EPIDEMIOLOGICAL GEOGRAPHY OF CITY REGIONS:

An Exploratory Text on Harare Metropolitan Area, Zimbabwe

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ISBN 978-1-77928-224-8
EAN 9781779282248

Published by the Zimbabwe Ezekiel Guti University (ZEGU) Press
Stand No. 1901 Barrassie Rd,
Off Shamva Road
P.O. Box 350
Bindura, Zimbabwe

SUBSCRIPTION AND RATES
Zimbabwe Ezekiel Guti University Press Office
Stand No. 1901 Barrassie Rd,
Off Shamva Road
P.O. Box 350
Bindura, Zimbabwe
Telephone: ++263 8 677 006 136 | +263 779 279 912
E-mail: zegupress@zegu.ac.zw
http://www.zegu.ac.zw/press

Dedication

To all professionals and citizens seeking to have disease-free metropolitan spaces across the world.

Acknowledgement

I want to thank all the people including participants, reviewers and editors who have made this project as success. Without you, the text would have remained a muddled idea in the head.

Book Synopsis

Effective health services are key in addressing the challenges of rapid urbanisation. Key strategies include integrating health into urban planning by embracing future population growth and addressing existing disparities. Zoning regulations that consider health impacts and support the establishment of healthcare facilities in high-density areas can help mitigate the negative impacts of urbanisation on health. This includes green spaces, improved public transportation, and infrastructure that supports healthy lifestyles. as well, strengthening governance structures and ensuring effective policy implementation are critical. Actions include improving transparency and accountability in health governance can help address issues such as corruption and mismanagement. Policymakers should be supported in developing and implementing evidence-based policies that address health challenges. This includes providing training, resources, and technical support to ensure that policies are effective and responsive to local needs. This monograph suggests several recommendations some of which are highlighted in this section. Specifically, policymakers should focus on developing comprehensive urban health policies that address the specific needs of Harare Metropolitan Region. These policies should prioritise investments in healthcare infrastructure, including the expansion and upgrading of facilities. investments in health infrastructure, including the construction of new healthcare facilities in underserved areas to meet the growing demand for services is primal. The upgrading and modernisation of existing healthcare facilities to improve service delivery and patient care and ensure that healthcare facilities are equipped with the necessary resources and staff to provide quality care. This was reduction of epidemiological challenges with the intent to complete eradication are noblest aims.

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Chapter 1: Urbanisation and Epidemiology Intersecting: Context and Setting

For the first time, since time immemorial, most humans resided in urban areas by 2010 (Olsen, 2000; WHO, 2010). The UN (2018) argues that, currently, more than 50% of people globally, live in urban areas and these numbers might rise to above 70% by 2050 with most of urbanisation occurring in African countries. Urbanisation already has an adverse effect on global health and could significantly impact the epidemiology of infectious diseases. Lilienfeld (1978: 87) defines epidemiology as "...a method of reasoning about disease that deals with biological inference derived from observations of disease phenomena in population groups." The contamination of water sources has been found to be one of the major risk factors causing epidemic diseases like cholera in all the regions of Africa; with lower areas being contaminated more through surface water (Griffith *et al.*, 2006).The central argument presented in this research work is that urbanisation in Harare Metropolitan Region has significantly influenced the epidemiological patterns of diseases, particularly communicable diseases, due to poor sanitation, inadequate health infrastructure, and spatial inequalities. The main thrust of the study is to unpack the factors surrounding disease incidences in Harare Metropolitan Region and map the spatial distribution of health facilities in relation to population distribution.

Coexisting with demographic changes, sub-Saharan Africa is experiencing changing epidemiological patterns, particularly a shift towards a dual disease burden. Vearey *et al.* (2019) postulate that non-communicable diseases (NCD) are becoming more prevalent even while infectious diseases remain a considerable source of illness and death, especially among children. NCDs, such as diabetes, obesity and heart disease, are strongly associated with attendant effects of excessive urbanisation. In Harare, Fernandez (2011) argues that bus stops and informal markets, residential housing, water supplies and sewage disposal system were identified as risk factors related to the cholera epidemic that hit Harare in 2008-2009. In some urban areas, as compared to rural areas, higher population density, poor housing and poor sanitation and infrastructure have contributed to increased risks associated

with infectious diseases (Neiderud *et al.*, 2015). By reducing habitats for the vectors, the urban environment may ease the incidence of pathogens and transmission of diseases.

Informal settlements are commonly overcrowded and lack basic services, amenities and facilities, which factors the WHO (2019) has attributed to a higher risk of certain communicable diseases, notably diarrheal illness. During the rainy season, when there is scant sewage disposal or working sewer system, shallow wells get contaminated easily by excrete in run-off of rains as water follows the slopes and get into the lower parts (Zarocostas, 2009). Lack of functional health facilities and poor environmental status closely related to cholera, characterises the situation in developing countries. Zimbabwe as a country has undergone economic downfall especially from the early 90s and this has affected all sectors and the health sector was not spared. The factors surrounding increased incidences of communicable diseases ranges from economic, social and political. For example, Zimbabwe's economic crisis reached peak in 2008 happening concurrently with the cholera epidemic that hit Harare ever in history.

The collapse of Zimbabwe's health system greatly contributed to the severity of the 2008 cholera outbreak. (Jönsson and Guha, 2009). The health care systems had become dysfunctional, water supplies were irregular and sanitation systems had collapsed in Zimbabwe. That greatly affected the poor who are largely located in overcrowded spaces such as Matapi Hostels, Chitungwiza high-density suburbs which are always flooded with sewer. During the 2008 cholera outbreak, health centres in Harare and Chitungwiza registered and cared for 19,422 persons who met the case period's cholera definition. Suburbs with the highest attack rates were located on the south-western area of Harare. Examples of such suburbs include Matapi Hostels and high-density areas in Chitungwiza, which were heavily affected due to poor sanitation and flooding with sewage

Overall, the average elevation is lower and the distance to the epicentre (Chitungwiza) is smaller. These statistics have not been clear whether it is the elevation or the distance from the epicentre that contributed to the spread of the disease or not. Further to this, a study conducted in Hopley suburbs

one of the fast-growing high-density suburbs in Harare revealed that maternal health has greatly been affected by the continuous weakening of the public sector in the country. The gains that had been attained since independence declined sharply from 85% down to maternal deaths accounting to 67% of maternal deaths in 2010. The dying health system coupled with social and economic challenges exacerbate the existing situation. Existing studies have shown that maternal age, age at first marriage, mother's level of education, sanitation, source of drinking water, wealth status, preceding birth interval, birth weight and birth order are significantly associated with the risk of dying during childhood. The high-density and poorly planned suburbs of Harare such as Hopely and Caledonia expose women to diseases related to poor pregnancy management due to lack of primary health care services.

Various questions remain unanswered on the topic of epidemiological patterns in the urban landscape. Whether the threat of disease by suburb is attributed to one simple or multiple factors within a specific suburb due to the ecological fallacy remains unanswered, especially in developing countries, like Zimbabwe. Though lack of water and health facilities are the most known factors involved in the origin and spread of an epidemic (Chadoka and Odimegwu, 2016), the multiplication of more risk factors needs to be highlighted. The relationship between urbanisation and infectious disease is less clear-cut and is moreover impacted by external factors, such as geography and climate. Besides, urban environments are not homogeneous, so risk factors are likely to vary across the continent, across a country and even within a city (Potts, 2012). It is argued that the urban environment may reduce the transmission and incidence of other pathogens, for example, through reducing habitats for some vectors (Hassell, 2006). Basing on this argument, it is not clear whether this tallies with the situation in Harare or not. There has been lack of such studies that brings about the relation between disease outbreaks, facility location and distance /time spend to reach the facility.

The study aims to engage a spatial analysis of the relationship between population and disease occurrences to inform urban public health

management. With specific reference to Harare Metropolitan Region, the specific objectives of the study are to:

1) identify the drivers of communicable disease occurrences in Harare Metropolitan Region;
2) describe selected disease incidences in urban areas;
3) examine the relationship between places of selected disease prevalence and placement of urban health facilities;
4) examine the influence of spatial segregation of the city, population distribution and health facilities and estimate the time used to reach selected health facilities should an emergence happen;
5) relate population distribution to health facilities and the epidemiological patterns; and
6) suggest policy and practical models to inform governance of urban health.

Despite existing knowledge, the study could be the first to make any attempt to try and understand the epidemiological patterns in the urban setting of Harare concerning time use, disease emergencies and location of health facilities. The study highlights the importance of studying epidemiological patterns considering concentrating mainly on factors as time use, disease emergencies and health facilities. The results of the study shall help to plan for some health-related events and also put preventive activities linked with water and sanitation in prevalent suburbs in Harare and Zimbabwe at large.

Following observations made by Rydin *et al.* (2012) and Burdett *et al.* (2011) in their studies, the study shall also help in improving urban health and well-being, recognise and reduce inequalities in health outcomes and in building capacity on national and on regional levels to promote urban health and well-being. The study shall also highlight the behavioural risk factors for infectious diseases in urban settings studies and proffer policy interventions that have specifically been applied to cities. It will also identify current gaps in the literature that may constitute opportunities for future research in this area. The study comes with many benefits at all levels in the societies. Identifying epidemiological patterns guides public health action to orientate further preparedness interventions in Harare. The marginalised shall benefit from reduced inequalities in health outcomes and build capacity on national and

regional levels to promote urban health. The results of this work shall inform public health policy as it relates to capacity building and health systems strengthening in urbanising areas. To researchers, the study highlights knowledge gaps that grounds further research pointers even into rural settlements.

A better understanding of epidemiological patterns and infectious disease risk factors specific to urban settings shall emerge from the study's mixed-methods approach, which includes spatial analysis using GIS, mapping disease outbreaks in relation to health facility locations, and examining factors such as population density, sanitation, and urban infrastructure. By focusing on Harare's urban environment, the study aims to identify key drivers of disease outbreaks, assess spatial inequalities in health access, and propose policy interventions to improve urban public health management. Policy interventions to plan for and act against future urban outbreaks also emerges. The study shall contribute to policy-making, especially in issues to do with urbanisation and epidemiology. The study is also bound to improve their research skills.

Urban areas are complex systems whose characteristics impact the health of people who live in them. The interaction between epidemiology and spatial configuration if becoming more visible. Urban landscape attributes influence various spatial variations in risk of epidemiology. Land changes for instance influence the densities per square meter and the rate at which certain diseases are spread across people. Infectious diseases for instance were contracted by many people if the people are densely populated as compared to the impact on less densely populated environments. Over the years, emergence and re-emergence of vector-borne and zoonotic diseases has been experienced in high-density areas that have inadequate public services mostly in Africa. The linkages between diseases and urban densities go beyond mere densities to include the availability of key services. These services include key services that are needed to reduce the occurrence of diseases and the services needed in events that people get the diseases. The ability for one to get quick medical attention is key in responding to health emergencies. This is also the same when considering the importance of the availability of key services such as WASH infrastructure in preventing diseases.

There are spatial variations in disease risk or incidence. This may lead to some urban landscapes being characterised as having high disease prevalence than others. The disease prevalence is a result of partly local environmental factors. The rapid intensification of agriculture, socioeconomic change and ecological fragmentation can have profound impacts on the epidemiology of infectious disease. Spread and persistence of newly emerged (or re-emerged) pathogens can then be perpetuated by a combination of factors including expanding global human populations and urbanisation especially in poor communities who are less pro-active. Historically, human population density and growth were predictors of infectious diseases. This was so because there were more reactive approaches and less pro-active measures. In that line of argument, human responses to their urban environments in the wake of increased urban population and densities are critical in safeguarding the health of urbanites.

The study is guided by a mixed methods approach. Mixed methods are a methodology for developing better, more context specific instruments that addresses complex scenarios. It provides a more complete understanding of the research problem than either quantitative or qualitative alone. Several philosophical approaches are going to be employed to curtail the shortcomings of one philosophical approach. It allows researcher to tie together several steps in an evaluation process. The approach allows researcher to apply scientific tools using existing data and deduce possible interventions that can be employed to make urban planners to place health facilities in the shortest distance from the populations to be saved. The mixed method approach allows the researcher to inquire about the various types of experiences that include opinions, perception, thought, memory, imagination, embodied action, emotion and social activity (Creswell et al. 2007; Gray *et al.* 2007) and also to gather quantitative data using spatial analytical tools such as GIS.

Case study approach has been adopted as the research design for the study. The study leans heavily on quantitative methodological design and it seeks to map clinical facility locations in relation population locations in Harare, Zimbabwe. The study has sought to investigate and understand why certain urban localities have higher incidences of disease types than others and how planning for facilities can reduce distance travelled by patients to get medical

attention-epidemic response. This is guided by Yin (2017) who argues how the essence of case study is to try and illumine why and how certain decisions and outcomes emerge.

The population of the study comprised clinic facilities in Harare Province. Purposive sampling is the key sampling technique in the study. Purposive sampling was complimented by in depth interviews with health personnel. 11 clinic facilities have been purposively selected in the study: one facility from each of the 11 local districts. Hot spot mapping was employed using GIS to establish incidence of disease outbreaks in each clinic catchment.

The area of focus of the study was Harare Metropole. In the metropole, Harare is Zimbabwe's capital and largest city of Zimbabwe. It comprises 11 local council districts. There are more disease outbreaks in Harare compared to the other cities especially water borne diseases Luque Fernandez (2012). The incidence of disease, especially during the rainy season, has increased coupled with the declining economy and social services system. Since independence Harare has attracted large influx of migrants from the rural areas. This has resulted in straining existing resources that were not further developed to match the growing population.

To address the research, aim and objectives of the study, both primary data collection and secondary data collection methods were adopted. Secondary data were gathered using literature review and archival data from clinical records and geographical. Primary data were gathered using GIS and other mapping tools. The data were complemented with in-depth interviews and focus group discussions.

Literature review is a data collection technique that involves a "systematic identification, location and analysis of documents containing information related to the research problem" (Mills and Gay, 2019: 80). The literature and documents that were reviewed comprise the book, book chapters, journals, health rights and policies, the Zimbabwean constitution and any other related epidemiological, urban planning and spatiality documents.

Interviews were conducted with selected individuals working as health workers, planners and epidemiologists and residents of selected suburbs. Semi-structured interviews with open-ended questions were used to give room for the generation of qualitative data. This will enable the researcher to capture the lived experiences, that will address the location and distribution of health facilities in Harare city concerning disease outbreaks. The interview will use more open-ended questions with residents to invoke discussions (Creswell *et al*., 2007; Gray *et al*., 2007). Focus group discussions involve gathering people from similar backgrounds or experiences to discuss a specific topic of interest (Creswell *et al*., 2007; Gray *et al*., 2007). Focus group discussions are more like group interviews that comprise several individuals who can contribute to understanding the research problem (Mills and Gay, 2019). Focus group discussions were held with different population groups, middle-aged females and males, mixed groups, the elderly and the adolescents' groups. This will enable the researcher to get a wide range of responses on clinical services availability during disease outbreaks.

Quantitative data collected using GIS and from secondary sources (maps) were analysed using spatial analytical tools. Qualitative data were analysed using NVivo package. NVivo is a qualitative data analysis (QDA) computer software package produced by QSR International. NVivo helps qualitative researchers to organise, analyse and find insights in unstructured or qualitative data like interviews, open-ended survey responses, journal articles, social media and web content.

Triangulation of methods requires to understand ethics and include how they are going to address ethical considerations in their research plans (Mills and Gay, 2019). Against that background, the researcher was highly sensitive to possible ethical issues that may arise during the study. Researchers have the responsibility of maintaining the well-being of research participants (Gray *et al*., 2007). The researcher neither harmed participants during engaging with them nor force participants to participate in the study. The researcher first sought their informed consent of participants before engaging with them in research. On engaging with each participant, the researcher explicitly highlighted the purpose of the study and notify the participants of their right to refuse participating in the study if they feel they did not want to

participate. To ensure confidentiality, the researcher used anonymity. Where anonymity was not be used, the researcher protected the confidentiality of the identities of study participants. During conducting the research, the researcher were truthful and honest in conducting all research activities.

Certain limitations were encountered during research activities. The first limitation is that the study is relying heavily on technological tools such as drones and geo-mapping. Faulty tools may affect the timely collection of data. The study also relies on clinical staff and currently, the clinics are short staffed and this may affect availability of required respondents. This may stretch the time frame for the study completion. The study is also geographically limited to Harare. There might also be other experiences in other cities and contexts outside Harare. In seeking to improve the validity and reliability of the study, the researcher selected Harare, firstly because it is a city with most of Zimbabweans. Secondly, it is the main city expected to have better medical standards sufficiently aimed at better responding to disease incidences. The other limitation expected are the challenges of data collection during COVID-19. Face-to-face interviews were limited due to COVID-19 protocols. The researcher will therefore utilise virtual tools and applications such as Zoom applications to collect data online.

The chapter introduces the relationship between urbanisation and epidemiological patterns, focusing on Harare, Zimbabwe. It argues that urbanisation, particularly in African cities, has contributed to a dual burden of disease, with both infectious and non-communicable diseases (NCDs) becoming prevalent. The chapter highlights how poor sanitation, overcrowding, and inadequate infrastructure in high-density suburbs have exacerbated health risks, as seen in the 2008 cholera outbreak. It underscores the need for spatial analysis to understand how urban configurations influence disease distribution and access to health facilities. The research aims to identify drivers of communicable diseases, examine the relationship between disease prevalence and health facility placement, and propose policy interventions to improve urban public health management.

Chapter 2: Epidemiological Patterns in the Urban Landscape: A Literature Review

The study of epidemiological issues has evolved over time, inferring that this is a dynamic science that changes its focus as new health and demographic issues arise. The present chapter aims to critically review available literature on the complex interplay between urbanisation, epidemiological patterns, and access to healthcare, with a specific focus on the context of sub-Saharan Africa and Harare, Zimbabwe. It seeks to synthesise existing knowledge on how urban environments influence the spread of infectious diseases, the challenges posed by a dual burden of disease, and the role of spatial factors in shaping health outcomes and access to health facilities. Frerot *et al.* (2018) have traced the changing definitions of "epidemiology" for the period 1978-2017 as an indicator of such dynamism. As such, the inference of epidemiological patterns was highlighted by Lilienfeld and Lilienthal (1980: 416) who assert that "Epidemiology is concerned with the patterns of disease occurrence in human populations and the factors that influence these patterns". This definition was further elucidated by Salathe´ (2018) who explains that the goal of epidemiology is to understand the patterns of disease and health dynamics in populations and the causes of these patterns to use such knowledge to mitigate and prevent disease and to promote public health. On the other hand, Buck (1988) argue that the study of epidemiological phenomena is of great significance to public health as it brings up the prospect that the society is the epicentre for explaining health problems and their solutions. In this context, the chapter reviews epidemiological dynamics in urban areas hinging upon the presumption that accessibility of health services counters the infectivity, pathogenicity, and virulence of disease outbreaks in urban populations.

The United States Department of Health and Human Services (2012) refers to epidemiological patterns as the occurrence of health-related events by time, place, and person. In this regard, time patterns refer to any time period that may influence disease or injury occurrence. Subsequently, personal factors that affect epidemiological changes are demographic variables such as age, sex, and socio-economic characteristics that may influence the occurrence of a health risk. On the other hand, place patterns connote any geographic

variation, and this includes urban and rural differences. As such, looking at the three factors of time, place, and personal characteristics of populations, the study is about descriptive epidemiology within an urban set-up.

There is no universal definition of what constitutes an urban area. However, population sizes and densities are the indicators that are commonly used to demarcate urban areas. As such, urban areas are mostly characterised by high population growth owing to both natural population growth and urbanisation factors. Boyce *et al*. (2019:1) observe how "…urbanisation continues to be a major driver of demographic change in today's world." On the other hand, the demographic factors that contribute to natural population growth (low infant mortality rate, lower morbidity, and higher life expectances) connote epidemiological transitions. Defo (2014), rectifying Omran's definitions (Omran, 1971), explains epidemiological transitions as the long-run shift in mortality and cause-of-death patterns inherent in the secular mortality decline from high to low levels embedded in a series of concurrent changes in population health. Focussing on urban areas, epidemiological transitions would infer such demographic changes within urban space and as such would be explained through urbanisation and thus a relatively young population structure. By and large, epidemiological transitions describe epidemiological patterns within a specified population and space.

On a global scale, epidemiological patterns across urban space vary from country to country, and from urban area to urban area. Nonetheless, as compared to rural areas, it is evident that the patterns vary. Urban life has the advantage of relative proximity to health facilities as compared to rural life (Norwegian Institute of Public Health, 2020). However, Moore *et al*. (2003) argue that decreases in activity, whether someone is working or not, combined with access to processed food high in calories and low in nutrition, contribute to the burgeoning epidemic of obesity and diabetes worldwide. Moreover, high population densities that characterise urban life are associated with various public health problems. Moore *et al.* (2003) aver that diseases transmitted through respiratory and faecal-oral routes are more frequent in situations involving crowding, for example tuberculosis, rheumatic heart disease, and helminthic infections. Additionally, as cities are

characterised as economic hubs that attract high mobility, disease transmissions are rapid in such environments.

Brizuela *et al.* (2020) aver that urban design determines the densities and relative locations of housing, jobs and services inside a city and this helps shape interaction networks through that diseases are spread as determined by transport networks. This concurs with the findings of Gosce and Johansson (2018) who submit that there is a positive relationship between public transport and airborne transmission of diseases. Analyses of the SARS outbreak in 2003 in Beijing suggest that the geographical spread was affected by population density, health care resources and public transport routes (Norwegian Institute of Public Health, 2020). On the other hand, modelling studies confirm that air transport significantly contribute to the spread of epidemics, notably outbreaks of influenza A(H1N1), SARS and COVID-19 and major cities are the major hosts of such outbreaks owing to such mobility (Wilson and Chen, 2020).

During the outbreak of global epidemics, public health preparedness is often found wanting. Such a lack of preparedness contributes to the spread of diseases as noted during the pneumonic plague outbreak in Madagascar in 2017 that spread to urban areas, where health care workers were not used to diagnosing the plague, leading to delayed diagnoses and continued transmission and rapid spread due to population density and susceptibility (Roberts, 2017). On the other hand, lack of preparedness during the outbreak of COVID-19 exposed a lack of surge capacity in most health centres worldwide. This was evident in that there was a shortage of intensive care beds, mechanical ventilators, and facilities for screening patients, laboratory capacity and supplies, PPE, medical equipment, and pharmaceuticals in most health facilities (Norwegian Institute of Public Health, 2020). Additionally, the imposition of infection control measures such as non-pharmaceutical control measures in most cities were ineffective during the onset of the outbreak. For example, cities like Paris and Rome had challenges implementing full lockdown for their homeless population during the COVID-19 outbreak. By and large, such a lack of preparedness has cost lives due to delayed intervention measures.

There are inherent inequalities within urban areas due to socio-economic factors. These inequalities pose a threat to effective epidemic control as there are varied intervention measures and responses owing to such disparities. The 2014-2015 Ebola outbreak in West Africa confirm such sentiments of inequalities whereby it was proven that the outbreak was more severe across urban informal settlements (Eisenstein, 2016). As such, Boyce *et al.* (2019) argue that populations residing in specific high-density neighbourhoods, and especially in informal settlements or slums, are at an increased risk for infectious disease due to over-crowdedness and limited accessibility to health facilities. By and large, as a preventive measure to infectious diseases, Saha *et al.* (2018) argue how model simulations for the low-income residential areas in Delhi affirm that vaccinating slum residents would be effective in curbing epidemics.

During pandemics, urban people lose faith in primary health care and subsequently favour referral health care (Yuan *et al.*, 2009). However, such actions result in inefficient health care delivery as most hospitals would not have the surge capacity to control the disease. Subsequently nosocomial spread has become a common feature during disease outbreaks. Transmission is facilitated by the close contact between patients and staff, large number of patients during outbreaks, the presence of families visiting the sick, the vulnerability of patients due to underlying medical conditions and the connectivity between health care facilities found in urban areas (Norwegian Institute of Public Health, 2020). For example, the outbreak of the 2015 MERS in South Korea had nosocomial spread characteristics whereby the disease was transmitted across health facilities (Kim *et al.*, 2017). On the other hand, during the outbreak of COVID-19, Chinese urban hospitals were overwhelmed by large numbers of patients, and this resulted in nosocomial transmissions before fever clinics for triage were constructed (WHO-China Joint Mission, 2020).

