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COVID-19 AS A DISASTER AND CHALLENGES OF MANAGING THE PANDEMIC IN URBAN SLUMS: THE CASE OF NAIROBI

M.Sc. Thesis by

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M.Sc. THESIS EXAMINATION RESULT FORM

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COVID-19 AS A DISASTER AND CHALLENGES OF MANAGING THE PANDEMIC IN URBAN SLUMS: THE CASE OF NAIROBI

ABSTRACT

Since the emergence of the COVID-19 outbreak, its potential impact on the health systems and infrastructure all across the world has drawn significant attention from scholars and policymakers in terms of output of researched publications. Several models and designs have been established to examine the social and economic impacts of the pandemic purposely to develop solutions to the outbreak. However, what is yet to receive attention in the same continuum, is the question of how the public health interventions have impacted livelihoods in the large and complex informal settlements found largely in urban settlements. This thesis strives to address this gap by examining the relationship between public health interventions during novel disease pandemics such as COVID-19 and livelihood in informal settlements. This thesis seeks to identify how previous policies have left certain segments of the society particularly those in densely populated urban settlements vulnerable to direct and indirect consequences of the pandemic.

Keywords: Urban slums, COVID-19, Nairobi, disaster management, challenges.

BİR AFET OLARAK KOVİD-19 VE ŞEHİR MERKEZLERİNDE PANDEMİYİ YÖNETMENİN ZORLUKLARI: NAIROBI ÖRNEĞİ

ÖZ

COVID-19 salgınının ortaya çıkmasından bu yana, tüm dünyadaki sağlık sistemleri ve altyapısı üzerindeki potansiyel etkisi, araştırılan yayınların çıktıları açısından bilim adamları ve politika yapıcıların büyük ilgisini çekti. Salgına yönelik çözümler geliştirmek amacıyla pandeminin sosyal ve ekonomik etkilerini incelemek amacıyla çeşitli modeller ve tasarımlar oluşturulmuştur. Bununla birlikte, aynı süreklilikte henüz dikkat çekmeyen şey, halk sağlığı müdahalelerinin, büyük ölçüde kentsel yerleşimlerde bulunan büyük ve karmaşık gayri resmi yerleşim yerlerinde geçim kaynaklarını nasıl etkilediği sorusudur. Bu tez, COVID-19 gibi yeni hastalık salgınları sırasında halk sağlığı müdahaleleri ile gayri resmi yerleşim yerlerindeki geçim kaynakları arasındaki ilişkiyi inceleyerek bu boşluğu ele almaya çalışmaktadır. Bu tez, önceki politikaların toplumun belirli kesimlerini, özellikle yoğun nüfuslu kentsel yerleşimlerdekileri, pandeminin doğrudan ve dolaylı sonuçlarına karşı nasıl savunmasız bıraktığını belirlemeyi amaçlamaktadır.

Anahtar Kelimeler: Kentsel Gecekondular, COVID-19, Nairobi, Afet Yönetimi, Zorluklar

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Growing investments by public and private sectors over the years has been attributed to the reduced effects of infectious and viral diseases even though they still account for over 25% of the global mortality rates [113]. When communities or countries experience pandemics of these diseases or viral infections, the impact tends to be disproportionate, with those in middle and low-income classes and countries being at more risk [62]. Outside these groups other populations that are facing humanitarian crises may also be in positions of increased risks of mortality and morbidity. Past epidemic prone diseases such as hemorrhagic fevers, Typhoid, and Ebola, have re-emerged and as the global population increases and international travel intensifies, so is the threat of disease pandemics [113].

In light of the recognition of the new global settings and how easier it has become for disease pandemics to spread all over the globe, there is an equally serious concern that the ability of a global response to disease epidemics is not at par with the level of threats posed. For instance, previously failed attempts to contain the Ebola epidemic in west Africa, was attributed to a weak international public health system and weak capacities and mechanism to respond to disease pandemics [92]. But this failure cannot only be benched upon the weaknesses of the international response, but also, and perhaps even more importantly, the entrenched and long-standing weaknesses of public health systems at the national and sub-national levels including on how other common occurring pathogens such as malaria, measles and cholera are responded to [98].

The delayed detection and declaration of potential pandemic diseases as well as subsequent slowed decision-making process largely founded on emancipated political and economic consequences or considerations, and the poor coordination and resourcing posit the main factors behind a poor, unsustainable, and ineffective

response to epidemics [81,98]. Nonetheless, these factors often come to light during post-pandemic response evaluations. As such, it remains of utmost significance to examine and find new innovative techniques that intersect with the local social and economic demographics during ongoing pandemics in order to provide sustainable identification and spread mitigation solutions [75].

Over the last five decades, urbanization has been one of the visible demographic transformations experienced in several developing countries, particularly in Africa. Indeed, as a demographic phenomenon, urbanization has significant potential to impact the development trajectory of such societies. In regions such as Africa which is cited as a leading continent in the rates of urbanization, the last five decades have seen a rapid movement from rural settings to urban areas. Projections by World Bank predict that Africa by 2030 will have over 50% of its population living in urban areas. Increasingly, while rural-urban migration is a significant factor in the growth of new urban areas, population growth rates through birth within the urban settings has also emerged as an important factor.

Contextualizing urban transformation is important particularly in regard to disaster management. How these settlements have emerged, how they operate, and the population which inhabits informal urban settlements offer the basic but rather fundamental aspects of how disasters can be addressed within such environments. Indeed, disasters are not new to humankind as earthquakes, wild-fires, floods, volcanic eruptions, and huge storms or tsunamis have been part and parcel of human history. It is however until recently that scholars particularly in the field of historical studies have begun adequately publishing about such natural disasters and how they impact human life. A new emerging category to these disasters are disease pandemics which on the account of huge progress achieved in sectors such as land, sea, and air transport, can rapidly escalate to a global disease outbreak putting millions of lives at risk on one hand, while on the other, capable of completely wrecking the global economy and social order. The status of the global travel network as of 2020 is unparalleled in human history. For example, in 2018, more than 4 billion (approx. 60% of global population) travelled by commercial flights. In other words, the nature of global convergence today, also means that pathogenic or viral diseases are capacitated to rapidly spread

thereby increasing the threat of such diseases in their size, magnitude, spread and impact.

Prior to the outbreak of COVID-19, the radical transformations in human health and progress in medicine to address health scares over the last five decades has seen a gradual decline of collective memory of disease pandemics [87]. For one, the existing human population who can still remember the times before the advent of antibiotics, is by estimations very scarce. Nonetheless, other existing threats posed by diseases such as fever, Ebola, Malaria, and HIV/AIDs remain a concern despite huge advances in medicine. Studies by McDonald *et al*.,[68] on pathogenic viruses such as the H5N1 which can infect humans, raised professional concerns that a global influenza pandemic was imminent, and the outbreak of COVID-19 perhaps epitomized these previous concerns.

When the World Health Organization (WHO) declared COVID-19 a global pandemic after it emerged in a food market in Wuhan-China, it quickly spread to become one of the worst pandemics recorded in recent human history [16,82]. As of July 2021, approximately 195 million people had been infected, and more than 4.1 million others dead in over 177 countries [66]. During the early period of the outbreak, information on COVID-19 and individuals at risk was largely drawn from countries such as China, Germany, US, Spain, and South Korea in which the infections were concentrated at the time. Several recommendations such as washing of hands, self-isolation and physical distancing were largely touted as the temporary containment measures against the virus. Gradually, more attention was also diverted towards the issue of providing adequate critical care as the death rates of COVID-19 victims took a drastic upward trajectory. This also partly contributed to other strict government measures such as total lockdowns in exchange for government economic assistance packages particularly in wealthy countries to support daily livelihoods.

Figure 1: Breakdown of Global COVID-19 Cases (as of July 26th, 2021)

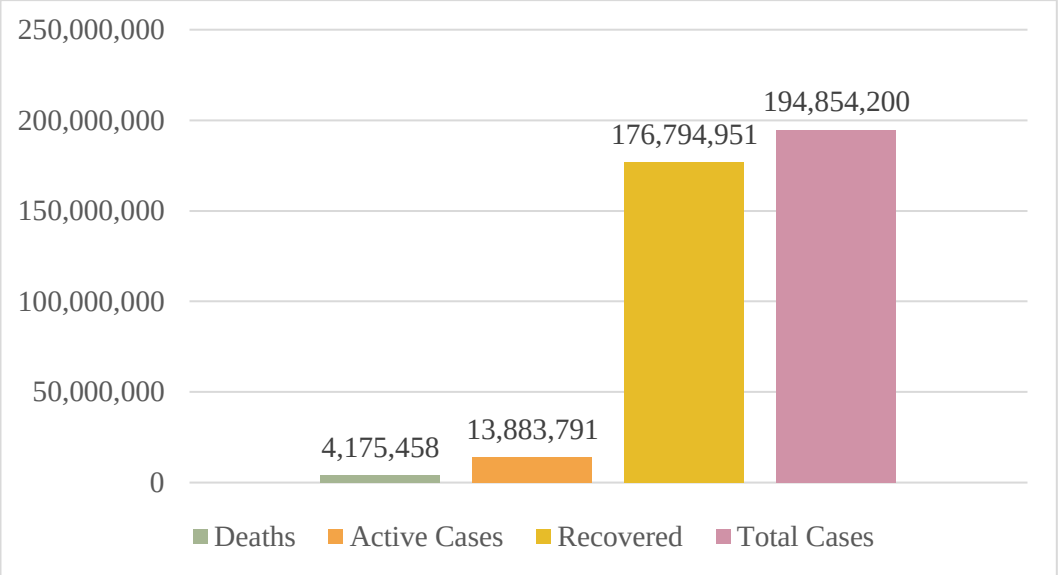


Figure 1. 1: Breakdown of Global COVID-19 Cases (as of July 26th, 2021)

Source: WHO/ECDC; Worldometers dataset

However, in low and middle-income countries, the national economic capacities could not enable the allocation of similar economic packages to citizens subjected to the same COVID-19 containment measures. One such group to bear the grunt of these affirmative government measures are the inhabitants of informal urban settlements most of who depend on daily earnings in order to be able to sustain their livelihoods. To this disproportionately affected groups, COVID-19 became both a social and economic disaster, with many faced by the tough decision of either breaking government sanctioned COVID-19 containment measures or experiencing starvation.

1.2 Research Objective

The objective of this study is to examine how public health crisis can spell disaster to different segments of the society and explain why going forward, public health crises should be considered in a country's disaster management strategy. By examining the case of urban slum dwellers in Nairobi, this thesis also seeks to examine how systematic marginalization, poor policies and inappropriate planning strategies can

accelerate the public health crisis into a disaster. To achieve this objective, the following research questions will guide the study.

1. To what extent is the COVID 19 pandemic a disaster
2. How does the COVID 19 affect slum dwellers in Nairobi?
3. How do previous policies and government inaction accelerate disasters?
4. What policy recommendations can we derive from the COVID 19 pandemic for future disaster management?

1.3 Relevance of the Study

The outbreak of COVID-19 has renewed concerns about the quality of life and risks that resident in urban informal settlements are faced with on a daily basis. The demographical and physical characteristics of these settlements also mean that in the presence of a disaster or a pandemic outbreak, they are most likely to be the least prepared to mitigate the threats and impacts of pandemics. The attempts of governments to institute necessary draconian measures in an attempt to mitigate such existing threats only tend to exacerbate the problems faced in these settlements.

The focus of this thesis on Nairobi is justified on two counts. First, because of its primacy, Nairobi represents an urban growth trajectory that other Kenyan cities (both within and outside the Nairobi metropolitan area) are likely to follow as the country is gearing up towards achieving a middle-income status. This has seen the city attract increased rural to urban migration thereby leading to emergence of other challenges such as higher average distances and travel times and higher use congested public transport systems. As such in the absence of proactive policies and infrastructure investments to influence sustainable urban growth, these issues that are a great threat during disasters will continue to exacerbate if not addressed comprehensively.

Secondly, the choice for Nairobi is due to existence of data which is critical to this study particularly at a time when the COVID-19 pandemic has made movement and interaction very difficult because of social distancing rules and lockdown restrictions. The other cities in the country lack detailed data and can therefore offer very limited analysis of this study. Achieving a better understanding of the accessibility and

mobility situation in Nairobi can also provide important lessons for other Kenyan cities, in particular on mistakes to avoid.

The Nairobi informal settlements are characterized by non-permanent physical structures, overpopulation, lack of access to essential needs such as clean water, social amenities, sanitation and hygiene, and insecure property rights, which are all key determinants of poor health outcomes particularly during pandemics. These features have transformed slums into habitats of very vulnerable members of the society such as racial, ethnic or religious minorities, migrants and low-income families who are also faced with challenges of systemic discrimination and marginalization. The intersectionality of these attributes pose as a difficult challenge to the management of disasters especially those related to issues such as disease pandemics.

1.4 Methodology

This thesis adopts an explanatory methodology to examine the context of COVID-19 as a disaster, and the challenges faced in the management of the pandemic in the Nairobi urban informal settlements. Given the rate of infections in the country, and particularly in Nairobi which has emerged as an epicenter of the virus in Kenya, the social, economic and political settings of the city bring certain unique challenges which form the basis of this research. This study will conduct an in-depth analysis of literature to examine the dynamic of COVID-19 as a pandemic, government response, and why the social and economic characteristics of Nairobi's informal settlements are a challenge to managing the virus.

