatalities	108	2.715	9.694	0	91.061
cases thousand	108	115.6	365.022	.226	3446.532
gov_type	108	2.25	.712	1	3
democracy index	100	4.094	1.725	1.13	8.14

Note: Government type (Gov_type) is coded as follows for the analysis: 1= democratic, 2=Partially Democratic, 3= authoritarian (not democratic).

For comparison and triangulation, I also included democracy index of the Economic Intelligence Unit (EIU), which ranges from 0 to 10, with 10 designated as the most democratic. With an average of 4.13, most African countries fell below the median point of five, indicating less inclination towards democracy as shown in Table 3.

Table 3: Categorization of African States-Economic Intelligence Unit (2021)

Ranges of Democracy Index (inclusive)		
0-2	3-5	6-8
Congo, Dem. Rep.	Eswatini	Lesotho
Central African Republic	Rwanda	Ghana
Chad	Comoros	Namibia
Equatorial Guinea	Niger	South Africa
Libya	Ethiopia	Cabo Verde
Eritrea	Angola	Botswana
Burundi	Gabon	Mauritius
Guinea	Mali	
Sudan	Mozambique	
Cameroon	Algeria	
Djibouti	Burkina Faso	
Guinea-Bissau	Mauritania	
Congo, Rep.	Nigeria	
Togo	Benin	
Zimbabwe	Cote d'Ivoire	
Egypt, Arab Rep.	Gambia	
	Uganda	
	Sierra Leone	
	Morocco	
	Kenya	
	Tanzania	
	Liberia	
	Senegal	
	Madagascar	
	Zambia	
	Malawi	
	Tunisia	

Source: Economic Intelligence Unit (2021) https://www.eiu.com/n/democracy-index-2021-less-than-half-the-world-lives-in-a-democracy/

The Democratic Index ranges from 0 to 10 (most democratic). It measures how freely and fairly individuals can choose their political representatives, how much they value their civil liberties, how much they favor democracy over alternative political systems, how much they can participate in politics, and how well their government is able to represent them.

5.1.2 COVID 19 Data Distribution

Africa exhibited varying patterns in terms of COVID-19 mortality and infection rates. Specifically, Northern Africa accounted for 22.3 percent of the total COVID-19 infection rates and 24.7 percent of the mortality rates. In contrast, Eastern and Southern Africa represented 45.0 percent of the total COVID-19 infection rates and 42.7 percent of the mortality rates, primarily influenced by the situation in South Africa. Pandemic patterns that have been presented graphically using box plots and categorized between the four regions of Africa in Figures 12 to 15. Based on the work of Rader et al. (2020) on the spatial diffusion of epidemics and the COVID 19 pandemic, the prevalence of the COVID 19 pandemic in Northern Africa can be inferred from the proximity and interdependence of Northern Africa to Europe in terms of trade and migration and the effects of advancing the spread of the virus, in comparison to other regions in Africa. For instance, South Africa first COVID 19 cases were also imported from Europe. Mkhize (2020) highlights that the early cases of COVID 19 in South Africa were traced back to Europe from a South African traveler visiting Italy. Gaye et al. (2020) also alluded to the presumption that Egypt, Algeria, South Africa and Morocco were identified as countries with a high risk of experiencing the spread of COVID 19 due of their significant volume of imports and travel from China to their major urban centers. Consequently, these countries have recorded the highest numbers of confirmed cases and fatalities in Africa.

South Africa and Nigeria remained outliers in Southern Africa and Western Africa Regions, with the highest COVID 19 prevalence rates. Nkalu et al. (2019) and Chirisa et al.(2022) noted that urbanization and population structures in these countries contributed, among other factors, to the high transmission rates of the pandemic. Noting similar trends to the Ebola Pandemic as cited by Yang et al. (2015), modelling analysis indicates that urban areas exhibit higher rates of reproduction of viruses. Furthermore, epidemiological data consistently demonstrate a bias towards increased case numbers in urban areas across various countries. South Africa accounts

for 70 percent of the country's population residing in urban regions, and Nigeria exhibits patterns that are representative of the broader African context, characterized by an urban population comprising around 50 percent, yet proportionally, the urban areas are smaller than the rural or peri-urban areas.