On the other, the spread of the SARS epidemic in Toronto was partly owed to a transmission of the disease into at least 128 cases within a singular hospital (Skowronski *et al.*, 2006). Additionally, one of the first COVID-19 cases in Norway was an ophthalmologic doctor returning from vacation, that resulted in an outbreak among health care workers at the hospital in March 2020

(Norwegian Institute of Public Health, 2020). Such a feature of epidemics is also evident in Sub-Saharan urban health facilities. However, easy access to primary health care services will lower the burden on hospitals. Moreover, health-care workers need to be prioritised in vaccination programmes to avoid such a type of transmission (Taylor *et al*., 2010). Nonetheless, Yang *et al*. (2016) observe how most governments in developing countries, particularly in Sub-Saharan Africa, are not able to fund immunisation for most epidemics and are thus usually bailed out through donations and the cities in this region have poor infrastructure for mass vaccinations. By and large, Vearey *et al*. (2019) aver that the sub-Saharan Africa epidemiological patterns are characterised by a dual burden of disease. Non-communicable diseases (NCDs) are becoming more prevalent even while infectious diseases remain a substantial source of morbidity and mortality, especially among children; moreover, many NCDs, including diabetes, obesity, and heart disease, are strongly associated with urbanisation (Boyce *et al*., 2019). In the African context, urbanisation is associated with poor neighbourhoods and informal settlements where accessibility of health facilities is limited (Turok and Mcgranahan, 2013).

Urban inequalities in accessing amenities are more pronounced in African cities whereby the poor face some challenges in accessing them. This is because of a combination of factors tied to rapid urbanisation, limited resources, and historical patterns of segregation. The fast pace of urban growth often outstrips the capacity of governments to provide essential services, and pre-existing inequalities related to income, infrastructure, and spatial planning exacerbate these challenges, leaving poorer residents disproportionately underserved. These factors contribute to significant disparities in access to amenities for the urban poor in African cities. As such, people living in informal settlements face higher risks during epidemics as they lack in the provision of social amenities. Additionally, some diseases spread more rapidly depending on the housing factor, a fact that portrays the risk in high-density suburbs and informal settlements in African towns and cities. Diseases showing increased prevalence or transmission in high population density urban environments include respiratory diseases, viral haemorrhagic fevers, malaria, and enteric diseases (Boyce *et al*., 2019). For malaria, research has confirmed that the disease in Africa flourishes in

situations where temporary housing structures are prevalent, and this characterises slum settlements (Killen *et al*., 2019). On the other hand, Sasaki *et al*. (2008) reveal that in Lusaka, cholera was more prevalent in areas with poor sanitation infrastructure such as lack of access to a latrine and poor drainage systems.

In sub-Saharan Africa, the prevalence of one epidemic disease correlates with the epidemiology of other health problems. For example, the risk for respiratory infections, and specifically tuberculosis, can be impacted by the burden of HIV in urban environments or by close contact with others infected with tuberculosis (Boyce *et al*., 2019). On the other hand, Murewanhema and Makurumidze (2020) submit that in Zimbabwe, poorly controlled chronic diseases (hypertension, diabetes, and HIV) during the outbreak of COVID-19 increase the odds of death from the pandemic. Interestingly, Wong *et al*. (2015), researching on the transmission of infectious diseases in the slum areas of Kenya, discovered that for HIV-negative people living with HIV-positive people, the probability of them contracting respiratory and diarrheal infections was high. By and large, such positive correlations among various infectious diseases in Africa are promoted by poor epidemic preparedness among the responsible authorities.

In sub-Saharan Africa, the necessary quick access to health facilities is derailed by various factors. Magalhães *et al*. (2012) find distance as a hindrance to access malaria treatment in northern Angola urban areas. On the other hand, exclusive urban planning is seen as a causal factor for the inaccessibility of health facilities in poor neighbourhoods (WHO, 2019). However, when considering infectious pathogens with high case-fatality rates such as viral haemorrhagic fevers (VHFs), including Ebola, Lassa Fever, Marburg, and Crimean Congo Haemorrhagic Fever (CCHF), rapid diagnosis and timely, high-quality delivery of treatment are critical, and these features are lacking in most African urban public health matrices (Boyce, 2019). As such Polonsky *et al*. (2014) submit that typhoid fever in the African urban set-up is re-emerging under the challenges of increasing urbanisation, chronic underinvestment in water and sanitation infrastructure, and emerging drug-resistance.

In the Zimbabwean context, morbidity and mortality trends in the urban areas show that the population is still affected by common preventable and treatable diseases and conditions including nutritional deficiencies, communicable diseases, pregnancy, childbirth and new-born-related conditions (JICA, 2012). On the other hand, the evolving epidemic of HIV in Zimbabwe continues to have a major influence on the incidence and pattern of occurrence of cancer, particularly Kaposi sarcoma, non-Hodgkin lymphoma and cervical cancer, and these are associated with HIV&AIDS in urban areas (Chadambuka *et al*. (2011).

Urban health service delivery during pandemics, particularly the COVID-19 outbreak, is poor. Just like most urban health facilities in sub-Saharan Africa, the COVID-19 outbreak exposed a lack of surge capacity in controlling the epidemic. The referral hospitals were overwhelmed by patient inflows and the local authorities, particularly Harare City Council, were ill-prepared for a health pandemic of such a magnitude. As such, Murewanhema and Makurumidze (2020) assert that health delivery during such a public health crisis epitomized the three-tier delay model as the epidemic led to: reduced consultations due to lack of PPEs; challenges in transporting patients from primary level to higher-level facilities since most of the treatment was accessed in referral hospitals; and lastly supply chain disruptions that led to the shortage of medicines and ventilators. The situation was not helped by the fact that the government had imposed a national lockdown as a control measure to curb the spread of the epidemic and, therefore, accessing health facilities, was a challenge since the only legible public transport were those affiliated to the transport parastatal, the ZUPCO. On the other hand, UNOCHA (2020) highlighted that people living in urban informal settlements are at increased risk of contracting COVID-19 due to inadequate access to essential health care, clean water and sanitation services and crowded living conditions.

Most epidemics have underlying causal factors. As such, if local authorities are well prepared for the occurrence of such epidemics, the epidemics were controlled before they become too widespread. Polonsky *et al*. (2014) reveal that the enteric infection epidemics that were experienced in Zimbabwe, mostly in Harare Metropolitan Region, between 2008-2014 were mostly

linked to chronic underinvestment in the maintenance of water and sanitation infrastructure, leading to irregular water supplies, difficulties in protecting drinking-water supplies, and the breakdown of sanitation systems. These conditions triggered the occurrence of typhoid and cholera in Harare Metropolitan Region.

On the other hand, it was reported that there was nosocomial transmission of COVID-19 among the local authority health workers in Harare (UNOCHA, 2020). The lack of preparedness, as evidenced by a lack of PPEs exacerbated this health problem. On this note, Norwegian Institute of Public Health (2020) notes that such shortages were made acute due to the fact of relying on importations from China that had since impose a national lockdown to contain the COVID-19 epidemic. Nonetheless, these workers need to be prioritised in vaccinations since they are front-line workers who are exposed to the disease through providing health care to the patients. By and large, UNOCHA (2020) submits that it is critical that the capacity of the health system to test, isolate and treat all cases of suspect, confirmed and probable COVID-19 cases is enhanced.

As observed by the United Nations (2017), there is no universal definition of what constitutes an urban area, but countries use population density and size as indicators of urbanity and thus delineate urban areas. Nonetheless, United Nations (2018) projects the number of megacities to increase from around 33 to 43 by 2030, with most of them being concentrated in Asia and Africa. There is a positive relationship between urbanisation and accessing health facilities (Norwegian Institute of Public Health, 2020). In this light, it were pointed out that as urban space increases, the number of health facilities is also deemed to increase. However, accessing these facilities is dependent upon mobility factors on the part of the urban population (Brizuela *et al*., 2020). On the other hand, despite the increased advocacy towards sustainable urban health development, little is being done towards addressing emerging infectious diseases on a global level.

Banton and Grant (2013) note that the World Health Organisation (WHO) European Healthy Cities programme does not include planning measures to tackle risks associated with respiratory pathogens, despite the programme

having twelve objectives towards urban health planning. Therefore, despite an envisaged increase in health facilities, the key factor towards accessing health services is urban planning and designing. For example, China promoted the construction of fever clinics and dedicated hospitals as a means to solve the low surge capacity of referral hospitals in dealing with the COVID-19 epidemic (Meng *et al*., 2020). Such flexible planning bridged the gaps associated with three-tier health-care delivery systems (that is, primary, secondary, and tertiary healthcare systems).

On the other hand, WHO (2018: 83) argue how health systems in sub-Saharan Africa region are underperforming, operating at around 49% of what they can and this is owed to low system resilience. However, Vearey *et al.* (2019) assert that between 2015 and 2050, over half of the expected global population growth were in Africa, and this highlights the need to plan towards sustainable and resilient urban health within the region. However, since the African urban space is characterised by intra-urban inequities, as depicted by increasing housing informality within the region's urban areas, accessing health facilities would prove to be a challenge for most urban dwellers (UN-Habitat, 2014). African cities are inherently unjust spaces typified by inequality and inequity (Vearey *et al*., 2010; Friel *et al*., 2011).

Referring to the city of Nairobi, Boyce *et al.* (2019) buttress the fact that inequality in accessing health facilities lead some urban dwellers to seek health services from unlicensed vendors. This is the same in the Zimbabwean context whereby accessing health facilities is hindered by the income factor and this has pushed people to seek some medications from the streets (Parliament of Zimbabwe, 2019). However, such trends imply that surveillance mechanisms for early detection of epidemics would be disrupted since the unlicensed practitioners would be able to report to the responsible authorities if there is an outbreak. By and large, UN-Habitat (2014) argue that the sub-Sahara region urbanisation is characterized by a generally *laissez-faire* approach to urban management, and this has led to the proliferation of unplanned, underserviced settlements, where diseases, associated with poor water and sanitation, are rife.

The United Kingdom Home Office (2019) argues that in Zimbabwe, 14% of the health facilities in urban areas while 86% are in rural areas. Despite the fact that cancer is among the diseases that contribute to morbidity in Zimbabwe, cancer screening services are only available at referral hospitals in the country, and these are in urban areas. On the other hand, without health insurance, the high costs of biopsies, surgery, and treatment for cancer mean that many cancer patients cannot afford proper care and end up dying from a disease that is now mostly preventable and this is a morbid example of inequity in Zimbabwean health service delivery system. On the other hand, research carried out by Isbell and Krönke (2018) on the Zimbabwean health system revealed many aspects of urban public health in the country. The following are some of the research findings: 61 % of Zimbabweans living in urban areas live in areas with a nearby clinic and these mostly were within walking distance.

Expectedly, health facility access was found to be more common in cities (75%) than in rural areas (52%) and this confirms the urban advantage of accessing health care. Harare Province has seven quaternary-level healthcare facilities and forty-five primary level clinics (Isbell and Krönke, 2018). Despite these health facilities, in 2018, there was another cholera epidemic that was fuelled by poor sewage and water systems and inadequate health-care infrastructure and shortages of medicine, intravenous fluid, and protective clothing (Isbell and Krönke, 2018). In such a crisis, the local authority is always caught unprepared. For example, in 2020, there was another typhoid outbreak in Harare with 695 cases and 10 deaths and during such a crisis, the local authority, Harare City Council Health Department needed five new incinerators (UNOCHA, 2020). By and large, it is deduced that controlling health emergencies is not an event but rather requires a systematic approach whereby the central authority must collaborate with the local authority to prepare for such public health emergencies.

Morino *et al.* (2021) argues how the prompt delivery of services is essential in ensuring that the maximum time is available for urban dwellers to do accomplish other social functions besides accessing health services. On the other hand, Hullard *et al.* (2019) argue how health system accessibility is not merely a function of traveling to hospitals, clinics, and health posts, but is also

a function of community response to infectious disease threats. This means that the population would be comparing the opportunity costs of accessing the health facilities. In other words, if the facilities are distant and thus take more time, or the journey involves some travelling challenges, the people would be reluctant to access the facilities. In this sense, WHO (2018:42) submits that access to health and health related essential services involves the removal of physical barriers faced by the population that hinder their use of such services. As such, besides removing the travel challenges, there is need to ascertain that that the people would not be delayed by poor services when they reach the health centres. Such a delay is limited by making available hardware needed to deliver services, that is, health workforce, infrastructure and equipment, and the availability of medicines. In this sense, a measure of achievement implies that efficient health and health-related services are close to households and communities, allowing their utilisation as and when needed.

In the African region, health investments in the workforce, infrastructure and supplies remain low. This is reflected by the low access index of 0.32 and this indicates that the health systems in the region are only able to assure 32% of the potentially possible access to essential health services (WHO, 2018). The access index varies significantly between countries, ranging from a low of 0.12 (Central African Republic) to a high of 0.70 (Mauritius). However, noteworthy is the fact that the proxy indicators for health accessibility are largely resource-dependent, without a measure of distance or travelling time needed to reach the health facilities. Nonetheless, in comparing countries by income level, there is a consistent improvement in access to services, the higher the GNI of the country (WHO, 2018: 46). Therefore, it is expected that the more economically developed a country is, the more accessible, even considering the time taken to access the health services, the health facilities are.

In the Zimbabwean context, accessibility of health facilities with respect to time use is influenced by two factors: distance and the funds needed to secure the health services. For example, in the 2010-11 ZDHS, 36% and 10% of the women in the urban areas cited money to pay for treatment and distance, respectively, were hindering factors for them to access health facilities (JICA,

2012). This implies that, instead of spending time accessing health facilities, the women would rather use the time to make more money since travelling to the health facility makes them lose the opportunity to make more money and depleting their disposable income by paying for the health services.

Morino *et al.* (2021) argue that the time saved from mobility in accessing health facilities is critical as urban dwellers do not only waste time on the roads, but they also incur high opportunity costs during commuting. On this note, Liu (2019) asserts that in the United States, an average of 54 hours per year are lost during travelling owing to traffic jams and congestions for every American driver. By and large, due to such traffic problems, Morino *et al.* (2021: 101) estimate that on average, traffic delays lead to a consumption of USD 1010 per year per person, that cumulatively translates to over USD 166 billion per year nationally. This points out to the fact that proximity to health facilities has some advantages, and these are not only financial. By and large, during an epidemic such as the ongoing COVID-19, lives are sometimes lost due to delays in accessing health services. If a person dies, all the human capital investment on the person at individual and national level would have been lost.

With regards to health service accessibility in Zimbabwe, Isbell and Krönke carried out research and it was found that in general, health service delivery in the country is characterised by inefficiency (Isbell and Krönke, 2018). The research highlighted that in addition to difficulties in obtaining health care, many Zimbabweans complain of long waiting times, with only 19% of the respondents submitting that they are assisted promptly. Contrariwise, 45% of urban dwellers, as compared to 32% of rural area respondents, revealed that the delays in accessing healthcare were more acute and such scenarios worsened during health crises such as cholera outbreaks (Isbell and Krönke, 2018). This indicates that the opportunity costs for accessing health services are higher for urban populations than people in rural areas in the country.

As observed by Moreno *et al.* (2021), the 15-Minute City concept hinges upon the philosophy of chrono-urbanism. This concept, as expounded by Mulíˇcek *et al.* (2014), seeks to conceptualize access to urban utilities through the lens of time, asserting time taken to access basic amenities as an indicator of

wellbeing. In other words, the philosophy propounds that "the quality of urban life is inversely proportional to the amount of time invested in transportation, more so using automobiles" (Moreno *et al*., 2021: 100). In this context, it is advocated that basic amenities for urban people need to be acquired within a 15-minute walkable distance, or rather cycling distance.

Li *et al.* (2019) trace the conception of the 15-minute City concept to Japan's urban planning and design in the 1960s when the "local life circle" and "settled circle" concepts were introduced. These concepts were meant to introduce the aspect of proximity of basic services to the people. As such, the concept was modified and modified in Asia whereby the residential design of South Korean cities was influenced by it. Additionally, Xiao *et al.* (2014) reveal that the development plan for Taiwan in 1979 was also hinged upon such a proximity concept. the concept has gathered momentum with the Shanghai local administration incorporating it in the 2016 Shanghai Master Plan whereby the "15-minute community life circle" was subsumed to be the basic unit of building community life (Shanghai Administration, 2016). On the other hand, Li *et al.* (2019) carried out research and found that the third-tier city of Baoding was planned as observed by the 15-minute city concept. Specifically, the research results showed that "the allocation of convenient commercial facilities, dining facilities and medical facilities is relatively good; the allocation of community cultural facilities, primary and high schools needs to be improved; and the community pension service facilities need to be constructed urgently" (Li *et al*., 2019: 602). In other words, the 15-minute City Concept is an emergent concept that seeks to incorporate the input of local communities into urban planning through prioritising and localising their interests. By and large, these findings cement the conviction that the adoption of the Concept into urban planning leads to urban dwellers enjoying six essential urban functions: living, working, commerce, healthcare, education, and entertainment within a walkable distance (Moreno *et al*., 2021).

Moreno *et al.* (2021) have modified the concept by including the following components into the concept: proximity, diversity, density and digitalisation. In line with this concept, it is realised that density has a direct link to travel and diversity as propounded by Ewing and Cervero (2010) that high densities in urban areas, as facilitated by ultra-high-rise buildings would lead to

diseconomies of scale in travelling. Therefore, the Concept advocates for density to imply people per square kilometre whereby the optimal number of people that a given area can comfortably sustain in terms of urban service delivery and resource consumption would be considered in planning. On the other hand, the component of proximity in this Concept denotes both spatial and temporal connotations that infer that within the 15-minute walkable distance, basic services would be accessible for urban residents. Although such a chrono-urbanism aspect is arbitrary, the significant factor is that these services would be readily available to the people without wasting valuable time and travel resources to access them. Of importance to urban planning and accessibility of urban utilities is the fact that the Concept favours diversity through mixed use of urban space and multiculturalism. In this context, the urban land-use zone concepts are discouraged and thus planning is inclined towards compact usage of urban space and such planning promotes urban sustainability and inclusivity (DeLisle and Grissom, 2013; Sinxadi *et al*., 2020).

Noteworthy is the fact that the digitalisation component actualizes the three preceding ones. Moreover, digitalisation in this context aligns the 15-Minute City Concept to the Smart City one since the factor promotes resident inclusivity and participation in planning through technology advancement (Dembski *et al*., 2020). Nonetheless, the 15-minute Concept is more inclusive than the Smart City Concept in that technology advancement in the latter concept is the major key to urban sustainability, yet it has proven to be costly to the urban poor and thus promote inequalities (Pandey, 2020).

By and large, Boyce *et al*. (2019) commend that urban planning were an under-utilised yet important tool, even in resource-limited settings. This implies that there is no substitute for urban planning as its absence has dire consequences, especially in sub-Saharan Africa. Sasaki *et al*. (2009) argue that poor urban planning in African urban areas is a colonial era legacy that promoted exclusivity as facilitated by racial segregation. By and large, Boyce *et al*. (2019) asserts that such poor urban planning in the African urban landscape increases the risk factor for disease outbreaks such as malaria, particularly in the city of Lusaka, due to poor drainage and inaccessibility of some health facilities that were favourably located near white residential

areas during the colonial era. By and large, UNOCHA (2020) portray distance and unpreparedness as limiting factor to access COVID-19 treatment for people in Harare Metropolitan Region as COVID-19 patients were attended in referral hospitals only and these had an acute shortage of equipment such as ventilators during the outbreak. However, since Harare City Council is condoning urban sprawl and mixed-land use initiatives within the city centre, and at the same time shunning mixed-land use within residential areas (as evidenced by Operation Murambatsvina and other like operations) such a standing in urban planning is not sustainable during an epidemic as COVID-19, as evinced by the 15-minute City Concept.

Brizuela *et al.* (2020) argue that the agglomeration of jobs and services drives large fractions of a city's population increases contact rates between the residents of distant neighbourhoods and this exponentially increases the spread of respiratory diseases such as COVID-19. By and large, it is herein submitted that people have unequal roles in spreading such respiratory diseases and the heterogeneity depends on the distance they travel on a daily basis. Such inequalities lead to spatial inequalities in the size, timing and growth rate of epidemics (Merler and Ajelli, 2009).

The empirical research in Guadalajara City, Western Mexico, by Brizuela *et al.* (2020), revealed that the mobility of urban residents determines the success of epidemic control interventions. The researchers observed that efficiency of vaccination campaigns is likely to vary depending on the target population, that is whether inhabitants of the city centre, its visitors, or people living in suburban areas. On the other hand, the observation highlights that the success of such non-pharmaceutical interventions as lockdown measures need to be widespread to reduce the interaction of other people from distant neighbourhoods. Inversely, there is need for total containment of people within their local neighbourhoods if such intervention measures as lockdowns are to be successful. By and large, the research findings included the following: by evenly distributing activity hubs throughout a city (instead of clustering them in the city centre), city planners can segregate subsets of the population and potentially inhibit the rapid transmission of pathogens across distant neighbourhoods. Noteworthy is the fact that the research results affirm the need for urban planning to promote decentralisation of

basic urban utilities to reduce the travel time for urban dwellers and thus promote physical distancing between residents from distant neighbourhoods and thus affirm the need to adopt the 15-Minute City Concept in urban planning.

Urban areas have inherent socio-economic inequalities and inequities (Vearey *et al*., 2019). During the colonial era, such discrepancies in accessing urban basic facilities such as health were fuelled by racial segregation, but today, disposable income disparities are the drivers. Therefore, housing informalities, particularly slum settlements, carry the inequality burdens and this makes them risk areas in epidemic outbreaks (UNOCHA, 2020). As such, WHO (2018: 84) recommends that "there is need to find means of taking services to previously unreached populations; not only those physically unreachable but even those unreached when in plain sight – like the urban informal settlements." The declaration reveals that health inaccessibility for some urban dwellers is hindered by urban planning as health facilities cannot be established in "illegal settlements" as propounded by corresponding master plans.

To curb inequality problems in cities, one particular blueprint is used worldwide, and this is the Urban Health Equity Assessment and Response Tool (HEART). This is a guide for policy and decision-makers to identify inequities in health between people living in various parts of cities, or belonging to different socioeconomic groups, and to facilitate decisions about effective strategies, interventions and actions that should be used to reduce health inequities (Norwegian Institute of Public Health, 2020: 30). Through this tool, local authorities are able to prioritise areas within their jurisdiction that may need health interventions. As such, the blueprint is a tool for redistribution of health resources during health emergencies and crises. Of importance is the fact that Urban HEART is a package that incorporates the following response strategies: incorporate health in urban planning and development; emphasise and strengthen the role of urban primary health care; strengthen the health equity focus in urban settings; put health equity higher on the agenda of local governments; and pursue a national agenda (World Health Organisation & WHO Centre for Health Development, 2010). Of particular importance to African cities, particularly Harare, the capital city of

Zimbabwe, is the need for the Harare City Council to promote primary healthcare so that the people would not find it necessary to travel long distances to referral hospitals during a health emergency.

In line with the Urban HEART tool, health provision in cities need to be guided with the following institutions: good clinical governance practice; person-centred provision; and health resilience. WHO (2018: 67) advocates that "Clinical governance is focused on ensuring that a standard quality of preventive, promotive, clinical or rehabilitative care is provided to each person, irrespective of where they access services." In the Zimbabwean context, both central and local authorities need to collaborate to ensure that good healthcare is also accessed in public institutions, not in private health centres only where the fees are exorbitant. On the other hand, person-centredness in healthcare provision ensures that a patient is the fulcrum of decision-making regarding healthcare. This means that the responsible authorities would consider the opportunity costs incurred by the patient in accessing the health facilities, and thus during planning, they would strive to reduce these costs by offering quality healthcare that is accessible in terms of travel-time, for example. By and large, there is need to promote resilient healthcare provision and this is characterised as "the inbuilt capacity of the system to sustain provision of essential health and health-related services even when challenged by outbreaks, disasters, or other shocks (WHO, 2018: 42).