This thesis will contribute to illuminating the effectiveness, efficiency, and suitability of the broadly recommended strategy of containment of COVID-19 infections as an attempt to 'flatten the curve' by reducing the daily rates of infections with a special emphasis on the informal settlements. Data on the COVID-19 infections will be collected from WHO websites, Kenyan Ministry of Health, and Worldometers website which has emerged as a leading platform for country specific and global COVID-19 infections, recoveries and deaths. Other relevant documents and information will be obtained from The Economic Survey of 2020 , National Population and Housing Census of 2019, and the Kenya Demographic and Health Survey. These sources of

information will be exploited to generate critical and analytical information on important variables such as number of hospitals or health facilities, population density, and population mobility in order to examine the challenges of countering the COVID-19 pandemic.

1.5 Literature review

1.5.1 Emergence of Informal Settlements

Informal settlements have received significant attention from urban researchers who point out that the rapid of informal settlements is a consequence of several factors at local and global levels as well as the deep foundations of colonial legacies [90]. Some of these colonial legacies pertain to how cities or town were planned and governed. In regard to the local and global factors, rapid urban growth, dynamics of liberalization policies, poo leadership, and the absence or lack of transformative political will to address urbanization in sustainable and large-scale manner [37]. Since the 1950 urbanization has experienced rapid growth particularly in low-income continents such as Africa, Latin America and parts of Asia. To put this dramatic context into perspective, populations of cities such Accra (Ghana) grew from 393,000 residents in 1950 to over 4.2 million as of 2020 while that of Jakarta (Indonesia), grew from 1.4 million inhabitants in 1950 to a projection of approximately 10.8 million in 2020 and Porte Alegre (Brazil) increased from 880,993 to over 2.93 million in the same period [109]. The rapid rise in population and the consequent persistent pressure on existing public resources such as infrastructure, public urban lands and services therefore contribute to the emergence and subsequent expansion of informal settlements.

While urbanization has been ongoing including in developed countries such as Japan or America, their national and federal or local governments have done considerably well in tackling the issue of informal settlements partly because of their significant financial resources. However, this cannot be seen as the only factor. Other countries such as Egypt and Peru were at one time having almost similar income levels in 1990 and 2001 and about the same rates of informal settlements yet Egypt comparatively reduced the number of urban citizens living in the informal or slum settlements (from 57.5% to 34.9%). Peru on the other hand experienced an increase in its informal

settlement population from 60.4% to 70.1% [37]. The difference in the rates of informal settlement cannot be attached to income levels given Peru had a slightly higher level of income. Rather, this variation can be attributed to the difference in governance.

The growth and development of new cities and towns is determined by the nature of identified and established urban plans, patterns of investments needed, and the institutional arrangements such as land management and property rights. These three ideological tenets of urban development play important roles in determining the emergence, presence or absence of informal settlements. Urban development plans respond to the demographic and economic needs of the people, investments facilitate the establishment and maintenance of critical infrastructure, while institutional regimes ensure law and order is established in both social and economic dynamics. The combination of these factors results in a dynamic urban environment that can support its own growth and development. Alternatively, if these aspects of urbanization are poorly managed, informal settlements emerge thereby forcing the inhabitants of such settlements to resort to localized solutions that only aims to solve their immediate needs and not of the future. In short, rapid urban growth in the context of poor governance or planning, leads to the emergence of informal settlements.

Scholars who associate the emergence of urban informal settlements with colonialism make reference to the colonial legacies on institutional governance. Theoretical and empirical studies [4,33] have demonstrated that colonial occupation in Africa and other developing countries has a profound long-term effect on the qualities of institutions and governance. The underlying argument of these studies is that colonization impacted on the nature of institutions established in colonial territories that were passed down to post-colonial governments. In areas where there were unfavorably harsh environment for colonial settlers, extractive institutional regimes were established, and they persisted even after independence with overall impact being poor economic policies. A study by Banerjee & Iyer [17] highlights those variations in colonial land revenue institutions correlate with contemporary variations in agricultural productivity, investment in health, and educational facilities across regions in India. In the urban context, the impacts of colonial administration continue to affect

urban planning, enforcement institutions and design of towns and cities [14,84]. Hardoy & Satterwhite [43] argue that:

> "Many colonial governments…put in place a range of laws, norms and codes governing housing, building and planning which remain today, largely unchanged…[These were developed] at a time when the nation's economy was predominately agriculture and rural based, and people's right to move to urban centres was often restricted. Not surprisingly, they are very poorly suited to an independent nation where rapid urban growth and increasingly urban societies have become the norm."

Despite the efforts of African governments to repeal some of the draconian colonial urbanization laws by dismantling or reforming such colonial institutions, the technical and perhaps even the physical planning features of urban planning in particular areas continue to persist. In Tanzania for instance, colonial rules that imposed restrictions on urban migration and introduced zoning regulations were removed, but the underlying features such as those regarding the population density and house structures requirements have been maintained [54,60]. Fox [37] summates the impact of colonial legacies to the emergence in of informal settlements as shown below:

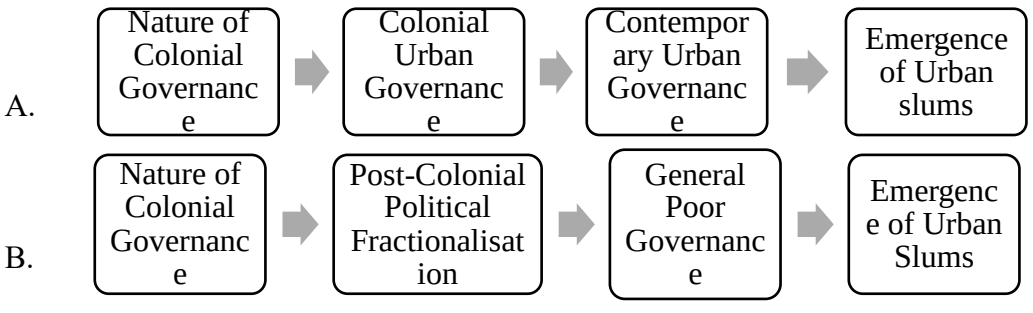


Figure 1. 2: Nature and Emergence of Slums

1.5.2 Drivers of informal settlements

Different studies have attempted to examine the varying drivers in terms of the densification and expansion of informal settlements. According to a publication by the UN-Habitat, rapid urbanization is the main factor that contributes to not only the emergence but also high growth rates of informal settlements. The growth of urban informal settlements commence when urban centres begin to experience a rapid growth in population without a corresponding adequate supply of housing [8]. Similarly, Brueckner and Lall [21] reiterated that this housing gap is created by the failure of housing markets to avail commensurate housing to the rates of urbanization. In regions such as Africa and other developing regions, urbanization has significantly expanded as a result of low income from agricultural activities in rural areas, economic crises, rural poverty, perceptions in rural areas that urban centres offer better quality of life, and search for better prospects for employment in urban centres [66,77].

Other studies such as Olajuyigbe et al.,[85] also highlighted the role of poor governance in the expansion and growth of informal settlements. The authors argued that several governments are very slow in how they respond to urbanization or ignore the development of informal settlements, fail to establish pro-poor policies, and fail to avail the security of tenure for landowners in informal settlements that could motivate them to undertake development.

Other scholars have ventured into the analysis of spatiality of informal settlements. Xie et al.,[117] and Ahmed and Bramley [6] argued that all forms of human settlement are unique and thus, it is unlikely that a similar set of causes are universally applicable for all contexts. As a consequence, the different factors that lead to the emergence of informal settlements are often examined on a case-by-case basis. However, for purposes of developing theories on informal settlements, scholars have attempted to classify the causes of urban growth by classifying factors that are distinct to informal settlements in different categories of economic, physical, and socio-cultural [100]. Xie *et al.,* [117] provided an alternative to this assessment and identified other factors such as proximity, neighborhood characteristic, and site. The table below offers a summary of some of the studies and their findings on key drivers of informal settlements.

Table 1. 1: Summary of selected studies on the drivers (emergence and growth) of informal settlements

Source	**Sietchiping (2005)**	**Dubovvk *et al.*, (2009)**	**Abebe (2011)**	**Shekhar (2012)**
Name of study	*Developing countries' slum dynamics awareness*	*Informal settlements modelling in Istanbul*	*Modelling informal settlements in Dar es Salam*	*Modelling probable informal settlement drivers in Pune*
Proximity	Closeness to transport networks	Proximity to roads	Proximity to roads	Proximity to transport networks
	Proximity to rivers		Proximity to rivers Proximity to ocean	Proximity to riverbanks and canals
	Proximity to source of income	Proximity to industrial areas	-	Proximity to job locations
		Proximity to central business district	Proximity to central business district and sub-centres	
Site	-	-	Population density	Population density
	Topography Marginal and less valuable land such as dumpsites Low lying areas and wetlands		Environmental hazard areas Slope	Slope

	Policies on spatial planning	-	-	-
Characteristics of the neighborhood	Interaction with existing informal settlements		Proportion of informal settlements in the surrounding and planned residential land	Close interaction with ‘old’ informal settlements
	-	Proportion of surrounding urban land	Proportion of surrounding urban land	-
	Surrounding undeveloped land	Proportion of undeveloped land in the surrounding	Proportion of undeveloped land	Undeveloped lands in the neighborhood

1.5.3 Global overview of informal settlements

Informal settlements are a global phenomenon, and the United Nations Habitat estimates that approximately 25 percent of the total global population live within areas classified as informal settlements [108]. Although accurate data that can locate the exact statistics of global informal settlements, the figure below demonstrates the population distributions in percentage of those households in informal settlements across different countries and regions.

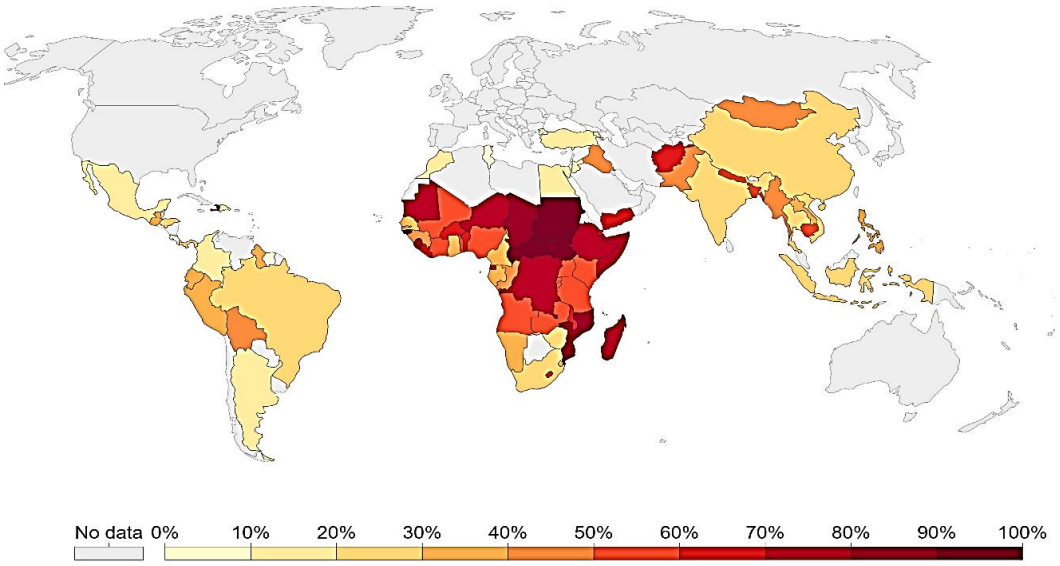


Figure 1. 3: Share of urban population living in informal settlements

Source: UN Habitat (2015)

In Sub-Sahara Africa, the rates of urban informal settlements remain one of the highest in the world with countries such as Ethiopia, Angola, Chad, Somalia, Madagascar, Niger, Mauritania, and Benin recording an average of 83 percent incidences of households living in informal settlement [39].

1.5.4 Pandemics and urban settlements

According to statistics by the Open Government Data Platform India, a report by the UN [108] and studies by Patel & Shah [91], there are over 1 billion people who live in informal settlements in the cities found in developing countries. Since the WHO declared COVID-19 a global pandemic several studies have come up to examine pandemics and urban settlements. Corburn *et al.*,[27] contributes to the growing literature on pandemics and informal urban settlements by examining the immediate solutions and strategies to respond to disease pandemics in informal settlements by highlighting the need establish long-term plans overarching contemporary disaster responses. Studies by Batty [18], propose the integration of the 'new science' of cities into urban health planning so as to advance the agenda of slum health in developing countries.

In other words, integrating the complex new science of health will entail instituting public health as a key part, goal, and process of urban planning to the extent that Corburn [26] in his study emphasizes that urban planning should be treated as a preventive medicine. In such a model, the inhabitants of informal settlements, are considered as a piece of the coproduction of health intervention, cities as organs with highly complex systems, places as relational and urban management as adaptive [26]. Increasingly the complexity science is integrated in urban smart city planning in developed countries such as South Korea but remain largely unexplored in the developing world where informal settlements remain a key feature.

1.5.5 Influenza epidemic and socio-economic rights

The outbreak of the Spanish flu in 1918 perhaps ranks as the deadliest epidemic witnessed in the 20th century and has received significant attention from scholars having infected more than a third of the global population and claiming over 50 million deaths [46]. According to studies by Mamelund *et al.*,[63], the social and economic status of countries informed the rates of mortality such that in high-income countries lower deaths were reported in comparison to low-income countries. Similar patterns were also observed in wealthy households than amongst the urban poor who bore the brunt of the epidemic.