Figure 12: Total Fatalities by Country: Northern Africa

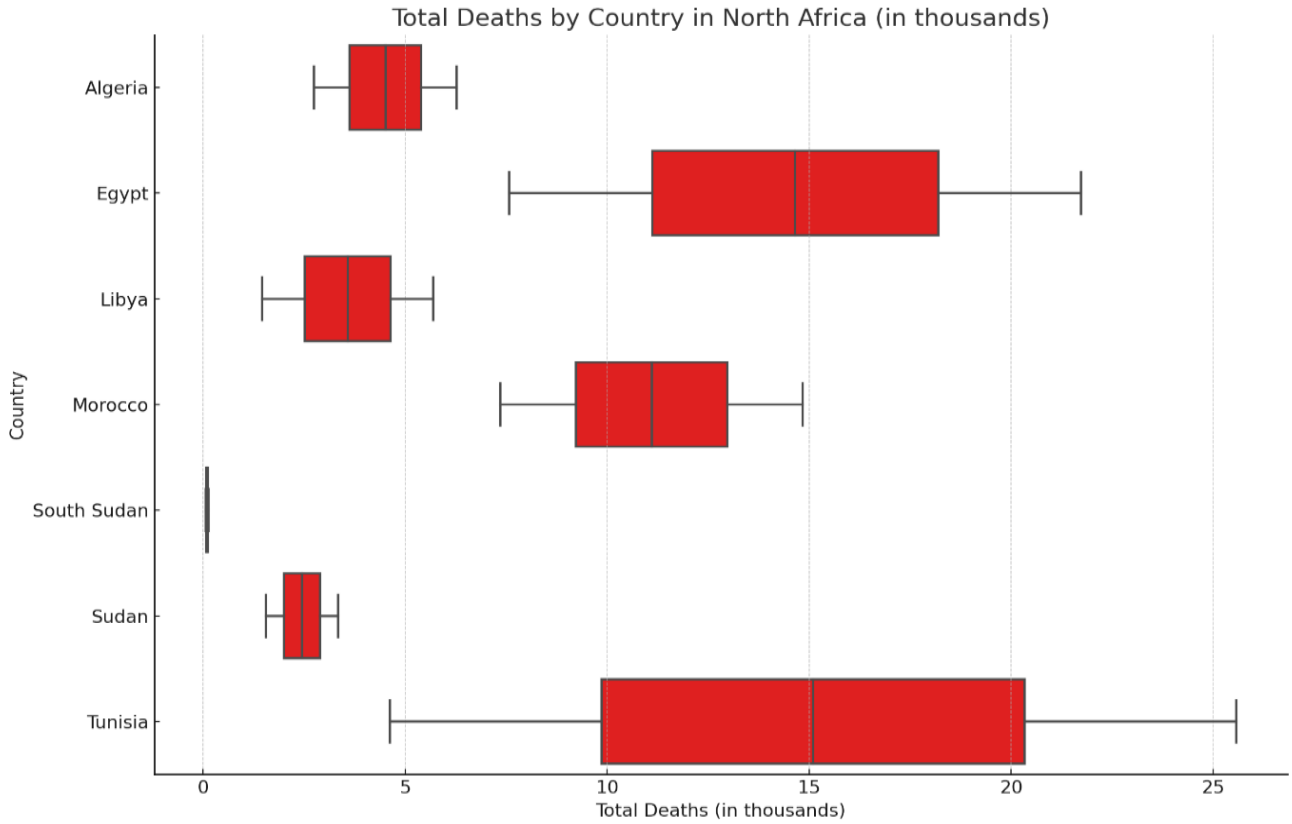


Figure 13: Total Cases by Country: Northern Africa

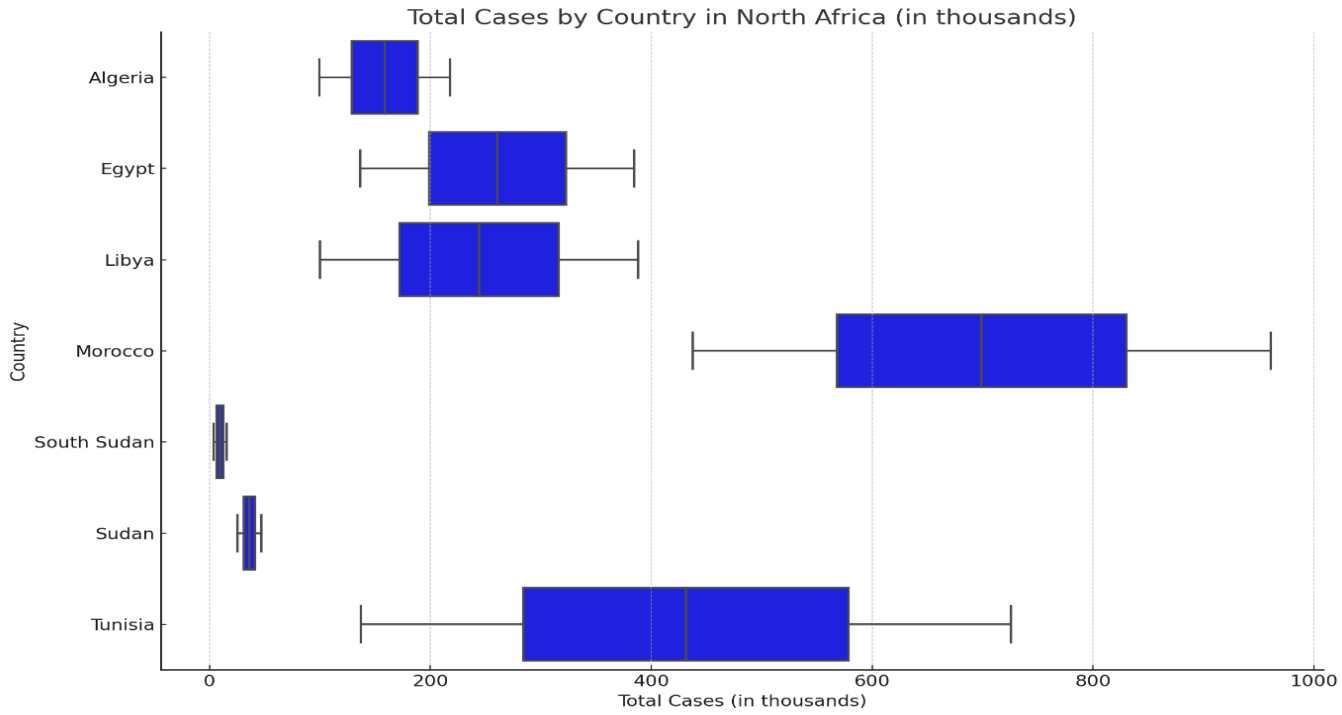


Figure 14: Total Fatalities by country: Western Africa

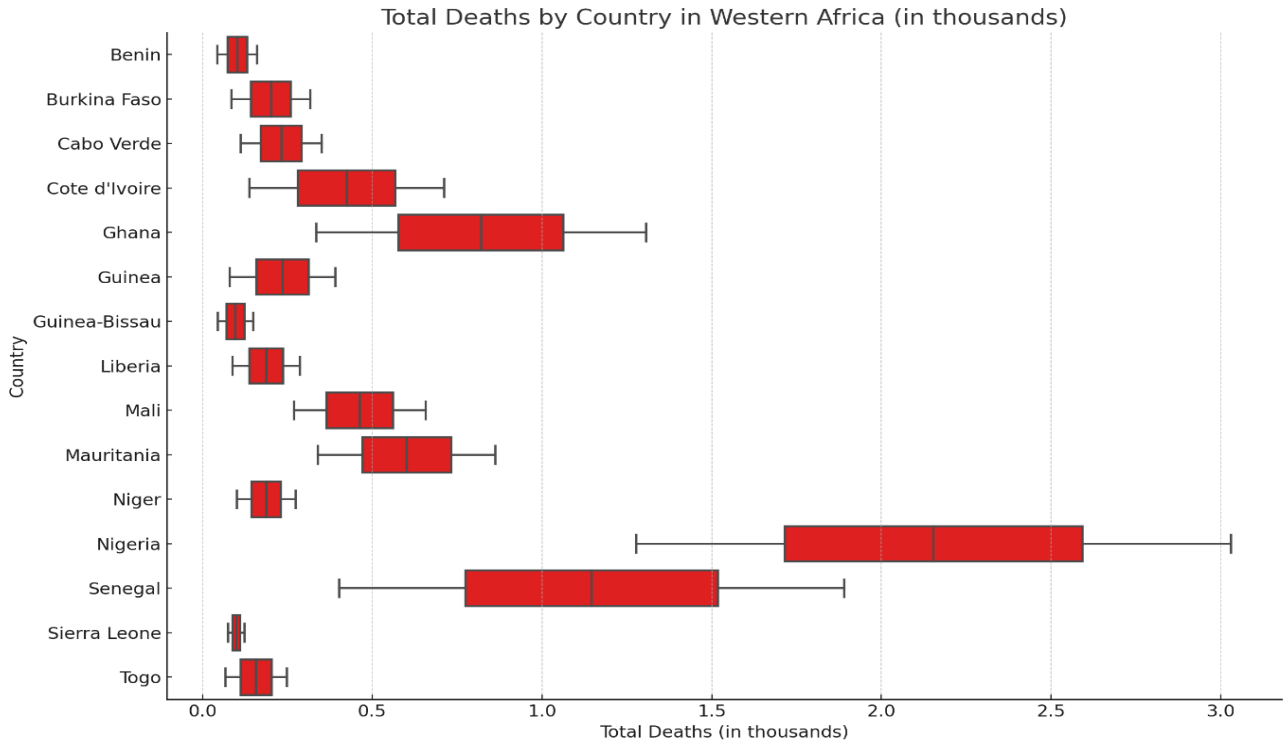


Figure 15: Total Cases by country: Western Africa

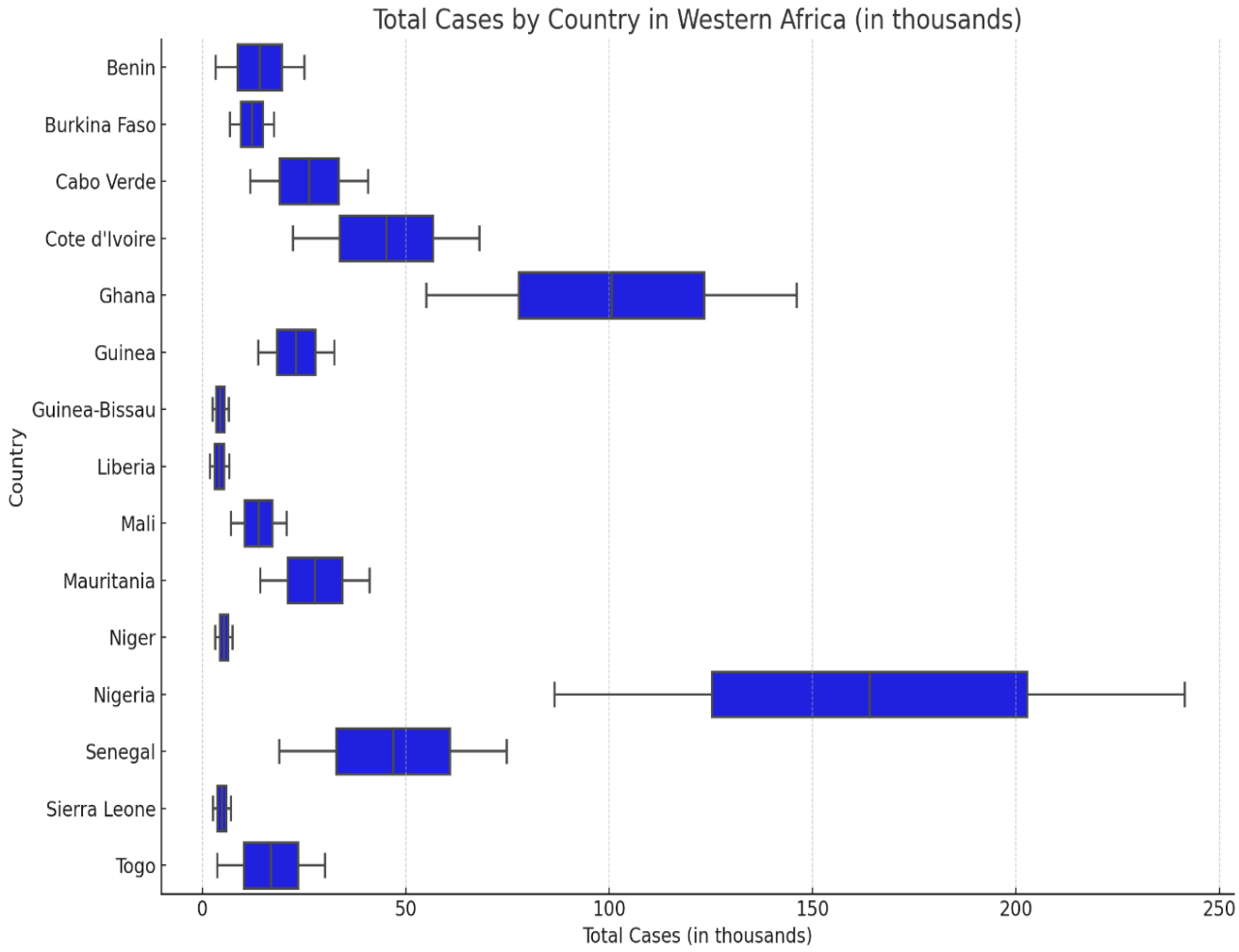


Figure 16: Total Fatalities by country: Eastern and Southern Africa

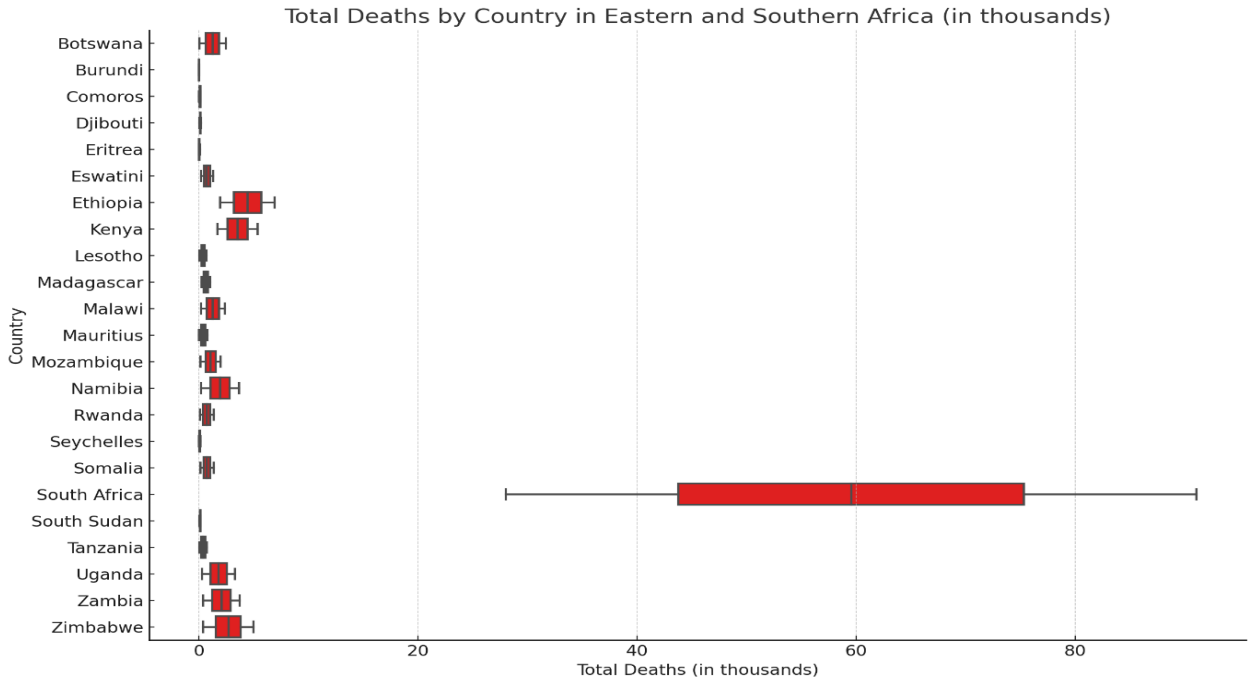
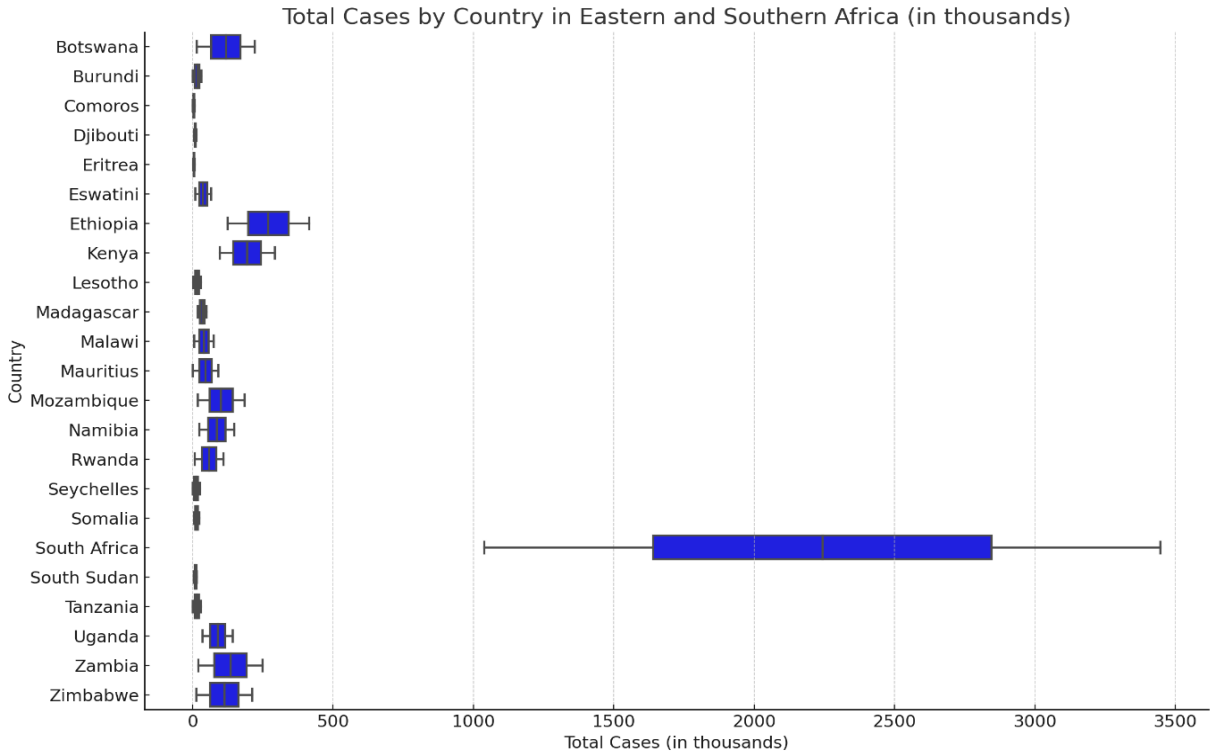


Figure 17: Total Cases by country: Eastern and Southern Africa



5.1.3 Demography

On the demographic front, and in reference to Table 2 on descriptive statistics, the percentage of the population over 65 years (pop_65) has an average of 3.719 percent. This is coupled with a population density (pop_density) mean of 109.133, suggesting that, on average, there are about 109 individuals per square kilometer across the countries studied. The mean average of 3.7 percent of the population above 65 years of age exhibits a notable correlation with a reduced burden of COVID-19, as evidenced by the much higher likelihood of hospitalization and mortality among older populations, which are estimated to be 35 times and 1100 times more, respectively (Levin et al., 2020). According to the World Population (2020, as cited in Wang et al.,2020), Africa, on average, has the most youthful population, with a median age of 19.7 years. In contrast, the countries most severely affected by the pandemic include India, with a median age of 26.8 years; Brazil, with 31.4 years; the United States, with 38.5 years; and the United Kingdom, with 40.5 years. The mortality rate of COVID-19 in Africa exhibited a discernible age-related trend, wherein 28.3 percent of the observed variance could be attributed to differences in age distribution. Nevertheless, South Africa exhibited a higher mortality rate compared to other countries that possess similar age distributions, such as Egypt, due to other prevailing health conditions such as pulmonary disease, asthma, chronic renal disease, malignancy, HIV, identified as the most common co-morbidities of COVID-19 chronic as well as active and past cases of tuberculosis, which were further exacerbated by South Africa's prevailing social and economic disparity conditions(Bulled & Singer, 2020; Gaye et al., 2020).

5.1.4 Health Expenditure