The epidemiological patterns in urban areas are mainly determined by urban design and planning. These in turn are influenced by socio-economic factors that tend to favour the urban affluent. In this regard, the inherent inequalities in accessing urban utilities are more exposed during epidemics. The poor have limited resources to access healthcare, yet at most, the local authorities are ill-prepared to control and intervene in health emergencies. As such, the urban poor carry the epidemiological burden of accessing healthcare over long distances since primary healthcare in most cases, lacks the surge capacity to offer the needed healthcare. However, in epidemics such as the ongoing COVID-19, healthcare delivery in urban areas is further derailed by lockdown measures that are non-pharmaceutical interventions by governments to contain the disease. Resultantly, morbidity for people with chronic diseases

such as HIV, diabetes, and hypertension problems is increased since they would must travel long distances to access efficient healthcare. By and large, it is proposed that urban planning need to adopt chrono-urbanism as elaborated by the 15-Minute City Concept. The adoption of the 15-Minute City concept implies that the basic amenities such as healthcare would be accessed within some walking distances and thus will not strain resources for the urban dwellers. Moreover, the Concept promotes the need for proximity to cut opportunity costs incurred during travelling to access other basic facilities. By and large, issues such as chrono-urbanism, urban inequalities, good clinical governance practices, and healthcare resilience in urban areas are emerging issues that aim to promote the welfare of urban dwellers during crises such as the COVID-19 epidemic.

The present chapter has focused on reviewing the existing body of literature concerning urbanisation, epidemiological patterns, and access to healthcare, particularly in the context of sub-Saharan Africa. It has argued that rapid urbanisation in African cities presents unique challenges, leading to a dual burden of disease, with both infectious and non-communicable diseases becoming prevalent. The chapter underscores the importance of understanding the spatial dimensions of health risks, influenced by factors like sanitation, infrastructure, and socioeconomic disparities. Furthermore, it emphasises the need to explore the relationship between disease outbreaks, the location of health facilities, and the impact of these factors on urban public health management. The literature review highlights gaps in current research, particularly the need for studies that integrate spatial analysis with epidemiological data to inform policy and improve health outcomes in urbanising areas.

Chapter 3: Conceptual Framework and A Historical and Geospatial Spatial Context of Harare Metropolitan Region, Zimbabwe

Harare previously known as Salisbury is the capital city of Zimbabwe that became fully recognised as one in 1980 (Hove and Tyirimboi, 2011). The city is located in the north-eastern part of the country' It enjoys tropical continental climatic conditions that have the summer and winter seasons mainly characterised by hot, wet summers and cool, dry winters. It experiences distinct seasonal variations influenced by its geographical location. Kamusoko *et al*. (2013) contend that the average annual rainfall for the city ranges between 470mm and 1350mm that is recorded from November to March, however, due to climate change, there have been unpredictable variations in rainfall patterns. The city, located upstream of Manyame River Catchment, has an elevation of approximately 1483m and all the runoff that takes place in the city flows to Lake Chivero, the major source of water for the city (Tyirimboi, 2011). The chapter lays the foundation for the study by establishing the conceptual framework and providing a historical and geospatial context of the Harare Metropolitan Region. The chapter intends to provide an understanding of Harare's urban development and spatial dynamics, which influence epidemiological patterns, health service accessibility, and disease prevalence within the region.

The metropolitan province of Harare, has, as observed by Kamusoko *et al*. (2013), about four main districts that include Epworth, Harare urban, Chitungwiza and Harare rural. It covers about 942km^2 with an average altitude of 1500m. The province has various vegetation types and species that include grasslands and woodlands that are mainly characterised by the Brachystegia species and jacarandas. The geological has the Dolerite and Gabbro in the northern side, the granites in the south and eastern parts and lastly, the Phylite and Metagraywacke situated in the centre. The city is richly endowed with agriculturally rich soils and the practice of urban farming, though controversial has been the norm in the city and contributing to the livelihood of many people in the city (Muronda, 2008).

The metropolitan region encompasses the Harare City that is also the capital city, and the largest city in the country. The city's road network, that is one of the spatial components of the city, is radial with the central business district (CBD) at the centre and industries in the south and eastern parts. The low-density areas in the northern and northeastern parts of the city with an

average size of about 1000m^2 a plot. The high-density suburbs in the extreme south and southwestern parts of the city with at most 300m^2 plot size Kamusoko *et al.* (2013). The medium density suburbs ranging from at least 500m^2 to 1000m^2 and these are mainly found in the southern part of the country. Prior the attainment of independence, the city was divided as observed by racial lines. But this ended upon the attainment of independence where now it was classed as observed by socio-economic divisions. Figure 3.1 presents the map of Harare and its satellite towns.

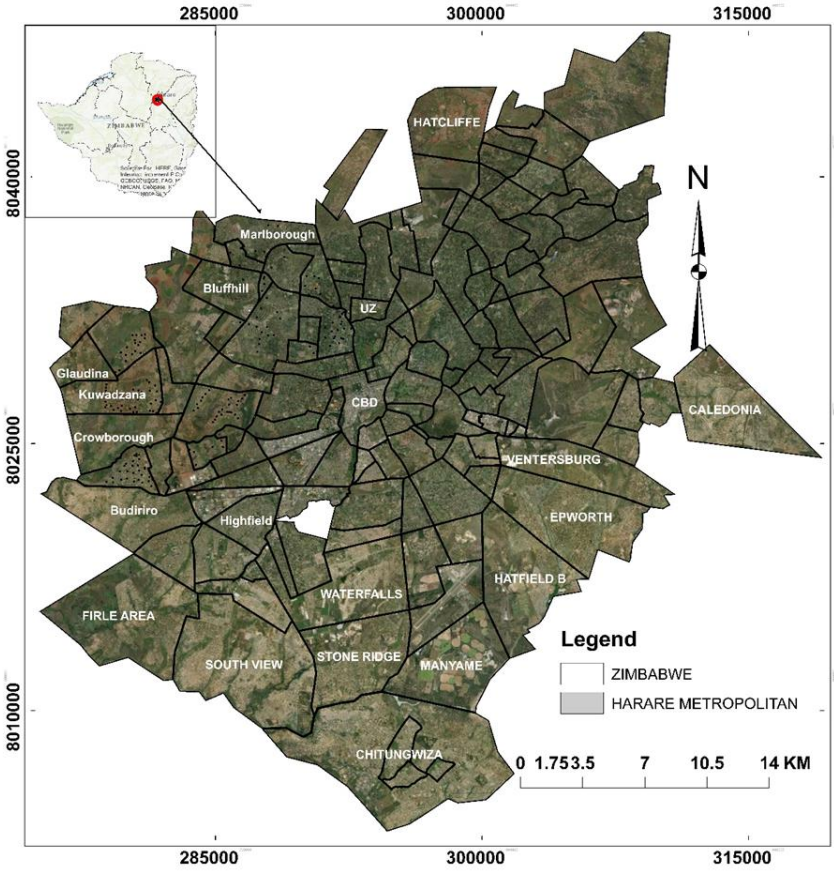

Figure 3.1: The Establishment Harare Core and its Satellites: Harare, Ruwa, Epworth and Chitungwiza

Harare was initially founded as a fort during the colonial period in 1890 by the pioneer column. The pioneer column was a force under Cecil John Rhodes, who was the head of the group. It was initially named Fort Salisbury and became popularly known as Salisbury. It had noticeable growth as compared to other forts that it was declared a municipality as of 1897 and in 1935, it became recognised as a city (Muronda, 2008). The growth and development of the city cannot be classified as parasitic but rather generic as its growth was influenced by heterogeneity rather than orthogenetic transformation. Geo-political and economic factors are the major influencers of growth in the city as compared to the socio-cultural and physical influences that often initiate development of a specific area as displayed in Byland's development model.

The development of the City of Harare fits in the Byland's model from stage 3 rather than from stage 1. This gives the city a unique background in its formation as compared to other cities. The colonial regime had a readily formulated plan to ensure that Harare becomes the central place or city and this was not in cognisance of any development model (Muronda, 2008). Mbare was the original Harare and is the oldest place in the city established around 1907 in the southern part of the CBD. The place initially had four large hostel flats that were intended to house single men and had a population of approximately 34 000. The city's core satellites began growing gradually. The married people had semi-detached, six roomed houses and rentals where ranging from at least $5 to about $18.50 a month. Home ownership commenced around 1963 under the 99year leasehold agreement (Munzwa and Jonga, 2010).

The development of Chitungwiza town began around 1970s. The town developed from the Seke and St Mary's townships. The St Mary's township was designated for missionary churches and related services. The original intent of the colonial government to develop the town was to locate the Africans away from Harare city. The town began to grow exponentially with a population of approximately 15000 as of 1969 and 354 472 in 2012 (ZIMSTATS, 2012). As observed by World Population Review (2021), the town's 2021 population is around 391 429. The major drive for the increase in population has been rural to urban migration. A greater part of this took place

during the 1970s liberation struggle. Despite being a standalone city, most of the working population in Chitungwiza have their jobs in Harare city (Kamusoko *et al*., 2013).

Epworth on the other hand, developed long back in the 1970s as an unplanned, informal settlement. It is situated in the southeastern part of the city. The settlement was formed because of people fleeing the liberation struggle as people sought accommodation in Harare city. The population grew rapidly soon after the attainment of independence as people who had no accommodation in the city joined the people in Epworth. As observed by ZIMSTATS (2012), the settlement had approximately 153 116 people. The area is administered by a local board and has been facing challenges of service provision as the residents lack access to the basic services such as water. Due to administration issues, the town has not been placed under the City of Harare but is managed by a local board.

The City of Harare is surrounded small, and growing towns of Norton, Epworth, and Chitungwiza and the population of these have outgrown the general population of the City of Harare. As observed by Mukamo (2015), the population of Epworth and Chitungwiza was estimated to be around 2.1 million above that of the City of Harare that was around 1.5 million as observed by ZIMSTATS (2015). Population in the city has been growing speedily with rural-urban migration being the major contributor. In 1982, it had about 656 011 people, 1 189 103 in 1992, 1 435 784 in 2012, and currently sits at 1 542 813 (World Population Review, 2021).

The major challenges striking the City of Harare include water shortages that have led the outbreaks of diseases such as cholera. As observed by Hove and Tyirimboi (2011), the cholera epidemic gripped many parts of the city particularly the high-density suburbs such as Budiriro and Glenview. At least 4 047 deaths from cholera were reported in 2009 (OCHA, 2009). Acute water shortages have been driving most of the population into unhygienic sources of water. For water accessed from boreholes, due to underground seepages and contact with wastewater, hasn't been safe for consumption (Jonga and Chirisa, 2009).

There are various laws that govern local urban authorities, and these ensure proper decision making and lay out the mandates of the councils. As observed by Chatiza (2020), these laws and regulations influence resident behaviour, ensure the meeting of public needs through determining public interest and effect the functioning of the economies. A well-functioning city is governed by regulations and laws to facilitate orderly development. However, laws have been a hindrance to development especially when they are rigid and outdated. Urban local authorities have been empowered to oversee general development issues within their jurisdiction. These issues involve the promotion of health, education, economic and social development that enhance city functioning and growth. Successful cities often have effective laws.

Harare City Council is an institution set aside to facilitate development within the city and the surrounding areas (Mukamo, 2015). In facilitating development within the city, the council makes use of by-laws that are key in regulating socio-economic activities to achieve sustainable and resilient development (Chatiza, 2020). Sustainable development is facilitated where the regulations are improved continuously to keep abreast with the changing environment and trends in urban development (Mandipa, 2014). As observed by Toriro (2018), the City of Harare makes use of existing statutory instruments to regulate development under its jurisdiction. One example is the Statutory Instrument 195 of 2014 (SI 195/2014) that controls street vending within the central business district. Other legislative frameworks include the Urban Councils Act (Chapter 29: 15) and the Regional Town and Country Planning Act (Chapter 29:12) that encompasses all development and planning issues on development.

The city has other subsidiary legislation that work hand in hand with the statutory instruments and Acts. As observed by the City of Harare (2020), the city has a strategic plan that exists to ensure effective planning by identifying the key challenges and the possible solutions to that so that resources are channelled towards sector where they are fully needed.

Chitungwiza, the name originates from the term 'Dungwiza', a mountain to that Chaminuka used to perform spiritual activities. It was formed during the

colonial period as a dormitory town meant to decongest the City of Harare (Hove and Tyirimboi, 2011). The municipality of Chitungwiza was established as observed by the provisions given in the Urban Councils Act (Chapter 29:15) as a local authority with the responsibility to deliver social services (Manjobo, 2015). The town continues to expand rapidly with rural to urban migration being the major contributor to the growth in population. As observed by Chiunya (2015) the town had approximately 350 000 and was reported to be the third largest town settlement in the country. It is located about 25 km in the southern part of Harare. The council's work is also provided for in the Urban Councils Act (Cha 29:15) and the Regional Town and Country Planning Act (Matimati and Rajah, 2015). However, it has other strategic plans that help it achieve specific local development one of which ran from 2014 to 2018 that promoted Result Based Management (IRBM) (Matsiwe, 2017).

Epworth developed as a satellite town located southeast of Harare at about 15km. As observed by Chirisa (2009), the town did not develop as a residential area and hence the development was haphazard. It is a peri-urban settlement that covers at least 3600 hectares. For ensuring proper administration, the settlement has been divided into 7 wards. Though initially recognised as an informal settlement, a local board was set to ensure administration of the area. The Ruwa local board was established in 1986 by the then government of Zimbabwe (Pawaringira and Madobi (2013). The local board has been relying on the state for assistance in managing the affairs of the town. As observed by the 2012 census, Epworth had approximately 162 000 people and the population continues to rise. Chatiza (2020) highlights that the local board has a water by-law that was put in place to manage water sources. However, due to water shortages and other inconsistencies, the by-law has been difficult to implement.

Ruwa is located on the eastern side of Harare at approximately 23 km along the Harare-Mutare Road. It was created as a growth point in the year 1986 and later as a local board to manage urban issues as appointed by the central government in 1991. This has been done in accordance to the provisions of the Urban Councils Act, section 14 as highlighted by Chirisa (2009). Prior 1991, Ruwa was under the administration of Goromonzi rural district council. Due

to the challenges in housing provision in almost any urban area, the Ruwa local board seems to have given the private sector powers in housing provision. As observed by Manyanhire *et al.* (2007), water supplies to the town have been from Harare City Council though this had its own challenges and inconsistencies. Due to the inadequacies in the municipal water supplies, many people have resorted to wells to supplement water supplies.

Disease prevalence has been a general issue countrywide, however, Harare, being the capital city with the largest population tends to be more vulnerable to disease outbreaks. Tuberculosis, Cholera, HIV and the new COVID-19 pandemic fall on the list of many diseases affecting the city. According *et al.* (2020), at least 12 702 cases of Tuberculosis that were mapped in the Harare city. Co-infection from HIV and tuberculosis was hovering around 72%. The subscription to World Health Organisation's End TB Strategy by 2035 program has been one of the steps taken nationally as a means to lower the case of TB (Timire *et al.*, 2019). Cholera is one of the frequenting epidemics in the city that is mainly because of poor service provision (Mason, 2009). The major areas that are affected are high densities that include Budiriro and Glenview due to water shortages and inconsistencies in refuse collection.

Cholera outbreaks and occurrences in Harare have been frequenting and the major cause being poor service provision. Mason (2009) reveals that Mabvuku/Tafara an dmany other locations in the capital city are highly affected by cholera outbreaks and their statistics often range from 2000 to 5637 cases since 1992. Chitungiwiza locations that include St Mary's and Zengeza are often affected by the same epidemic. The current pandemic of COVID-19 hasn't been selective of areas since it has hit worldwide. However, as observed by Murewanhema *et al.* (2020), efforts to ensure comprehensive testing have been done but the shortage of testing kits has been a limiting factor. Harare had the highest number of cases much of which were a result of overcrowding in the city.

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Health infrastructure facilities are generally fewer as compared to the size of the population. Urban expansion in the city hasn't been met with an equal improvement in the health system (Ray and Masuka, 2017). The health workers are often paid lower wages that demotivates their efforts towards

improving the health services. Isbell and Kronke (2018) reveals that the current facilities often fail to cater for mass populations during an epidemic. One such is cholera that claimed at least 4000 lives nationwide in 2008.

The Metropolitan City of Harare has revolved immensely since the attainment of independence. The city has been popularly known as a sunshine city. However, with the progressing development and the massive population increases have exacerbated urban challenges within the city. Poor urban governance and mismanagement of funds amongst many other challenges have led to the outbreaks of epidemics such as cholera due to poor service provision. Efforts to resuscitate the quality of the city have been made though some include the destruction of informal settlement structures that have led to an increase in homeless people.

The present chapter established the conceptual framework and historical-geospatial context of Harare Metropolitan Region to provide a foundation for understanding its urban development, spatial dynamics, and related challenges. Harare, formerly Salisbury, became the capital of Zimbabwe in 1980 and is characterised by a tropical continental climate with distinct seasonal variations. The chapter explored the city's physical geography, including its elevation, vegetation, geology, and water systems, particularly its reliance on Lake Chivero. Harare's spatial organisation was outlined, from its colonial origins to post-independence changes, highlighting its radial road network, socioeconomic residential divisions, and expansion of satellite towns such as Chitungwiza and Epworth. It examined key drivers of urban growth, including rural-urban migration and geopolitical factors. Furthermore, it discussed major urban challenges, particularly water shortages and disease outbreaks like cholera, exacerbated by governance inefficiencies. The role of local authorities and statutory instruments in urban management is also analysed.

Chapter 4: Trends, Occurrence and Prevalence of Communicable and Infectious Diseases in Harare Metropolitan Region Since 1900

Communicable and infectious diseases are a hazard to public health and welfare. A rising trajectory of disease occurrence and prevalence is an indicator of poor public health provision. In this regard, the study of disease trends over time encompasses an examination of both local and central authority capabilities in administering health amenities to the public. Noteworthy is that both the colonial and post-colonial disease incidences in Harare Metropolitan Region are of interest to this research. By and large, a comparison of public provision during these distinct political eras, as divided by the 1980 independence watershed, is inevitable.

The colonial era was pronounced by discrimination in policy implementation among the native Africans and the white settlers. This significantly affected public health provision in Harare Metropolitan Region, known as the sphere of influence of Salisbury, during that time. On the other hand, independent Harare Metropolitan Region is influenced by inappropriate and outmoded urban planning provisions that, in turn, negatively impact upon public provision of health facilities in this area. By and large, the people in this area are entangled in this set-up that is inherently handicapped to offer adequate healthy provisions as enhanced by water and sanitation facilities. Resultantly, disease outbreaks and disasters as triggered by these factors are common in the study area. The chapter analyses the trends, occurrence, and prevalence of communicable and infectious diseases in Harare Metropolitan Region since 1900. It seeks to understand the historical context and evolution of disease patterns to inform current public health challenges and future interventions in the region.

The mounting of the Union Jack on 12 September 1890 in Salisbury marked the colonization of Zimbabwe by Britain. The subsequent policies were meant to serve a dual purpose of suppressing African activism and upholding white supremacy. In the health sector, there was no political will to provide for universal health coverage as the public health policies were determined by

economic interests whereby health facilities were concentrated in urban areas and mining areas to preserve the labour force (Packard, 1997). For example, Holland (1976: 219) puts forward that "Sexually transmitted diseases were shown to be an important, but neglected, social and medical problem in Rhodesia". On the other hand, Arnold (1988) contends that the white settlers were suspicious of the way the native Africans dealt with the diseases such as malaria and smallpox that were rampant in the Tropics and therefore deepened their quest to subjugate the Africans as a philanthropic duty since the Africans were seen as a reservoir of such diseases (Vaughan, 1993). As such, the European public health policies were sometimes used as a colonisation tool to lure the Africans into subjugation, and this was bound to fail as the Africans had their own ways of dealing with the diseases as enhanced by indigenous knowledge systems (Brown, 2004).

By and large, the incompatibility of the motives of public health provision between the white settlers and the native Africans led to some of the diseases such as malaria and sexual transmitted infections (STIs) to become endemic in Zimbabwe during the colonial era. On the other hand, Chikumbu (undated) contends that colonialism changed African means of controlling diseases, citing sleeping sickness that was controlled through environmental modification during the precolonial era, and thus became difficult to implement after the establishment of colonial rule. By and large, UNEP and ILRI (2020) submits that the expansion of colonial rule in Africa facilitated outbreaks of zoonotic sleeping sickness that killed one third of the population in Uganda and up to one fifth of the people living in the Congo River Basin in the first decade of the twentieth century.

At independence, the Zimbabwean government inherited a dual health system that was biased towards developing urban health facilities, relegating rural health needs. Simmons (2012) puts forward that inequalities were evident as health facilities in urban areas are more resourced than those in rural areas. This contributed to localization of some diseases in Zimbabwe. For example, Holland (1976) submits that STIs were more concentrated in urban areas during the colonial era owing to the following factors: population imbalance owing to the discriminatory colonial rule that allowed only the male sex to reside in production locations, and a relatively young population

that is largely sexually active. On the other hand, diseases such as malaria and smallpox were concentrated in rural areas owing to geographical factors such as low terrain (Freeman, 1995). On the other hand, some enteric diseases such as cholera and typhoid have become more common in urban areas of Zimbabwe than in rural areas (UNHabitat, 2005). Nonetheless, governmental interventions such as the primary health care (PHC) initiatives that were more pronounced after independence have helped in blurring the ruralized disease occurrences in Zimbabwe. For example, at national levels, the annual malaria incidence (cases per 1,000 population) has decreased substantially from 153 in 2004 to 19 in 2018 (Zimbabwe DHIS2, 2018).

However, at national level, three major diseases continue to impact heavily on Zimbabwe and these are HIV, Malaria and Tuberculosis. This public health threat has led to the country benefitting from the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM, 2012). Nonetheless, with regards to malaria, at the national level, annual incidence (cases per 1,000 population) has decreased substantially over the last 15 years, from 153 in 2004 to 19 in 2018 (President's Malaria Initiative Report, 2020).

On the other hand, besides donor funding, communicable and infectious diseases in the country have become a concern for both local authorities and the central authority in the country. Noteworthy is the fact that the Zimbabwe Public Health Act CAP 15/17 No. 11/2018 Section 26 offers that "Every local authority shall take all lawful and necessary precautions for the prevention of the occurrence, or for dealing with the outbreak or prevalence, of any infectious or communicable diseases, and shall exercise the powers and perform the duties conferred or imposed on it by this Act or by any other enactment." The Act, as a regulatory law for the provision of public health in Zimbabwe, defines infectious disease as any communicable disease caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi that can be spread, directly or indirectly, from one person to another as specified in section. In this context, a communicable disease means a disease that can be transmitted from one person to another. However, most local authorities in Zimbabwe are associated with corruption, inefficient service delivery, and political bickering (Chanza *et al*., 2014; Isbell and Konke, 2018).

By and large, the present chapter seeks to critically examine the trends, occurrence and prevalence of communicable and infectious diseases focussing on the contribution of both colonial and post-colonial local authorities in exacerbating and/or abating such diseases within the context of Harare Metropolitan Region. The World Bank (2015) documents the fact that the Harare Metropolitan Region Metropolitan Area encompasses five urban areas of Harare, Chitungwiza, Epworth, Ruwa and Norton. Although these areas are overseen by independent urban authorities, they are linked together based on sharing a common water supply system and a common destination for their wastewater into the supply dams (The World Bank, *ibid.*). Therefore, since water and sanitary facilities are central to most disease outbreaks in the country, it is only convenient to study disease patterns in such a large metropolitan area.

Research has proven that the neighbourhood factor is sometimes a more significant variable than individual, or rather personal factors, in determining risk to diseases (Gabrysch *et al*., 2008; Boyce *et al*., 2019). Inversely, if the neighbourhood is poorly planned to ensure efficient public health delivery, the risk factor for contracting or transmitting a disease is enhanced. Employing a meta-population model, Brizuela *et al*. (2020) demonstrate that the agglomeration of daily activities can largely influence the growth rate, size and timing of urban epidemics. By and large, "smart" urban city planning fosters a convenient neighbourhood to reduce the prevalence of both communicable and infectious diseases since these are diseases that are susceptible to be passed from one person to the other (The Norwegian Institute of Public Health, 2020).

Comparing the prevalence of infectious diseases (IDs) and non-communicable diseases (NCDs), WHO (2004) submits that infectious diseases (IDs) have been the most important contributor to human morbidity and mortality yet there are now trends of NCDs sometimes exceeding infections. In this context, WHO (2011) confers that a communicable disease is an illness caused by a specific infectious agent or its toxic products and arises through transmission of that agent or its products from an infected person, animal, or inanimate reservoir to a susceptible host, either directly or indirectly. In this case, an infectious disease were described under communicable diseases as

the disease is transmissible from person to person by direct contact with an affected individual or discharges or by indirect means. Nonetheless, although infectious diseases can affect people of all ages, they are a direct threat to children under five as they lack the immunity to fight these diseases in most cases.