In 2009, another outbreak of swine flu was recorded. However, due to improved aggregate social and economic conditions observed in several countries, the 2009 epidemic recorded comparatively lower mortality rates of 284, 000 to the 1918 Spanish flu.[1] In other words, the improvement social and economic conditions of states and households can facilitate better mitigation of the effects of pandemics. Similar to the experience of the Spanish flu, countries that had recorded minimal progress in addressing social inequalities such as access to healthcare, were more affected by the epidemic. Studies by Johnson & Mueller [46] demonstrate that the reduction in social inequalities across communities and the use of preventive measures such as

[1]CDC estimate of global H1N1 pandemic deaths: 284,000 available at https://bit.ly/2A5YW9L

vaccinations are critical to the protection of individuals with low socio-economic status who are not able to access quality and appropriate healthcare during pandemics.

Initiatives by governments and other interventions in the public health sector can collectively advance the efforts established towards the mitigation of disease pandemics. In the education sector, a study by Feinberg *et al.*, [36] reflect that the level of education (limited literacy) was an impediment to the access of preventive services. Additionally, lack of education only served to expedite the already existing problems experienced by individuals in low levels of education. For example, because of the low level of education, they could only access low-income employment opportunities, and this translated to poor nutritional diets and inability to access healthcare. The closure of schools to mitigate the pandemics also negatively impacted on the quality of education of students and pupils [20].

In the housing sector, access to standard housing affected the impact of Spanish flu. In Norway for instance, Mamelund *et al.*, [63] establishes that individuals who lived in small houses experienced higher mortality rates in comparison to those who resided in better neighbourhoods. Other studies such as [70] indicate that structures of houses and conditions of rooms have a direct impact on health and this impact can be negative particularly in areas with higher concentration of houses and people. The use of substandard and inadequate materials during construction can affect the health of inhabitants in such conditions and facilitates the transmission of respiratory pandemics such as influenza. In both the Spanish and Swine flu epidemics, the closure of public spaces by governments was common intervention.[2]

1.5.6 HIV/AIDS epidemic and socio-economic rights

HIV/AIDS scourge which emerged into public domain in the early 1980s remains one of the biggest health issues the world continues to grapple with. Since the 1980s, approximately 37.9 million people have been infected globally [61]. However, unlike the Spanish and Swine flus which are transmitted through respiratory contact,

[2] HSRC (2018) 'The Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, 2017' available at https://bit.ly/2KZFjSX

HIV/AIDS is transmitted sexually, via mother-to-child during birth, through blood transfusion or, via any other bodily fluids contact with infected individuals. Key among the preventive measures that have been adopted by governments are public campaigns calling for behavioural changes in the form of abstaining, being faithful to love partners, and using condoms during sex (also widely known as the ABC messaging). Research evidence reflect that in communities where these measures were adhered to registered relatively lower rates of infections. In comparison to COVID-19 behavioural change has largely been emphasized in the form of social distancing rules, self-isolation, and maintaining hygiene.

In countries such as South Africa which has recorded some of the highest rates of infections estimated at 7.7 million infections or roughly 20% of the total global HIV/AIDS infections, highlight the impact of the pandemic on vulnerable population. A study by Van Damme *et al.,* [111] shows that women are more affected by HIV infections at 26%, men at 15% and that about 260,000 children who are under 14 years are living with the virus. The disparities in the rates of poverty and exposure to domestic violence, pose a challenge to vulnerable groups such as women in accessing antiretroviral drugs while the male, exploit violence in order to exert control over their female partners [111].

In South Africa, demographic dynamics such settlements in formal and informal areas also determine the prevalence of HIV/AIDS. Informal settlements with higher concentration of people within a small area have registered higher number of HIV infections. According to Mabaso *et al.,* [61], majority of these urban informal settlement dwellers migrate from rural areas from other parts of the country to the urban centres in such of better economic opportunities.

For the majority of those infected with HIV/AIDS one of the major challenges is societal stigma. Several studies [30,48,55], have indicated that both women and men face discrimination in the society when their status of HIV become known. Koodibeste [55] for instance, notes that 12.6% of men and women are between the ages of 15 and 49 reported discriminatory attitudes towards them because of their HIV status. At times stigmatization of HIV victims extend to other critical places such as in the health

sector, where 3.2% of individual living with the virus have been denied health services in South Africa.

1.6 Conceptual Framework

Pandemics pose inconsiderable threats to societies and can be more dreadful, in how it impacts informal settlements. From the challenges and the containment measures discussed in Section 4 of this thesis on COVID-19, four significant relational networks that are important to both health and socio-economic concerns in informal settlements emerge. These networks include: 1) the relational networks in the informal settlement communities; 2) the relational networks between those who inhabit these informal settlements and non-slum communities in the urban centres; 3) the networks that enable and sustain the movement of goods and services in urban areas; and 4) the migratory networks pertaining to the areas of origin and destination.

These networks which emerge out of the natural configuration of informal settlements, impact the context of COVID-19 pandemic in contemporary times and well beyond. To contrast these informal networks against their nearest equivalents within the same context of urban areas, the table below offers insight in COVID-19 response that directly emerge from how informal settlements and cities are conceptualised.

Table 1. 2: Relational networks in urban centres and impact on COVID-19 pandemic management in informal settlements

Traditional View	Response to Pandemic and the effects on residents in informal settlements	Relational Networks	Implications on Future Pandemic Response

Slums	Enforcement of lockdowns has resulted in the loss of economic livelihood of residents and challenges in acquiring basic needs.	Social relational networks within the informal settlements	Are critical stakeholders to engage with and leverage in pandemic (e.g. COVID-19, Ebola) response efforts in urban centres.
Slums and non-slums as divided areas	Heavy-handed policing in the form of police brutality as part of quarantine	Employment relational networks	Efficient and sustainable contact tracing measures to map out the potential spread of pandemics and subsequently contain the same.
Urban settlements as closed systems	Lockdown restricts inter-county movements and neglects the existence of small economies of scale that depend on the	Migration networks	Mapping the points of origin and destination of essential goods can assist in the planning of safe and efficient transportation and minimise the

	daily flow of people and goods.		burden that may be caused by low supply in urban centres.
Physical network of infrastructure such as piped water supply and sewerage	Frequent handwashing and individual hygiene	Socio-physical network of infrastructure where shared access points to water and sanitation acts as linkage between residents as nodes	Communal or multi-access areas such as water points are a potential risk factors during pandemics and decentralized access of such utilities should be prioritised.

Source: Author Analysis

Foremostly, the social and economic dynamics within the informal settlements also mean that the inhabitants of these areas are heavily dependent on each other particularly to cope with disasters, emergencies, or pandemics such as COVID-19. Often, the existing social networks within these settings serve as social capital. In other word, they are networks with shared social norms, values and understanding that promote, facilitate and sustain cooperation within or among the residents of informal settlements. As such, during pandemics or disasters, these networks can play a significant role in the management and containment of disease outbreaks. However, the focus on top-down approaches fail to recognize these networks as an important resource in the management of pandemics despite their potential advantages of being leveraged to address the challenges posed by pandemics.

Secondly, the relational networks in urban centres between residents in informal settlements and non-informal settlement communities is underlined by labour relations

in the context of slum-dwellers providing services to non-slum residents through informal contracting. Consequently, the adoption of top-down approaches in the management of COVID-19 pandemic failed to acknowledge the existence of this labour relations thereby leading to massive losses of sources of livelihood for slum-dwellers and in extension, disruption in the provision of essential services such as waste collection which is largely done by the urban poor. Therefore, when these sources of livelihood are disrupted, residents of the informal settlements who depend on the daily income become unable to meet their needs.

Thirdly, urban centres have networks that facilitate the flow of goods and services in and out of the cities. However, the imposition of total lockdown that included that disrupted the movement of goods and services, informal settlements became grossly affected in terms of food supply chains. It is important to acknowledge that most of the households in informal settlements are not in a financial position to acquires food supplies that can last them a few days let alone durations longer than a month. Knowledge on the circulation of essential goods such as food, emergency medicine and healthcare in informal settlements is therefore critical in the planning of responses during pandemics or disasters.

Fourth, on the general scale, urban centres can be conceptualized as part and parcel of networks of places often with higher rural origins and urban destinations. This is a common trend in developing countries experiencing rapid urbanization. During pandemics, these network of migration is can be reversed such that the migration shifts from the urban areas to rural regions. Faced with the choice of starvation, unemployment and uncertainty regarding how soon normalcy can be reinstituted during pandemics, many residents of informal settlements opt to migrate back to rural areas. In the absence of proper and sustainable measures to address the socio-economic challenges of informal urban settlements, the trajectory of such migration only serves to increase the threat of spreading disease pandemics further and wider to remote areas in the country. Thus, if urban areas are properly conceptualised as networks of migration, a better public health response can be established to facilitate the movement of people, goods and services in a reliable and sustainable manner.

The essence of this conceptualization is that it enables us to rethink about informal settlements in a more comprehensive manner that can sustain and advance disaster management in urban informal settlements which are usually exposed more.

CHAPTER 2

URBAN INFORMAL SETTLEMENTS IN NAIROBI

2.1. Background of informal settlements in Nairobi

The reference 'informal' settlements is an attempt to project the conspicuous characteristics of urban areas that do not meet certain limits of what would be considered as dignified standards of social spaces and living. According to a study by the Cities Alliance, the formation of informal settlements can be attributed to two fundamental problems: urban growth and governance.[3] The United Nations- Habitat noted that the emergence of informal settlements is attributed to several factors, some which are closely inter-linked such as economic vulnerability and underpaid labor, lack of affordable housing for vulnerable population in urban centres, poor governance, population growth, displacement by conflict, rural-urban migration, climate change, marginalization, natural disasters, and discrimination [108].

While these factors can adequately encapsulate such areas worldwide over, the Kenyan informal settlements tend to have certain characteristics that are distinctive. Such include: 'landlords' of housing structures have a quasi-legal right of occupation or no rights at all; structures are built using temporary construction materials that do not adhere to the minimum quality standards; houses are let on a room-by-room basis with a majority constructed as single rooms; the areas are densely populated; physical structures and layout are haphazard such that introducing public services such as road construction, drainage, water and sanitation is almost impossible without conducting extensive demolitions that displaces thousands of residents; and, majority if not all of the inhabitants are low income earners.

During disasters, informal settlements are therefore usually in a state of unpreparedness because of the lack of planning epitomized by non-consideration of

[3] Cities Alliance. (n.d.). About Slum Upgrading. https://www.citiesalliance.org/themes/slums-and-slum-upgrading

safety and infrastructure. Due to these demographics, the rates of mortality and morbidity are also high because of disease outbreaks emerging from the poor environmental conditions. Indeed, while not all settlements in the city embody these characteristics or to the same degree, the characterization nonetheless provides a broad picture of the informal settlements in Nairobi.

The emergence of Nairobi can be traced back to the British colonial administration in Kenya. The construction of Kenya-Uganda railway which was to connect the Indian Ocean port of Mombasa with Kampala in Uganda to facilitate easier exploitation of natural resources laid the foundation for the rise of Nairobi into a major regional city it has become today. Once the construction of the railway was completed in 1901, the headquarters of the East African Railways was moved from Mombasa to Nairobi [9]. Henceforth, Nairobi has expanded rapidly to become a major social, commercial, and technological hub for East and Central Africa. As of 2019, this cosmopolitan city is inhabited by three major population components that include Africans (95%), Asians (approx. 4%) and Europeans (approx. 1%) [83].

Table 2. 1: Population Distribution in Nairobi (As of 2019)

Area (Sq. Km)	Population	Population Density (person per Sq. Km)	No. of Households	Gender Distribution	
				Male (%)	Female (%)
703.9	4,337,080	6247	1,506,888	49.9	50.1

Source: Author Compilation from Kenya National Bureau of Statistics (KBS)

Since its founding in 1901, Nairobi has experienced rapid population growth from the previous recorded 118,976 in 1948 to over 4.3 million as of 2019. Its physical size has also expanded from 3.84 sq. km to 703.9 sq. km over the same period. The increase in physical size and population can be largely attributed to rural to urban migration and natural increase (high birth rates). Since the inception of Nairobi as a city, respective colonial administrations and post-colonial governments have failed to address existing and emerging informal settlements even after the government declared such

settlements illegal. Some of the major informal settlements include Kibera, Mathare, Korogocho, and Mukuru Kwa Njenga.