As explained earlier in the introduction, the average health expenditure (health_exp) is 4.50 percent, suggesting that countries in the dataset, on average, allocate approximately 4.48 percent of their GDP to health-related expenses. The World Bank dataset excludes health expenditure indicators for Somali and Libya in 2020 and 2021 because of the lack of central government, ongoing civil conflict, and politico-security instability in the two countries(Ahmad et al., 2022; Ayub et al., 2016). Nonetheless, health expense indicators were still missing in the World Bank database for the year 2021 for the following 26 countries: Democratic Republic of the Congo,

Eritrea, Central African Republic, Sudan, Republic of the Congo, Chad, Guinea-Bissau, Mali, Equatorial Guinea, Sierra Leone, Angola, Madagascar, Guinea, Papua New Guinea, Djibouti, Gabon, Sao Tome and Principe, Togo, Algeria, Niger, Cote d'Ivoire, Benin, Cabo Verde, Senegal, Comoros, and Mauritania, as the World Bank did not update their database at the time of conducting this study.

However, inferences can be made from the health expenditure average ratio for the year 2020 to be relatively proximate to health expenditure in 2021, as evident by trends in the country ranking and assertions of poor health capacity of African countries, particularly sub-Saharan countries; consequently, there is a dearth of progress in health infrastructure development, characterized by a multitude of under-resourced and fragile public health facilities with regard to bed allocation, equipment, and human resources already strained by existing communicable diseases (Arthur & Oaikhenan, 2017; Dzinamarira et al., 2020; Gebremeskel et al., 2021).

One of the outstanding observations of the underlining health expenditure data in Table 4 is that Lesotho had the highest ratio of health expenditure at 11.9 percent, followed by Liberia at 9.4 percent, and the Central African Republic at 9.4 percent.

Table 4: Health Expenditure per country ranking

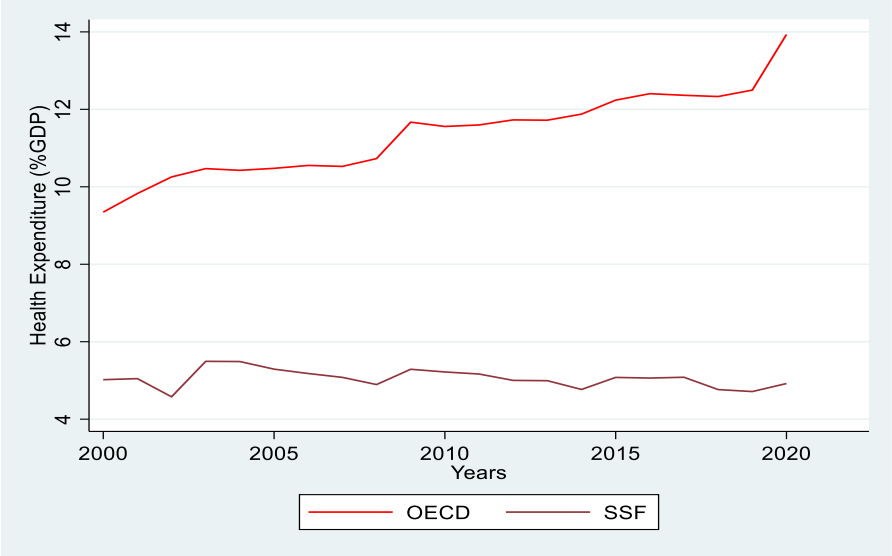
Country	Iso	Continent	Year	iso_year	health_exp %
Lesotho	LSO	Africa	2020	LSO2020	11.8
Liberia	LBR	Africa	2020	LBR2020	9.5
Central African Republic	CAF	Africa	2020	CAF2020	9.4
Namibia	NAM	Africa	2020	NAM2020	8.9
Sierra Leone	SLE	Africa	2020	SLE2020	8.8
South Africa	ZAF	Africa	2020	ZAF2020	8.6
Guinea-Bissau	GNB	Africa	2020	GNB2020	8.4
Mozambique	MOZ	Africa	2020	MOZ2020	7.6
Rwanda	RWA	Africa	2020	RWA2020	7.3
Burkina Faso	BFA	Africa	2020	BFA2020	6.7
Burkina Faso	BFA	Africa	2021	BFA2021	8.7
Seychelles	SYC	Africa	2021	SYC2021	6.9
Tunisia	TUN	Africa	2021	TUN2021	6.6
Namibia	NAM	Africa	2021	NAM2021	5.9
Egypt, Arab Rep.	EGY	Africa	2021	EGY2021	4.1
South Africa	ZAF	Africa	2021	ZAF2021	4.0