Empirical evidence suggest that infectious diseases are directly related to extreme weather events (EWEs). In this regard, WHO (2004) puts forward that the major Earth's climate/oceans system, the El Niño Southern Oscillation (ENSO) events, have become more frequent and intense, leading to extreme weather conditions such as droughts and storms. By and large, ENSO years have been associated with epidemics of infections including malaria, dengue, cholera and viral encephalitis (Kovats, 2000). Epstein (2000) argue how there are two main channels through that ENSO events lead to disease outbreaks: public health system breakdown due to accompanying disasters; and also, the spread of "nuisance" organisms. For example, Cyclone Eline of 2000 resulted in floods that caused internal displacement of people, leading to major outbreaks of typhoid and cholera in Mozambique (Epstein, 2000).

Additionally, the United Nations Environment Programme (UNEP) and International Livestock Research Institute (ILRI) report (2020) observes how climate change has been instrumental in facilitating newly emerging infectious diseases in tropical regions where the warm temperatures suit the lifecycles of both pathogen and vectors. Moreover, climate change influences the geographic distribution of mosquitos and other vectors that transmit viruses such as the chikungunya virus and West Nile virus. The 2010 Rift Valley fever outbreak was influenced by higher-than-normal average rainfall (UNEP and ILRI, 2020). The Centre for International Governance Innovation (CIGI, 2009: 10) argues how the increases in temperature, climate change-induced natural disasters and scarcity of safe drinking water due to droughts are major contributors to the spread of infectious and water-borne communicable diseases in Africa. On the other hand, Nava *et al.* (2017) attributes the outbreak of infectious diseases in Brazil to El Niño and La Niña EWEs.

The UNEP and ILRI (2020) organisations partnered on a research about zoonotic diseases. The research established that about 60 per cent of human infections are estimated to have an animal origin, and of all new and emerging human infectious diseases, some 75 per cent "jump species" from (non-human) animals to people (UNEP and ILRI, 2020: 07). For example, the research revealed that most human pandemic influenza viruses have a complex evolution with mixing of viruses in different domestic animal compartments, usually pigs and poultry and interacting with human influenzas to produce highly pathogenic human influenza pandemics, with pandemic human influenza (H1N1), Middle East respiratory syndrome (MERS), and severe acute respiratory syndrome (SARS) having proven or suspected domestic animal involvement in transmission.

Unsustainable utilisation of natural resources accelerated by urbanisation, land use change and extractive industries leads to an increased interaction between animals and people and this promotes human exposure to insects, ticks and other vectors of wildlife pathogens. In this vein, Clavel *et al.* (1986) submit that the natural reservoirs for HIV Type 1 are Chimpanzee and that for HIV Type 2 are the Sooty Mangabeys. On the other hand, monkeys and apes are the immediate hosts for Ebola Virus, with unconfirmed reports that the natural reservoirs for the Virus being the African fruit bats of the *Pteropodidae* family (UNEP and ILRI, 2020). Such revelations argue how unplanned urbanisation systems that involves the destruction of natural habitats for the fauna may lead to zoonotic disease outbreaks due to an increased interaction between people and animals.

In 2019, Matthew R. Boyce, Rebecca Katz and Claire J. Standley carried out literature review research in a bid to have a better understanding of infectious disease risk factors specific to urban settings in Sub-Saharan Africa (Boyce *et al.*, 2019). It was found out that infectious diseases remain a substantial source of morbidity and mortality, especially among children, in the region. The most common infectious diseases in Sub-Saharan Africa, as covered by the literature reviewed were the following: malaria, HIV&AIDS, and diarrheal diseases. This corresponds with the findings by Havelaar *et al.* (2015) that among the major infectious diseases in Africa are HIV/ AIDS and malaria.

Nonetheless, Boyce *et al.* (2019) contends that urbanisation may directly contribute to the emergence or re-emergence of infectious diseases through the degradation of ecosystems, intensification of agriculture, and increased opportunities for the human-animal interface, especially with rodent or peri-domestic reservoir species. This finding is in line with those observed by the UNEP and ILRI research partnership (UNEP and ILRI, 2020).

Additionally, higher population density, poor housing, and poor sanitation infrastructure increase the risks associated with some infectious diseases, notably malaria and enteric diseases. With regards to poor sanitation infrastructure, a group of researchers, notably Sasaki, Suzuki, Fujino, Kimura, and Cheelo, found that cholera outbreaks in Lusaka, Zambia were fuelled by poor drainage networks and ablution facilities. Nevertheless, one particular disease epidemic may positively lead to the other due to increased interactions among urban dwellers. This is particularly significant when one focusses on the relationship between HIV&AIDS and tuberculosis (TB): Corbett *et al.* (2009) submits that in some cases HIV infection is a significant risk factor for smear-positive prevalent TB. Concerning other respiratory diseases such as COVID-19, the Norwegian Institute of Public Health (2020) reveal that the epidemic has a higher transmissible rate in urban areas as compared to rural areas due to high population densities and high rates of intermingling among the urban people.

The research employed a literature review research methodology in tracing and examining the trends, occurrence, and prevalence of the most common communicable and infectious diseases in Harare Metropolitan Region. This research methodology was necessitated by the relatively study period between 1900 up to the present. Moreover, through a desk-top review methodology trends from official reports are easily depicted. By and large, since it was established that the most common communicable and infectious diseases in Sub-Saharan Africa include enteric diseases, particularly cholera, and malaria and HIV&AIDS, the research will also focus on these diseases within an urban context, notably, Harare Metropolitan Region. On the other hand, COVID-19 is also examined in the study as an emerging respiratory disease.

Policies during colonial rule contributed to occurrence and prevalence of STIs in Harare (formerly Salisbury). Holland (1976) observes how the most common STIs in the urban area during the colonial period were syphilis and gonorrhoea with the former being misdiagnosed as chancroid in the 1970s. The general white settler mentality regarding these diseases was that "The native is the reservoir of infective tropical disease, from that the European and his family is subject to invasion" (The Southern Rhodesia Government, 1930: 09). As such, Holland (1976) reveals that statistics gained from the European population with regards to STIs in Salisbury were not accurate, with only eight in-patients reported as suffering from such diseases in Government hospitals in 1972. However, the Medical Officer of Health report (1972) of Salisbury reveals that private laboratories reported 640 positive specific Treponema tests in Europeans during the last five months of 1971 and this translates to a monthly average of 128 patients. Such statistics confirm that STIs in European populations were not widespread in Salisbury. On the other hand, concerning the African population in this city, the survey by Holland (1976) confirmed that STIs were more common in the African population than in white settlers. The results of the study revealed that 1707 diagnoses were reported with 12% of them having syphilis, and 64% having gonorrhoea.

Due to colonial rule regulations, there was a notable sex imbalance in Salisbury in 1969 and this was 2.4 to 1, with more males than females and this was even more distinct in the 15-19 age group (Central Statistics Office, 1971). As such, Willcox (1949) argues how Salisbury had, in general, an incidence of around 80% of STIs contracted from prostitutes. Subsequently, Holland (1976: 219) argues how "Discrimination, poverty, poor housing, lack of education and opportunity all contribute to the heavy drinking in Salisbury townships with its associated marriage breakdowns, immorality and prostitution". Such factors still account for the prevalence of STIs in independent Harare.

The first recorded case of HIV&AIDS in Zimbabwe was recorded in Hurungwe district in 1986 (Duri, 2013). On the other hand, Lopman and Gregson (2008) conducted a research to find out when the epidemic peaked in Harare. Using mortality data, a back-calculation technique was employed to reconstruct historic trends in incidence of HIV&AIDS for Harare, it was

found that annual incidence peaked between 4 and 5% between 1988 and 1990 in the city and this preceded any other peak elsewhere in Zimbabwe. This argues how the epidemic was more widespread in Harare Metropolitan Region in its early years after its diagnosis and has since declined. In this vein, Duri (2013) argues how HIV&AIDS prevalence is heterogeneous at national level, with Harare having the lowest prevalence of 13% as compared to that of small towns and farms that is at 22% on average. These results correspond with the findings by the Zimbabwe Ministry of Health and Child Welfare that concurred that the highest HIV prevalence was observed in Matabeleland South (23.8%) while the lowest was in Harare (10.8%). However, UNAIDS/WHO (2004) submits that in 1994-1995, 86 percent of sex workers tested in Harare were HIV positive and this period was marked by an increase from 52% in 1990 to 71% in 1995 of HIV prevalence among STI clinic patients in the City. This reveals that sex workers are among the main groups of people who transmit HIV in Harare.

Cholera is an enteric disease that is fuelled by contaminated water and poor sanitary infrastructure (WHO, 1997). For example, Christie (1987) cites that there were cholera outbreaks in 1974 and 1975 in Manicaland province and these were triggered by a contaminated borehole. Noteworthy is the fact that the first cholera case in Zimbabwe was recorded in 1972 (Chipare, 2010). Nonetheless, there is no history of recorded cholera outbreaks during the colonial rule in Harare. This were attributed to the fact that the two water treatment works that supply water to Harare Metropolitan Region, the Morton Jaffray Water Treatment Works (nominal capacity of 614Ml/day) and the Prince Edward Water Treatment Works (90Ml/day), were adequate in supplying the population during the colonial period. Chanza *et al.* (2014) put forward that Harare's population in 1969 was 385,000 and this rose to an estimated population of 610,000 in 1977 of which 79% were black and this was mainly attributed to rapid in-migration due to the escalating liberation war. Nonetheless, during the colonial period, the risk factors for cholera were minimal in Harare.

The post-colonial Harare has recorded several cholera outbreaks. During these outbreaks, a cholera case was defined as any patient presenting 3 or more liquid stools and/or vomiting for the last 24 hours. The most devastating

cholera outbreak was in 2008 and the first cases were recorded in Chitungwiza when on the 20th of August 2008, an outbreak of 118 cholera cases was declared (Chipare, 2010). Based on WHO (2009: 3) daily cholera updates and alert reports, of the 19 582 cases recorded in the entire City of Harare, at least 55% of them were from Budiriro and its environs alone. Following this outbreak, the location of Marindale in Norton experienced 1 400 cases of cholera and 50 deaths in 2008 (Parliament of Zimbabwe, 2010).

As observed by USAID (2009: 2), a breakdown in water and sanitation infrastructure exacerbated this cholera outbreak, and the collapsed health system was unable to respond adequately. Nevertheless, in Norton, the local authority acquiesced that some sewage pipes in Marindale had dead-ends, that is they did not flow to the main sewage pipes that carried sewage to the water works and as a result the pipes burst, releasing sewage into the residential areas. By and large, to prove that cholera has become endemic in Harare Metropolitan Region, another cholera outbreak was experienced in Harare in 2018 and this was declared on the 6th of September 2018 by the Ministry of Health of Zimbabwe that also notified WHO on the same day (WHO, 2018). Twenty-five patients were admitted at the Beatrice Infectious Disease Hospital in Harare presenting with diarrhoea and vomiting on 5 September 2018. Most cases came from Glenview 8 and 3, and Budiriro 1 and 2 suburbs. As such, Isbell and Kronke (2018) assert that besides poor sewage and water systems, the latest outbreak was also facilitated by inadequate health-care infrastructure and shortages of medicine, intravenous fluid, and protective clothing.

Polonsky *et al.* (2014) argue how typhoid is among the major public health menaces in developing countries where there is poor accessibility of clean water and sanitation facilities. As such Zimbabwe has suffered a recurrence of the hygiene-related disease and this has mostly been in urban areas, particularly Harare Metropolitan Region. Just like cholera, there is scarce evidence of recorded typhoid cases in this area during the colonial era. The WHO and the Ministry of Health and Child Welfare (2012) puts forward that a suspected typhoid case is that when any person suffers from a gradual onset of steadily increasing and then persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes, abdominal pain and

constipation or diarrhoea and a confirmed case was defined as a suspected case confirmed by isolation of S. Typhi from blood, bone marrow, bowel fluid or stool. In this regard, the diagnosis tests through blood, stool and urine samples were carried out at the Beatrice Road Infectious Disease Hospital in all the typhoid outbreaks in Harare.

As highlighted above, typhoid is an endemic public problem for Harare Metropolitan Region. Muti et al. (2014) argue how in January 2010 there was a typhoid fever outbreak in Mabvuku and Tafara suburbs of the City of Harare. There was a resurgence of the disease in Harare from October 2011to June 2012 and the first positive case was confirmed through laboratory tests at the Beatrice Infectious Disease Hospital. Muti *et al*. (2014) notes that in Dzivarasekwa twenty-four cases were found to be positive for Salmonella typhi in stool, urine or blood and only one death was reported. For the same outbreak of 2011, Polonsky *et al*. (2014) argue how as of 17 March 2012, a total of 3795 cases of typhoid fever had been reported, of which 62 (1.2%) were confirmed by laboratory diagnosis. During this outbreak, two deaths were reported and this corresponds to a case fatality ratio of 0.05%. Noteworthy is the fact that the diseases were more intense in the suburbs of Dzivaresekwa and Kuwadzana that accounted for 67.7% of the case-patients (Polonsky *et al*., 2014). Compounding the problems associated with ongoing COVID-19 epidemic, UNOCHA (2020) reveals that in August 2020, another typhoid outbreak was recorded in Harare, and this had 695 cases and 10 deaths.

As observed by UNEP and ILRI (2020), there have been there have been at least six major outbreaks of novel coronaviruses in the last century and the latest is the ongoing COVID-19 epidemic. In Zimbabwe, this disease was first detected in Harare on 20 March 2020. As observed by UNOCHA (2020), the highest weekly incidence risk for COVID-19 has been in the urban provinces of Bulawayo and Harare, with a consistent sharp increase in incidence in Harare since the second week of July 2020, increasing incidence in Harare Metropolitan Region. This reveals that due to the high transmission rates in large cities, Harare is a high-risk area for contracting the disease. It was established that the disease was imported as it was first detected in China in December 2019. Therefore, since Zimbabwe's largest airport, the Robert Mugabe International airport in Harare, this increases the risk factor for

COVID-19. Moreover, despite the fact that the third wave of the epidemic, that is mostly propelled by the Delta strain of the coronavirus, has hit Kwekwe, sporadic positive COVID-19 cases are still evident in Harare, a relic of it once being a hotspot for the disease in early 2021.

Corbett *et al*. (2007) contend that tuberculosis (TB) disease can result from either rapidly progressive disease following recent infection with Mycobacterium tuberculosis or from reactivation of latent TB infection. As such, Havelaar *et al*. (2015) argue how TB is among the top three infectious diseases together with HIV&AIDS and malaria in developing countries. Commenting on the case of Harare, TB incidence would be expected to rise during the course of an HIV epidemic, even if TB transmission rates were in decline owing to increased numbers of highly susceptible individuals (Corbett *et al*., 2007). However, in developing countries, that are highly susceptible to HIV&AIDS epidemics, the burden of TB prevalence is uncertain (Dye *et al*., 2005). As such, basing on a research carried out by Corbett and colleagues in 2009, it is established that Harare has a substantial burden of infectious TB, "with 4 in every 1000 screened individuals having smear-positive culture-positive TB, predominantly due to undiagnosed disease" (Corbett *et al*., 2009: 05). By and large, as low case detection proves to be the main setback for the control of TB in Harare, it is imperative to advocate for the control of the disease through intensified case-finding strategies.

The communicable and infectious diseases that are common in Harare Metropolitan Region are those associated with poor sustainable development. It is submitted that the recurrent outbreaks of cholera and typhoid are directly related to poor service delivery in this metropolitan area. This is attributed to many factors chief among them being the following: overpopulation; poor urban planning, socio-economic hardships, and corruption.

The dawn of the liberation war was a push factor for rapid urbanisation in Harare as people emigrated from rural areas into the city for protective reasons. This led to the establishment of most suburbs in the south-west of Harare city. On the other hand, socio-economic inequalities between rural

areas and urban areas also contributed to rapid urbanisation in Harare Metropolitan Region. By and large, such an influx of people into the urban area also put pressure in peri-urban areas such as Epworth and suburbs in the outskirts of the City such as Mabvuku and Tafara. Moreover, the strategy to relieve population pressure in Harare by establishing Chitungwiza as a satellite town of the City did little to ameliorate the situation since Harare remained the core city and these intervention measures only served to increase its immediate sphere of influence. As such, the necessary service delivery system was derailed. The two Water Treatment Works that serve Harare Metropolitan Region are inadequate and this has resulted in water shortages and poor water quality. These are the risk factors for diseases such as cholera and typhoid since the people are forced to tolerate poor quality sources of water for domestic use. The overpopulation factor for promoting these diseases is supported by the fact that during the colonial era, when the population in Harare Metropolitan Region was relatively small, there were scarce incidences for such diseases yet they cannot be described as emergent diseases.

The prevalence of some diseases such as STIs, cholera and typhoid may also be attributed to poor urban planning and bad governance practices. During the colonial period, STIs were mostly prevalent in production locations such as farms, mining areas, and towns. The discriminatory laws dictated a separation of men and their female counterparts and this caused a sex imbalance in these locations, resulting in sex work being a lucrative business due to a high demand. This promoted the spread of STIs in these locations and thus increased morbidity and mortality rates from such diseases. According Chanza *et al.* (2014), the first settlement for African workers in Harare (formerly Salisbury) was established in 1892, and legislation in 1906 allowed the designation of separate black residential areas, and made it compulsory for all African workers not living at their place of work to live in these locations.

Davison (2000) argues how urban planning during this time was mainly determined by imported urban planning concepts such as the "garden city", the "neighbourhood" and the Radburn design concepts. However, such imported urban planning concepts were not meant for Zimbabwean mode of

urbanisation that is mostly characterized by informality and a rapid influx of a relatively young population. Therefore, since urban planning in Harare Metropolitan Region has its foundations in such imported urban planning concepts, the planning products have proven to be ineffective in promoting sustainable urbanisation. For example, it was pointed out that the cholera outbreak in Norton was due to poor drainage systems and this has fostered bursting of sewage pipes, and thus promoting the occurrence of diseases.

As such, Boyce *et al.* (2019) argue how urban planning was an under-utilised yet important tool in reducing the risk factors for the occurrence and prevalence of diseases. By and large, the effect of neighbourhood characteristics has a great bearing on disease outbreaks as shown by the incidences of HIV&AIDS (Gabrysch *et al.*, 2008). The neighbourhood concept is of great significance in the consideration of disease outbreaks such as cholera and COVID-19 since it propounds proactive planning and designing of urban areas to circumvent the spread of diseases. On the other hand, bad governance practises, as indicated by rampant corruption cases in local authorities, have worsened the situation in metropolitan Harare since the resources used to promote public health in this urban area are sometimes diverted for different uses by those in authority (Isbell and Konke, 2018).

Disease trends, occurrences and prevalence are indicators of public health delivery. As such, endemic communicable and infectious diseases depict poor public health delivery in most cases. The control of such diseases needs a holistic approach that is buttressed in sustainability of city development. In this regard, proactive urban planning in city development considers environmental, social and economic factors, aiming for an equilibrium. This way, inequalities and deprivation effects in public health service delivery would be reduced. On the other hand, good governance practise and political will are relevant factors in determining communicable and infectious diseases. As such, corruption and political unaccountability in Harare Metropolitan Region have failed the metropolitan area in sustainable public health delivery. Therefore, there is need for all stakeholders to be effectively involved in public health issues, and these are specifically the central authority, respective local authorities, resident organisations, and other civic organisations. Such an inclusive partnership in planning and execution of public health concerns

would effectively impact upon disease patterns in Harare Metropolitan Region.

The chapter has presented a historical analysis of communicable and infectious diseases in Harare Metropolitan Region since 1900, revealing shifts in disease patterns influenced by urbanisation, economic factors, and public health interventions. Initially, diseases like malaria and tuberculosis were dominant, but the city has faced outbreaks of cholera, typhoid, and diarrheal illnesses, particularly affecting high-density suburbs due to poor sanitation and inadequate infrastructure. The chapter likely explored specific epidemics, such as the 2008 cholera outbreak, highlighting the interplay between economic crises, a collapsing health system, and social vulnerabilities. It also explored how factors like water contamination, overcrowding, and spatial inequalities contribute to disease prevalence. Overall, the chapter provided a historical foundation for understanding current epidemiological challenges and informing targeted public health strategies.

Chapter 5: The Nexus between Place of Selected Disease Prevalence and Placement of Urban Health Facilities

The present chapter critically explores disease incidence in urban areas. It explains the intractable relationship that exists between places of disease prevalence in urban areas and the placement of health facilities in which it seeks to discuss the connection between urban infrastructure and the occurrence of diseases within the urban space. The main argument presented in the present chapter is that urban areas are mostly affected by certain diseases such as Infectious diseases, respiratory diseases, epidemic diseases, that arise due to poor sanitation and the increasing rate of urbanisation hence the quicker the spread of the diseases as the proximity of people is too close. The chapter deals with how certain diseases are most common in the urban environment and the likelihood of the dwellers being affected by these diseases at a given period. The study deploys a desktop study that engaged literature. Secondary data sources that include books, research articles and journals were used to collect the information used in the chapter. Data was analysed using both quantitative and qualitative techniques. Results indicate that urban societies are more prone to several diseases in which huge amounts of people get affected with new cases being recorded each time. Some of these diseases such as epidemic diseases are more common in the urban environment because of poor urban facilities. The trends show that high populated areas are the most prone to diseases and there are high speeds of spreading. It is argued that urban areas have become the super spreader of diseases due to high population rates. In conclusion, the incidence of diseases in urban environments are very high with high frequency rate mostly among the lower income classes. It is recommended that steps be taken in the positioning of the urban facilities that is one step towards the curbing of disease prevalence and their incidence.

The chapter aims to explain the variability of diseases in urban settlements specifically in Zimbabwe and how they prevail over time. It seeks to disclose the connection that exist between the occurrences of diseases in urban areas, they pattern and the most affected group with the existing urban facilities. It

has been noted in the study that different urban infrastructures such as the health facilities, sanitation facilities, public transport and housing infrastructures have a permanent role in the prevalence of diseases in urban environments. The contributions of these facilities, their positioning and functionality might be both positive and negative with regards to the spread of diseases in the urban areas. The chapter also discusses many diseases that are in two categories namely communicable and non-communicable diseases that are mostly common within the urban space such as infectious diseases, respiratory diseases and waterborne diseases and explains how they affect the urban populace. It explains the incidence of both communicable and non-communicable diseases in the urban set up. Some of the diseases that are put into consideration in the chapter includes cholera, typhoid, bilharzia and coronavirus that has become the biggest battle that the whole world is fighting against. The prevalence of diseases in the urban areas is a risk to the lives and health of the population of different countries across the earth as most of the people are believed to be staying in the urban areas. Previous studies have noted that due to urbanisation and natural population growth, 60% of the world's population resides in the urban areas. It has been observed that the most affected population are the low-income earning residents of the urban cities. Thousands of people are losing their lives due to increased transmission of diseases in urban areas with many people becoming orphans, widows and childless. This calls for a serious lookout on the development of the urban facilities that are a result of the outbreak and spread of diseases and poor health facilities that are failing to be utilized in controlling diseases in the urban space.

Looking deep into this matter and finding solutions to it were beneficial in saving the lives of the people that will also increase the life expectancy and standards of living as well. The study was compiled using secondary information from previous studies. Articles, book chapters, journals among other academic documents were utilised to collect the data used in the chapter that support and gives evidence on the prevalence and incidence diseases in the urban areas and their relationship with the existing urban facilities especially the health facilities found in the urban areas. The validation of the information presented in the chapter was done through cross

referencing and the use of more than one source of data. The results show that the incidence of diseases in the urban areas is high due to the closeness of people to each other and high population volumes. Due to rapid urbanisation disease prevalence is also at its peak as the outbreak of diseases is increasing as the population increases especially communicable diseases.

Results also indicate that the prevalence of diseases in the urban areas is related to the urban facilities with some disease prone areas noted for having deteriorating infrastructure and poor health facilities for the citizens. It can be argued that the health of the people is very important as it marks the development of an area and an indicator of improved standards of living. In summation it can be said that more efforts should be done to curb the incidence and prevalence of diseases in the urban environments. It is recommended that investments be done in the health sector to improve the delivery of health facilities among urban areas and restoration of urban infrastructure that are a result of the continuous outbreak of diseases in the urban environment.