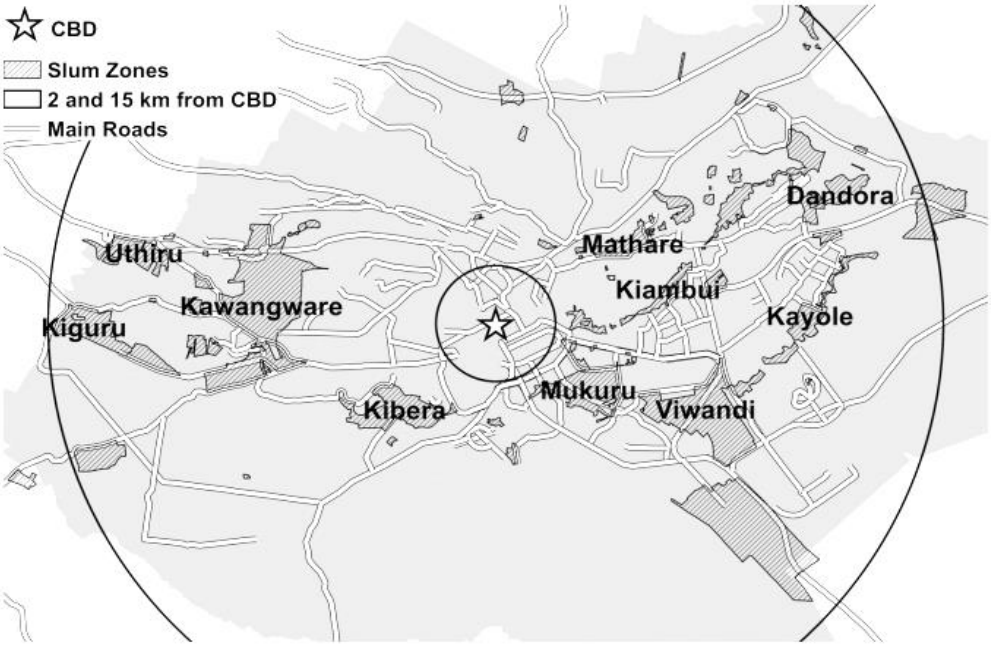


Figure 2. 1: Informal settlements in Nairobi

Source: Adopted from Bird *et al.*, (2017)

Kibera is the largest informal settlement in Kenya and amongst the top three in the entire continent. It is estimated that more than 200,000 people inhabit the slum in an area measuring just 2.5 sq. km and is just about 5 km away from the Nairobi City Center. The slum is further disintegrated into thirteen villages namely Laini Saba, Kisumu Ndogo, Raila, Kichinjio, Makina, Kianda, Lindi, Makina, Soweto West, Silanga, Kambi Muru, Soweto West, and Mashimoni. The building structures in Kibera are largely mud-walled with corrugated iron sheets. Moreover, the structures are very small in size measuring about 12 ft by 12 ft and are each occupied by a single household of averagely seven members [77]. Some of these shanty structures (about 10%) found in the slum are owned by the Kibera residents while the rest are owned by absentee landlords who charge monthly rental rates from a minimum USD 15 for single rooms [15].

Table 2. 2: Main slums and population distribution per hectare in Nairobi between 2000-2020

		Inhabitants per hectare			
Slum	**Area/hectare**	**2000**	**2010**	**2020**	**% increase in population**
Dandora	182.15	248.61	403.18	585.31	336.70
Huruma	78.14	614.44	911.93	1381.42	766.98
Estate	249.08	146.32	281.17	318.26	171.94
Kawangware	329.14	186.25	272.76	399.94	213.69
Kiambiu	50.02	284.26	529.78	714.16	429.90
Kibera	287.13	439.43	671.88	985.70	546.27
Korogocho	99.74	281.84	481.86	588.93	307.09
Kwa Njenga	133.21	155.26	257.00	358.74	203.48
Majengo	60.45	253.27	380.81	577.98	324.71
Mathare	100.70	329.72	519.27	804.99	475.27
Mukuru	49.02	92.56	122.61	186.95	94.39
Soweto	192.23	139.83	224.86	333.45	193.62
Viwandani	167.11	140.22	211.09	306.58	166.32

Source: Adopted from Ren *et al.*, (2020)

In Mathare Slums, the earliest residents of Mathare Valley are traced back to 1920s and 1930s when the colonial government had displaced Africans from other areas such as Pangani [34]. In 1963, a larger group majorly comprised of independence fighters settled in Mathare on government land. Henceforth, the settlement expanded to include

13 villages namely Kosovo, Mashimoni, Village 2, Village No. 10, 3A, 3B, 3C, 4A, 4B, Kwa Kariuki, Mabatini, Gitathuru, and Kiamutisya. Over 60% of the land is government owned while the rest is privately owned by both individuals and companies. The estimated population in the slums as of 2017 is over 200,000 people.

Last but not least, Korogocho is also another major informal settlement in Nairobi that emerged in the early 1980s and similarly to Kibera and Mathare, over 50% of the land is government owned and the rest is private individual, or company owned [72]. Korogocho is also estimated to have a population of more than 200, 000 individuals staying in seven villages covering 1-1.5 sq. km [112]. However, unlike the other two settlements, the nature of houses in this slum is more permanent with walls made of building blocks and iron sheet roofing.

Residents in these in informal settlements live under very deplorable economic, social and environmental conditions without adequate or no access to basic needs and social amenities. The daily challenges they encounter are multi-dimensional and multi-level ranging from poor solid waste management, lack of proper and affordable housing, access to electricity, energy, healthcare, and education.

2.2. Significance of the informal settlements

For developing countries, although informal settlements are considered as unsuitable for human habitation, there existence nonetheless play an important at least in the context of temporary needs. Frequently, informal settlements are considered as the ‘informal sub-sector’ of the property market, which in the case of Kenya, constitutes the informal sub-sector of the rental housing market. In many urban centres including those outside Nairobi, an overwhelming majority of the urban dwellers and residents occupy houses based on rental transactions. The Government of Kenya established in one of its studies of the housing sector that urban households appropriated on average, 30 percent of their incomes on housing. In addition, a contextual study on housing in Nairobi found that about 92 percent of the population were rent-paying households. Thus, the existence of informal settlements in metropolitan cities such as Nairobi is key to meeting the housing gap created by formal housing which for many of the residents has failed to meet the standards of affordability. However, it is also

imperative to recognize that this gap filled by the informal settlements does not constitute to low-cost housing because households still have to engage in extra-expenditure in sourcing for basic amenities such as water, electricity, and sanitation.

The elusive affordability of housing for an overwhelming majority of urban households as well as the phenomena of rural-urban migration has meant that informal urban settlements have become the main entry points for nearly all the internal migrants arriving in Nairobi. According to an assessment conducted in 2017, Kenya had a backlog of 2 million housing units that is growing at 350 thousand units per annum [38]. Although the government has come up with various programs such the Affordable Housing Program to meet the affordable housing gap for urban residents, the supply is yet to match the demand. The slow progress of such initiatives have meant that the majority of the urban poor have had to contend with living in informal settlements.

2.3. Significance of the informal economy

Comparatively to other regions across the world, Africa, and specifically sub-Sahara Africa has the highest rates of informal non-agricultural employment at approximately 72 percent. This high statistic is replicated in Kenya according to a study by Budlender [22] who noted that approximately 61 percent of non-agricultural work is informal and that more than 90 percent of new jobs are also in the informal sector. In other words, the informal sector is a key source of employment for urban residents especially those within the informal settlements. According to Mendi and Mudida [69], the informal sector created over 713 thousand employment opportunities which were mainly taken by individuals living with the informal urban settlements such as those in Nairobi.

Importantly, informal housing constitutes one of the core components of the informal economy especially with regard to the informal rental systems. A report published by UN-Habitat [108] noted that in 2004 for instance, the informal rental income in Nairobi amounted to USD 31 million which was much higher than the total budget for development, operations, and maintenance. This urban informal economy is epitomised by the existence of different forms of spatial distributions such as open markets, streets, and open spaces in informal settlements. In 2011, a study by

Muungano Support Trust established that in informal settlements such as Mathare, over 87 percent of the households obtained their earnings from the informal sector, 61 percent of which was located within the boundaries of Mathare informal settlement.[4] The implications of these dynamics is that the informal settlements in Nairobi as well as in other parts of the country are not only residential areas but also serve as economic spaces, thereby, having a significant impact with regard to the implementation of policies and any other form of intervention by the government in such areas.

2.4. Informal settlements upgrading programmes

Rapid urbanization in Nairobi sparked by rural-urban migration as well as growing global concerns and advocacy the development of cities that are free from informal settlements that began in the 1970s influenced the government of Kenya to develop new mechanism to address the emerging problem of informal settlements particularly in major cities such as Nairobi, Kisumu, Mombasa. These concerns became the basis upon which Kenya developed experimental strategies to improve the conditions of urban informal settlements through strategies such as evictions, demolitions, upgrading, resettlement, and re-development [108]. However, it is important to note that it was until the year 2000 that these initiatives gained momentum following the establishment of the Millennium Development Goals (MDGs) which laid emphasis on upgrading informal settlements. Specifically, Goal 7 of the MGDs stipulated that it sought "a significant improvement in the lives of at least 100 million slum-dwellers" by the year 2020.

As a signatory to the UN, Kenya used the momentum to accelerate is agenda on the improvement of informal settlements with the first meeting between the Government of Kenya and the UN-HABITAT Executive Director taking place in the same year and a subsequent Memorandum of Understanding (MOU) was signed in 2003 in which the UN-HABITAT would spearhead the Kenya Slum Upgrading Project (KENSUP) covering Nairobi's informal settlements starting with Kibera which is Kenya's largest

[4] Muungano Support Trust, Slum Dwellers International, University of Nairobi, and University of California, Berkeley. (2012). Mathare Zonal Plan: Collaborative Plan for Informal Settlement Upgrading. Centre for Urban Research and Innovations: Nairobi

slum settlement. In 2005, the government came up with the KENSUP Implementation and Financing Strategies for the period 2005-2020 to align with the MDGs timeframe. In its programme objective, KENSUP aimed at improving the livelihood of more than 5.3 million dwellers in informal settlements which translated to approximately 1.6 million urban households at a cost of USD 13 billion of USD 13 billion [107]. International institutions such as the World Bank Cities Alliance and the Kenyan government provided the opening funding for the initiative. The government also contributed for the implementation of the program by providing training, materials and supplies, local consultants, equipment, and construction. In addition, the UN-HABITAT was mandated to facilitate the availability of technical advice mainly through volunteers from the UN; help with the mobilization of financial resources through liaising with donor agencies and the Kenyan government with the ultimate goal of creating a Slum Upgrading and Low-Cost Housing and Infrastructure Fund [107].

Following the establishment of the KENSUP, the government later launched a national development blueprint known as Vision 2030 to guide the development agenda and strategy through to 2030 with the main objective of lifting Kenya to a middle-income country [65]. Informal settlements were identified as one of the target areas that need significant investments and Vision 2030 set as one of its agenda to transform urban areas by emphasizing that it seeks to attain “a well-housed population living in an environmentally-secure urban environment”. This agenda was later reinforced by the promulgation of the Constitution of Kenya 2010 which guaranteed every Kenya the right to “accessible and adequate housing” which meet reasonable standards of hygiene and sanitation. As a consequence, the government initiated the Kenya Informal Settlement Programme (KISIP) aligned with its Vision 2030 Agenda in 2011 with geographical focus on Nairobi and other cities such as Mombasa, Garissa, Eldoret, Naivasha, Nyeri, Machakos, Kitui, Malindi, Thika, and Kericho. The Kenyan government contributed USD 10 million; World Banak USD 100 million; Swedish Development Agency (SIDA) USD 10 million; and the Agence Française de Developement (AFD) USD 45 million.

Table 2. 3: Summary of the main difference between KENSUP and KISIP

Development Programme	**KENSUP**	**KISIP**
Key objectives	Improvement of housing	Infrastructure and strengthening security of tenure
	Provide physical infrastructure and social amenities	Strengthen key institutions involved in urban governance
	Long-term 2005-2020	Short-term 2011-2016
	Mobilise communities in informal settlements to participate	Participatory urban planning

Source: Author summary

Collectively, the implementation of the two programmes was delegated to the Ministry of Housing and the Ministry of Lands in collaboration with other local administrative authorities such as the municipal authorities before the 2010 constitution and county governments since 2013. Collectively, they coordinated all activities involved in the programme such as financial management, project coordination, monitoring, procurement, program design, evaluation, and reporting [12].

In 2017, the government revamped the agenda on upgrading informal settlements as a means of accelerating the targets of Vision 2030 by launching the Big Four Agenda that set a target of delivering 500,000 low-cost houses across the 47 counties in Kenya by 2022, with Nairobi being identified as a priority county for the project due to its large population of residents living in informal settlements [94]. To kickstart this initiative, the government created the Kenya Mortgage Refinance Company (KMRC) which is partly owned by the government and commercial banks with the main goal

of providing affordable mortgage rates at single digits and payments spread through a 20-year period from 7 years which was the limit for the Kenyan housing sector [53]. Importantly, the Big Four Agenda sought to reduce cost of constructing affordable housing by up to 30 percent and increase home ownership by 50 percent [94].

In this new programme, the Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works was mandated with both the formulation and implementation of the formulation and the implementation of the construction of the 500,000 housing units, upgrading of slums, development of civil servant housing schemes, and determining the standards for building and construction [40]. Another institution, the National Housing Corporation was also mandated with research on low-cost housing, construction and engage in Outright Sale, Rental Housing, Tenant Purchase, and Rural and Peri-Urban Housing Loans [41]. Another scheme known as the Civil Servants Housing Scheme Fund was also established as a supportive institution mandated with implementing policies and projects that seek to bridge the housing gap that has led to the emergence of informal settlements.