Eswatini	SWZ	Africa	2021	SWZ2021	4.0
Botswana	BWA	Africa	2021	BWA2021	3.8
Mozambique	MOZ	Africa	2021	MOZ2021	3.6

Ultimately, it shows that comparatively, no African state had achieved a minimum of 15 percent of its budget allocated to public health in 2020/2021, despite a commitment made by African Union member states in July 2001 to augment the allocation of financial resources from their respective governments towards the healthcare sector, with a minimum target of 15 percent of the government budget. According to Ssozi and Amlani (2015), only a limited number of countries were able to achieve and maintain a target of 15 percent in the following periods: Burkina Faso (2004-2010), Malawi (2003-2011), Mozambique (2001-2006), Rwanda (2006-2011), Sierra Leone (2001-2005), Swaziland (2008-2011), Togo (2009-2011), and Zambia (2004-2011). It would be interesting to analyze why health expenditures have declined over the years, but such an analysis is beyond the scope of this study.

Regarding economic insights, the GDP per capita (gdppercap) had an average of USD 2,455.311, indicating the average economic standing of African countries in this study. Furthermore, Coccia (2021) and Wildman (2021) illustrate that income inequality and a low proportion of public healthcare expenditure to Gross Domestic Product (GDP) further exacerbate the precarious situation of the health system in Africa. For instance, compared to OECD members, health spending in African nations was substantially lower on average over a 20-year period from 2000 to 2020 (see Figure 18). Current health spending in Africa amounts to 5.05 percent of GDP and roughly USD 70.41 per person. In comparison, OECD countries spent a higher percentage of their GDP—11.36 percent—on health spending and much more per person (USD3,832.29). This discrepancy emphasizes the limited financial resources available for healthcare in Africa, which may impact the region's accessibility and quality of healthcare services (World Development Indicators,2022).

Figure 18: Comparative Trend of health Expenditure for Sub-Saharan Africa and OECD countries.



Source: WHO Global Health Expenditure Database (2023)

5.1.5 Government effectiveness

Government effectiveness, a proxy for governance quality and efficiency, averaged -0.781. The score ranges from -2.5 (weak) to 2.5 (strong). In our dataset, countries ranged from very weak governance (-2.383) to relatively strong governance (0.942). Seychelles, Mauritius, Botswana, and Rwanda were rated as having a relatively strong governance. On the other hand, Zimbabwe, Burundi, Liberia, Guinea-Bissau, Chad, Congo, Sudan, Central African Republic, Eritrea, Congo, Dem. Rep, Somalia and South Sudan had the weakest governance ratings.

5.2 Correlation Analysis

The correlation matrix in Table 5 shows a significant relationship between GDP per capita and Government Effectiveness (gvt_effectiveness), with a coefficient of 0.554. This reveals that countries with a higher GDP per capita in Africa tend to have more comparable effective governments, although the correlation is moderate. The findings presented in this study align with previous research that has demonstrated a notable effect of higher economic capacities on increasing governance, and vice versa (Kaufmann et al., 2004 ;Garcia-Sanchez et al., 2013).

Interestingly, Government Effectiveness showed a moderate but significantly positive correlation with pop_65 at 0.55. This suggests that African countries that have more effective governments are associated with a larger elderly population. This finding can be inferred from the existing literature that government effectiveness improves health outcomes and life expectancy in low- and middle-income countries (Ciccone et al., 2014; Olafsdottir et al., 2011).

Furthermore, the type of regime (type_of_gvt) reveals negative associations with variables such as GDP per capita at -0.464, emphasizing that the nature of governance is associated with economic performance, although it is weak. In other words, as the type of regime changes from democratic to autocratic, there tends to decrease in GDP per capita. The strength of this association was measured at -0.464, indicating a moderate negative correlation. This means that, as the type of regime becomes more restrictive or less conducive to economic growth, GDP per capita tends to decrease, albeit weakly. The weak negative correlation may be based on the short time frame of two years used to measure the association of political regime and economic growth, and analysis would be more meaningful over a longer period of time(Doucouliagos & Ulubaşoğlu, 2008). Nonetheless, the correlation still signifies that democracy is likely to enhance economic growth, although the relationship is weak.

Table 5 : Pairwise correlations

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) health_exp	1.000								
(2) gdppercap	0.132	1.000							
	(0.253)								
(3) gvt_effectiven~s	0.154	0.554*	1.000						
	(0.172)	(0.000)							
(4) pop_65	0.186	0.677*	0.555*	1.000					
	(0.099)	(0.000)	(0.000)						
(5) pop_density	-0.008	0.096	0.387*	0.326*	1.000				
	(0.942)	(0.335)	(0.000)	(0.001)					
(6) type_of_gvt	-0.088	-0.469*	-0.264*	-0.422*	-0.090	1.000			
	(0.439)	(0.000)	(0.006)	(0.000)	(0.355)				

(7) fatalities	-0.010	0.225*	0.206*	0.274*	-0.079	-0.250*	1.000		
	(0.931)	(0.022)	(0.035)	(0.004)	(0.416)	(0.009)			
(8) cases_thousand	-0.055	0.236*	0.229*	0.272*	-0.073	-0.225*	0.979*	1.000	
	(0.628)	(0.016)	(0.019)	(0.005)	(0.450)	(0.019)	(0.000)		
(9) democracy_index	0.083	0.308*	0.726*	0.446*	0.157	-0.243*	0.230*	0.250*	1.000
	(0.482)	(0.002)	(0.000)	(0.000)	(0.118)	(0.015)	(0.021)	(0.012)	

**** p<0.01, ** p<0.05, * p<0.1*

The results indicated that GDP per capita (gdppercap) is closely linked to the proportion of the population aged 65 and over (pop_65), with a coefficient of 0.677. This implies that countries with a higher GDP per capita often have a larger elderly population, similar to the findings of Pritchett and Summers (1993) and Bloom and Canning (2009) that wealthier people are healthier, measured by reduced infant mortality and longer life expectancy, and that economic and demographic factors are a consequence and outcome of one of the other. Based on this observation, the study avoids including both variables in the same regression to prevent overlapping effects.

The correlation between GDP per capita (gdppercap) and democracy index (democracy_index) is approximately 0.308, indicating a waek positive correlation between these two variables. This correlation coefficient suggests that as the democracy index increases, there tends to be a tendency for GDP per capita to increase, although the strength of this relationship is moderate at a significance level of 5 percent level. This moderate correlation supports Acemoglu et al. 's(2019) presentation of empirical evidence, indicating a positive relationship between democracy and economic growth in the long run. In this context, our findings do not account for the potential long-term impact of democracy index and GDP per capita, which could have influenced COVID-19 mortality and infection rates; however, as in Cassan and Van Steenvoort (2021), the moderate correlation between these two factors is discarded and looked into independently in our model.

Another noteworthy relationship is between the democracy index and government effectiveness. A coefficient of 0.713 suggests that countries scoring higher in democratic practices typically exhibit better governance. Therefore, in the analysis, cautiousness was exercised not to combine these variables to maintain clarity regarding their individual impacts. The relationship between Democracy _index and pop_65 is slightly weak (under 0.5), given its coefficient of 0.431.

As for the outcomes, both fatalities and total cases (cases_thousand) exhibit significant correlations with GDP per capita, with coefficients of 0.225 and 0.236, respectively, suggesting a rather weak relationship between a country's economic standing and pandemic-related outcomes.

Finally, the remarkably high and significant correlation of 0.979 between Fatalities and Total Cases underscores the intuitive fact that nations with more cases are likely to have more fatalities. This is not a major concern, because they are dependent variables that are estimated separately. However, among the independent variables, correlations above 0.5, especially between gdppercap, gvt_effectiveness, and pop_65, may be indicative of potential multicollinearity concerns. To mitigate this, various regression models were specified, interchanging these predictors to ensure robust results.