The increase in the outbreak of diseases within the urban areas of Zimbabwe has led to the need to dig through to reveal the trends of diseases prevalence in these areas. Due to the increased urbanisation and the expansion of the cities, the incidence of diseases has yet increased leading to loss of lives and poor health among the affected groups of the urban environment. Unlike in the past, urban areas are the most affected by diseases outbreaks due to increased population density. The situation has resulted in the study that seeks to understand how diseases are spreading and come with ways in which the urban facilities can be improved to curb the disasters associated with diseases prevalence in the urban area. It also identifies the diseases that are of most concern in the urban areas around Zimbabwe and develop a understanding on how the incidence and prevalence of these diseases is linked to the urban facilities with most concern centred on the urban health facilities in the urban Zimbabwe and finding how viable these urban facilities are and how they can be improved to ensure that the health of the urban dwellers is secured and there is a reduction in the prevalence of diseases in the urban cycles.

The key concept premising the present chapter is to articulate the occurrence of diseases in urban areas and the connectedness that exist between the prevalence of diseases in connection with the urban facilities. The chapter agrees that incidence of diseases and their prevalence in the urban environments .... It has been noted from different studies around the world that the prevalence of diseases in urban areas are because of the available infrastructures among other factors such as economic conditions and socio-economic conditions that are less relevant to the study as the focus is on the facilities in different urban settlements. The chapter focuses on both communicable and non-communicable diseases that are most common in the urban areas. Among these diseases are Infectious diseases, respiratory diseases, and epidemic diseases. Many studies have investigated on how urban facilities contribute to diseases incidence and prevalence in urban cities, but little concern has been put forward to upgrade these limitations especially in the less developed countries where the prevalence of diseases is increasingly due to the dilapidation of the facilities in these areas. Urban areas can be defined as places where people live with advanced technologies and better standards of living, unlike the countryside.

At a global scale, the incidence of diseases in urban areas varies with the type of disease affecting the population and the places of the disease occurrence in the given area. It has been noted that the incidence of water-borne and infectious diseases is more common in the developing world than the developed countries with quiet several people at risk, as more than half of the developing countries are more vulnerable. Moreover, urban environments are not homogeneous, so risk factors are likely to vary across the continent, across a country, and even within a city. It has been noted that urban environments are not homogeneous, so risk factors are likely to vary across the continent, across a country, and even within a city. It is argued that there is an increasing susceptibility to infectious disease, especially emerging infectious disease (Quammen 2012). Susceptibility of the low-income population to diseases has been very high hence the high rates of disease incidence among this group. Locally the incidence of diseases is more common in highly populated areas where the circulations of people are very high and among large families residing in a limited or smaller apartment.

Most communicable diseases such as cholera and typhoid spread fast in the highly populated ghettos and the low-income earning people as compared to the low-density areas. Neiderud (2019) suggests that malaria risk in urban areas is higher in irregularly or sparsely built-up areas and that high building density reduces dengue risk. It is in poor quality housing that the risk factor for respiratory diseases and malaria. Inadequate water supplies and sanitation and waste management are also associated with high incidence of diseases as there is much time spent in queues waiting for water thus allowing people to associate with each other. The density of inhabitants and the close contact between people in urban areas are potential hot spots for rapid spread of merging infectious diseases such as severe acute respiratory syndrome and the avian flu.

The prevalence of diseases at a global level is believed to be increasing time and again. This is because of different factors such as the increased urbanisation rate throughout the universe. Gowda, Bhojani, Devadassan and Beerenahally (2015) argue that the occurrence of chronic diseases around the world are on a rise due to inequalities in the accessibility of health services especially among the urban poor. In India, urbanisation has been discovered to be the major cause of the prevalence of chronic diseases [World Health Organisation (WHO) 2011]. Gowda *et al.* (2015), discovered a huge inequity among the poor urban dwellers as the struggle to get access to the basic amenities and health services. This clearly indicates that the prevalence of diseases is high among the urban poor people as compared to the high-income earning residents (Brashier, Londhe, Madas, Vincent and Salvi 2012). In a study carried out in Bengaluru, in India, it has been discovered the prevalence of chronic diseases is increasing and has surpassed the numbers obtained in the previous study. Some diseases such as Hypertension, Diabetes, heart problems among others have been identified to be affecting the poor dwellers of the urban area (Godwa *et al.*, 2015). It has also been observed among urban cities of Sri Lanka that chronic diseases are more prevalent among medium and high urbanist groups (Eckert and Kohler 2014). In a study carried out in Sri Lanka, it was noted that the prevalence of overweight and diabetes mellitus is more common among men in the high urban category (Eckert and Kohler 2014).

Regional trends articulate that the number of newly diagnosed cases in urban areas is increasing as the population is also expanding hence the proximity of the people is becoming high leading to the spread of the diseases. In some cases, urbanisation may directly contribute to the emergence or re-emergence of infectious diseases through the degradation of ecosystems. In Africa several common diseases hit the urban environments such as typhoid, cholera and malaria among others that are mostly caused by poor sanitation within the urban environment. At regional level, it has been noted that the prevalence of diseases is high in largely populated areas. Some authors argue that high population density areas are frequently identified risk factor for infectious disease in sub-Saharan Africa.

Apart from that, increased prevalence has been identified in diseases such as malaria, fevers and respiratory diseases. These high transmission in high population density urban environments are because of the proximity of people especially in marketplaces, stadiums, cinemas among others. Apart from that, high-density neighbourhoods, and informal settlements have been factored out as places that are at an increased risk for infectious disease. At the household level, with one study showing that larger households were at a higher risk for enteric diseases. In Accra city, a town in Ghana, the prevalence of communicable diseases has been noted in the urban environments. Infectious diseases were identified in a study in Accra to prevail in the city that are affects the urban poor and in areas with deteriorating facilities, compared to the other residents of the city. Malaria and diarrhoea most common and being the cause of thousands of deaths around urban society (Fobil *et al*., 2011). In Zimbabwe, the prevalence of diseases is high among the low-income earning groups.

Urban facilities have always had an impact on the standards of living of the urban settlers that constitutes the health of the people. Among the infrastructures found within the urban space are the commercial centres, industrial, housing infrastructures, transport facilities among others. Higher population density, poor housing, and poor sanitation infrastructure as compared to rural areas have also been shown to increase the risks associated with some infectious diseases. These facilities are believed to be offering services for the people living in the urban areas. However, it has been noted

that the processes of extended urbanisation, that include suburbanisation, post-suburbanisation and peri-urbanisation, has result in increased vulnerability to infectious disease spread among different groups of people as pressure has been increased on the available facilities that are failing to cater for the growing population. The re-emerging infectious disease events and outbreaks around the world to reveal how extended urbanisation in the broadest sense has amplified the conditions necessary for the spread of infectious diseases. The increase urbanisation has resulted in the shortages and pressure on the urban facilities that has resulted in the spread of epidemic diseases in the urban space. This research mainly focuses on several urban facilities and their linkage to the prevalence of diseases in the urban space. It seeks to discuss how health, transport, sanitary and housing facilities have contributed to the increase of disease outbreaks and multiplication of the cases of people affected with certain selected diseases that prevail within the urban environment. Human movement was another significant risk factor and encompassed several different behaviours. The risk for multiple diseases is increased because of travel, including travel by urbanites to areas where certain disease prevalence is high.

The prevalence of diseases and the urban facilities have a linkage. It can be argued that the quality of facilities determines the health of the people and the physical environment in which they stay. Good quality infrastructure improves the health of the people and as well lowers the prevalence of diseases within the settlement areas. The built environment characteristics are an important factor for diseases risks in urban areas. The prevalence of malaria in urban areas has been identified especially in spatially populated areas of the city where there is enough space for mosquitoes breeding and poorly built houses. The risk of malaria infection is lower among residents of completed houses. Risk of respiratory diseases in the urban environment is associated with poor quality housing therefore the informal settlements are more prone to influenza and other respiratory diseases.

At a global scale, it has been noticed that urban facilities are very crucial for keeping the urban residents healthy. In developed countries, many sustainable developments that are being done to maintain the health standards of the people in both the countryside and the urban communities.

Sasaki and colleagues found that insufficient drainage and lack of access to a latrine increased the risk for cholera in Lusaka, Zambia. Keating and colleagues found similar results for malaria whereby households in well-drained areas had a significantly lower risk of infection. Stressing much emphasis on the health facilities in Zimbabwe, it is in a worrisome state whereby the hospitals and clinics are falling to provide the basic services that are required by the citizens. With the growing population within the urban areas, little action has been taken to expand the public health facilities that are affordable for most of the urban residents. The public around the urban spheres. Most of the informal settlements do not have access to health facilities in their respective areas leading to high prevalence of diseases. Besides the limited number of infrastructures, the public health facilities in Zimbabwe are ailing to provide enough services to the residents due to inadequate technology and shortages of medicines and other requirements for the nurses and doctors to tackle their jobs thus leading to more deaths and spread of diseases in the urban setup.

Qualitative and quantitative data collection methods were used to compile the data that is presented in the chapter. Desktop research method was made use of whereby several journals, articles book chapters among others were used. Already existing research from different places around the globe were used to give a comparison on the connection between diseases prevalence and the urban infrastructures in these areas. These existing studies contributed in finding the variability that exist with space and time.

Results show that the incidence of diseases in the urban areas varies with space. It has been noted that there is high incidence of diseases in the highly congested areas of the urban environments as compared to the scarcely populated areas. Huge numbers of cases have been recorded in most populated areas for instance the Ghetto. This is evident looking at the spread of diseases such as cholera within the urban environment. Huge number of new cases are recorded in suburbs such as Budiriro, Kuwadzana, Epworth and Mbare where people are over populated hence the pressure and frequency of sharing certain commodities such as the restrooms, kitchens among others where a single house in shared by more than two families and flats meant for bachelors become the home for a whole family. This naturally brings people

close to each other thus resulting in a quick spread of diseases and the number of people affected. Due to the use of urban public transport, it has been discovered that the transmission of respiratory diseases is more common among the people who make use of public transport for circulation within the urban space unlike the people who uses their own mode of transport. Though precautions have been taken to lower the spread of covid-19, ZUPCOs are super-spreaders of the corona virus and other respiratory diseases such as influenza. People who use public transport have been recorded to be more exposed as they meet different people whose status is unknown without any social distance and being overcrowded in these buses creating a favourable environment for the spread of diseases. The incidence and prevalence of diseases is very high due to shortage of transport as people are also made to wait in queues for a very long time waiting for transport thus resulting in the gathering of people hence the spread of the virus among the urban areas.

The prevalence of diseases in urban areas is also associated with location of the area. several epidemic diseases are more common in informally settled areas where there is inadequate basic services provision. The results from the study indicates that the prevalence of diseases in the urban areas is because of poor urban facilities. There are not enough resources to modify the infrastructures within the urban environment that will help curb the present reoccurrence of diseases in the society. It has been discovered that there is shortage on the facilities such as housing and transport hence the congestion of people has resulted in a catalysed spread of diseases in the urban societies. Due to the increasing rate of urbanisation and natural population growth among developing countries, pressure has been built on the available facilities that at the time of the urban settlement formation were meant to cater for a certain number of people.

It has been found out that there are housing shortages that has led to the creation of slum settlement such as Hopely, Epworth and Caledonia among others where no proper services in unavailable thus making these areas epicentres of diseases. Basic facilities such as hospitals, clinics, water and sewer reticulation are absent in these areas that are a threat to the prevalence of diseases. Due to lack of clinics where the adolescence can acquire information about infectious diseases and how to protect themselves and

getting some contraceptives to protect themselves during intercourse. This has resulted in the increased incidence of HIV&AIDS and many more sexually transmitted diseases among the youths.

Due to poor sanitation in areas such as Budiriro and Glen View, the prevalence of cholera remains high due to the contamination of water by bursting sewer pipes that have become eroded and overweighed as the population continue to increase. Since these ae densely populated areas thus the circulation and proximity of people is very high resulting in quick transmission of diseases. The prevalence of typhoid has been noted in Mkoba in Gweru that is also a high-density area and lacks enough basic facilities hence the outbreaks of typhoid and cholera. the prevalence of epidemic diseases is high in high-density suburbs as compared to the medium and low-density areas.

The development and expansion of these areas is slower than the rate in which the population is increasing thus the accumulation of people on the little infrastructures available. There have been records of housing infrastructure shortages that has led to the sharing of small apartments meant for bachelors by the whole family or more thus leading to the increased breeding space for diseases and their spread especially respiratory diseases and water-borne diseases such as cholera and the recent COVID-19 viruses. Apart from the occupation of available housing infrastructures by more than the expected number, informal settlements have become a problem within the urban space that are the super spreaders of diseases and the generators of most communicable diseases in the urban areas. As observed by … different risk factors in the urban environment can, for example, be poor housing that can lead to proliferation of insect and rodent vector diseases. These areas lack basic services such as sanitation systems, absence of water and sewer reticulation have led to the genesis of typhoid, cholera among other diseases.

The prevalence of diseases within the urban space is associated with the poor urban facilities. It has been noted that the prevalence of cholera and typhoid is one of the major challenges within the high-density suburbs of most cities in Zimbabwe that is associated with lack of service delivery and the proximity of the people to each other that is noted that the more closeness

the people are the high the incidence of diseases in these areas. Failure to meet the need for public health facilities increase has led to the continuous prevalence of diseases among the urban poor that lacks financial capacity to acquire health services in the private hospitals and clinics this due to the little response put on the increasing urban population that has led to the need for the expansion of health facilities in the urban environments. Prevalence of diseases in urban areas can be attributed to the failure of the local authorities to provide for the urban facilities such as housing, sanitation and the health facilities.

Conclusively, the prevalence of diseases in the urban areas of Zimbabwe is mostly associated to the poo urban facilities provision. The prevalence of diseases in the urban areas is increasing each day as the population continue to increase thus leading to the shortages or pressure on the available facilities that are failing to sustain the population. Serous measures need to be taken to deal with the causes of the prevalence of diseases in the urban areas with more effort put on how the incidence of diseases be controlled and reduced. The connection that exists between the prevalence of diseases and urban facilities is strained hence there is need to fill up the gap for sustainable urban health of the people. There is need to develop the housing infrastructure that suit the increasing population due to urbanisation and natural population growth as this will reduce the incidence of diseases in most crowded areas where more than one family is forced by the situation to share a house meant for one family.

Apart from housing facilities, the service providers must make sure that there is proper sanitation in all suburbs with proper disposition of waters and their management and the provision of clean sources of water to regulate the prevalence of epidemic diseases among the urban residents. It is also recommended that the government must subsides and invest in the construction of new hospitals and clinics around the urban areas. New technology should be provided in these health facilities together with the medications at a reasonable price for the urban poor people to afford them and fight prevailing diseases in the urban space. Provision of housing infrastructure and the upgrading of informal settlements should be implemented to reduce the existence of diseases breeding areas where there

are no services, and the risk of epidemic diseases are very high and their incidence among the community. He local authorities should also rehabilitate the deteriorating services such as waste management and the provision of clean water within the residential areas.

The present chapter critically explored disease incidence in urban areas, specifically examining the relationship between disease prevalence, urban infrastructure, and the placement of health facilities. It argued that urban areas are disproportionately affected by diseases like infectious, respiratory, and epidemic illnesses due to factors such as poor sanitation and rapid urbanisation, which facilitate quicker disease spread. The chapter deployed a desktop study, engaging with books, research articles, and journals to collect secondary data, which was then analyzed using both quantitative and qualitative techniques. Results indicated that urban societies are indeed more prone to various diseases, with high population density exacerbating the issue and leading to faster transmission rates. The chapter concluded that the incidence of diseases in urban environments is notably high, especially among lower-income classes, and recommended strategic positioning of urban facilities as a crucial step toward curbing disease prevalence. The chapter also discussed both communicable and non-communicable diseases and how they affect urban populations, noting that factors such as health facilities, sanitation, and public transport play a significant role in disease prevalence.

Chapter 6: The Influence of Spatial Segregation: Population, Health Facilities and Time Use when Emergence Happens Interrogated

The chapter explores the distribution of population as compared to the health services provided within the cities. It also explains how the provided health services respond to peoples need during times of emergency. The main argument presented in the present chapter is that spatial segregation has caused disparities in the cities in terms of health service provision. In the sense that some areas are well-built and provided urban infrastructure that differs from other depressed regions. The difference is marked by economic status of the people, literacy rate, race and age of the people. Urban areas tend to be heterogeneous in terms of the allocation and location of facilities like health services. The study deploys a desktop study. The data were analysed. Results shows that the distribution of social groups, infrastructure, health activities or other elements has given birth to disparities in the areas. Many segregated areas experience economic decline. This causes the health systems to dilapidate as well. It is recommended that in the course of constructing new settlements the responsible authorities should consider equal provision of health services that are ready and capable of addressing the need of the people during the emergency times.

Over the past decades, there have been witnessed much suffering within the cities that emanated from spatial segregation. This has caused chain problems in cities and rural areas. Spatial segregation is caused by sociocultural, institutional, and economic factors. It has result in poverty, unequal access of better living standards and disparities in urban infrastructure development. The main driver of urban segregation comes from the idea that different groups of households have different willingness to trade consumption and locations in the city. Spatial segregation has not necessitated negative impacts on the social and economic status of the city inhabitants, but also on the health services. There has been substantial interest in the associations between city living and health relatively. The separation of the groups of people have indicated some sense of inequality considering access to quality and effective health services. This later caused a

distinctive gap on mortality and morbidity rates in parts of the cities. Spatial segregation has created situation where other areas experience high mortality and mobility rate in other areas as compared to others. Research has been done concerning the segregation yet, the existing literature has little information that explains the way in which spatial segregation affect the health services and their response during the time of emergency. The chapter covers the gap by exploring how spatial segregation within the city affects easy access to quality health facilities

The notion of spatial segregation refers to the distribution of social groups, infrastructure, activities, or any other element in space. Spatial segregation is broadly defined as the imposed or preferred separation of groups of in a particular territory. The separation depends on race, lines, ethnicity, language, religion or income. It is also defined as the degree of spatial separation between two or more population groups in a region.

Spatial segregation is also referred to as the distribution of social groups, infrastructure, activities or other element in space. It is also viewed as an inherent feature of cities and becomes a problem excluding or hindering certain groups from accessing services, activities and spaces the separation of groups within the city is because of social cultural, institutional and economic factors (Rasse, 2019). Health facilities are regarded as locations where healthcare is provided. They are also defined as place that provides healthcare. Health facilities include hospitals, clinics, outpatient care centres, and specialised care centres such as birthing centres, and psychiatric care centres. Originality of the city development in different countries provide the facilities that provides health to the communities were designated in different areas. These include hospitals, clinics, outpatient care centres that include birthing centres, psychiatric care centres.

Much effort was made towards placing these health infrastructures in different areas. However, despite these actions by government, non-governmental organisation and private sectors, some areas have been and are still facing challenges in accessing quality health services in their vicinity as compared to other areas. The health facilities in existence besides being of poor quality, they lack the ability to stand firm and strong during the times of

emergency in certain areas. The distribution of households across a city determines the outcomes of services to be offered (Ananat *et al* 2011).

The chapter seeks to explore the impact of spatial segregation to health services and its response during the times of emergency. The study was guided by theories surrounding the spatial segregation and health services. Various sources were used to acquire data from the studies that were already done in the past pertaining spatial segregation. The information in the chapter was derived from the secondary sources and it is desktop research.

Several measures are to be made towards addressing the identified gap that exist due to spatial segregation. It is of great importance to understand that spatial segregation affects the health services and its response during critical times. The measures to be taken concerning this situation should close all these health disparities and ensures that the health facilities provided can respond to the to the need during the times of emergency. The government need to appreciate that closing the gaps that were created by spatial segregation will enable equal access to quality of health in all areas. This can only be achieved mapping the population and equating them with the distribution of health services. This is the initial stage to address the disparities in health services that occurred because of spatial segregation. Recommendation notes that the government should note resort to aggressive measures to fight spatial segregation and curb its effects on the life of the people. The government must improve place-based investment to improve the health services of the cities.

Segregation turned into made regulation numerous instances in 18th and nineteenth-century America as a few believed that Black and white humans had been incapable of coexisting. Segregation quickly have become legit coverage enforced with the aid of using a chain of Southern legal guidelines. Through so referred to as Jim Crow legal guidelines (named after a derogatory time period for Blacks), legislators segregated the entirety from colleges to residential regions to public parks, theatres, swimming pools, cemeteries, asylums, jails and homes (Carniglia & Escobar 2020). There had been separate waiting rooms for white and black people in expert places of work and, in 1915, Oklahoma have become the primary kingdom to even segregate

public phone booths (Boustan 2011). It has regarded to be in all components of the world, wherein multiracial communities, wealthy and poor exist. It is assumed to have emanated from the colonial era where the colonists separated their settlements and services from the colonized people. The separation endured among the wealthy and poor and feature have led to variations in access to fundamental services within the cities. In southern states of the United States, discrimination started in late nineteenth century where it turned into legalized feature. In some regions the segregation is related to the racial businesses, ethnicity or religion while on other places it is associated with income status. Across Europe, policymakers fear that segregation will exacerbate local inequalities and in the long run have a negative impact on social cohesion (Andersson 2017). In Santiago and Chile, the segregation started in the period between 1979 and 1985 where the Pinochet regime existed. Though it turned into on a small scale the separation affected the extra than 2000 low-earnings households. This group turned was evicted from the high and middle-earnings residential regions. The wealthy people had been separated from the poor; the goal turned into creating neighbourhoods that were uniform depending on socioeconomic group.

In the United States of America, the population groups were assorted into distinct spatial neighbourhoods this was based on the race. The divisions among the blacks and the white race commenced. The income status contributed up to an extent where the demarcation was created between the white themselves depending on how much they earn. This segregation was not pronounced as compared to the black and white separation. The separation continued up to date where in the United States metropolitan areas have a China town, a little Italy, or other ethnic enclaves that host higher significantly concentrations of ethnic or cultural groups (Anderson 2016). In the United States, negative forces of segregation were just as effective but applied through restrictive property covenants. When these were declared illegal, they remained effective though less overt. The Realtors Code of Practice forbade the promotion of change of ethnicity in a neighbourhood. The prevalence of such a segregation is exacerbated by poverty as poor people are more likely to see their economic prospects and social relationships improved within their own ethnic group

In Africa, the forces that contribute to spatial segregation are many and varied. Segregation in Brazil depended on social elegance that have become dominant in the structure of cities and public policies. It started with the separation of groups due to social classes and exacerbated as the years progressed. The apartheid legal guidelines of South Africa were one extreme case of large-scale, government-sanctioned spatial segregation. Other cases have garnered less international attention, such as the Brazilian government's destruction of favelas in the 1960s, when the poor inhabitants were eliminated to other segregated locations (Boustan 2011). The white people settled in South Africa in 1952, that is when the segregation developed its roots and commenced to boom. Segregation grew out of its ideology that there are fundamental differences among various groups of people in South Africa and that the groups should be separated. Based on this segregation ideology, several legislations were enacted between 1910 and 1925. The 1910 Pass Law limited black families from moving to cities on a permanent basis. Blacks were allowed to seek employment in the city, but were prohibited form residing in cities. They were compelled to reside on reserves (land set aside for Blacks). In Africa, South Africa, Blacks consisted of 76.1%, Whites 12.8%, Asians 2.6% and those of mixed origin 8.5. The estimated rate of natural increase is 2.3% per year (Anderson 2016). In an extreme case, such as Johannesburg, the black south-western township Soweto was built 20 km from the centres of the city so that its presence would not inhibit white urban development in the south-western sector of the city itself.

Zimbabwe was colonized by the British in the 19th century. The country suffered from high levels of intergroup conflict, economic development, political and white resistance. The blacks suffered from the discrimination by the white people (Graham C. Kinloch 2003). They were restricted from occupying land in urban areas and were given space in the reserves. These areas were only meant for black hence was lagging in terms of the facilities needed for the wellbeing of the people. The black majority in Zimbabwe were excluded from owning more resources through the Land Apportionment Act. White people dominated all the facilities in the country. After the independence, the segregation became spatial as the demarcation were being made depending on the income status of the people. The rich were settled in

less crowded areas and have access to better infrastructure and services. On the other hand, the low-income earners were located in the high-density areas.