Table 6: Summary of the housing policy and institutional frameworks

Table 2. 4: Summary of the housing policy and institutional frameworks

Policy/ Institutional framework	**Core objective**
Big Four Agenda (Since 2017)	Construct 500,000 affordable houses and do away with informal settlements
Vision 2030	Bridge the housing gap by increasing annual output of houses from 35,000 to 200,000
National Housing Corporation	Construct affordable
State Department of Housing	Develop policy frameworks for the housing sector

Civil Servants Housing Scheme Fund	Support civil servants to either purchase or construct their homes
Kenya Mortgage Refinance Company	Provide cheaper loans for Kenyans to purchase homes

Source: Author summary

2.5. Challenges to implementation of housing policies in informal settlements

The presence of informal settlements in Nairobi has been as a result of several factors. However, collectively, these factors can be categorically linked to weak or poor policies that have not only led to the emergence of informal settlements, but also sustained them. Below are some of the ways or mechanism that have sustained the presence of informal settlements in Nairobi. According to a study by the UN Human Settlement Programme Staff [110], "the forces that have contributed to urban spatial segregation in Nairobi are many and varied. Some are legal and economic whereas others are cultural. During the colonial period, the people of Kenya witnessed a large-scale government sanctioned spatial segregation based on race and reinforced by planning laws as well as exclusionary zoning regulations.

2.5.1. The problem of land tenure

A report released by Amnesty International [11] noted that Nairobi's informal settlements occupied approximately 5 percent of the capital's total land area and hosted over 2 million people which was slightly less than fifty percent of the total residential population in the city. Although some efforts have been put to improve the welfare of the informal settlements, the progress has been slow and many of the households continue to face challenges in accessing basic services such as housing and critical infrastructure. Characteristically, poor waste disposal and lack of sanitation have also facilitated the perennial presence of some diseases and infections linked to sanitation. According to Kimani-Murage and Ngindu [52], approximately 32 percent of children under the age of 5 years in Nairobi's informal settlements were exposed to diarrhea-statistics which were twice the national average. This is not surprising given the status

and use of amenities such as pit latrines, and open-air disposal of human waste that is prevalent in Nairobi's informal settlements [42]. This lack of basic sanitation amenities was also reinforced by two different studies conducted by Corburn and Hildebrand [26] on Kibera and Mathare slums which established that on average 85 households shared a single toilet and 83 percent of households reported poor health respectively. In terms of access to water, a UN Human Rights [107] study highlighted that at least 35 percent of household in the informal settlements in Nairobi spent more than 30 minutes in order to get access to water while exposed sewerage channels led to water contamination, and with it, proliferation of waterborne diseases. In addition, water scarcity also meant that residents in informal settlements also paid much higher for water than other residents in the city's formal settlements.

These are the conditions that epitomize the character and quality of housing in the informal settlements of Nairobi in which a study by Bird et al., [19] documented that a dismal 24 percent of informal settlement households reside in houses with solid wall structures. The authors noted that the majority of the houses in informal settlements were constructed from corrugated iron sheets or more often, mud. Similarly, the houses tend to be very small with an average of members in a single household [88]. However, a stumbling challenge to appropriate infrastructural and housing development has been the land tenure that could enable to the landowners in informal settlements or those who are involved in rental transactions to undertake any major investments towards the improvement of critical infrastructure such as houses [51]. The lack of security of tenure on land resources was re-emphasized by Nakamura [79] who argued that it prevents residents in informal settlements from engaging in initiatives such as self-help construction of houses mainly because of the risks that lack of land tenure carries such as abrupt and forceful evictions or demolitions of structures by government. Indeed, the informal settlements in Nairobi have been frequently exposed to actual or threats of demolitions. The relevance of land tenure rights is captured by Syangga [102] who argued that security of tenure offers a legal protection to tenants and developers over threats such as harassment by government, demolitions, forceful evictions, and the forceful deprivation of an individual's property.

2.5.2. Affordability of housing

The biggest challenge of housing in Nairobi is its affordability for middle and low-income earners. Having affordable houses gives cognizance to the fact that there are families that lack sufficient financial resources to access proper housing without assistance usually directly from the government or through government facilitation of the private sector. In other words, affordable housing connotes the ability to access housing by individuals through payments made without undue financial stress despite being categorised in the lower financial income strata in the society. Gabriel [38], argues that affordable housing is tantamount to either public, social or low-cost housing.

There are two essential elements associated with affordability. Foremost, it is the realization that housing accounts for the largest share of family budgets varying between 25-50 percent, and secondly, there is an existing trend that involves rental or price increase of houses. Consequently, for the low-income earners, such trends illustrate that the median prices of houses increase without a commensurate increase in the median income of households. Indeed, the trends in deteriorating economic conditions against household incomes that are stagnant and increasing house prices necessitate affordable housing. Nonetheless, suppose a definition encompassing adequate, decent and sanitary housing can be determined, then the pricing of such a facility through government subsidy ceases to be an unreasonable burden on the income of families and therefore constitutes affordable housing.

The challenges facing access to affordable housing for middle and low-income groups is due to failed government intervention policies since the 1960s. The policies that were adopted by various African governments encompassed massive involvement in the planning and use of land, development regulation, and acceptance of responsibility for the public sector in providing affordable public housing for the low-income earners [108]. However, these interventions had minimal success in increasing the supply of affordable housing. One of the underlying reasons for this failure is that relevant government authorities that managed housing programmes had the discretion of allocating housing units meant for low-income earners, and instead allocated such houses to more prosperous members of the society.

The widespread land nationalization policies that swept through the continent in the early 1980s were construed as efforts by governments to spearhead national development because communal and individual land ownership was conceived as potential obstruction to the effective and efficient use of land by the government. Land nationalization also discourages private sector in providing investments in affordable housing due to insecure rights of tenure. Nationalization of land also had an impact on the evolution of customary land rules in the sense that rapid increase in population also led to high demands for land and customary law provides an avenue through which individual property rights develop as well as internalization of the rising value of land as an asset.

Land nationalization therefore brought to a hold this process as land rights cannot be transferred to freehold property and therefore, difficulties in accessing commercial credit in Africa by the formal sector who have thin layer of incentives to invest in affordable housing that tends to be long-term investment. In addition, nationalization involves a complex administrative oversight as well as conflicting and overlapping patterns of land regulations that hinder development of land and housing markets as is in the case of Africa in which a significant portion of and share is held under customary tenure and not available for commercial sale. Inadequate supply of formal land hinders the developmental needs such the provision of affordable housing.

Despite the less than adequate efforts by the government to invest in affordable housing, the desired beneficiaries, specifically the urban poor do not benefit from affordable housing either because of political interference in allocation or affordability. The mainstream problem to affordable housing is not necessarily the number of houses constructed, but rather, who produces these houses and how they are distributed to the beneficiaries. The political class in Africa are aware of the weak systems of governance and they exploit the loopholes in the legal systems to appropriate public land especially in the urban centres and cities in the hope of capitalizing on the increasing value for land. Land governance which is a central component in provision of affordable housing has been infiltrated by government policymakers and urban elites who have destabilized land market prices and thereby affecting the affordability of housing because of costs. In several African states, land

has been used as an item for political compensation for loyalty from political supporters who are also limited to a particular category of people.

The need for affordable housing emerges from the poor conditions associated with the informal sector such as overcrowding, lack of proper public transport systems and absence of water infrastructure. However, in these deficiencies, the political class and other elites including the senior police force officers in African states have exploited these circumstances to draw massive political support as well develop a multibillion-dollar informal transport industry. As such, [108] argues that poor management of urban centres, low investments in infrastructure, resource deficiencies and an overall weak system of governance have perpetuated the emergence and further development of informal settlements with influential groups and powerful politicians benefiting from the status quo. Likewise, Fox [37] argues that these informal settlements are the consequences of inefficiencies in political governance coupled with the inefficient spatial planning systems, infrastructural inequalities from the colonial legacies and the postcolonial political and economic networks have established a system of patronage networks who continue to exploit rent-seeking advantages. The informal settlements are therefore an important source of additional revenue for politicians, civil servants and other wealthy individuals in the society.

Engaging in slum upgrading programmes through the construction of affordable housing has therefore not been prioritised by the political elite who lack incentives because of the benefits that they accrue in exploiting the low-income masses. Additionally, the political elites are concerned about possible electoral costs that may emerge from displacement policies of informal settlers in order to pave way for construction of affordable houses. As such, there is a preference to maintain the low-income earners as tenants in informal settlements and collect their rents instead of pursuing lengthy procedures of eviction that also carry heavy political repercussions. Due to the fact that democratization is still relatively weak in the continent, the slums have become a very important source of political campaign manifestos that political leaders exploit by engaging in empty promises in each and every election to improve the housing conditions of voters.

2.5.3. Lack of proper public participation

Studies such as Abatena [1] have emphasized on the significance of public or community participation in the processes of implementing projects. Specifically, the author argued that higher participation of communities affected by a particular project at different stages including project identification, planning and implementation can determine whether such projects are successfully implemented or not. In Kenya, over a decade since the launch of the Kenya Slum Upgrading Programme (KENSUP) by the Government of Kenya in partnership with the UN-Habitat in 2004 and the Kenya Informal Settlement Improvement Project (KISIP) in 2011 as a joint initiative of the World Bank, Swedish International Development Cooperation Agency (SIDA), and the *Agence de Française de Developement* (AFD) of France, substantive impact is yet to be recorded on the welfare on Kenya's informal settlements. Anderson and Mwelu [12] pointed to the inadequate involvement of the residents in informal settlements for the slow or underperformance of these two slum improvement initiatives. This criticism of the two initiatives were similarly voiced by a publication by Amnesty International [11] and Kajilwa [47] who argued that the top-down approach that was adopted by the government limited the input of a majority of the residents living within the informal settlements particularly those in Nairobi and this was reflected by a study that revealed that almost half of all residents in informal settlements who had been allocated new houses constructed by the government had moved back to the slums with the main reason being the affordability and the distance of the new houses from their areas of economic activities.

2.5.4. Legal challenges

The scope of implementing policies such as those concerning development of housing especially for the informal settlements often face several legal challenges that ultimately lead to very gradual implementation process of the initiatives. This is particularly so given that in instances when the government fails to undertake adequate public participation, or when the manner in which the initiatives are being undertaken such as through abrupt demolition of informal settlements, then individuals, affected groups, or civil society organisations tend to intervene by seeking court orders to halt the processes from proceeding even further. International human rights organisations

such as Amnesty International, or other domestic human rights groups such as the Kenya Human Rights Commission or the Law Society of Kenya have often intervened during forceful evictions of residents and demolitions in informal settlements and instead called for more dialogue between the government and the communities living within informal settlements [11].

In Kenya, although the constitution does not expressly outlaw forced evictions, there have been several instances when the High Court of Kenya has issued injunctions against forceful evictions of residents from informal settlements in Nairobi especially if it has been proven to the Court that no adequate notice, no alternative places of resettlement, or no compensation was given to the residents prior to any evictions or demolitions [11]. Although these interventions are often grounded on the concern for human rights and welfare, they nonetheless derail the implementation processes of projects meant to improve the welfare of the residents and subsequently the general quality of human rights. However, it is not all times that the Court rules in favour of informal residents. According to a study by Lai (2014), within the legal dispensations of Kenya, the Law of Eminent Domain equally empowers the government to appropriate private property procedurally for the purposes of appropriating it for public use. However, this Law has equally been misapplied by government authorities in equal measure to forcefully confiscate land in informal settlement without compensation even though the constitution allows for compensation in good faith for the residents who have been inhabiting such public lands especially in the informal settlement for a long period of time [41].

2.6. Threats facing households in informal settlements

Rapid urbanization in Kenya has resulted in the expansion of population within informal settlements especially in Nairobi and this unprecedented transformation has contributed to a diverse range of socio-economic problems. As previously mentioned in the history on the emergence of informal settlements in Nairobi, the factors can be summarised as a multiplicity of the colonial era legacies and post-colonial era challenges of poor leadership and governance. Indeed, the presence of a significant population residing within these informal settlements is a testament of adaptation to poverty and this has put many residents at great risks. For many residents, the absence

of critical infrastructure means that access to water, health, housing, sanitation and other economic and social amenities has almost become part and parcel of life. These section focus on distinct challenges that include land and housing problems, landlord-tenant problems, insecurity, ethnic militias, police brutality, unemployment, challenges to education and civic awareness.

2.6.1. Land and housing problems

In Nairobi's informal settlements several problems have emerged relating to the question of land ownership. Indeed, besides the lack of security of tenure, incidents of violent conflicts over land issues are common within the informal settlements. This is mainly due to the controversies involved in the acquisition of land even though it is in temporary basis. Despite many of the residents in the informal settlements owning land on the basis of having settled there earlier, most of the contemporary landowners in the informal settlements, beginning in the 1990s attribute their landownership to the assistance received from the provincial administration, specifically, from Chiefs and "village elders" popularly known as *wazee wa vijiji* in exchange of some financial transactions for which official receipts were also issued. Other landowners also attribute their ownership of land to purchases from the defunct Nairobi City Council and similarly have authenticated documents to support their claims. In other words, it is government officials who assisted some residents in informal settlements to illegitimately acquire public land and put-up temporary structures. In settlements such as Huruma, Kibera, Embakasi, and Kangemi where the vast percentage of land is owned by government, government officials exploited the weak legislations to grab and misallocate land. Similarly, members of the public also exploited the weak legislations to encroach on public utility lands such as rail, road, and river reserves.

The greatest challenge of this type of land acquisition method in the informal settlements is that more often, different people were allocated same land and issued with fake title deeds by government officials and as a consequence, control over pieces of land became ultimately underpinned by the laws of the jungle where those with greater ability to exercise violence over the others in order retain control of contested lands. This phenomenon has seen different people or groups hire militias or thugs in the informal settlements to forcefully demolish or evict others from contested lands.

But even more importantly, the question of land and encroachment into public utility lands has meant that public utility projects that could improve the general welfare of residents residing within such informal settlements have had to be abandoned.