5.3 Model estimates

In analyzing the determinants of the total COVID cases presented in Table 6, a few noteworthy observations can be highlighted. Health expenditure initially showed a negative relationship with the total number of cases, implying that higher health expenditure could lead to a reduction in the total number of cases. This relationship is significant at the 5 percent level in the second model and at the 10 percent level in the fourth model, although its significance diminishes as other variables are introduced. For example, in Model (2), we see that on average, a one-percentage-point increase in health expenditure as a share of GDP is associated with a drop in the total number of cases by 52.69 thousand. This discovery provides empirical evidence in line with the theoretical framework proposed by Grossman (2017), which posits that allocating resources towards health investments leads to enhanced health outcomes, such as reduced mortality rates, ultimately resulting in improved individual well-being. The findings presented in this study align with previous research that has demonstrated a notable impact of health expenditure on health outcomes in sub-Saharan Africa on the reduction of HIV/AIDS and other communicable diseases. The aforementioned research conducted by Arthur and Oaikhenan (2017) and Ssozi and Amlani (2015) is relevant in explaining the statistical significance of health spending components in reducing mortality rates and improving health outcomes, although variables were found to be of relatively low elasticities.

Table 6: Influence of Socio-Economic and Governance Indicators on Total COVID-19 Cases.

	(1) cases	(2) Cases	(3) Cases	(4) Cases	(5) Cases	(6) cases
i.Authoritarian	81.31	57.29	1,145.57**	149.31	1,172.20**	1,100.96*
	(0.18)	(0.08)	(2.17)	(0.20)	(2.15)	(1.94)
ii.Partly Democratic	-24.56	-50.42	1,213.44**	32.80	1,241.78**	1,179.55**
	(-0.07)	(-0.10)	(2.45)	(0.06)	(2.43)	(2.22)
health_exp		-52.69**	-13.44	-50.01*	-10.07	-12.30
		(-2.07)	(-0.73)	(-1.87)	(-0.48)	(-0.57)
Gdppercap			0.99***		1.00***	1.01***
			(5.82)		(5.69)	(5.62)
gvt_effectiveness			-2,721.07**		-2,724.28**	-2,791.35**
			(-2.79)		(-2.73)	(-2.73)
pop_65				326.41		-287.84
				(0.41)		(-0.57)
pop_density					5.21	4.43
					(0.36)	(0.30)
_cons	93.16	377.22	-4,942.29***	-950.41	-5,664.97**	-4,477.48
	(0.29)	(0.82)	(-5.82)	(-0.29)	(-2.61)	(-1.48)
N	108	80	77	80	77	77

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

GDP per capita has a consistently positive association with the total number of cases across all models. This robust relationship, significant at the 1 percent level, suggests that countries with higher GDP per capita experienced more cases. For instance, in Model (6), a one dollar increase in GDP per capita was associated with an increase of 1.01 in total COVID cases. As stated earlier

in the literature, countries with higher GDP are characterized by higher urbanization, and crowding in urban areas tends to have a greater seroprevalence of COVID-19 than rural areas. Preliminary evidence corroborating the aforementioned is supported by Kissler et al.(2020) in their study on New York City, Rader et al. (2020) in cities of China and Italy, Bamgboye et al.(2021) in Nigeria, and Chirisa et al.(2022) in their study of the urban penalty of COVID 19 on Anglophobe sub-Saharan Africa.

Piazza and Stronko (2020) shared their preliminary opinion on the positive correlation between GDP per capital and COVID 19 mortality and infection rates, stating that wealthier nations exhibited a delayed implementation of stringent regulations in response to the pandemic compared to their counterparts with later exposure and lower economic status because of the challenges in deciding whether to prioritize public health or economic activity. It was hypothesized that their ability to make this decision was influenced by their robust institutional capabilities and healthcare infrastructure. In contrast, less affluent nations were likely pushed to expeditiously implement rigorous public health measures because of inadequate access to fundamental sanitation, scarcity of medical resources, and insufficient infrastructure for public healthcare. In addition to the logical implications of development, it can be inferred that nations that were exposed to the virus at an earlier stage faced a greater number of uncertainties than those that encountered the virus later. It is plausible to hypothesize that these uncertainties hindered their ability to formulate and implement effective public health policies promptly. Piazza and Stronko (2020) identified grey areas that scholars can delve deeper into within the realm of public policy research, with a specific focus on examining the reactions to pandemics.

Furthermore, the variable representing government effectiveness demonstrates a strong negative correlation with total cases, suggesting that a better governance mechanism might have been instrumental in curtailing the spread of the virus. For instance, according to Model (3), a one-unit increase in government effectiveness on average is associated with a reduction in total COVID-19 cases by 2,721.07 thousand. According to the definition and in the context of the study of COVID 19, it is noted that countries with higher government effectiveness ratings mitigated against increasing mortality and infection rates of the pandemic more effectively, with the right public health policy execution of stay-at-home measures, lockdowns, social distancing, safety masks, and vaccination. Martínez-Córdoba et al. (2021) rightly observed that African countries,

in comparison to Europe and America, despite limited resources at their disposal, managed to control infections and mortality rates by leveraging prior experiences with other pandemic outbreaks such as Ebola or HIV/AIDS.

Considering specification (6), the regression results in Table 6 suggest that countries designated as “Authoritarian " experience, on average, approximately 1.100 million more cases (significant at the 10 percent level) than countries that are categorized as “Democratic.” Similarly, countries labelled as "Partially Democratic" see an average increase of roughly 1.179 million more cases (significant at the 5 percent level) compared to fully democratic countries. These results suggest that, holding other factors constant, countries with fewer democratic freedoms (either "Authoritarian " or "Partially Democratic") have reported more COVID-19 cases in comparison to those with full democratic freedoms.

Table 7: The Impact of Socio-Economic and Governance Factors on Annual COVID-19 Fatalities.

	(1) fatalities	(2) Fatalities	(3) fatalities	(4) fatalities	(5) fatalities	(6) fatalities
I. Authoritarian	2.39	2.00	29.94*	4.09	30.72*	28.46*
	(0.20)	(0.11)	(2.01)	(0.20)	(2.00)	(1.78)
ii.Partially Democratic	-0.13	-0.69	31.64**	1.21	32.46**	30.49*
	(-0.01)	(-0.05)	(2.27)	(0.08)	(2.25)	(2.04)
health_exp		-1.14	-0.11	-1.08	-0.01	-0.08
		(-1.64)	(-0.22)	(-1.48)	(-0.02)	(-0.14)
Gdppercap			0.03***		0.03***	0.03***
			(5.45)		(5.33)	(5.29)
gvt_effectiveness			-76.58**		-76.67**	-78.80**
			(-2.78)		(-2.73)	(-2.74)
pop_65				7.44		-9.12
				(0.34)		(-0.64)

pop_density					0.15	0.13
					(0.38)	(0.31)
_cons	1.80	8.03	-134.63***	-22.22	-155.70**	-118.07
	(0.21)	(0.64)	(-5.63)	(-0.25)	(-2.54)	(-1.38)
N	108	80	77	80	77	77

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 7, the relationship between the type of political regime in countries and annual COVID-19 fatalities is explored, using "Democratic" (full democratic freedoms according to Freedom House) as the base category. The regression results in column (6) suggest that, compared to countries categorized as "Democratic," those labeled as "Authoritarian" have an estimated average increase of 28.46 thousand fatalities (significant at the 10 percent level), while countries designated "Partially Democratic" experience an average increment of 30.49 thousand fatalities (significant at the 10 percent level). This implies that, holding other factors constant, countries with fewer democratic freedoms ("Authoritarian" or "Partially Democratic") have a higher annual count of COVID-19 fatalities relative to countries with full democratic freedoms.

On the other hand, GDP per capita consistently presents a positive association across all models, suggesting that a higher GDP per capita may be correlated with increased fatalities, significant at the 1 percent level. This indicates that relatively higher-income countries in Africa have higher fatalities than lower-income countries do. This result stems from the positive association of income level and infections in Table 6.

Another salient finding is the pronounced negative relationship between government effectiveness and fatalities, reinforcing the notion that more effective governance may play a pivotal role in curbing the fatality rate of the pandemic. For instance, in Model (6), a one-unit increase in government effectiveness leads to a decrease of 76.58 thousand COVID fatalities, significant at the 5 percent level. However, variables such as health expenditure, population over 65 years and population density did not achieve any statistical significance across the different

specifications.

5.3.1 Robustness checks

To check the robustness of the results, the study applied a change in the variable on democracy to examine its impact on COVID 19 outcomes. Instead of the freedom house categorical variable, a continuous democratic index published by the Economic Intelligence Unit (EIU) (2023) was used. The variable ranged from 0 to 10, with 10 representing the most democratic. The index gauges how freely and fairly individuals can choose their political representatives, how much they value their civil liberties, how much they favor democracy over alternative political systems, how much they can participate in politics, and how well their government is able to represent them.

Table 8: Impact of Democracy Index on COVID-19 Cases: A Robustness Check

	(1) cases_thousand	(2) cases_thousand	(3) cases_thousand	(4) cases_thousand	(5) cases_thousand	(6) cases_thousand	(7) cases_thousand
democracy_index	-108.99	-236.99	-146.07			-135.48	-224.95
	(-0.49)	(-0.58)	(-0.52)			(-0.46)	(-0.86)
health_exp		-56.30**	-2.93	-32.79*	-35.65	-0.77	-16.40
		(-2.14)	(-0.14)	(-1.81)	(-1.33)	(-0.03)	(-0.75)
Gdppercap			1.00***	0.71***	0.54***	1.01***	1.00***
			(5.22)	(5.25)	(2.99)	(5.08)	(5.72)
gvt_effectiveness				-3,848.11***			-2,910.19***
				(-4.16)			(-2.93)
pop_65					-465.85		-384.87
					(-0.68)		(-0.76)

pop_density					-6.75	3.24	1.71
					(-0.34)	(0.19)	(0.12)
_cons	570.28	1,442.68	-1,394.10	-3,925.46***	1,621.74	-1,867.02	-1,664.28
	(0.63)	(0.80)	(-1.02)	(-4.91)	(0.43)	(-0.66)	(-0.49)
N	100	74	73	77	77	73	73

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

As shown in Table 8, the democracy Index consistently shows a negative correlation with COVID-19 cases across all models. For example, in Model (2), every unit increase in the democracy index led to a decline of approximately 237 thousand cases, although this relationship was not statistically significant across the models.