A distribution or set of geographic observations representing the values of behaviour of a particular phenomenon or characteristic across many locations on the surface of the Earth. The factors determining population distribution are resources, infrastructure, access to basic services and accessibility like distance from the central business district. The term generally describes how the population is spread out (Borregaard & Nachman 2008). As in what areas it takes place. Population distribution signifies the spatial pattern due to dispersal of population, formation of agglomeration. The distribution of population is not even in any location or city with varying degrees of concentration of population giving rise to varying densities in the different parts of the world. Areas that consist of high-income earners have sparse population. These areas have better facilities in terms of health care. Due to the fact that the areas have less population as compared to the low-income neighbourhoods, the healthy facilities tend to have the ability to respond to the times of emergency. The distribution of health facilities across the world is not even in the sense that the areas that are areas with low-density have better facilities on health as compared to the high-density areas.

In Africa the concept of spatial distribution has gained understanding as the phenomena that population describes how the population is spread out in a certain location. This works hand in hand with the population density that describes the number of individuals in a given space. There are factors that determine the distribution of people at a certain location in Africa. These include. In African cities like Harare, Johannesburg, Kinshasa, Nairobi, Dakar and Lusaka the rich and poor people in different societies (White *et al*., 2012). The segregation depends on the income earned by an individual. This means that even the health care facilities provided to these two groups differs in terms of quality, efficiency and the ability to respond to during the times of emergency. In areas where low-income earners are located consist or high population in which at times overrides the provided health care centres (Turrell 2009). From the fact that these people are low-income earners, they

cannot afford to build themselves the better facilities for their health care. Given a situation where the resources are being sponsored, the resources channelled in the lagging neighbourhoods are far below the expected quality as compared to the high-income earner's neighbourhoods. World Health Organisation's distribution of health services recommend that there should be minimum threshold of 23 doctors, nurses and midwives per 10 000 population.

In Zimbabwe, the distribution of health facilities is said to be equally accessed in all the cities. The health services are accessed by every individual despite the income status, race, gender, age, language or religion. The Constitution of Zimbabwe (2013) section 29 (1) alludes that the state must take all necessary steps to ensure the provision of health services that are accessible, adequate and basic throughout the country. On Section 29(2) states that the state is obliged to act in an appropriate way to provide fair, and reasonable measures to ensure that the distribution of health services do not have any restrictions during the times of emergency at any health institution. The Public Health Act section 76(1) states that every citizen and any permanent resident of Zimbabwe has the right to adequate health care (Zimbabwe's health delivery system 2018). This means that the distribution of the facilities is equal despite the being a citizen of the country or not. As observed by Zimbabwe National Health Strategy (2016-2020), the situation on the ground in Zimbabwe has at least 2 doctors at every district and at least 2 doctors at every primary health care.

Massey's theory of segregation and poor neighbourhoods' formation is based on population dynamics of segregation on the context of racial inequality in poverty rates (Quillian 2012). The idea being brought by this theory is that segregation separates high-poverty racial groups from low-poverty racial groups. High-poverty in this context means the people who lives in low-income neighbourhoods whilst the low-poverty are referred to as the high -income earners. Due to this separation, poverty concentrate within the low-income neighbourhoods while the people who earn high income are shielded from poverty contact. By adding some degree of poverty status segregation within race, poverty is further concentrated, producing high neighbourhood poverty contact for the poor of high-poverty racial groups (Quillian 2012).

The people who in these areas suffers from inequalities from basic facilities such as health facilities. The infrastructure is lagging in nature. The people in these areas suffer from diseases and rarely gets desired or suitable treatment. If there are diseases outbreaks, the healthcare centres neighbourhoods do not have the ability to respond to the emergencies. If they have the ability, they are overwhelmed due to the high population. This shows that segregation has impact on the distribution of the health facilities. The high-income neighbourhoods consist of low population density and benefits from the high-quality medical facilities.

At global context, segregation by race or income is a universal feature of cities around the world (Boustan 2011, Musterd *et al*., 2017). Segregation urban areas considered disadvantageous for minorities and low- income households in the cities. Segregation affects the provision of infrastructure to the public mainly the health facilities that are up to standards. The absence of urban integration defines the reasons why other communities are lagging in terms of health systems. Segregation in this context means that the city inhabitants are in a certain way suffering from denial to equal access to health services that addresses the need of the population. The people are actively excluded from the allocation of resources and access to the institutions. The resources channelled towards the development of health system are not equally distributed in all the areas. the existence of the separation between the low-income and high-income neighbourhoods in the city

Segregation means the separation of groups depending on the race, socio-economic status. The people are excluded from equal access to basic needs in the city (Parisi *et al*., 2011). Regionally, segregation in South Africa has been experienced because of race. The blacks were separated from accessing the facilities and services that were being accessed by the white people. The way in which the residential areas where the black people were built is far much different from the way the dwelling places of the white people. The provision of health facilities was not equal in both sides. The economic status of the black people was not stable hence could not manage to build themselves hospitals and clinics. The poverty was exacerbated by the fact that the blacks were viewed as cheap labour as a result they were being awarded salaries that

could sustain them from hand to mouth and left them with no money to build hospitals that will sustain them during the times of emergency.

In Zimbabwe, segregation from the colonial era is still imprinted on the urban space. The segregation in local context has witnessed the separation or isolation of low-income neighbourhoods. These neighbourhoods are characterized by lack of essential facilities (Sampson *et al*., 2002). The neighbourhoods are demoralized because they lack access to the required basic needs. Access to better quality of health facilities is influenced by the segregation within the city that occurs due to income status, race and religion. The segregation has affected the healthy system in the sense that even if the medicines are provided, the infrastructure still will not allow other health care operations to be carried out within the low-income neighbourhoods (Command 2017). This is contrary to the situation in areas like Borrowdale and Mt Pleasant, most high -income earners are located. These people have access to quality health services because they can afford to pay the services, this is shown by the mushroom of private hospitals in the southern part of Samorah (Low density areas). The health care facilities being built that side are expensive and only little population can manage to get treatment. Segregation gives people who are disadvantaged with no choice. This is so as they cannot access the quality health services within their vicinity at the same time, they do not earn income that allows them to go for better medical facilities in other areas.

Health care is a multidimensional concept that is subject to sociodemographic or boundaries. As a matter of fact, sickness know no boundaries any more than equality does, hence the distribution of the facilities need to be considered. Peipins et al (2011) states that the distribution of healthcare facilities is based on the socioeconomic status and location of residential areas in a city where suburban residents had lower access to the facilities than in the central city.

A health facility is defined within the global context, locations, institutions or centres that provide health care to the people. In the global context the health facilities are known as health houses, since they provide basic needs for the community and the surrounding areas (World Health Organisation 2002).

Iran consists of a population of about 80 million people who resides in the 31 provinces of the country having 74% resides in the urban settings. During 2016, the number of health care facilities that were distributed totalled to 921 (Roudi *et al*., 2017). Galobardes (2007) states that the distribution of hospitals was in favour of the district with larger residential floor area. the distribution of the facilities in high class area differs from lower class area (Table 6.1).

Table 6.1: Shows unequal distribution of health facilities in Iran (Inequality in geographical distribution of hospitals and hospital beds in densely populated metropolitan cities of Iran)

Item	Mashhad	Tabriz	Shiraz	Tehran	Esfahan
Districts	13	10	9	22	14
Total population (in number)	3,001,184	1,558,693	1,565,572	8,693,706	1,961,260
Total hospital	39	29	40	162	36
Private	1099	803	1026	7488	689
Public	6769	4995	5488	22,719	5107
Total	7868	5798	6544	30,207	5796

Africa has got disparities in terms of the distribution of health facilities. They are usually caused by geographic inequalities and financial instabilities. In Africa, provision of health facilities distribution state that distribution of the services be it planning or other activities should ensure that the actual services are accessible to all the population and not even a single individual is marginalised from these basic services (English *et al*., 2006). World Health Constitution (WHO) (1946) provides that the distribution of health facilities should make sure that the facility is accessible to every human being. The constitution states that the human rights in Africa creates a legal obligation in ensuring timely access, affordable health care that is of better quality and can withstand the pressures during emergency. Equality and non-discrimination principle provide that no human rights are exercised without segregation based on race, language, socio-economic status and religion. In terms of health facility distribution, it states that all the discrimination should be rectified. The availability of a strong health system all the time is noted in (Article 12) was defined in General Comment 14 of the Committee

on Economic, Social and Cultural Rights – a committee of Independent Experts, responsible for overseeing adherence to the Covenant (Maina 2019).

In Zimbabwe 14% of the health facilities in cities and the rest are in rural areas. In 1980, the country targeted to distribute the health facilities usually within 8 kilometres (Chimhou, 2012). By 1990s, it becomes difficult for the country to provide these kind of health facilities. This witnessed the people paying of their pockets to access health facilities. In times of emergency, the situation becomes calamitous especially in areas where most poor people are concentrated. The government owns around 70% of the country's healthcare facilities, while the private sector owns the remaining 30% (Chimhou 2012). The private healthcare sector in Zimbabwe, that initially caters to the upmarket clients, is now open to low-income urban populace. With the number of trained medical personnel on the rise, even 'high-density' suburbs can seek treatment privately.

The provided information consists of missing links. This is so as the population increases at a doubling rate as compared to the actions of distribution of health facilities in the areas. A sustainable aid to the distribution of health facilities does not consider the accessibility only but also the location and threshold as well.

The health facilities in cities despite being unequally distributed, it faces difficulties with transport system both externally and internally. The transport system affects the response of the health team during the times of crisis. Traffic causes significant challenge on the travel time (Fraser *et al*., 2020). This result in life-threatening delays for injuries or sickness that require medical emergencies. The time taken transporting a patient in areas where the roads are less congested is less than what is being taken in congested part of the city. Usually in low-income areas are characterized by few wide tarred roads and bigger population. This defines how congested the roads were, hence affect the time taken for the health vehicles to travel to and from the hospitals. The transportation barriers result in deferred care of patients, medication use and missed appointments. People who live in the part of the city where the are many transportation barriers carry a burden in their lives. The relationship between poverty and transportation availability

is reflected (Wallace *et al*., 2005). Using the case of Atlanta, the patient who do not have private cars suffers from the delays in receiving medical care due to long distance and congestion.

In many low and middle-income countries (LMICs), timely access to emergency healthcare services is limited. At regional context, Nairobi and Kenya are counted among the most congested cities in Africa (Fraser 2020). Despite the fact that the Low Economically Developed Countries (LEDCs) have poor vehicles to assist during the times of emergencies, congestion within the cities triple the travelling time. This causes the health system to fail during the dire times where urgent response is needed. In Kenya, insufficient resources have affected the response of medical system. The country lacks ambulance services and some hospitals have contracted the private companies (Khan 2017). People who live in the peripherals of the city are in most cases transported by taxes and trucks to the hospitals. Considering that the ambulance faces challenges in manoeuvring out of the congestion, in the event of using a taxi or a truck the situation becomes dire.

Beginning with vehicles that are used to transport patient between hospital. The country is facing shortages in functioning ambulance. Out of 200 fleet that is needed in the country, only 134 are functioning to ferry patients to the hospitals during life threatening situations (Xinhua 2020). The ambulances are not equipped with devices that can track the location of the patient in of the help. In low-income neighbourhoods like Mbare, the ambulances use the nearby police station to track the patient. This takes much time to attend the patient. In addition, the road infrastructure in Zimbabwe is in a dilapidated state as they are potholed. Comparing the speed of the ambulance and the state of these roads, the travelling time becomes long that the patient might even pass away on their way to the clinics (Peipins 2011). The potholed roads are concentrated in low-income neighbourhood areas. these areas consist of people who are very poor and cannot manage to construct roads themselves, hence resources are channelled unequally within the city. The state in which the ambulance is deplorable in the sense that, the equipment for pre-hospital care are not enough to the patient hence they fail to respond during the times of emergency.

The key ingredient to realising the efficient health service provision to the city inhabitants is neither provision of more finances, nor legislation although they are of great importance but god transport services. The transport system that does not promote delays during the transportation of patient to the hospitals. Even if the government try to provide the required fleet of vehicles for transportation of patient to and from hospital. There is need for technological advancement in the provided vehicles because even the few that is in use now have delays on its own. The vehicles need to be equipped with radios to communicate with the hospital staff to get them prepared in case of an emergency. Another missing link is that the there is need for well-trained hospital people to operate the vehicles, these people have skills to attend in a first aid situation.

The study adopted desktop research. It basically involves the process of collecting data from existing sources (Permentier *et al*., 2013). Desktop research can also be called secondary data collection, and the data is collected without any field work involved. The researcher reviewed the existing literature considering the spatial segregation and healthy system within different countries to get more understanding of the topics. The sources were published reports and statistics, research papers, online newspapers and documents. This method of data collection was adopted in the chapter because it is a low-cost technique since it does not involve going to the field. Desktop research do not consume time, it is quick and cheap. The information is easily fetched on the internet.

The distribution of population is not even in any location. There are some areas that are densely populated than others. This has caused differences in pressure on the health facilities. The separation of groups in the city have influenced the accessibility of health services. Using a case of Nairobi, where the densely populated areas are characterized by low-income earners who struggle to access medical facilities from their pockets and vice versa (Maya 2020). The distribution of the population does not tally with the distribution of health services that are able to respond during the critical times. In low-income neighbourhoods, the health facilities are fewer as compared to the high-income earning neighbourhoods. Providing the services that tally with the population distribution within the specific area will give the health

system the ability to respond during the times of emergencies. The distribution of population should be determined by the facilities in which the area is able to provide to the residents.

Separation of groups within the city affects the distribution of health facilities. The distribution of these facilities is based on economic status and locational in the area. It has been noted that the equal distribution of healthcare systems in locations has reduced the morbidity and mortality rate in cities. Unlike in the era where divided cities are been created through inequalities in the distribution of infrastructure and services. The equal access to health facilities have caused eradication of disparities in cities

It has been noted that segregation caused inequalities within the city in terms of health infrastructure distribution. The low-income earners are excluded from accessing quality medical facilities. This has resulted in the high morbidity and mortality rate in the affected areas. Equal distribution of health facilities lessens the burden to the people that live in low-income neighbourhoods. The existing health infrastructure is also relieved from the excessive pressures exerted by the high demand of services from the city inhabitants, hence are enabled to respond during times of emergency. Beside that the system itself is able to provide efficient services for all services.

Transport system also determines the response of the health system. The provision of adequate transport system in the city also improves the health system. Decongesting roads in the city allows the vehicles carrying patients to the hospital to move faster. Timely access to health facility is improved by the provision of better transport system in the city. Low death rates are achieved through provision of the required number of ambulance fleets. This means health systems are responding very quick during the time of emergencies.

The inequalities within the urban areas in continuously causing much problems day by day, hence need to take necessary actions that can deal with the situation. Many causes of the segregation have been identified and how it affects the living standards and social life of the people. Understanding that spatial segregation within the city affects the distribution of health facilities is very crucial. The areas within the cities have been suffering from the

disparities in economic and social sector. Many countries have struggled to provide ways that can address the socio-economic problems, in a way that the health system provided in any given area is stronger enough to respond during the critical times. Shortage of health care facilities in other areas has caused problems in the cities. The theory of segregation highlighted that due to this separation, poverty concentrate within the low-income neighbourhoods while the people who earn high income are shielded from poverty contact. This shows that health facilities being accessed by the two groups are different. The transport system affects the response of health system. People who are poor have barriers to transport that can ferry them to and from the hospital. Understanding that the spatial segregation affects the distribution of health services can help in addressing the situations.

In light of the knowledge that spatial segregation within the city affects the distribution of health systems and its performance during times of emergency. The separation of people into groups like poor and the rich causes the inequalities in terms of the services being received. This will cause the local government and the private sector to develop cities and spread the healthcare centres as observed by the number of people located in that area. The theory of segregation links with the existing literature as it indicates some sense of inequalities in the distribution of services. The government as well is enlightened on the issue of separating the groups of people. Since it has been outlined that in low-income neighbourhoods, there are people who are poverty tormented and cannot afford private health services. In the case of population count, these areas contain large number of people, hence should be provided with services that tally with their demands and can be able to sustain it during the critical situations.

The government of the countries should also take note of the transport system and infrastructure within the cities. In light of the points highlighted in the concept, that the transport system and infrastructure affect the response of the of the provided health system. This reflects that the government should pay more attention to traffic congestion within the country and make arrangements that can address the problem accordingly. Traffic congestion has causes delays and death in transit of many patients.

Also not side-lining the state of the vehicles used to transport the patient to and from the hospital. The government should provide the required number of ambulance and all the fixtures like GPS system to track the patient's location.

In all the efforts of creating liveable places in urban areas. There is need to understand that spatial segregation affects the distribution of health system and its response during times of emergency. The chapter was about the spatial segregation that happens within the city and mapping the distribution between population and health facilities and time when emergency happens. It provided the existing literature, theory, and concepts of the context. By having this information, government and the health sector will know the way in which the health service centres are supposed to be distributed against the population on ground. They were able to evenly distribute the services and resourcing depending to the population in a certain area. Considering the knowledge that even if the health system is distributed in a certain area but without considering the total population within that space, it will weaken the system from responding to critical situations. The local government should consider this in the process of building new cities and regularization of others. The transport sector should be alarmed that the congested cites with dilapidated road infrastructure also affect timely response of the health system when emergency happens. Health service providers are recommended to adopt some new technology in use of the ambulance.

The present chapter has explored the distribution of population in relation to the health services provided within cities. It has also explained how these health services have responded to people's needs during emergencies. The main argument presented has been that spatial segregation has caused disparities in health service provision across different urban areas. Some regions have been well-developed with urban infrastructure, while others have remained deprived due to differences in economic status, literacy rates, race, and age. Urban areas have remained heterogeneous in terms of the allocation and location of health facilities. A desktop study has been deployed to collect data, and the analysis has shown that disparities in social group distribution, infrastructure, and health services have persisted. Many

segregated areas have experienced economic decline, which has contributed to the deterioration of health systems. It has been recommended that, in the planning of new settlements, responsible authorities should ensure equal provision of health services that are capable of responding effectively during emergencies.

Chapter 7: Occurrences of Communicable Diseases in Harare Metropolitan Region, Zimbabwe

The present chapter critically examines the occurrence and drivers of communicable diseases in Harare the capital city of Zimbabwe that is facing rapid population growth due to increasing urbanisation rate and natural population growth. The main argument articulated in the present chapter is that Harare has been identified as an epicentre of communicable diseases in the country hence the chapter seeks to discuss why there is high incidence of communicable diseases in this city. The study deploys a desktop study that engaged literature. Several data sources were reviewed. Among them are journals, articles and books among other important data sources. Both qualitative and qualitative techniques were made use of in the collection and analysis of data. Cross checking of different data sources was done to validate the information obtained for the presentation of reliable information. Results indicates that, the occurrence of communicable diseases in Harare Metropolitan Region is increasing as the population continues to increase. This is being caused by the change in land uses, social inequities, lack of public health services and sanitation issues together with the poor service delivery in the city. Conclusively, Harare is at high risk of communicable diseases as the frequency of the outbreak of diseases, such as cholera, continuously hit the city. It is recommended that measures should be implemented to curb the drivers of communicable diseases in the urban environment of Harare. There is need for sustainability in the development process and amendments are required to deal with the major problems surrounding the city leading to the outbreaks of communicable diseases.

The chapter aims to discuss the drivers and occurrence of communicable diseases in the capital city of Zimbabwe that is the Harare Metropolitan Region. Harare is one of the cities in the country with the highest population and high rates of urbanisation. The growing population has led to the creation of informal settlements due to the shortage of housing infrastructure. As the capital city, Harare is the main player in the economy of the country hence people claim it as the most functional city. Due to the increasing population growth, Harare has become more prone to communicable diseases due to several diseases derivers. Diseases, such as cholera, typhoid, COVID-19,

influenza, among others, have been identified in Harare. Several drivers are related to the occurrence of these diseases and among them is climate change, increased population growth, change in land use, and service delivery among others. The chapter explains and discuss how these drivers result in the outbreak of diseases in the city and how this can be dealt with to maintain a healthy people within the urban environment.

The present chapter notes that though the drivers and the occurrence of communicable diseases in Harare has been looked at in the past little effort has been done to improve and eradicate the problems that are leading to the outbreak of diseases. The outbreak of diseases remains a concern in the health sector especially among the urban poor living in the ghetto. The chapter seeks to present how change can be brought about and how best improvements can be reached in mitigating the causes and outbreaks of communicable diseases in the Harare Metropolitan Region. A desktop study was undertaken in compelling the information presented in the chapter. The use of secondary data from the previous studies was done and both qualitative and quantitative data collection techniques were used for the aim of the chapter. Validation for reliability of data was done through triangulation of the different sources of information and data sources.

The results indicate that the occurrence of communicable diseases in Harare is frequently increasing especially among the highly congested areas. The deteriorating standards of living in the city is raising much capability of diseases outbreaks. Urbanisation has been found to be the major cause of diseases outbreak around the city and poor health facilities together with poor sanitation are the push factors of the occurrence of diseases in the urban environment of Harare. Disease outbreaks is one of the challenges the city is facing. It is argued that with the present situation of the city a lot needs to be done to mitigate the occurrence of the diseases and to maintain the health of the dwellers of the great Harare. In conclusion, Harare is vulnerable to the drivers and occurrence of diseases due to the proximity of the people that is because of the increasing population. Population growth can be attributed to be the major cause of the drivers of communicable diseases in the urban environment of the Harare Metropolitan Region. It is recommended that, ways to curb or lower the occurrence of diseases in Harare be found to create

a healthy living space and enhance the health of the people. It is recommended that the drivers of diseases outbreak be dealt with in a well thought way to avoid the worsening of the situation.

Maintaining the health of the people is one of the main goals of the development of different countries as the health status of the people is threatened. The study is been pushed by the appeal by the Millennium Development Goals that seeks the improvement of the health of the people throughout the whole world. Mukherjee (2017) argues that the goals highlighted the need for the health systems to strengthen to achieve the health improvements promised to be reached by the year 2030.

Africa is one of the continents among other developing continents is in hard moments due to the occurrence of communicable diseases in both its rural areas and urban setups. Mason (2009) notes that, cholera is endemic in several countries in southern Africa, and minor outbreaks have been recorded in Zimbabwe many times in the past. This indicates that the outbreak of communicable diseases is not just a problem that is being faced by Harare along but the southern region of the continent is also struggling to curb these diseases with Zimbabwe.

In Zimbabwe, the occurrence of communicable diseases has been driven by a few factors. Malaria, cholera, typhoid, influenza ad recently COVID-19 virus has been part of the health issues the government through the Ministry of Health had to deal with. In areas, such as Kariba and the Lowveld, the occurrence of malaria has been high due to the prevalence of mosquitoes. Due to poor sanitation and other hygienic issues the prevalence and occurrence of waterborne diseases.

At a local scale, Harare is one of the cities that has been repeatedly hit by communicable diseases especially water-borne diseases, such as cholera and typhoid. In 2008, there was a cholera outbreak that struck the city and resulted in the death of many people around the city. In the past ears, another outbreak was recorded by the Ministry of health. This indicates that cholera has become part and parcel of the city and a biggest threat to the lives of the people especially the population residing in the high-density suburbs. Several

drivers have been picked to be the main sources of the continuous outbreak of waterborne diseases in the urban environment.

The key issue of the chapter is to expose the causes of communicable diseases occurrence in the City of Harare. Communicable diseases are understood to be diseases that occur due to the existence of pathogens. Olson (2015) notes that there should be conditions that leads to the emergence of pathogens that ae understood in the chapter as the drivers leading to the existence of diseases in the urban environment of the Harare Metropolitan Region. The occurrence of communicable diseases can be attributed to several factors that are locally recognised. The deteriorating health facilities of the urban residents in Harare has raised eyebrows of many as they seek to understand why the occurrence of diseases in the urban areas in gradually increasing from time to time. The city has been affected by several communicable diseases with cholera being on the top, claiming lives of many urban citizens. The aim of the chapter is to look on the drivers of these communicable diseases and draw ways in which they can be mitigated. The study is very important as the occurrence of diseases is interrelated to the drivers of their existence hence the need to study the underlining key factors of the causes of the diseases in the urban setup. From the prevailing literature infectious diseases that is one example of communicable diseases occur when underlying mix of antecedent epidemiologic drivers provide the necessary conditions for a pathogen to emerge in susceptible population (Olson 2015). This clearly shows that diseases occurrence is driven by certain conditions that the chapter tries to convey.