Collectively, the question of land ownership in Nairobi's informal settlements has had a direct bearing on the security of the residents. Foremost, it has impacted on the security of land tenure particularly for those who legally own land and would wish to develop them and secondly, it has a direct bearing on the physical security of residents who have to contend from time to time from sporadic violence between different groups sometimes backed by armed militias or thugs over the control of contested lands.

2.6.2. Conflicts between tenants and landlords

According to a study by Sana [99] the relevance of political support to political leaders during elections has influenced many residents in informal settlements to re-examine the political economy of tenancy within the informal settlement particularly in slums such as Kibera. In past general elections especially after 2007 when Kenya experienced a post-election violence, a general consciousness emerged amongst the tenant communities largely comprised of ethnicities such as the Luo, Luhya and Kisii, against the Kikuyu who are perceived to be the main landlords in Nairobi's informal settlement [104]. Increasingly, the tenants have made more demands to the landlords for better facilities such as toilets, waste disposal utilities, and better house structures including doing periodic renovations of the structures to minimize the impact of rainy seasons on the structures. More tenants have protested against alleged reluctance of landlords to improve the housing structures. Marx *et al.,* [64] note that on the part of the landlords, tenants are obligated to either comply with the payments or relocate to other given that it is them who constructed the structures and that there is no house for free.

But perhaps it is the events of the 2007-post election violence that aptly summarizes the tenant-landlord conflicts in Nairobi's informal settlements. A hotly contested election marred by allegations of electoral cheating sparked violence and informal settlements such as Kibera became one of the centres of the conflict. The majority Luo

and Luhya tenants who supported Raila Odinga (Luo) against Mwai Kibaki (Kikuyu) torched and destroyed properties belonging to the Kikuyus within Kibera and chased the landlords away [28]. In place of the torched structures, tenants reconstructed their own structures while in areas where the tenants failed to torch the structures, they refused to pay rent for several months until calm was restored. In response, those landlords who managed to retain their possessions even the violence responded by evicting mainly the Luo and Luhya tenants including those who had committed to comply with the demands of landlords [99]. In other slums such as Mathare and Huruma, monthly rents were increased disproportionately to the market value as a strategy of forcing tenants to 'voluntarily' relocate and those who refused were similarly threatened by militias who would be called to undertake the evictions.

The unfortunate legacies of the 2007 post-election violence remain at the center of tenant-landlord conflicts even today. Sana [99] notes that landlords in informal settlements have organized themselves into informal unions where they deliberate on rental rates and the decisions are implemented unanimously often with very effective outcomes. In other words, majority of the tenants in informal settlements have had to deal with and accept being emasculated by the landlords who have also tended to grant tenancy on a discriminatory ethnic basis given that Kenya's election are often hotly contested and the threat of violence during electoral cycles are very high. This fear of violence and the organization of landlords have significantly empowered them to conduct evictions of tenants in the informal settlements without a sense of humanity. They landlords do not only fail to adhere to the national las on eviction, but they also take the law into their own hands without caring much about the rights of tenants to consultation, compensation, or the right to adequate notice to enable them look for alternative housing.

2.6.3. Insecurity

Informal settlements in Nairobi are comparatively faced by higher problems of insecurity than formal settlements. According to a study by Omboi [86], insecurity in Nairobi's informal settlements is as a result of the high unemployment rates especially amongst the youths who are pushed into criminal activities. In his study, Omboi [86] notes that approximately 86 percent of the respondents who took part in the study

agreed that unemployment pushed youths into crime in Mathare slums. Yet, of greater concern is that although crime rates informal settlements are often high, law enforcement does not correspond to the policing needs of the residents living in Nairobi's informal settlement. The police have been criticized for only conducting casual security patrols in the evenings and instead, the real work of policing is left on the hands of the residents. Elfversson and Höglund [32] argued that the impact of this development is that it has led to the emergence of vigilante groups often established alongside ethnic lines to provide security. For many of the households, this has meant that they have had to part with payment of 'security tax' of at least 100 Kenya shillings, while developers paying as much as Kshs 50,000-100,000 for construction of flats within the informal settlements [99].

It is important to note that these vigilante groups become very active during electoral periods where they grow in number significantly in order to compete for political influence and extort money from politicians who also use them as sources of security during campaigns. However, these groups become part of the security threats that face the informal settlements especially after electoral periods when the income streams from politicians dry up. They become infiltrated with thugs who extort money from residents including taxing public transport vehicles that do not often ply routes to the informal settlements. Equally, competition over the different vigilante groups over territorial supremacy have been one of the leading causes of violent conflicts that threaten the safety of residents in informal settlements and their businesses. The grand paradox in this discourse is that the Kenyan government has been very lenient to such groups and even considers them as key actors in community policing.

2.6.4. Unemployment

Unemployment remains as one of the key drivers of expansion of informal settlements in Nairobi. Apart from the natural increase in population in the informal settlements, growing rural-urban migration has continued while the intake of migrants into the labor market has not been commensurate, thus leaving thousands of people stuck in the informal settlements without much hope for acquiring gainful employment. Low rates of formal education and the absence of transformative investments due to insecurity, lack of security of tenure of land and property, and poor infrastructure have

undermined any sustainable solutions to the problem of unemployment. Thus, high rates of unemployment in Nairobi informal settlements have created deplorable conditions and this has meant that several households have continuously been exposed to dire socio-economic vulnerabilities.

2.6.5. Limitations to accessing quality education

According to a study by Dixon *et al.,* [29] the general state of education in Nairobi's informal settlements are deplorable and the available institutions offering primary education are a very few compared to the demand. This is partly due to the government policy of free and compulsory primary education that has increased enrollment in primary [3]. The unintended consequence of this policy is that within the informal settlements, private schools mushroomed in order to fill the gap left by the absence of adequate public schools. However, majority of the private schools similarly lack the appropriate supporting infrastructure such as good classrooms, playing facilities, appropriate ventilation, and sanitation. Even more importantly, majority of these private institutions are also not registered by the Ministry of Education, therefore, they also do not pay much attention to the government guidelines on the standard and quality of education that should be provided by schools.

CHAPTER 3

COVID 19 – A THREAT TO URBAN INFORMAL DWELLERS IN NAIROBI

3.1. COVID-19 in Nairobi

While urbanization is known to be associated with increased opportunities for social and economic progress both at the individual and population levels, it generally leads to changes in four main areas namely; (i) demographic changes in age and sex structures, (ii) social changes in family patterns and support systems, (iii) economic changes that arise from industrialization and the resulting economic growth and (iv) psychological changes associated with characteristics of slum areas [101]. For instance, the slums in Nairobi are known to be characterized by a polluted environment, overcrowding, poor infrastructure, poor sanitation, high levels of violence, marked absence of the public sector and debilitating poverty [5]. Vulnerable groups, including children and older persons, are particularly affected by these conditions that exacerbate morbidity and mortality [73]. The desperate living conditions that are characterized by limited availability of livelihood opportunities often lead to risky behaviour that, among others, include excessive alcohol consumption, prostitution, and drug abuse, all of which are associated with higher levels of interpersonal violence, injury, and deaths. Rapid urbanization has been shown to lead to stark disparities among urban populations in terms of economic and health well-being. This is mainly because the most rapidly urbanizing areas have been undergoing unplanned growth processes that have also led to degradation of the environment, urban sprawl and pollution.

Since the outbreak of COVID-19 epidemic in Wuhan District of China, there have been speculations coming from governments, public health experts, academic researchers, economists, and political analysts as to how the pandemic would unfold. For many societies, particularly those in the global south, the concern has been huge and conspicuously worrying. Two views emerged to the extent that COVID-19 spread

will most likely remain very limited given the demographical dynamics that are characterized by populations dominated by young people, warm climate, and tight government measures.

On the other side, projections were also made that the pandemic poses a great threat to these societies because of the presence of weak public health systems and due to the fact that a significant portion of the population live in sub-standard populations characterized by high poverty levels, huge inequality gaps, and overcrowding in urban settlements. These sentiments were further compounded by the revelations that the available healthcare systems were not prepared to meet the infrastructural healthcare demands to manage COVID-19 patients [95].

As a measure to prevent the occurrence of the worst-case scenario of an uncontrolled COVID-19 pandemic outbreak, countries in the global south such as Kenya initiated aggressive measures in line with the recommendations of the World Health Organization (WHO). Such measures include: the imposition of curfews and stay at home orders overseen by the police; closure of social places like churches, mosques, schools; stopping inter-county movement of people with the exception of essential service providers; and the close down of the airspace for both domestic and international use [9].

In Nairobi the first case of COVID-19 was reported by the Ministry of Health (MoH) on the 12th of March 2020. This was also the first case to be reported in the whole country and is perhaps due to the nature of the city as a commercial and transport hub of the country. The test conducted and confirmed at the National Influenza Centre Laboratory housed at the National Public Health Laboratories was the sample test of a Kenyan citizen who had returned from the U.S through a transit in London, United Kingdom (UK). Given the high uncertainty of the virus at the time, the MoH issued public warnings that infections were going to rise rapidly in the coming days and beseeched Kenyans to remain calm and adhere to health guidelines issued by the government [27].

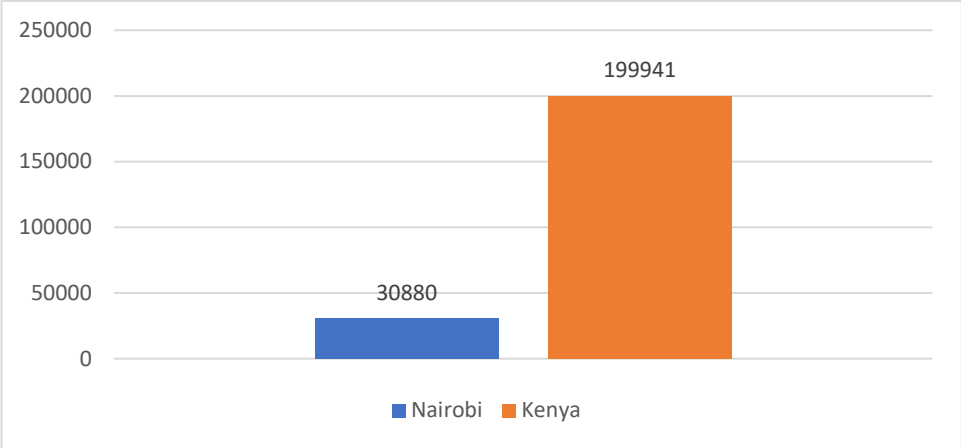


Figure 3. 1: COVID-19 Cumulative Cases in Nairobi by July 28th 2021

Source: Author analysis of data from Kenya Ministry of Health, Fastrack Cities[5]

As COVID-19 infections increased particularly in Nairobi, Mombasa, Kwale and Kilifi counties which were identified as COVID-19 hotspots, the government implemented a lockdown preventing movement in and out these three regions. During a televised speech at a time when the country had registered 158 COVID-19 infections, President Kenyatta announced:

> "The cessation of movement within the Nairobi metropolitan area shall be for an initial containment period of 21 days with effect from 7pm. We are at war, and we must win. We must make a stand here, before COVID-19 starts to spread out of control."[6]

Whereas COVID-19 infections have increased since the first infection was recorded to all the other 47 counties in Kenya, Nairobi has registered the largest rate of infections and fatalities as of July 2021. From the onset when the first case of COVID-

[5] See, Nairobi County COVID-19 Cases. https://www.fast-trackcities.org/data-visualization/nairobi-county-covid

[6] See Al Aljazeera News. COVID-19: Kenya bans travel in and out of Nairobi, other areas. Accessed via https://www.aljazeera.com/news/2020/04/COVID-19-kenya-bans-travel-nairobi-areas-200406163601579.html

19 was registered in the country, the Kenyan government identified housing, sanitation and hygiene as the frontline defence against the virus. For many analysts of the COVID-19 pandemic, access to these basic human rights in light of the pandemic could transform into factors of life and death particularly in areas with weak public health systems [97]. In Nairobi, the outbreak of COVID-19 brought to light and to the attention of the Kenyan government, the true extent of social and economic inequalities experienced in the informal settlements in Nairobi and other urban centre across the country.

3.2. Impacts of COVID-19 on Nairobi's informal settlements

Even in the absence of a disaster such as a the COVID-19 pandemic, informal settlements in Nairobi are faced with a myriad of challenges which become exacerbated during disasters or pandemics. The relationship between poor living conditions such as those in the informal settlements, and the health of its residents particularly during novel pandemic diseases has long been recognized in research and policy documents on issues such lack of access to affordable housing, healthcare, hygiene and sanitation, road infrastructure, overcrowding, and absence of well-located vacant land to develop social amenities [13,14]

The mere existence of social, physical, and structural inequities that characterize urban environments fundamentally necessitates rethinking in a multidisciplinary approach so that innovate mechanisms can be developed to mitigate against the potential and real impacts of health pandemics such as that created by the COVID-19 virus. As reflected in Figure 4, COVID-19 has created various channels of vulnerabilities because of its interconnection with different issues such as economic development, personal, and infrastructure. Despite the fact that such connections may vary across different settings, and this can be subjected to further research, what we can deduce is that the complexity of informal settlements especially during pandemics and other disasters need to be prioritized in intervention initiatives. The variations in both environmental and social settings in informal settings re-emphasize the relevance of community-based and participatory approaches in managing the impacts of health pandemics and other forms of disasters in the short-term and long-term in order to minimize suffering and build resilience of informal settlements.