Health expenditure had a negative relationship with COVID-19 cases in Model (1), where an increase in health spending corresponded to a decrease of roughly 56.30 thousand cases. This relationship is statistically significant at the 5 percent level in this model but loses significance in the later models. GDP per capita maintains a positive relationship with cases across the models. For instance, in Model (5), a one dollar increase in GDP per capita is linked to an increase of 1,000 cases, significant at the 1 percent level. This supports the earlier finding that countries with higher incomes registered more cases.

Government effectiveness in Model (5) shows a negative correlation. A unit increase in government effectiveness is associated with a reduction of 2.91 million COVID-19 cases, significant at the 1 percent level. However, variables such as population over 65 years of age and population density did not show consistent significance across the models. These findings reiterate the roles of governance and economic factors in the spread of COVID-19.

Table 9: Impact of Democracy Index on COVID-19 Fatalities: A Robustness Check

	(1) fatalities	(2) fatalities	(3) fatalities	(4) fatalities	(5) fatalities	(6) fatalities	(7) fatalities
democracy_index	-4.73	-9.70	-7.31			-7.11	-9.97
	(-0.81)	(-0.88)	(-0.93)			(-0.87)	(-1.39)
health_exp		-1.24*	0.17	-0.62	-0.69	0.21	-0.26
		(-1.75)	(0.29)	(-1.23)	(-0.93)	(0.31)	(-0.44)
Gdppercap			0.03***	0.02***	0.01***	0.03***	0.03***
			(4.94)	(5.02)	(2.85)	(4.79)	(5.51)
gvt_effectiveness				-105.94***			-83.27***
				(-4.13)			(-3.07)
pop_65					-13.62		-13.54
					(-0.72)		(-0.97)
pop_density					-0.17	0.06	0.01
					(-0.31)	(0.13)	(0.02)
_cons	22.29	51.70	-22.79	-108.09***	45.65	-31.74	-14.05
	(0.94)	(1.06)	(-0.60)	(-4.88)	(0.44)	(-0.41)	(-0.15)
N	100	74	73	77	77	73	73

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 9, the democracy index consistently displays a negative coefficient, suggesting that COVID-19 deaths may be lower in countries with higher democratic scores. However, as the coefficient was not statistically significant across the models, this relationship was not statistically confirmed. In terms of health spending, higher investment in health, as per Model (2), seems to be linked to a decline in deaths, which is significant at the 10 percent level. However, its importance disappears in the later models.

As observed in the previous tables, GDP per capita shows a strong positive relationship with fatalities. Specifically, in Model (5), for every additional dollar in GDP per capita, countries reported an average of 30 additional COVID-19 fatalities, significant at the 1 percent level. This reinforces the previous conclusion that wealthier African countries have experienced more fatalities. Government effectiveness is an essential factor in this context. In Model (5) in Table 6, a unit increase in government effectiveness corresponds to a significant reduction of 83.27 thousand COVID-19 fatalities, underscoring the pivotal role of governance in mitigating the negative impact of the pandemic.

On the contrary, factors such as the percentage of people over 65 and population density did not show statistical significance, indicating that they might not be the main factors influencing COVID-19 fatalities. Essentially, the robustness tests confirm the important roles played by economic and government effectiveness factors in both COVID-19 cases and deaths.

5.4 Discussion of Results

This study objectives were to provide valuable insights into the interplay between governance, socio-economic factors, and COVID-19 outcomes in African countries. More particularly, it set out to answer the primary questions on the extent to which regime type affected the response to COVID-19, as measured by infection and mortality rates and what other factors influenced the effectiveness of a country's response based on its regime type. Based on the literature reviewed, several hypotheses were posited to explore the relationships among these variables. Each hypothesis was tested, with varying outcomes regarding their acceptance or rejection.

The first hypothesis examined the relationship between the type of governance regime and COVID-19 outcomes. The null hypothesis (Ho) posited that the governance regime (fully democratic, partly democratic, and authoritarian) influenced COVID-19 outcomes, specifically infection and mortality rates. The alternative hypothesis (Ha) suggested that governance systems did not influence these outcomes. The findings indicate a significant association between governance type and COVID-19 outcomes, leading to the rejection of the null hypothesis. This aligns with previous research showing that more democratic systems tend to have better health outcomes during pandemics. Both authoritarian and partially democratic nations exhibit a

noticeable surge in total COVID-19 cases and fatalities when compared to fully democratic countries. Although the literature suggests that democratic nations generally yield better health outcomes than autocratic regimes, this study's findings cast doubt on the strength of this negative correlation in the context of African Countries. The observed correlation, while present, lacked statistical significance across all models utilized in the analysis. This lack of statistical significance suggests that the relationship between regime types and COVID-19 mortality and infection outcomes may not be universally applicable. Consequently, the results of this study do not support the assertion that regime type significantly influenced the outcomes of the COVID-19 pandemic. The findings neither confirm the notion that autocracies are more adept at controlling the pandemic or the converse.

Contrary to previous research, demographic factors did not consistently moderate the relationship between governance systems and COVID-19 outcomes in the models. While population density and age were included in the analysis, their significance was not evident across all specifications, suggesting that they might not be the primary drivers influencing the impact of the pandemic. This may be because, unlike in existing literature where comparisons were made between countries across continents where regional variations came into play, African countries have an overall youthful population and lack heterogeneity among the population age and density variables. Further graduality and reconstruction of the age variable were conducted to further test the significance of the correlation in Table 10 and Table 11.

Table 10:Impact of Age on COVID-19 Cases

	(1) cases	(2) cases	(3) cases	(4) cases	(5) cases	(6) cases
i.Authoritarian	81.31	57.52	1,145.55**	172.38	1,172.17**	1,180.19*
	(0.18)	(0.08)	(2.17)	(0.23)	(2.15)	(1.94)
ii.Partly Democratic	-24.56	-50.40	1,213.36**	26.07	1,241.69**	1,2 40.85**
	(-0.07)	(-0.10)	(2.45)	(0.05)	(2.43)	(2.21)
health_exp		-52.72**	-13.45	-62.63	-10.08	-17.22

		(-2.07)	(-0.73)	(-1.67)	(-0.48)	(-0.69)
Gdppercap			0.99***		1.00***	1.03***
			(5.82)		(5.69)	(5.50)
gvt_effectiveness			-2,721.05**		-2,724.27**	-2,672.94**
			(-2.79)		(-2.73)	(-2.48)
pop_0_14_percent				-195.68		372.20
				(-0.23)		(0.67)
pop_15_64_percent				-387.27		215.29
				(-0.47)		(0.40)
pop_65_above_percent				0.00		0.00
				(.)		(.)
pop_density					5.21	10.37
					(0.36)	(0.51)
_cons	92.25	374.87	-4,954.33***	30,178.74	-5,669.55**	-33070.85
	(0.28)	(0.81)	(-5.83)	(0.39)	(-2.63)	(-0.67)
N	110	81	78	81	78	78

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The regression results show that even if we segment ages into categories, as prescribed in the World Development Indicators (WDI) as follows: Population ages 0-14 (% of total population), Population ages 15-64 (% of total population), and population ages 65 and above (% of total population), the demographic variable is still not significant in accounting for cases and casualties, as seen in tables Table 10 and Table 11. Moreover, owing to multicollinearity, the variable capturing the population percentage of people aged 65 and above was omitted from the model. In a population with constant birth and mortality rates, it is not unexpected that the upper two population categories will be highly correlated.

For these cases, the disaggregation of the demographic variable has little impact on the

coefficients of the other independent variables we found in Table 6. For instance, under specification (6), the coefficient of the authoritarian regime variable only changed from 1,100.96 to 1,180.19, with the inclusion of segmented demographics. However, the partly democratic coefficient under specification (6) was adjusted from 1,179.55 to 1,240.85. There was no change in the signs and significance levels of the regime variable (specification (4) remained positive and non-significant), yet all the other coefficients of specifications (1) to (3) and (5) had very small changes after the decimal point. Specification (2) of health expenditure was significant in the model with aggregated demographics and remained so with the disaggregation, with very little post-decimal point changes in the coefficient from -52.69 to -52.72. However, specification (4), which was significant with a coefficient of -50.01 lost significance with the inclusion of disaggregated demographics and registered a coefficient of -62.63. The coefficients of GDP retain their significance and coefficient values with only post-decimal point changes in specification (6). There was a noticeable change in the coefficient of government effectiveness in specification (6), where the coefficient changed from -2,791.35 and -2,672.94, but the level of significance remained unchanged across all specifications. There were some sizeable changes in the constant in both specifications (3) and (6), which included the disaggregated demographics.