Communicable diseases tend to vary with places and Harare is mainly affected with waterborne diseases as there is more conditions that leads to the outbreak of such diseases. The continued impacts of communicable diseases in Zimbabwe have led to the main objectives of the chapter as it seeks to dig through to find out the root cause of the continued diseases outbreak in the Harare Metropolitan Region and how best they can be controlled as the health of the people constitute to the development of the country's economy. Though there is effectiveness in the diagnosis and treatment of diseases during outbreak times, little efforts have been made to eradicate the drivers of communicable diseases in the urban area of Harare.

However, from that in the chapter that previous researches and studies' main focus was on the outbreaks of waterborne diseases with little focus centred on the other types of communicable diseases that includes vector borne and respiratory diseases among others. Therefore, the study seeks to unveil the occurrence of such diseases in Harare and the key drivers to their occurrence and how best they can be eradicated. The chapter tries to identify what efforts are being done to eradicate respiratory diseases and other communicable diseases in Harare.

At a global scale, communicable diseases are seen to vary with space and time. Different types of communicable diseases have been listed by The World Health Organisation (2001). These were grouped into four groups that include waterborne, respiratory born, vector borne and .... . Communicable diseases are defined as illnesses caused by virus or bacteria that people spread to one another through contact with contaminated surfaces, bodily fluids, blood products, insect bites and through the air (Edemekong and Huang 2021). Globally respiratory diseases have been seen to affect all countries as there are different outbreaks of flues in every region each year due to coldness and other effects. The occurrence of respiratory diseases is believed to prevail in many nations as these viruses float through the air and can be easily passed from one person to the other through the air. This can be seconded by the global pandemic recently faced by all nations that is the COVID-19 outbreak in China that has managed to spread throughout the whole world and claiming lives of many people around the world.

Some communicable diseases become a universal problem due to their nature of spreading hence affect everyone with no consideration of what is their social group or level of development. In most developed countries the prevalence of communicable diseases, such as waterborne and vector borne diseases is very limited due to the level of service delivery and their standards of living that are high. Besides that, the developed countries have enough technology and facilities that can help eradicate these diseases without causing much harm to their health services and the people. United Nations (2018) asserts that, Cholera that is one of the water-borne diseases is transmitted mainly through contaminated water and food, and the

breakdown in water supply and sewerage disposal in urban areas is believed to be the underlying cause for the rapid emergence of cholera in the cities.

At a global perspective, communicable diseases have been noted to be the major cause of deaths for ages. These are driven by various factors and affect different age groups with some having high prevalence in children as compared to the adults while some tend to affect women more than men. Most of the waterborne communicable diseases are mostly associated with the less developed countries and the poor citizens of different countries especially the urban poor people. This clearly shows that communicable diseases, such as cholera and typhoid, mostly affect the poverty-stricken groups more than the other social groups. Due to the level of development, most communicable diseases are known to affect the developing countries, such as the Asian continent, Africa and South America. Edemekong and Huang (2021), observed that there is high prevalence of communicable diseases in endemic areas that includes parts of Africa, Asia and Latin America with most infections occurring in the early childhood as compared to areas, such as North America and Western Europe that record few infections during childhood.

At a global level, the occurrence of respiratory diseases has been noticed through ages with all the continents and countries being affected. It is discovered in the previous studies that there have been different types of respiratory diseases that emerged in different countries throughout the ages up to the present moment where COVID-19 has threatened the health systems of the people and resulted in the most deaths that has occurred between 2019 and 2021. History states the occurrence of respiratory diseases that are global is not just a recent problem but has prevailed for decades with the records dating the most severe pandemics and epidemics such as the Spanish flu of 1918, the Asian flu of 1957and Hong Kong flu of 1968 (Madhav, Oppeneim, Galivan, Mulembakani, Rubin and Wolfe 2018).

At regional levels, most countries get affected with certain diseases in which countries adjacent to each other suffer common pandemics. One of the pandemics that occurred in the Asian continent is the Severe Acute Respiratory Syndrome (SARS) that affected 37 countries among them is

Taiwan, Singapore, Canada and China. Besides this, the occurrence of respiratory diseases has been recorded in Latin America, Brazil, the Caribbean together with other 76 countries in South America (Madhav *et al*., 2018) have been noted through the outbreak of Zika virus in 2015. In Africa, the occurrence of respiratory diseases cannot be denied as witnessed by the outbreak of Ebola virus diseases epidemic that affected the western part of the continent, including 22 countries among them being Guinea, Liberia and Sierra Leone (Marsh 2020). This has also been noted in the Middle East in countries, such as Saudi Arabia, Korea, United Arab Emirates and other 22 countries within the region through the occurrence of the Middle East Respiratory Syndrome pandemic in 2012 (Marsh 2020). Therefore, it is sad that the occurrence of communicable diseases especially respiratory diseases is universal and have different impacts in different regions. On local basis, communicable diseases occur among people of different social groups and age gapes though in some cases they affect the whole population. Swine flu of 2009 that affected in South Korea is an example of the occurrence of respiratory diseases on a local sphere of influence.

Communicable diseases are because of different factors that might be locational meaning that they are driven by the location in which the diseases it is occurring. In a study in Europe, seventeen drivers of infectious diseases were identified (Semenza *et al*., 2016). It is argued that there are three main categories of infectious diseases drivers in Europe that are the public health systems, globalization and environment and lastly sociodemographic issues (Suk and Semenza 2011). The drivers of communicable diseases can be argued to be either economic, social, environmental or political depending on the area in which they occur. This means that the drivers of communicable diseases vary from place to place and with time. Some of the key drivers noted by Olson (2015) includes, climate change, industrial development, and social inequality, lack of proper sanitation, poor health facilities, poverty and change in land use among others.

Climate change has become one of the greatest fears of the whole world and has begun to shake the health of the people with many people suffering from communicable diseases that are because of it. Suk and Semenza (2011) in a study carried out in Europe, argues that change in temperature, wind, rainfall

or humidity influence the health of the people as this can expose them to vector borne diseases and water borne diseases. At a global scale urbanisation has always found to influence the health of the urban people. It is argued that propagation and dissemination of pathogens are attributed to urbanisation, change in land use and the built environment and the industries. Giving reference to the outbreak of cholera in Manchester City during the industrialization revolution period the expansion of the population is a threat to the occurrence of communicable diseases in the urban environments. Therefore, it is argued that communicable diseases are a universal problem that affects very country though their impacts vary with the level of development and availability of resources among other factors.

In Europe, the occurrence of diseases is also attributed to travel and tourism. In other words, the migration of people is a threat to the occurrence of diseases in different areas around the world as noted travellers contributed to the spread of the COVID-19 virus around the universe. Emigrant, asylum seekers and immigrant settlers are seen to be contributing to the spread of infectious diseases in their origin country, transit and the countries of their destination as the importation of infected people trigger the occurrence of airborne diseases. The movement of people is related to the importation of vectors, pathogens and infected persons into Europe. It has also been noted that the use of public transport, such as automobile, train, ship and airline is associated with the spread of communicable diseases in the European continent (Semenza *et al*., 2016).

Drivers of communicable diseases have been identified in different countries around the African continent. In Afghanistan, several drivers causing the outbreak of communicable diseases were identified in a study done by (Word Health Organisation [WHO], 2001) that includes migration of people from one place to the other thus carrying the infection with them to the other community, overcrowding, cold weather, lack of safe water and poor sanitation, contamination of water and food and poor health services. This have led to the occurrence of diseases, such as tuberculosis, typhoid, cholera, diarrheal diseases, among other communicable diseases that have affected the area.

At a national level, several communicable diseases have been identified and these have different drivers with regards to the location of the areas. It is argued that one of the key drivers of the occurrence of diseases in the rural areas of Zimbabwe is mainly due to migration of people to and from the reported areas of outbreaks. It has also been noted that areas that are close to the boarders are at high risk of communicable diseases in Zimbabwe. Among the identified is Chipinge, Chiredzi, Beit-bridge, Kariba, Binga and Manicaland province. It is discovered the pattern of occurrence of diseases in Zimbabwe is changing with time as urban areas are becoming more prone to waterborne diseases and this is attributed to the local drivers within these urban areas. Mason (2009) commented that Zimbabwe is becoming an epicentre of cholera for the countries bordering it. This can be seconded by the occurrence of cholera in the urban areas of Zimbabwe due to poor sanitation and service provision.

At a local scale, it is understood that there are a few drivers that has been identified to be the cause of communicable diseases in the urban environment especially in Harare. The rapid increase in population can be the key driver of communicable diseases in Harare. In Harare, several key drivers were found among them is the dilapidation of water and sanitation infrastructure in which both sewer and water pipes bursts resulting in the contamination if clean water. The supply of clean water remains a major problem in Harare and continues to be the cause of disease outbreak as the local authorities fail to meet the demand due to shortages of water supply sources and the finances to invest in the recycling of water. United Nations (2018), notes that, experiences in erratic municipal water supplies were implicated in unprecedented cholera outbreak of 2008/9. The degradation of health and sanitary infrastructure that occurred over time is another driver of the occurrence of diseases in Harare as argued by United Nations (2018).

The challenges of lacking chronic piped water and dilapidation of sewage system forced the people to rely on water from boreholes and shallow wells that are contaminated as was revealed from the water quality assessments during the 2018 cholera outbreak investigation (USAID Global Health 2020). The other driver is the transfer of responsibility for water supply and sewerage disposal from City Councils to the Zimbabwe National Water

Authority (ZINWA) that is incapacitated and lack the required resources to provide clean water that is a necessity for the urban dwellers. Although ZINWA has promised on many occasions to correct the supply problems, lack of finance from central government has limited their ability to do this. The transfer of responsibility has resulted in some parts of Harare and Chitungwiza to go for more than 2years without running water. This has contributed to more reliance on shallow wells that were readily contaminated because of the lack of sewage disposal.

Missing in the literature is how best these drivers of communicable diseases can be eradicated. the identification of the drivers of these diseases is not a new dichotomy but this was done at all levels from the global scale to the local levels, but the main objective of the chapter is to come out with the ways in which they can be dealt with to limit or to erase the prevailing diseases outbreaks

The chapter used desktop research whereby several case studies were reviewed. Secondary data sources were used to collect information that was used to justify different concepts raised in this research. A desktop study was undertaken in compelling the information presented in the chapter. Data from the previous studies was done and both qualitative and quantitative data collection techniques were used for the aim of the chapter. Validation for reliability of data was done through triangulation of the different sources of information and data sources.

The occurrence of communicable diseases in Harare is frequently increasing especially among the highly congested areas. Some areas identified to be more prone to the occurrence of these diseases are the poorly serviced residential areas together with the informal settlements around the city. The deteriorating standards of living in the city is raising much capability of diseases outbreaks. Urbanisation has been found to be the major cause of diseases outbreak around the city and poor health facilities together with poor sanitation are the push factors of the occurrence of diseases in the urban environment of Harare. Disease outbreaks is one of the challenges the city is facing.

The occurrence of communicable diseases in Harare Metropolitan Region is increasing as the population continues to increase. Rapid urbanisation as people move from the rural areas and other small cities to seek employment in the capital city that is believed to be the centre of economic growth and better living standards are assumed to prevail there. Natural population growth has also led to the overcrowding in the City of Harare thus making more susceptible to the occurrence of diseases. The proximity of residents is becoming too high resulting in quick transmission of diseases. Overpopulation gas been noticed to be one key driver of the occurrence of disease in the urban area of Harare. This been the reason that too much pressure is put on the available resources such that the sewer and water systems that were planned for a certain number of people is forced to service more than 70% of the expected figures thus leading to water shortages and bursting of sewer systems. This can be argued to be a driver to the occurrence of communicable diseases in Harare as it has effects on the standards of living of the people.

Without putting much blame on the growing urban population, the service provision in Harare has been discovered to be bad as residents go for weeks without garbage collection on that leads to dumping of litter on the available open spaces within the residential areas that can be regarded as breeding spaces for pathogens. Most of the open spaces have been turned into dumping sites, producing odour smells in other words air pollution and breeding areas for mosquitoes, flies and other insert that carry viruses to the people hence the occurrence of infectious diseases. Limited public transport has contributed to high occurrence of respiratory diseases in Harare.

Social inequities are another driver of diseases occurrence in Harare, this can be noticed through the database of the affected people as more numbers are recorded among the poor urban dwellers who fail to afford the private health services and purchase clean water and equipping themselves to other private service providers such as Clean City that is responsible for garbage collection and delivery of safe water to the residents. Lack of public health services can be driving the occurrence of communicable diseases in Harare. The occurrence of communicable diseases in Harare has been noted to be frequently increasing in these results. This is attributed to poor health

delivery around the city. Health systems have been compromised by the critical shortage of financial capabilities as the sector is under-funded by the government and declining health infrastructure due to lack of resources to renovate these infrastructures.

Harare is more prone to the occurrence of communicable diseases. Several drivers to the occurrence of communicable diseases have been identified in the city. With the present situation of the City of Harare service provision, there is high risk that the occurrence of infectious diseases might struck the people at any moment. The results stipulate that the occurrence of cholera in hare is because of lack of effective services provision. Most of the residential areas struggle to get clean water supply leading to the sinking of deep wells that becomes a danger to the health of the people as they get contaminated. The collection of solid waste has been noted to be absent in most of the residential areas leading to the creation of dumping sites within the residential areas' open spaces. Results demonstrate that the occurrence of diseases is still a risk factor for the City of Harare as the key drivers of their occurrence still prevail and the situation continues to worsen as the economy devastate.

It is concluded in the present chapter that the occurrence of communicable diseases in Harare especially waterborne diseases still needs a long way to go as there need for dealing with the key drivers of their occurrence is still low. To reduce the occurrence of these diseases, there is need to work on the root causes that is the different drivers of communicable diseases in Harare in particular. Several recommendations have been gathered that will improve the situation in Harare if they are followed well. It is recommended that for a complete eradication of communicable diseases in Harare, there is need for the proper ad skilful approach to dealing with the drivers of the diseases. The identified drivers of communicable diseases need to be addressed for instance the shortage of housing that have led to the creation of slums that are the super spreaders and epicentres of diseases. The government needs to develop housing projects that will help increase shelter for the growing population. Affordable housing infrastructure should be allocated for the urban poor people.

Investment in public health is one of the best approaches that needs to be taken in dealing with the increasing risk of diseases in the City of Harare. The health facilities need to be subsidised by the local government through the provision of medications at a lower price and investing in new technologies that can be used for the benefits of the residents in the eradication of communicable diseases in the city. To meet the growing population of Harare there is need to construct more hospitals and clinics as this will reduce pressure on the available infrastructures. With the growth of the population, there is need to increase the infectious diseases hospital and the health facilities in the city.

Service provision should be an essential element of the city. Proper disposition of wastes is another key issue that needs to be dealt with in reducing the occurrence of diseases in the city. Recycling of solid wastes, such as plastics and other commodities, will help reduce pollution. Besides the local authorities should invest in wastewater treatment ad recycling as this will help solve the shortage of water supply systems as noted that the water supplies are becoming limited as the sources cannot deliver the demand of the whole city therefore the recycling of wastewater and its use will reduce losses incurred through the divergence of wastewater into the rivers and the expenses of piping water from faraway water sources. Proper disposition of wastes is advocated for as it is the major cause of the outbreak of diseases, such as cholera and typhoid, as food and water get contaminated.

The decongestion of the city is one of the ideas that will reduce the occurrence of diseases in the City of Harare. This can be done through creation of small towns and the development of rural areas that will limit the number of people migrating to the city as the services and jobs they were seeking were readily available in their local areas.

The present chapter has critically examined the occurrence and drivers of communicable diseases in Harare, the capital city of Zimbabwe, which has faced rapid population growth due to increasing urbanisation and natural population growth. The main argument has been that Harare has been identified as an epicentre of communicable diseases in the country, and the chapter has sought to discuss the reasons behind the high incidence of such

diseases in the city. A desktop study has been deployed, engaging various literature sources, including journals, articles, and books. Both qualitative and quantitative techniques have been used in the collection and analysis of data, and cross-checking of different data sources has been conducted to validate the reliability of the information. The occurrence of communicable diseases in Harare Metropolitan Region has increased as the population has continued to grow. This trend has been driven by changes in land use, social inequities, lack of public health services, sanitation issues, and poor service delivery. Harare has remained at high risk of communicable diseases, as outbreaks such as cholera have continued to affect the city. Measures should be implemented to curb the drivers of communicable diseases, ensuring sustainability in urban development and necessary amendments to address the root causes of disease outbreaks.

Chapter 8: Legislative Alignment for Sustainable Urban Health Towards Entrenching Environmental Rights in Zimbabwe

The present chapter explores in a critical fashion, the alignment of existing laws to the provisions of the constitutional environmental rights impact on environmental outcomes using available data from published reliable data. The legislative framework in Zimbabwe aims for a sustainable economic and environmental health system among the result factors of sudden changes in the climate caused by violation of environmental rights. The main argument is that the existing laws should be reviewed and aligned with the current climatic changes and proposed sustainable urban health to preserve environmental human rights. The study deploys a desktop research methodological approach that engaged review of available literature from relevant journal articles, google scholar, review of available legislative frameworks, published human rights and environmental reports drawing cases from developed countries. Results indicate that, there is a collaboration of agencies in protecting human rights norms that apply to environmental rights thus including the right to a safe, clean, healthy and sustainable urban health environment. The study concludes that constitutions do matter for beneficial environmental outcomes, implying that government should consider the incentives and limitations faced by polluters and resource users and those faced by politicians who originate, oversee, and enforce environmental regulations to archive sustainable urban health environment.

Environmental rights refer to any declaration of a human right to a certain level of environmental quality (Economist Intelligence Unit (EIU), 2019). Human rights and environmental protection are inextricably linked; human rights cannot be realised without a safe, clean, and healthy environment. It has been pointed out by ..... () that sustainable environmental governance cannot be achieved without establishing and respecting establishing and respecting human rights. Globally, the right to a healthy environment is inscribed in over national constitutions. Therefore, this link is becoming more widely acknowledged (Chirisa & Muzenda, 2013). There are several recognised environmental human rights. Environmental rights are made up of

substantive (or basic) rights and procedural (or procedural) rights (tools used to achieve substantial rights).

On the other hand, substantive environmental rights are those where the environment has a direct impact on the right's existence or enjoyment (Jeffords and Minkler. 2016). Civil and political rights, such as the right to life, freedom of association, and freedom from discrimination; economic and social rights, such as the right to health, food, and a decent standard of living; cultural rights, such as the right to visit religious sites; and collective rights, such as indigenous peoples' rights, are all examples of substantive rights. The right to a healthy environment has been recognised and protected by the Constitution in over 100 states, making it the strongest kind of legal protection available (Boyd, 2012; *ibid.*). A healthy environment is included in almost two-thirds of the constitutional rights; alternate formulations include rights to a clean, safe, favourable, wholesome, or ecologically balanced environment.

The chapter examines Zimbabwe's laws and policies relating to the recognition of indigenous peoples' and local communities' rights, including the legal and policy measures and mechanisms that are appropriate in each situation, and the impact of these rights on natural resource exploration and extraction, large-scale agricultural land use, and infrastructure and/or development projects. Its purpose is to assist the reader in comprehending how various legal and institutional structures either support or hinder environmental rights to have sustainable urban health system (WHO, 2018). It also looks at ways to encourage community engagement in resource management and the local and national development process.

The study significantly contributes to the understanding of urban health by highlighting the critical linkages between environmental rights and the well-being of urban populations. By examining the legal and policy frameworks that protect indigenous peoples' and local communities' rights, this research underscores the importance of environmental justice in ensuring sustainable urban health systems. It demonstrates how the recognition and enforcement of environmental rights can mitigate the adverse impacts of environmental degradation on human health, particularly in urban settings where pollution,

lack of access to clean water, and inadequate sanitation are prevalent (OHCHR, 2023).

The chapter is structured as follows: Background to the Study that provides an overview of the context and significance of environmental rights in urban health; Conceptual Framework that outlines the theoretical underpinnings of the study; Literature Review that synthesises existing research on environmental rights and urban health; Research Methodology that details the methods used to collect and analyse data; Results that presents the findings of the study; Discussion that interprets the results in the context of the broader literature; and Conclusion and Recommendations that summarises the key findings and suggests policy and practical implications.

Human rights legislation or regulations encourage or restrict local communities' access to natural resources. Various laws and regulations have been enacted in post-independence Zimbabwe to promote and recognise local community rights in natural resource governance. The goal to address the needs and interests of all Zimbabweans lies at the heart of the human rights framework (Boyd, 2012). Current laws and regulations can be examined at the international, regional, and national levels. The International Covenant on Economic, Social, and Cultural Rights (ICESCR) is the main international legal foundation influencing Zimbabwe's national legal system. It is an international treaty that establishes international norms for economic, social, and cultural rights worldwide (EIU, 2019). The international covenant on civil and political rights, the convention on the elimination of all forms of discrimination against women, the convention on the elimination of all forms of racial discrimination, and the convention on the rights of the child are among the international legal instruments that Zimbabwe has ratified.

The new Zimbabwean Constitution (2013) incorporates several clauses from various foreign treaties. Zimbabwe has ratified the African Charter on Human and Peoples' Rights, enacted in 1981. The African Charter guarantees the preservation of economic, social, and cultural rights while respecting freedom and identity and ensuring equitable access to humanity's collective heritage. Boyd (2012) emphasized that all peoples should have the freedom to manage their wealth and natural resources, ensuring this right is protected through

various environmental laws and regulations. Many laws and policies exist at the national level in Zimbabwe to promote and protect environmental human rights. The country's supreme law, the Constitution, defines citizens' fundamental environmental rights, including those related to natural resources and sustainable health. The new Constitution, that was adopted on May 22, 2013, provides for environmental rights and their judicial enforcement comparable to civil and political rights, and economic, social, and cultural rights (Mudzonga, 2021). In this aspect, the new Constitution marked a welcome break from the Lancaster House Constitution of 1979, that neither guaranteed these rights nor allowed for their enforcement by the courts.[1] Section 73 of the Constitution states that everyone has the right to a healthy and safe environment, and the right to have the environment protected for the benefit of current and future generations through reasonable legislative and other measures that prevent pollution and ecological degradation and promote conservation (Section 73(1)(a) and (b)(i)(ii)). This provision, in principle, provides compensation to communities that have been harmed by pollution and environmental damage that as affected the sustainability of the health provision. While the right is framed as an individual one, it can be argued that it also applies to groups, as pollution and environmental degradation affect not just one person, but the entire group or community.

The acknowledgment of the linkages between environmental rights and sustainable urban health has risen dramatically in recent years. International and domestic legislation, judicial rulings, and academic research on the link between environmental human rights and sustainable health systems are fast increasing in number and breadth. Sustainable urban health refers to the

[1] The Lancaster House Constitution of 1979 refers to the constitutional agreement reached during the Lancaster House Conference held in London from September to December 1979. This conference, chaired by Lord Carrington, brought together representatives from the United Kingdom, the government of Zimbabwe Rhodesia, and the Patriotic Front (led by Robert Mugabe and Joshua Nkomo) to negotiate the terms of Zimbabwe's transition to independence. The agreement, signed on 21 December 1979, established a new constitution for Zimbabwe that included provisions for free elections, a ceasefire, and the temporary reversion of Zimbabwe Rhodesia to its former status as the colony of Southern Rhodesia under British authority. This constitution, often referred to as the "Lancaster Constitution," was enacted by Order in Council on 6 December 1979 and provided for a transitional period leading to Zimbabwe's independence on 18 April 1980.

integration of environmental sustainability and human health within urban settings, ensuring that cities are designed and managed to promote the well-being of their inhabitants while minimising harm to the environment (Corburn, 2009). This concept encompasses various factors, including access to clean air and water, safe transportation, nutritious food, affordable housing, and opportunities for physical activity, all of which are crucial for maintaining health and reducing health risks such as air pollution, traffic injuries, and noise stressors (Barton and Tsourou, 2000).

Compromising factors include inadequate urban planning, lack of intersectoral cooperation, and the persistence of siloed approaches to health and environmental policies that can lead to health inequities and unsustainable urban development (Northridge and Sclar, 2003). Enabling factors involve the adoption of a "Health in All Policies" (HiAP) approach that integrates health considerations into all urban policy decisions, fostering multidisciplinary collaboration across sectors and institutions to create healthier urban environments (Stahl *et al*., 2006). This includes mapping health impacts, assessing economic benefits, and engaging stakeholders to support healthier development choices.