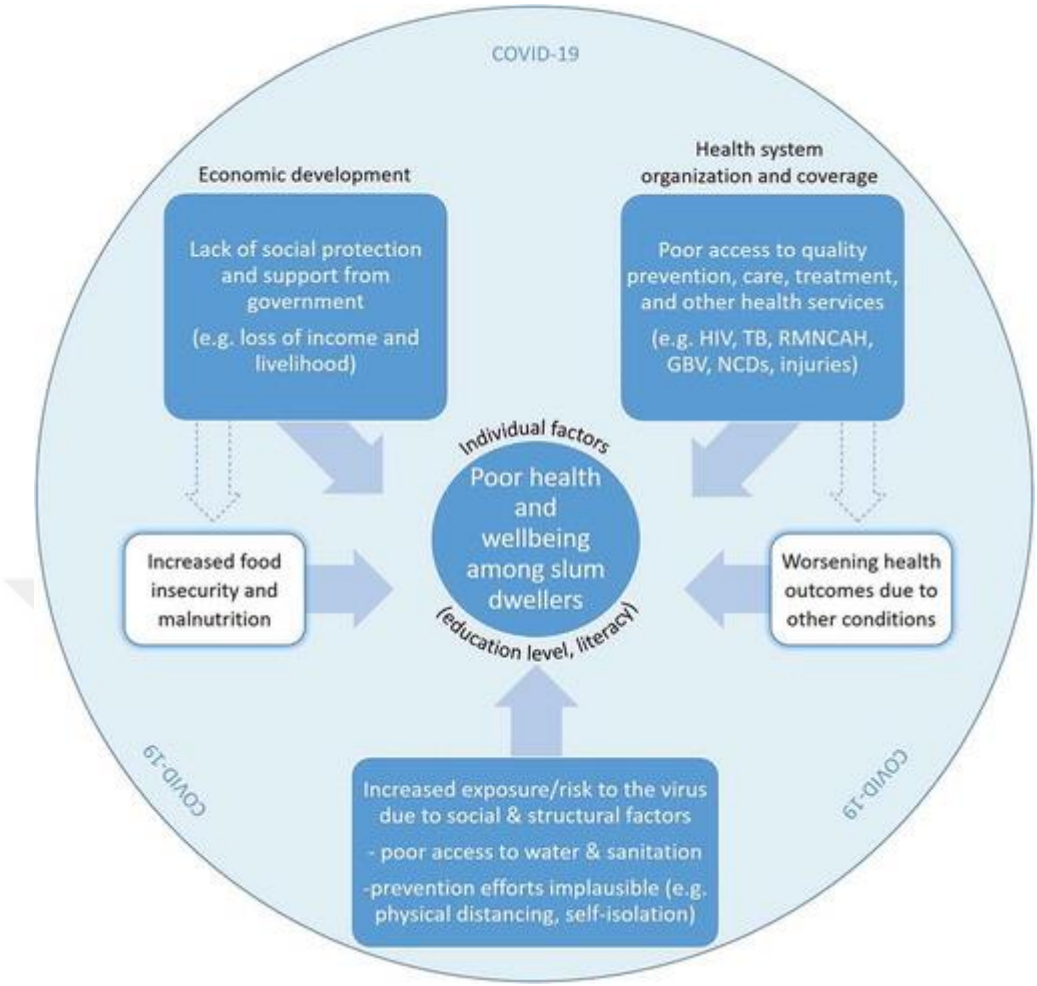


Figure 3. 2: Framework depicting social, structural and physical influences of slum environments leading to poor health outcomes in the context of COVID-19

Source: Adopted from Corburn *et al.*, (2020)

3.2.1. Threat to health

The physical conditions of informal settlements pose as one of the biggest risks to the health of residents who are gravely exposed to infections from infectious or communicable diseases. This threat is not only unique to Nairobi's informal settlements but also other informal settlements across the world where research has established that whereas only 20 percent of the poorest households live up to 55 years, the richest 40 percent of the urban rich get the chance to live beyond the age of 70 years [116]. In addition, for the global 20 percent poorest, the average infant mortality

rates for children under the age of five years is more than twice that of the wealthy urban residents living in formal settlements. Indeed, it is not the law of nature that has stipulated that children from poor households and other members in the poor category should have shorter lifespans, instead, is it but an outcome of the unjust and unequal social arrangements that is facing modern societies.

The absence of standard basic public healthcare facilities in Nairobi's informal settlements, has yielded the growth of numerous sub-standard health clinics that do not have the capacity to provide integrated primary health services despite the fact they provide services to a huge population [10]. This negatively impacts access to healthcare services among the slum residents [23]. Despite the emergence of other private healthcare providers to feel the gap in demand left by the absence of adequate public primary healthcare facilities, studies such as Ezah *et al.,* [35] highlight that they do not guarantee quality primary healthcare services because of lack of capacity and their nature of being driven by the pursuit of making profits.

Table 3. 1: Hospital bed capacity in Nairobi County

	General hospital beds			
County	**Public facilities**	**For profit facilities**	**Faith based facilities**	**Total**
Nairobi	2341	2013	473	4827

Source: Kenya Harmonized health facility survey 2019; Barasa et al., (2020)

In Nairobi County, although access to health facilities is comparatively better than other regions in the country, the health sector is significantly challenged with issues such as lack of adequate health personnel, adequate facilities, and the operation of unlicensed health facilities. In 2017 for instance, report released by the Nairobi County Assembly Committee on Public Health revealed that out of the available private clinics

at the time, 800 had been found to be providing services without the mandatory inspection of public health officers. In addition, the report also established that only 1500 private health clinics out 2,315 had received permits to provide health services to residents. A majority of these unlicensed health clinics were also dominantly located in informal and semi-informal settlements. Besides the lack of adequate health facilities and personnel in the informal settlements, the mushrooming private health facilities have also created negative implications by offering sub-standards services because they are largely profit oriented [23,35].

In informal settlements, poor health is not only an outcome of the environmental and spatial characteristics of those localities but also because of the structural inequalities that are sustained by resilient public institutions and structures. These means that residents of informal settlements such children, women, are people less abled are even more exposed to greater vulnerabilities. These sort of inequalities thus predisposed residents in informal settlements to even greater risks to COVID-19. The overburdened and understaffed health facilities became more vulnerable and increased the risks of local residents to become infected with Covid19 [27].

Even though the Kenyan government has attempted to address the inequalities in healthcare by introducing the Universal Healthcare Coverage (UHC), several challenges have emerged in relation to the barriers of access [27]. Several studies [25,36,56,118] have noted that the burden of sickness particularly in Kenya's informal settlements has been high as a result of weak coverage of the available preventive and therapeutic interventions. Otieno *et al.,* [89] in their study found out that the absence of effective universal health coverage for a majority of the residents in informal settlements highly correlated with lower access to primary healthcare. The authors attributed the low access to primary healthcare to the challenges of inadequate funding, inadequate health insurance coverage, and fragmentation of healthcare resources. Indeed, their findings was consistent to another study conducted by the Kenya Household Healthcare Expenditure and Utilization Survey (KHEUS) which extended even further to highlight that women were at even greater risk of accessing primary healthcare in informal settlements as a result of the low health insurance coverage [71].

During COVID-19 pandemic, the lack of adequate insurance cover significantly threatened the right to life for many individuals especially those within informal settlements. Indeed, as demonstrated in Table 5, the treatment and management cost for COVID-19 patients in Kenya

Table 3. 2: COVID-19 case management unit costs for severe patients

	Home-based care unit cost per patient			**Hospitalisation costs**		
Inputs	**KShs**	**USD**	**% of total cost**	**KShs**	**USD**	**% of total cost**
Health provider transport cost	22829.61	216.41	14.48	48000.00	455.01	6.32
Equipment (ICU including ventilator)	-	-	-	12887.60	122.17	1.70
Staffing	19835.18	188.03	12.58	350512.56	3322.65	46.19
Pharmaceuticals	55224.45	523.49	35.03	71946.61	682.01	9.48
Non-pharmaceuticals	2487.20	23.58	1.58	4527.20	42.92	0.60
COVID-19 test	1816.62	17.22	1.15	1816.12	17.22	0.24
Radiology	2961.70	28.08	1.88	2961.70	28.08	0.39
Other laboratory tests	10817.77	102.55	6.86	21817.77	206.82	2.87

Personal protective equipment	44292.37	419.86	28.10	243173.78	2305.14	32.04
Total cost per patient	157644.79	1494.38		758917.30	7194.07	
Total cost per day	13137.07	124.54		63243.11	599.51	

Source: Adapted from Barasa *et al.*, (2021)

In the presence of weak public health systems characterised by gross inadequate of healthcare facilities, one of the countermeasures fronted by the Kenyan government in order to fight COVID-19 was homebased care for positively identified COVID-19 patients who did not require immediate critical hospital care. The high costs associated with both the treatment and management of COVID-19 patients has been out of reach for many of the residents in informal settlements especially for those who are experiencing severe cases of COVID-19 infections who require extra medical attention using facilities such as the intensive care units (ICUs).

Although lack of health facilities, personnel and the costs involved in the management of COVID-19 infections directly threaten the health welfare of residents in the informal settlements, there are other indirect threats to health. Some studies have alluded to the long-term and adverse secondary health impacts especially when routine care such as reproductive health, antenatal care, immunisation, and nutrition are foregone during the pandemic. According to Pinchoff *et al.,* [93] women in informal settlements in Nairobi had comparatively forgone health services than males as a result of COVID-19 pandemic which also demonstrated that women are the one who are predominantly responsible for seeking healthcare to not only themselves but also the children in a given household. As a consequence, the economic impacts of the pandemic on women who are also marginalised in terms of economic opportunities in informal settlement meant that access to healthcare during the pandemic would notably experience a decline, thereby potentially leading to potential outbreaks or worsening

on of other diseases. At the beginning of the pandemic, the stigma associated with the outbreak of the also influenced several individuals not to seek healthcare services in informal settlements in Nairobi because of the fear that they could become infected within the hospital premises where other individuals infected were receiving treatment. For a majority of Nairobi's informal settlement residents, the guidelines on personal isolation and the costs involved therein established a deep stigma not only against going to hospitals where there other COVID-19 patients but could also make patients attempt to hide their symptoms and delay seeking health services [116]. In Nairobi's informal settlements Pinchoff *et al.*, [93] reported that the women involved in their empirical case study had foregone critical healthcare and that could potentially lead to secondary health effects on the long-term basis.

3.2.2. Economic Impact

In Nairobi, although the population in informal settlements constitute a huge portion of the overall population, different regimes beginning from the colonial era to the post-colonial governments have tended to marginalise informal settlements in terms of economic and health policies which as demonstrated during the COVID-19 pandemic, has exposed residents of informal settlements to disproportionate impacts. Indeed, the concern over the impacts of the pandemic were not only limited to the dynamics of public health because of the population and physical demographics of informal settlements, but also the economic dimensions that it would bring upon the implementation of certain public health measures as part of the strategy to contain the spread of the virus. The existence of deep-rooted inequalities epitomised by the conditions of informal settlements and other dynamics such as gender and occupation provide strong grounds upon which a pandemic can have even greater disproportional impacts.

In an empirical study on the impact of COVID-19 on informal settlements, Quaife *et al.*, [95] established that as a result of the containment strategies contributed to the complete or partial loss of income for over 80 percent of the respondents, they interviewed from five informal settlements in Nairobi. In addition, although some of the respondents admitted to receiving some form of support from the government, it was far much less, and the biggest challenge remained access to food which made

many households to take tougher measures including skipping some meals. It is important to take note that whereas the spread and infection of COVID-19 remained relatively low and under management by the government, the strict containment measures however posed even a greater challenge for residents in informal settlements who rely on daily wages to purchase their basic needs such as food and water. According to Quaife *et al.,* [95] the containment measures adopted by government in as much as vital as they are, could not be sustainable in the long-term especially in the context of economic and food insecurity.

Similarly, another study by Tompsett *et al.,* [106] on the impact of the pandemic on household income in Nairobi's informal settlement involving 3681 individuals established that the effects were not only sizeable but also long-term and that within the first six months of the pandemic average income dropped by 59 percent and after six months household incomes declined by 21 percent. Key factors mentioned as contributing to the decline of income included less opportunities in the labour market or reduced demand for services rather than the direct impact of the pandemic in terms of infections of residents residing in the informal settlements. During emergencies such as pandemics or even conflicts, studies such as Lafreniere *et al.,* [57] noted the disproportionate impacts of disasters or pandemics on the economic welfare of women mainly as a result of existing gender inequalities and marginalisation. Lafreniere et al., [57] adds that due to the sudden changes in gender roles during emergencies or disasters, women are exposed more to insecurity and restriction in movement. For instance, in past epidemics such as during the Ebola outbreak in Sierra Leone, research established that compared to men, women lost their jobs and the economic impacts had greater disruptions on other issues such as the education of girls whom a majority were forced to drop out of school due to reduced family incomes [59]. Similarly, a policy brief published by the United Nations Women [107] noted that COVID-19 had impacted the economic welfare of women who take on unpaid household labour such as cleaning, childcare, and cooking.

In the informal settlements of Nairobi, households are very fragile during crises and when faced with abrupt and deep external shocks, they become significantly incapable of dealing with the economic impacts that arise. One of the core measures introduced

by the government during the COVID-19 pandemic as physical distancing and personal hygiene as part of the recommendations put forward by the World Health Organisation (WHO) to manage the spread of the virus. However, in as much as this recommendation was key in dealing with the pandemic, its implementation in Nairobi's informal settlements is not only difficult but nearly impossible especially considering that in areas such as the Kibera slums, access to water and pit latrines that on average serve between 100-150 per latrine is a huge problem given that they also have an economic dimension in terms of payments made for the use of pit latrines and water [93].