Table 11: Impact of Age on COVID-19 Fatalities

	(1) fatalities	(2) fatalities	(3) fatalities	(4) fatalities	(5) fatalities	(6) fatalities
I. Authoritarian	2.39	2.00	29.94*	4.74	30.72*	31.11*
	(0.20)	(0.11)	(2.01)	(0.23)	(2.00)	(1.82)
ii.Partially Democratic	-0.13	-0.68	31.63**	1.02	32.46**	32.54*
	(-0.01)	(-0.05)	(2.27)	(0.07)	(2.25)	(2.06)
health_exp		-1.14	-0.11	-1.43	-0.01	-0.25
		(-1.64)	(-0.22)	(-1.41)	(-0.02)	(-0.36)
gdppercap			0.03***		0.03***	0.03***
			(5.44)		(5.33)	(5.21)
gvt_effectiveness			-76.58**		-76.67**	-74.84**

			(-2.78)		(-2.73)	(-2.47)
pop_0_14_percent				-3.75		11.94
				(-0.16)		(0.77)
pop_15_64_percent				-9.15		6.70
				(-0.41)		(0.44)
pop_65_above_percent				0.00		0.00
				(.)		(.)
pop_density					0.15	0.33
					(0.38)	(0.57)
_cons	1.77	7.98	-134.95***	678.88	-155.81**	-1,023.92
	(0.21)	(0.64)	(-5.63)	(0.32)	(-2.57)	(-0.74)
N	110	81	78	81	78	78

In the model with fatalities, the inclusion of disaggregated demographics leads to small changes in the coefficients of the independent variables. For instance, the authoritarian regime coefficient changed significantly in specification (6), moving from an initial 28.46 to 31.11. However, other models remain intact with specification (3), registering small changes in decimals. The impact of the partially democratic variable also increased from 30.49 to 32.54 with the inclusion of the three demographic categories. Government effectiveness moved from -78.80 to -74.84. There was a very noticeable change in the constant in specification (6), which increased by almost 10-fold to -1,023.92, but remained nonsignificant. Apart from the coefficients, the remaining coefficients in specifications (3) and (6) registered only small changes in the decimal points.

In reference to constructed hypotheses and to answer the research questions of what other factors contribute to the effectiveness of a country's response to COVID-19 outcomes, the model results support the notion that a country's public health infrastructure moderates the relationship between governance regimes and COVID-19 outcomes. Health expenditure initially displayed a negative relationship with total cases, suggesting that increased health spending might lead to a reduction in cases, which aligns with previous research on the impact of health expenditure on other

epidemics health outcomes in Africa. Again, the effectiveness of government measures emerged as a significant factor mediating the relationship between governance regimes and COVID-19 outcomes. Countries with higher government effectiveness ratings demonstrated a consistent negative correlation with both total cases and fatalities, emphasizing the importance of efficient government responses in pandemic control. Table 12 provides a well-documented summary of the linkage between the hypothesis, expected findings, and justification of the decision on the null hypothesis.

Table 12: Linkages of hypothesis, predictions, and results

Hypothesis	**Prior prediction/ expected outcome**	**Decision (Reject/Fail to Reject Ho)**	**Rationale**
Hypothesis 1: Relationship between the governance regime and COVID-19 mortality and infection rates.	Democratic regimes to show better COVID-19 outcomes(mortality and infection rates) than authoritarian or partly democratic regimes.	Reject Ho	Authoritarian and partly democratic regimes in Africa had higher cases and fatalities than fully democratic regimes. However, the relationship was not statistically significant
Hypothesis 2: Relationship between the state's public health capacity and COVID-19 mortality and infection rates	Higher health spending leads to lower cases and deaths.	Reject Ho	Results showed that higher public health spending is associated with lower COVID-19 cases.
Hypothesis 3: Relationship between socio-economic factors and COVID-19 mortality and infection rates	Higher GDP per capita related with more cases and higher mortality rates.	Reject Ho	GDP per capita had a positive association with COVID-19 cases and fatalities.

Hypothesis 4: Relationship between demographic factors and COVID-19 mortality and infection rates	Higher population density and older populations associated with more cases and deaths.	Fail to Reject Ho	Population density and age were not significant across all models, hence may not be key drivers of COVID-19 outcomes.
Hypothesis 5: Relationship between governance effectiveness and COVID-19 mortality and infection rates	More effective governance should lead to fewer cases and fatalities.	Reject Ho	Government effectiveness was negatively correlated with COVID-19 cases and fatalities, indicating that more effective governance mitigated the impact of the pandemic.

Socioeconomic factors, such as GDP per capita exhibited a consistently positive association with the total number of COVID-19 cases. This finding substantiates the hypothesis that socioeconomic factors moderate the relationship between governance systems and COVID-19 outcomes. A higher GDP per capita was linked to an increase in cases, possibly due to factors such as higher urbanization.

5.5 Limitation of the study

A significant constraint of this study is the short duration of the two years (2020 and 2021) selected for data analysis through panel regression. This limited time range may restrict the extent to which the study can comprehend long-term patterns or conduct thorough evaluations of how governance systems affect COVID-19 outcomes. Zhu (2013) states that panel data regression models work best when there are many periods (T) and sufficient entities (N). Estimating a Fixed effects model could lose a substantial amount of efficiency because of rarely changing variables, such as political regimes analyzed over a short period of time. Despite the options of alternative econometric models proposed by Hausman and Taylor (1981), Wooldridge (2013), and Plümper and Troeger (2007), which introduce a fix to the problem of invariant variables and estimation consistency by introducing certain variables that change over time as substitutes for those that remain constant, such models were not adopted in this study due to time constraints required to identify those substitutes.

In addition, this study does not explicitly investigate the reasons for the differences in government efficiency among countries or provide a comprehensive explanation of the factors that contribute to the observed political and governance frameworks. This constraint emphasizes the necessity for additional case study research and the application of sophisticated models to reveal more reliable connections among the underlying elements. Furthermore, due to potential limitations or the absence of health spending variables in certain countries, such as for the year 2021, the study had to rely on forecasts and assumptions based on data from 2020.

An additional constraint is the credibility of the potentially inaccurate or insufficient reporting of COVID-19 cases. Previous studies have raised concerns about potential underestimations of reported COVID-19 cases, particularly in non-democratic countries. Tuite et al. (2020) suggested that Egypt might have underreported COVID-19 cases. Tanzania's statistics on COVID-19 were reported from the onset of the pandemic until June 2020, after which the government decided to stop counting COVID-19 cases and deaths (Thenon et al., 2022). Although Günther et al. (2021) recommend adjustments of data considering estimates of misreporting, this study considers the finding that the effect of misclassification becomes negligible when true infection and mortality incidence is high and the use of reliable sources for the count is an added comfort.

CHAPTER SIX
CONCLUSION AND POLICY IMPLICATIONS

6.0 Summary of findings

When the COVID-19 Pandemic hit, governments worldwide rushed to address the crisis, prompting scrutiny of their actions. Reports highlighted how disorganized and delayed responses had hindered democratic countries such as the United States' ability to respond to the pandemic effectively and how autocratic countries such as China were able to timely contain the pandemic. These observations prompted scholars, policymakers, and commentators to debate how different types of regimes affected ability to manage the pandemic's mortality and infection rates. Notably, existing literature did not contain discussions on the impact of various types of regimes on COVID-19 fatalities and infections in Africa. This study aimed to fill that gap by presenting the first empirical investigation, as far as the existing literature indicates, on the extent to which how political regimes and an interplay of other socio economic and demographic factors were associated with COVID-19 mortality and infection rates in Africa.

The study employed the use of panel regression analysis on a population of 54 countries in Africa with variable data coverage for 2 years from the year 2020-2021. State of democracy was measured using trichotomous scale categorizing countries into fully democratic, partially democratic and democratic states using Freedom House Scale of measuring democracy. The results of regression analysis indicated that partially democratic and autocratic countries were positively associated with increase in COVID-19 fatalities and infection rates in comparison to democratic states. Although the association was found to be not significant at 5 percent level of significance. As a result, the findings of this study do not support the claim that regime type had a significant influence on the outcomes of the COVID-19 pandemic. The findings do not support the concept that autocracies are better at controlling pandemics, or the opposite, despite democratic countries registering fewer mortality rates and infection rates than partially democratic and autocratic countries .

The study however found that health expenditure and government effectiveness were negatively associated with the number of cases and fatalities, whereas GDP per Capital was positively associated with the pandemic outcomes. All the associations were significant at 5 percent level. Variables of population over 65 years of age and population density did not show consistent significance across the models.

6.1 Recommendations

The importance of state capacity in increasing health expenditure and government responsiveness has become evident, particularly in circumstances requiring unconventional measures to contain pandemics. This study affirms that in the short term, what matters most is not the type of political regime, but the efficiency of utilizing available resources to combat a pandemic. The WHO Regional Office for Africa (2022) illustrates the role of enhanced government capacity and effectiveness in managing health crises. Despite the challenges of limited resources at the onset of the pandemic, African nations demonstrated considerable capability, coupled with the advantage of a time lag when the first COVID-19 cases were reported on the continent, allowing them to learn from other countries and react promptly and effectively to the COVID-19 crisis.

Within the broader policy and implementation framework of Africa Agenda 2063, the study results call for policymakers to place a more deliberate focus on prioritizing implementation and fostering a culture of good governance and institutional excellence within the governance frameworks of African states. By promoting principles of government effectiveness, enhancing public service delivery, and fostering inclusive decision-making processes, African nations can build resilience and capacity to effectively tackle health crises as well as a myriad of socio-economic challenges on the path toward sustainable development. Moreover, it is essential to emphasize the importance of allocating adequate health budgets as a share of each country's GDP, as health expenditure has the strongest association with reducing the impact of future pandemic calamities. African countries should therefore strive to meet the target of 15% of GDP allocated to health expenditure to improve health outcomes. As it is now, no country in Africa has achieved this target.

6.2 Areas of Further Research

This study has not tackled several areas relating to public policy, governance structures, and other probable causes of COVID-19 outcomes. First, while different types of political regimes have been found to be insignificant regarding COVID-19 outcomes, there is still a grey area as to which forms of government systems are more effective in the pandemic response. This study has not fully explored the relationship between the different forms of government systems, such as parliamentary, presidential, federal, and unitary systems, and whether decentralization COVID-19 outcomes (mortality and infection rates).

Second, the data presented in this study support the notion that high state capacity has a negative correlation with COVID-19 outcomes. Despite supporting this broad conclusion, the analysis did not delve into the specific mechanisms through which these effects occur. Additionally, it does not reflect on how other nonpolitical actors, such as civil societies and the private sector, mediated the relationship between the state and COVID-19 outcomes through private public partnerships. Further case studies can be conducted to answer these questions.

Furthermore, follow-up studies could investigate the extent to which customs, religion, and political actors' opinions influence COVID-19 pandemic containment measures in Africa, drawing lessons on how the best risk communication and community engagement programs can be structured.

Finally, while keeping the main objective of assessing the extent to which regime types, particularly democracies, handled the COVID-19 pandemic and how this affected the number of COVID-19 cases and deaths, further research can explore how the public's perception of a leader's management of the pandemic affected their political future. Leaders who successfully handled the pandemic were re-elected, and those who did not were defeated. Further research would seek to better understand the relationship between a leader's response to a health crisis and their political success or failure, and further explore whether democracies perform better due to fear of public retribution.

7.0 APPENDICES

Table A1: Categorization of African States-Freedom House (2020-2021)

Fully Democratic	Partially Democratic	Authoritarian
Botswana,	Algeria	Angola
Cape Verde,	Benin,	Cameroon,
Ghana,	Burkina Faso,	Central African Republic,
Mauritius,	Côte d'Ivoire,	Chad,
Namibia,	Kenya,	Comoros,
Sao Tome and Principe,	Lesotho,	Congo (Brazzaville),
Senegal,	Liberia,	Democratic Republic of
Seychelles	Malawi,	Congo,
South Africa	Mali,	Djibouti,
	Niger,	Egypt,
	Nigeria,	Equatorial Eritrea,
	Sierra Leone,	Ethiopia,
	Tanzania,	Guinea,
	Tunisia	Guinea-Bissau,
	Togo,	Libya
	Zambia,	Madagascar,
	Zimbabwe	Mozambique,
		Rwanda,
		Somalia,
		South Sudan,
		Sudan,
		Swaziland,
		Uganda

Source: Serikbayeva et al. (2021) and Freedom in the World (2021).

Table A2: Variables and expected directions.

Variable	Meaning	Expected sign and impact	Explanation	Data Source
Covid	COVID-19 outcomes	Dependent variable	Dependent variable measuring COVID-19 outcomes like mortality and infection rates	World Health Organization Statistics (2022)
gov_type	Type of government system	Ambiguous	Impact on COVID-19 outcomes may vary depending on how each system is organized and how policies are implemented	Freedom House (2020-2022) Freedom in the World Economic Intelligence Unit(2022)
share_65	Share of population aged 65+	Positive	Older populations are more vulnerable to severe illness and mortality	World Bank (WDI-2020-2022)
Pop_density	Concentration of individuals within a specific geographic location	Positive	More concentration of individuals will induce more infection rates	World Bank (WDI-2020-2022)

Health_exp	Share of health sector expenditure in GDP	Negative	Higher health expenditures as a share of GDP may lead to better pandemic response	World Bank (WDI-2020-2022)
Variable	**Meaning**	**Expected sign and impact**	**Explanation**	**Data Source**
GDP_percap	GDP per capita	Negative	Higher GDP per capita may indicate better healthcare infrastructure and living conditions	World Bank (WDI-2020-2022)
gov_eff	Government effectiveness;	Negative	More effective governments likely to implement better public health measures: Factors include timing, the stringency of lockdown measures, and the extent of testing and contact tracing efforts and vaccinations	World Bank Governance Index (2020-2022)

Table A3: Population Density (People per Sq. km of land Area)

Population density	**Namibia**	**Mauritius**	**Africa average**
2020	3.023355	633.9579	108.1947
2021	3.07322	634.1182	110.3505

Table A4: Hausman Test for Choice Between Fixed Effects And Random Effects Model

```
                ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B)).
             |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
 type_of_gvt |
          2  |       2.387    -7.003531        9.390531        11.23864
          3  |       -.126    -7.746702        7.620702         9.02567
------------------------------------------------------------------------------
          b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg
    Test:  Ho:  difference in coefficients not systematic
               chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =        s0.77
              Prob>chi2 =      0.6793
```

The null hypothesis (Ho) of the Hausman test is that the preferred model is random effects, meaning that the unique errors (ui) are not correlated with regressors. A failure to reject this null hypothesis suggests that the difference in coefficients is not systematic and that the random effects estimator may be appropriate for the data.

```
                ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B)).
             |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
```

type_of_gvt |

2 | 81.31 -272.8089 354.1189 427.4955

3 | -24.562 -279.258 254.696 343.4144

---

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 0.70

Prob>chi2 = 0.7058

The Hausman test does not find systematic differences between the coefficients estimated using the fixed-effects and random-effects models. This suggests that for this particular dataset and model specification, the unique errors (ui) are not correlated with the included independent variables, and either a fixed- or random-effects model could be appropriate. However, the decision of which model to use should also be based on theoretical considerations and the nature of the data.

Based on the relationship between the main independent variable and the dependent variables, I choose a fixed-effects model because it controls for the time-invariant characteristics of each entity, allowing me to isolate the impact of the governance regime on COVID-19 outcomes. Therefore, it minimizes the omitted variable bias that could be introduced by unobserved, entity-specific effects that do not change over time.

Table A5: Breusch-Pagan Lm Test

Breusch and Pagan Lagrangian multiplier test for random effects

fatalities[country2,t] = Xb + u[country2] + e[country2,t]

Estimated results:

Var	sd = sqrt(Var)
fatalit~s	127.9896	11.31325
e	37.40954	6.116334
u	42.70229	6.534699

Test: Var(u) = 0

chibar2(01) = 10.15

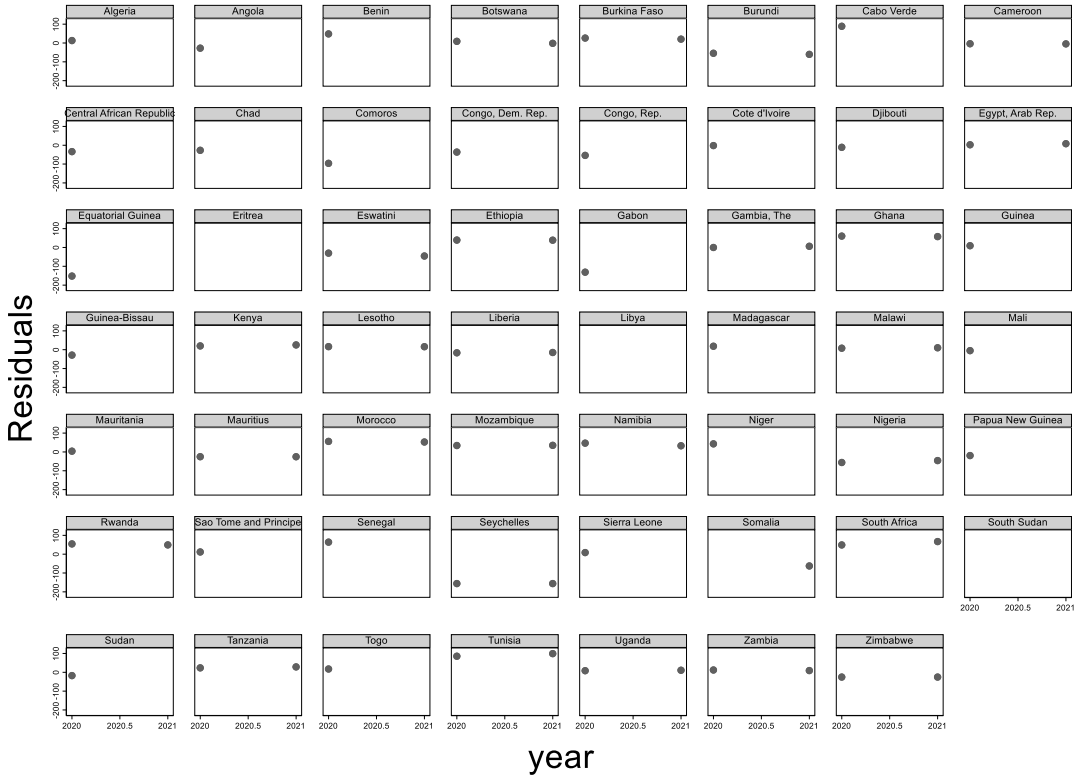
Prob > chibar2 = 0.0007

Although the study employs a fixed-effects model, it is always a good practice to confirm that this is preferred over a pooled OLS model.

Given that the p-value is significantly less than any conventional significance level (e.g., 0.05, 0.01), I reject the null hypothesis that there is no variance between the entities. This means that there is significant evidence of random effects in panel data. There are clear differences between the countries that affect the dependent variable fatalities, which are not captured by the observed variables in the model.

In practice, this test suggests that a random-effects model might be more appropriate than a pooled OLS model for panel data, as unobserved country-specific effects influence the outcome variable. However, the choice between fixed or random effects still depends on the Hausman test results and theoretical considerations about whether these country-specific effects are likely to be correlated with other independent variables in the model.

Figures A1:Residual Plots



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