For the approximately 2.4 million people who live in Nairobi's informal settlements, the United Nations Development Programme (UNDP) noted that they are more exposed to extreme poverty and that in the presence of a pandemic such as COVID-19, they are disproportionately exposed to difficulties in accessing basic needs. This is so given that the government implemented public health guidelines such as lockdowns, and quarantines as well as curfews which had harsher impacts on the residents of informal settlements. A report released by the Human Rights Watch highlighted that more than 60 percent of all businesses within informal settlements in Nairobi were totally or partially closed down during lockdowns, thus, exposing thousands of households to gross economic hardships. These economic hardships were exacerbated even further by the low delivery of public services, high population density, poor access to reliable and safe electricity, and the pre-existing high unemployment rates. More importantly, the public health measures and the low daily wages of approximately USD 1.90 for those working in the informal sector created a heavy deficit on informal settlement households who became unable to obtain other basic needs.

3.2.3. Access to Housing

To effectively manage the pandemic, physical distancing and guidelines for hygiene were issued by government as part of an internationally recognised strategy against COVID-19. However, for informal settlements where households had very limited or no financial income as a result of the implementation of measures such as lockdowns or curfews, many were exposed to the risk of eviction for the failure to pay rents, while

those who could afford the rents were forced to continue living in conditions of squalor where overcrowding became another huge problem given the very low quality of houses in informal settlements which became high risk areas for the transmissions of the virus. A report by the UN [107] noted that COVID-19 was more manifested in the urban areas especially in the context of vulnerability, management of the pandemic, and countermeasures. The high populations in urban centres and particularly in crowded settlements where the needs for hygiene or social distancing were surmountable further expanded the risk of the disease. In other words, the COVID-19 pandemic shone light to the deep inequalities in contemporary cities by demonstrating the significance of gender, socio-economic status, access to clean water, access to reliable energy, urban governance, and the quality of work and workplaces in the management of public health disasters.

During the pandemic, the amount of time spent at home significantly increased and therefore other expenses such as consumption of electricity also increased especially in the urban areas where lockdowns were stricter that in the rural areas [50]. This increased cost of energy generated significant financial burdens on poor households in informal settlements. In Nairobi's informal settlements, poor housing not only created difficulties in terms of social distances given that houses tend to be overcrowded, but also it significantly impacted on the education of thousands of school-going children. As part of the COVID-19 management measures, primary, secondary, and tertiary institutions of learning were closed down from physical learning and instead, lessons shifted to online or virtual learning. In the poor housing structures that exist in Nairobi's informal settlements, many learners could by Wasdani and Prasad [114] Chirisa *et al.,* [24], poor housing in informal settlements contribute to the inability of households to have regular and reliable access to electricity and internet services which were pre-existing even before the outbreak of the pandemic.

During the pandemic, housing became a huge problem especially for the informal settlement residents after government undertook evictions and demolitions of structures within the informal settlements to pave way for the construction of roads. According to a report by the Human Rights Watch [44], the government of Kenya in May 2020 just as the pandemic was taking hold in Kenya, demolished over 600

households in Kariobangi slums and in the process evicted over 5,000 individuals, a majority of whom were single mothers and children.

CHAPTER 4

DISCUSSION AND RECOMMENDATION

Urbanization has exponentially increased over the last decades in Kenya, and Nairobi has been one of the main destinations for the rural-urban migrants. This preference has been manifested in the sporadic growth in the population of informal settlements that have become more overcrowded because of the incommensurate investments in critical infrastructure and proper urban planning. Indeed, this is not only unique to Nairobi, but rather a global phenomenon given that over one billion people are estimated to be living within informal settlements globally. The informal settlements not only lack proper roads, foot paths, water, functional drainage systems, policing, and waste disposal points, but only increase in population have ensured that they have become very congested and overcrowded. This conditions expose residents in the informal settlements to high risk of becoming infected with infectious diseases such as COVID-19 and other disasters. This is because of the overcrowded conditions within households as well as within the larger physical environment of informal settlements; low access to basic services including sanitation and hygiene; vulnerabilities of working within the informal sector where security of work is non-existent; and the reliance of residents on public transportation services.

The pandemic created significant disruptions in the routine patterns of life and introduced a new normal for everyone through measures such as the mandatory social distancing guidelines. However, for the huge population in urban informal settlements, majority of the public health guidelines have not been just burdensome, but also nearly impossible to execute given the dynamics of informal settlements. Although the guidelines constituted a core component of the response to the pandemic, wide assumptions were also made with regard to the ability of households within informal settlements to access adequate physical space, basic services, and social nets. This however was not the case across the different informal settlements in Nairobi. During COVID-19, although by August 2021 not many infections had been reported in Kenya, and specifically within the informal settlements as had been projected in some of the

earliest statistical regression models, the shear population density in informal settlements provided a legitimate concern for potential spike in viral transmission. Overcrowding which is a characteristics of Nairobi's informal settlements lowers the quality of the living conditions which provides an ideal platform for infectious diseases to increase or evolve into even new dangerous viral or bacterial strains.

The dynamics of political economy in Nairobi's informal settlements during the pandemic introduced far reaching repercussions for poor households, and unskilled laborers who have migrated from different parts of the country to come and seek better opportunities. However, poor implementation of government urban development programmes have rendered Nairobi's informal settlements such as Mathare, Kibera, Mukuru, Kawangware, Korogocho, and Soweto in deplorable conditions with unreliable electricity, water insufficiency, low number of both primary and secondary schools, and inadequate health facilities. As a consequence, during the COVID-19 pandemic households within these informal settlements found themselves threatened by two disasters. On the one hand, they were exposed to a deadly virus spreading rapidly and which a definitive cure was yet to be discovered, and on the other hand the unintended consequences of the public health guidelines implemented by the government as a public health measure against the viral disease.

Indeed, panic and uncertainty that surrounded the virus especially during the first six months of the outbreak influenced the government to adopt blanket measures such as total lockdowns, social distancing guidelines, and closure of workplaces and schools which appeared to be much of a bigger threat than the virus as it subjected dwellers of informal settlements to the risk of death given that they are not in a position to earn a living because of the dependency on the daily wage income for basic needs. In many ways therefore, the policies of partial lockdowns, total lockdowns, social distancing, hand washing, and curfews appeared to have been taken without adequate consideration of the socio-economic challenges that residents of informal settlements undergo,- an oversight that need to be taken into consideration going forward especially when dealing with incidences of disasters that cut across informal settlements. Drawing from the pandemic response of countries such as the United States and European nations, it is evident that such financial or even technical capacity

is not only beyond the capacity of Kenya, but also of nearly all developing countries. The implication of this is that when the government is engaged in disaster response of a similar magnitude to the COVID-19 pandemic, then it is imperative that it interrogates adequately its internal demographic dynamics and come up with measures that not only address the problem, but also safeguards the local communities from being exposed to further vulnerabilities so as not to undermine its efforts.

The impact of COVID-19 is wake-up call for governments all over the world, and specifically in Kenya to reorient its development policies and strategies and put a distinctive focus on urban areas that are grappling with a host of challenges and are more prone t -o experience disasters in a disproportionate manner. This means that certain policies should be adopted in the short, medium, and long-term basis.

Firstly, on the short-term basis, the impact and threat of the pandemic has continued while the development of a cure has remained elusive. Instead, several versions of vaccines have been developed as the best defence for the viral disease. This means that the government in addition to continuous implementation of the initial public health guidelines should embark on an accelerated initiative of vaccination. In large urban centres such as Nairobi, vaccination of all residents and especially those within the informal settlements should be prioritised given that their level of exposure to the virus can be high because of their demographics and their capacity to manage or treat the infection remains extremely low because of the high cost associated and their dependency on daily wage incomes. Equally important, the government should also intervene and provide socio-economic support in order to also ensure that some of the preventive measures taken by the government are also effective. Although the Kenyan government during the pandemic period has been developing one-for-all policy in response to the pandemic, informal settlements in Nairobi are faced by unique challenges and as consequence also require slum-specific policies that meet the needs of the dwellers and conforms with the realities of the informal settlements. The government for instance had suggested tax cuts as one of the means of alleviating the economic impact on Kenyans. However, tax cuts have very limited direct impact on the residents in informal settlements. Under such circumstances, it is imperative that the government also developed a support program that could provide direct benefit to

the residents of informal settlements. Government initiatives for residents in informal settlements such as the *Kazi Mtaani Initiative* was very limited in its scope of beneficiaries because it targeted a very small percentage of the youth. Instead, the government can equally leverage the benefits of technology and come with initiatives of food distribution and delegation of health workers deep into the remote areas of informal settlements to provide health services. Social and health workers are not only critical in providing immediate care for certain medical ailments but are also central in addressing gender-based violence and sexual harassment which according to some studies such as [103] experienced a spike during the pandemic. Yet again, even though infections in Kenya have remained relatively lower compared to other parts of the world, the conditions of informal settlements as an indirect outcome of the pandemic demands a comprehensive plan from both the government and private sector to improve the environmental conditions. In this context, national institutions such as the National Youth Service and even the Kenyan military can play a vital role in the rehabilitation of the environment in informal settlements by engaging in activities such as cleaning of rivers and riverbanks in order to reduce pollution. More importantly, as a short-term measure, the government should continue with sustained sensitization campaign and counter any fake news that may be used to misdirect the public on the extent the threat of the virus or against partaking in vaccination processes.

Secondly, the is need for long-term measures adopted for the lessons learnt during the COVID-19 pandemic. In Nairobi, given that informal settlements occupy a dismal five percent of the land mass, it is imperative that government accelerate the informal settlement upgrading programmes and adopt latest technology and practices in the development of affordable housing in order to bridge the existing gap in demand as well as affordability. The need to improve the living conditions has become a fundamental human right stipulated in the 2010 Constitution and this will not only improve the physical environment of informal settlements but also establish a strong foundation upon which the several economic and social challenges can be resolved. Affordable housing for instance can create better amenities such as access to water, reliable electricity, and sewerage systems. Additionally, during construction of such affordable houses, additional supporting infrastructure such as roads, schools, markets, emergency disaster response such as equipped fire departments and police stations to

boost security in informal settlements. As a strategy, development of affordable housing in informal settlements is a long-term strategy that can improve the living standards for the millions of people living in Nairobi's informal settlements by reducing overcrowding as well as enable the ease of monitoring and surveillance of COVID-19 infections during the pandemic.

Similarly, as has been highlighted in this study, the COVID-19 treatment or management costs are way above the capacity of many residents in the informal settlements and during pandemics the cost of healthcare can be out of range for a majority of households. As a consequence, developing a national comprehensive and affordable healthcare coverage to support residents from all social classes should constitute a fundamental priority for the government. Indeed, it cannot be emphasized any further that a healthy nation is critical to the national development of any state. The existing and even previous national health insurance schemes have been plagued by the lack of adequate resources while corruption has also undermined the effectiveness of the scheme which has left many households unable to meet their health costs. Reforms in the national health insurance cover can be of great benefit to low-income earners especially those in informal settlements who are exposed to higher health risks.

Infrastructural development in informal areas can also improve supply chains and safeguard against abrupt fluctuations in food prices because of the shortages that emerge when disasters disrupt the flow of food. Constructing markets that can be subjected to surveillance and proper regulation can enhance supply chains and prevent artificial food shortages. During the pandemic, residents in informal settlements had to contend with buying at inflated prices because of the disruption caused in the supply chains due to the lockdown measures implemented by government. It is also critical that the government engages social workers in the post-pandemic era to allow them to engage on a more localised basis and find ways in a strong rapport can be built between the government and residents in the informal settlements in a manner that can enable government to successfully undertake developmental projects.

CHAPTER 5

CONCLUSION

Informal settlements face considerable challenges around the control of COVID-19, but locally developed strategies could mitigate the worst of the outbreak as long as action is taken fast. Preparedness and early action by local governments and communities are essential. Once an outbreak occurs, escalation can be rapid, leaving little room for further planning. This paper provides an initial mapping of key considerations that, it is hoped, will be of use for advocacy and action among residents, government and agencies to protect informal settlements from COVID-19. It also aims to extend beyond the outbreak, to highlight how the conditions that make settlements vulnerable to infectious disease must be ignored no longer. The principal approaches for reducing COVID-19 transmission are the same in any context, that is, reduced physical contact and improved hygiene. The tactics used will differ in informal settlements where there are acute challenges around space, water and sanitation, where people have an increased risk of eviction and where livelihoods are precarious. Informal settlements can be highly organized, with a range of local groups and community structures providing and advocating for services as well as collecting data on residential populations and facilities. These groups are well-placed to mount COVID-19 responses and many already are doing so. They are particularly well-placed to consider options in their area for decentralized forms of care, isolation and physical distancing. Financial and non-financial resources (information, equipment, supportive policymaking) are urgently needed to enable local residents to develop and implement their own strategies that are feasible and effective in their contexts. Public health interventions must be balanced with social and economic interventions, especially in relation to the informal economy, on which most people in informal settlements depend. Direct and indirect impacts throughout the informal economy must be considered. The vulnerabilities to COVID-19 are immense in informal settlements, but control measures risk further harms; mitigation of both must start with the inclusion of residents and their realities in planning.

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