The human rights and the environment mandate, that was established by developed nations, have expanded, investigates human rights duties concerning a safe, clean, healthy, and sustainable environment (Allan, 2017). It also encourages excellent practices in applying human rights to environmental policy. Many states' constitutions now include a right to a healthy environment. However, many concerns concerning the link between human rights and the environment remain unsolved and need to be investigated further.

Human rights and the environment are inextricably linked: a safe, clean, healthy, and sustainable environment is necessary to enjoy our human rights, whereas polluted, dangerous, or otherwise unhealthy settings may infringe on our rights (Shelton, 1991). If we are to address environmental concerns, governments must safeguard and promote environmental rights, and corporations must respect those rights. Environmental rights are quantifiable,

conspicuous, and functioning parts of society and its ecosystem, not abstract, distant, and unimportant abstractions. More than a hundred nations have included environmental rights in their constitutions. When environmental rights are infringed, people's health and well-being suffer, as does the planet's.

The Environmental Management Act (Chapter 20:27) of 2002, as amended in 2006, is Zimbabwe's overall environmental law and regulatory framework. It creates the Environmental Management Agency (EMA), that has as its goals the sustainable management of natural resources and environmental protection, the prevention of pollution and environmental degradation, and the preparation of a National Environment Plan and other plans for environmental management and protection. As observed by Section 3 of the EMA, the EMA takes precedence over other laws that are in conflict or inconsistent with it. Environmental rights and environmental management principles are protected under Section 4(1) of the EMA. These rights encompass the right to a healthy and clean environment, access to environmental information, protection of the environment for current and future generations, and participation in the implementation of legislation and policies that prevent pollution and environmental degradation. They also ensure ecologically sustainable management and use of natural resources, while promoting justifiable economic and social development (Allan, 2017). These rights support the acknowledgment of community rights and their engagement in the conservation and management of natural resources.

Unlike other Southern African countries, Zimbabwe has a comprehensive collection of environmental legislation that addresses all of the most pressing issues. Important environmental legislation dates back to the early 1940s (UNFCCC,2018). Until 2002, environmental regulation was fragmented, consisting of more than eighteen statutes overseen by eight distinct ministries. Until the Environmental Management Act was passed, this plethora of rules resulted in redundancy and overlap (Maome *et al*., 2012). The Environmental Management, Compliance, and Monitoring Act of 2002 harmonises all environmental management, compliance, and monitoring problems. It also improves environmental impact assessment rules (Chirisa and Muzenda, 2013).

In 1994, Zimbabwe was the first country to enact an environmental impact assessment policy. While reviewing the implementation of its policy for the first time in 2014, the government expressed concern about the high cost of compliance caused by excessively high consultant fees charged to private investors (Machaka, 2014). Zimbabwe places such importance on environmental conservation that the most important aspects of environmental stewardship have been included in the country's primary legal framework. The new Zimbabwean Constitution enacted in 2013 has a clause named "Environmental Rights." In the first phrase, "Every individual has the right to an environment that is safe for their health and well-being, one may argue that a human-centred approach was used. The next clauses discuss sustainable development and the need to protect the environment for future generations, stating that ecologically sustainable development and exploitation of natural resources while fostering economic and social growth" must be ensured. National lawmakers recognise the problem of striking a balance between economic and social growth on the one hand and environmental stewardship on the other. The final phrase of this section requests that the State adopt appropriate legislative and other measures to achieve the realisation of the rights set out in this section." (Section 73 of Zimbabwe's Parliamentary Act, 2013).

The environmental rights provision was originally included in the Environmental Management Act of 2002. It should be recognised that environmental rights include not just access to and control over natural resources, but also stewardship with a responsibility to maintain the environment. Sound environmental management necessitates a worldwide effort including many parties with particular priorities. As a result, environmental rights necessitate participatory initiatives including local residents, environmental stakeholders, the corporate sector, and government agencies (Chirisa and Muzenda, 2013).

The 2002 Environmental Management Act created an Environmental Management Agency to carry out the bill's requirements. Regrettably, the organisation does not obtain sufficient money. Furthermore, the 2002 Act charged the Environmental Management Agency with enforcing all existing environmental laws, despite the fact that several government ministries were

still in responsible of enforcing environmental laws. As a result, there are now overlaps in responsibilities and alternative fine structures for the same infraction (Maome *et al*., 2012).

Other factors contributing to the poor implementation of the 2002 act include a lack of definitions of roles and responsibilities among different sectoral ministries, a lack of stakeholder participation from the public, a lack of data to monitor implementation and impact, weak enforcement with some private companies polluting without being sanctioned, a lack of political will, institutional overlaps in the enforcement of environmental law, and ignorance of the law by farming, communal, and governmental entities. Another fascinating factor for the Environmental Management Act's poor implementation is the lack of dependence on traditional chiefs as stewards of environmental legislation. Traditional chiefs had complete authority over natural resources and were responsible for supervising their usage before to colonization. Environmental resources were put to good use in a long-term manner (Jeffords and Minkler, 2016). Traditional chiefs believe that, as in the past, natural resource management and monitoring should take place within their jurisdiction, with technical assistance from existing institutions. Environmental committees should instead monitor the environment for local governments in their jurisdiction, as observed by the 2002 Act.

Traditional chiefs and leaders are given environmental protection powers under the Traditional Leaders Act [Chapter 29:17], that was passed in 1998 and amended in 2001. 'that the land and its natural resources are used and exploited in accordance with the law,' a traditional chief must ensure. A traditional chief is in charge of preventing abuses such as overgrazing and over cultivation, and negative activities including the loss of flora and fauna, and any degradation, abuse, or exploitation of land and natural resources in his territory. He also assists development committees in putting local development plans into action (Parliament of Zimbabwe, 1998). Environmental protection is clearly the duty of both local governments and traditional leaders, that sometimes leads to confrontations between state institutions and traditional leaders (Chigwata, 2016).

Zimbabwe's government also uses a variety of economic incentives to encourage people to follow environmental standards. These incentives are primarily intended to help indigenous peoples who would otherwise be unable to adopt appropriate environmental policies due to a lack of resources. Most statutes also require the regulated community to report relevant information to the competent authorities. 85 Compliance with such standards, on the other hand, has been intermittent, and is typically not enforced until after an environmental problem has arisen. In Zimbabwe, the notion of environmental impact assessment has only received a semblance of acceptance. Most agencies and commissions, for example, will examine a range of environmental factors when making decisions, but there is no legislative need that a specific procedure be followed. Furthermore, citizen enforcement measures are uncommon in Zimbabwean law. Several observers have indicated that if Zimbabwe wants to address indigenous peoples' issues in national policies, citizen suit rules might help.

The goal of this desktop research is to examine the most important relevant acts or instruments that focus on structural and systemic concerns rather than specific individual/family needs. This information were used to help construct a sustainable urban environmental health polices and analysis tools. The study contains a summary of existing tools, concepts, and methods, and their strengths, flaws, and inadequacies. The desk review is not intended to be a comprehensive survey of the literature on urban environments or a context analysis. Rather, the study is intended to be a compilation of the current knowledge base on context analysis and its explanatory capacity for understanding urban forced-displacement situations and suggesting intervention entry sites. As a result, where feasible, the review focuses on synthesis reports, literature reviews, and case-study reports, and has relied on the published research works that are relevant to the study.

We focus on the recognition and growing support for environmental rights as fundamental human rights, particularly the right to a clean, healthy, and sustainable environment. It introduces key themes such as the international acknowledgment of this right, its connection to other human rights, and the role of global and local entities in advocating for its inclusion in legal

frameworks. The section also discusses the legal and societal implications of the resolution, emphasising the importance of environmental health for urban populations and the influence of global organisations and local actors in promoting these rights.

The present chapter provides evidence of the resolution acknowledges the right to a clean, healthy, and sustainable environment as a fundamental right essential to the enjoyment of human rights. This formulation incorporates the many terms used to refer to this privilege, as discussed below. It also states that it is "connected to other rights that comply with current international law," rather than being a stand-alone right. The text also invites states to take action by strengthening capacities and establishing policies that make this human right a reality. Aside from the wording of the text, the approval of this resolution demonstrates that support for environmental rights is growing the aspect or urban health is of great importance. While it does not have legal force, its symbol were enough to persuade reluctant nations to include the right to a healthy environment in domestic legislation. Furthermore, the momentum behind the right may lead to its stronger implementation in nations where it currently exists and also it has the potential to accelerate the acknowledgment of the right in an international, legally enforceable document.

Human and environmental rights have begun informal conversations about the right to a safe, clean, healthy, and sustainable environment being recognised internationally. In March 2021, 69 countries, including previously hesitant countries like Germany, unanimously adopted a declaration advocating for the acceptance of this right (Jeffords, 2016). The initiative of the Core Group received overwhelming support. More than a thousand non-governmental organisations (NGOs), including well-known groups like Birdlife International, Greenpeace, and Amnesty International, and specialised groups like the Centre for International Environmental Law and the Global Pact Coalition, rallied behind their rallying cry (Brown *et al.*, 2012). In addition, fifteen UN agencies signed a statement affirming the acknowledgment of the right. Much of the credit for this massive mobilisation

goes to UN Special Rapporteur on Human Rights and the Environment David R. Boyd and his predecessor John Knox.

The Human Rights Council adopted Resolution 48/13 on October 8, 2021, by a vote of 43 in favour, none against, and four abstentions, following a year of intensive agitation (China, India, Japan, Russia). Despite these abstentions and the absence of the United States from the Council, the passage of this resolution demonstrates near-unanimous support for the right to a healthy environment among the international community (Mudzonga, 2021). Various formulations allude to the right to a healthy environment, depending on the legal instrument. The right 'to a healthy environment' or the right 'to live' in a healthy environment is frequently mentioned in international texts. Despite this, there is rivalry over the descriptor 'healthy.' Some may advocate for the preservation of an "ecologically sound" environment a life of dignity and well-being", "sufficient to his or her health and well-being" and "respecting biodiversity" in this regard. The right to an environment capable of sustaining human society and the full enjoyment of human rights was defined by Brown *et al.* (2012) as "the right to an environment capable of supporting human society and the full enjoyment of human rights."

Similarly, a 'healthy environment' is mentioned in about two-thirds of national constitutions that recognise the right. Alternative terms, such as the rights to a clean, safe, favourable' wholesome or ecologically balanced' environment, could be used. The many designations may allude to various types of protection (Fisher *et al*., 2017). For example, the right to a "safe" environment will emphasize environmental protection as a non-harmful environment for humans. This is particularly notable because, as observed by the World Health Organisation (WHO), the environment is responsible for 24 percent of all global fatalities. On another level, the right to a "healthy" environment frequently refers to the protection of the ecosystem's health.

Regardless of denomination, the essential content of the right to a healthy environment is largely same throughout all of these national, regional, and international documents. The basic relationship between environmental conservation and successful human rights preservation lies at the heart of each of these concepts. Part of this is due to the status of the right to a healthy

environment as a claim right. Unlike liberty rights, claim rights imply a positive obligation on the part of third parties to the right-holder and several jurisdictions have lately reinforced this uniqueness. For example, both the judgments and verdicts of Courts bind individual rights to a state responsibility and the state is a frequent violator of the right to a healthy environment. Other entities, such as private corporations, can, nonetheless, carry duties under the right to a healthy environment. With the individual as the primary right-holder, the right to a healthy environment has been criticised for its anthropocentric nature (Chigwata, 2016). It is undeniable that the notion that humans have a right to a healthy environment is heavily influenced by the western conception of human rights, that places humans at the centre of the universe. This viewpoint should be matched with an eco-centric viewpoint that prioritises nature. The African Charter on Human and Peoples' Rights (1981) takes a step in this direction by recognising the right of all "peoples" to a suitable environment. Some countries have taken it a step farther by recognising natural and environmental rights.

The Environmental Management Act of 2002 simplified all environmental management, monitoring, and compliance concerns, and tightened requirements for all existing and new projects requiring Environmental Impact Assessments (EIAs) (Chigwata, 2016). Furthermore, the statute guarantees that everyone has the right to live in a clean environment. Furthermore, it ensures that individuals have access to environmental information. It further states that they have a mission and function to conserve the environment for the benefit of current and future generations, assist in the execution of pollution control legislation and policies, and fight environmental deterioration caused by deforestation and erosion. As a result, the locals are expected to utilise natural resources properly (Mudzonga, 2021). The National Environmental Policy aims primarily to control irreversible environmental damage, maintain important environmental processes, conserve a wide range of biological variety, and improve Zimbabweans' level of living (Boyle, 2007).

In connection to their environmental interests, a variety of players, including the state and civic organisations, have lobbied for environmental rights to be incorporated into the new constitution. Because environmental concerns are a

worldwide concern, various international institutions, including several United Nations environmental organisations, have been involved in the battle for environmental rights. These outside influences supported the idea of residents being empowered to regulate their local environment in a sustainable manner. The South African Constitution allows for environmental justice on a regional level. This notion has already been integrated into Zimbabwe's Environmental Management Act. This demonstrates the extent to that external factors may affect the formulation of laws, constitutions, and national policies. Outside parties have been working as watchdogs in the environmental rights advocacy platform, monitoring openness and equality of participation in contrast to worldwide norm. Local participation in debates and fora has been assisted, at least from the standpoint of modern institutions, by members of parliament, state officials, and councillors (Jeffords and Minkler. 2016). As grassroots entities, Village Development Committees and Ward Development Committees organised their communities to participate in the constitution making process, that resulted in the inclusion of environmental rights. In terms of traditional institutions, traditional leadership village heads, headmen, and chiefs have played an important role, particularly in rural regions. Ideally, chiefs control resource management at the local level.

Legally, the right to a healthy environment has both procedural and substantive consequences. Using national authorities' implementation of the right to a healthy environment as a model, a majority of States have passed laws specifying procedural and substantive aspects necessary for effective implementation of this right (Jeffords and Minkler. 2016). On the one hand, recognising a right to a healthy environment frequently means respecting procedural rights such as the right to receive information, participate in environmental decision-making, and have access to the health legal system. The Philippines, for example, has implemented particular environmental lawsuit regulations to support the preservation of the right to a healthy environment.

One of the most important techniques for regulating migration in the country, and particularly the emigration of health professionals, is an economic turnaround. The major reason for health professionals' departure is economic

hardship, that has affected individuals, institutions, sectors, and countries. Respondents cited competitive salary and non-financial advantages comparable to regional levels such as South Africa and Namibia as a retention strategy (Mudzonga, 2021). However, this can only be accomplished in a more functioning economy than Zimbabwe's. Incentives, such as automobile and home mortgages, have been shown to improve health professionals' morale. It might therefore be difficult to offer these incentives due to the government's fiscal state and economic hardships facing the country.

Furthermore, there is a scarcity and inaccessibility of fundamental requirements such as tap water, power, and even gasoline, therefore offering incentives with a scarcity of necessary services would be ineffective since professionals would seek alternate methods and ways to obtain such services. As a result, to give such incentives, the government must work on the economy and turn it around. Non-monetary incentives such as training and study leave have been suggested to incentivise health care employees to stay working in public health services (Stilwell *et al*., 2004), since one of the reasons for intention to emigrate in the study was to enhance one's education.

In addition to procedural rights, the right to a healthy environment has a substantive component. The right to a healthy environment, regardless of its specific articulation, preserves the natural environment aspects that permit a decent living. It includes the protection of fundamental human rights such as the right to life, clean water, food, and so on. The French Environmental Code, for example, protects the "right of people to breathe air that is not hazardous to their health." Similarly, the South African Constitution provides that "everyone has the right: (a) to an environment that is not damaging to their health or well-being." This substantive component has enabled national and regional courts to impose responsibilities on States to properly execute the right to a healthy environment. The Inter-American Court of Human Rights ruled in a historic judgement in 2020 that Argentina had infringed the right of the indigenous communities to a healthy environment owing to a lack of adequate measures to avoid damaging activities (Report of the Special, 2018). As a result, courts have acknowledged that states were required to prevent violations of the right to a healthy environment.

Nonetheless, due to significant hurdles, implementation of this right remains spotty. Only regional conventions and soft law instruments acknowledge it at the international level. In other words, it has yet to be acknowledged in a worldwide and legally binding convention analogous to the 1966 international covenants on human rights (Bonnet *et al*, 2019). Such a convention would face substantial challenges since major international powers, such as the United States and China, are still unwilling to accept the existence of environmental rights. Recognition of the right to a healthy environment at the national level should result in the development of "implementation legislation." However, those that acknowledge this right in their constitutions or through regional accords do not always put it into law. The right to a healthy environment cannot be realised to its full extent unless it is effectively integrated into national laws and practices (Boyd, 2012). Many states continue to fail to fulfil their commitments in a way that effectively respects, defends, and fulfils the right to a healthy environment.

Controlling the execution of this right is also a difficult task. So date, no formal international system has been established to oversee its implementation. One may argue that an international implementation control mechanism could fill this need. This mechanism might, at a minimum, take the form of a compliance committee, but its referral should be available not only to States, but also to people and non-governmental organisations (NGOs), following the model of the Aarhus Convention. Even better, an international jurisdictional entity were established with the goal of ensuring that states respect the right to a healthy environment. In the absence of such international institutions, the national judge is the first line of defence. Internal courts should be the first to ensure that the right to a healthy environment is respected, taking into consideration the extraterritorial impact of a state's activities, including those conducted outside its boundaries. In other words, the national judge must ensure that the State respects not just the right of its own people to a healthy environment, but also the right of all living things on the globe (Jefford, 2016). Regardless, the statistics from decades of application is encouraging. Recognising the right to a healthy environment often encourages governments to tighten environmental laws and regulations, and to allow for more public participation. A wide range of studies have indicated that include

constitutional environmental rights is positively associated to improved environmental performance.

In this report (WHO, 2018), it is pointed out that, the greening of well-established human rights, including the rights to life, health, food, water, housing, culture, development, property and home, and private life, has contributed to improvements in the health and well-being of people worldwide. However, more work needs to be done to further clarify and, more importantly, implement and fulfil the human rights obligations relating to a safe, clean, healthy and sustainable environment. The UN to formally recognise the human right to a healthy environment. Legal recognition of this right would acknowledge that this right must be universally protected, and would fill a glaring gap in the architecture of international human rights (Report of the Special, 2018). Further, it would be consistent with, and reinforce, the actions that many States and regions are already taking, resulting in benefits such as:

- Stronger environmental laws and policies;
- Improved implementation and enforcement;
- Greater public participation in environmental decision-making;
- Reduced environmental injustices;
- A level playing field with social and economic rights;
- And better environmental performance.

Finally, the aspects of environmental rights and sustainable urban health have a significant step on the potential to have far-reaching ramifications for human rights and the environment. The resolutions by the United Nations General Assembly, might pave the way for even more global international recognition, and possibly even an international covenant, on the right to a healthy environment. Environmental law does exist in Zimbabwe, and it is rather thorough when compared to other African countries. However, the majority believes that environmental regulation is not well implemented and enforced to ensure sustainable urban health system. In terms of impressions of the business community's attitude, attitudes are generally favourable; as the results revealed that, the environmental concerns are of concern to the business sector and are sufficiently or at least partially handled.

Environmental concerns are of importance to the society and yet they are not sufficiently handled by the corporate community.

The business sector has numerous alternatives for improving the current situation and deepening its commitment to environmental integrity. In section 6.4, eight particular metrics have been selected and described. Sustainable firms can take actions in the areas of training, institutional discussion, new technology, monitoring systems, and tools to improve their environmentally sustainable health systems. Their massive and growing presence in developing countries, particularly Zimbabwe, raises concerns about the outdated and highly polluting technology that is affecting the enforcement and monitoring hence the need to raise standards for urban health systems. There is room to investigate how to reverse this dangerous trend so that development can become more sustainable, meeting both social and environmental international standards.

In final analysis, environmental rights have been included not just to remedy colonial and historical wrongs, but also to address the present regime's lack of involvement and care of natural resources and health systems. Environmental management is crucial in ensuring that the needs of local people are prioritised. This is a part of environmental governance whose goal is democratic environmental management, in which everyone has the opportunity to obtain the information, skills, and abilities to contribute to environmental soundness while responsibly utilizing the environment's resources. This necessitates adequate environmental education and the exchange of information and expertise. While environmental rights are critical for environmental governance, the essay has underlined the need for environmental rights to be strengthened beyond constitutionalism. This entails advocating for more equity, representation, and engagement in environmental management.

Using credible available data, the present chapter has critically examined how current laws relate to the environmental rights provisions of the constitution and how they affect environmental consequences. A sustainable economic and environmental health system has been the goal of Zimbabwe's legislative framework, especially in light of climate change brought on by abuses of

environmental rights. The primary contention has been that to protect environmental human rights, current laws ought to be examined and brought into line with suggested sustainable urban health measures and current climatic changes. A desktop research methodological approach has been used, which involves reviewing pertinent literature from a variety of developed-nation sources. Findings show that authorities have worked together to defend environmental rights that are covered by human rights standards, such as the right to a clean, safe, healthy, and sustainable urban environment. To achieve positive environmental outcomes, constitutional provisions are important. To create a sustainable urban health environment, the government should take into account the incentives and constraints faced by resource users, polluters, and legislators in charge of monitoring and implementing environmental laws.

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Chapter 9: Towards Policy and Practical Models to Inform Governance of Urban Health in Zimbabwe

The study explored population distribution, health facilities and epidemiological patterns: towards policy and practical models to inform governance of urban health in Zimbabwe, with urbanisation on the rise the need to understand the population distribution in relation to the health facilities and the epidemiological patterns to inform on policy and practices of governance of urban health. The study examined the interaction of population distribution, the number of health facilities and the epidemiological patterns in the urban areas of Zimbabwe to understand the actions needed to address the health needs of urban dwellers. The study used a qualitative research approach with a case study research design to understand the population distribution in relation to health facilities and epidemiological patterns in urban Zimbabwe. The study showed that a proportion of the Zimbabwean population dwell in urban areas and service delivery in terms of health facilities is poor in some urban centres. The study showed that cholera, HIV & AIDS and mental health challenges are the main urban health challenges in Zimbabwe. The study concludes that underdevelopment in post-colonial Africa remain a scar on humanity aided by corruption. The study recommends new regional and town planning strategies.

Zimbabwe's independence in 1980 witnessed increased government responsibility in the provision of social services for the majority African population, who had been neglected under British colonial rule (Mhike and Makombe 2018). Education and health were key areas of government focus and agents for economic development in line with the new policy changes, the government expanded existing infrastructure and increased capital investment in social services (Mhike and Makombe, 2018). However, government policy realignments and financial investment in key sectors of the economy engendered an overarching narrative that overshadowed the function of non-state actors in the development agenda (Agere, 1997). The capacity and ability of the state and its institutions is key in public service delivery (Brinkerhoff 2011). The Zimbabwean state shows weak capacity, often leading to public service delivery failure (Muchadenyika, 2017). Post-

2000, Zimbabwe went at phenomenal speed from being a regional leader in Southern Africa to becoming an international pariah (Gretchen and Scott, 2011).

The country spiralled downwards heading towards a crush due to poverty with most of the vibrant sectors such as the health care system failing to keep up with the crisis. In particular, Zimbabwe recorded unprecedented regression in key human development indicators as the state failed to provide public goods and services to its citizens (Muchadenyika, 2017). At local government level, public health, local authorities address critical issues of service delivery in the daily lives of population (Kamete, 2003). However, local authorities in Zimbabwe are failing to provide water sanitation, health, education, transport and housing services to citizens (*ibid.*). The magnitude of service delivery collapse is typified by some various diseases that result in out breaks every now and then such as the cholera epidemic that claimed 4,000 lives the highest rate in Africa in over a 15-year period (ICG, 2009; Acemoglu and Robinson, 2013).

The political crises that the country has endured since the year 2000 has seen the country moving backwards in terms of development as there are no infrastructural developments in urban areas as far as health care system facilities are concerned compounded with poverty the existing facilities are failing to curtail the epidemics in urban areas. Undeniably, in urban Zimbabwe, the urban governance crisis has led to service delivery failure (Muchadenyika and Williams, 2016). Planning is at the heart of sustainable urbanisation and is the main conduit of urban governance (UNHABITAT, 2010). Urban challenges such as slums, urban sprawl, urban poverty and poor service provision are explained largely by present urban governance systems and urban planning approaches (UNHABITAT, 2009). Urban and regional planning in Zimbabwe has been poor as there are no health facilities spread across urban areas coupled with poor service delivery Zimbabwean urban areas have seen a surge in the spread of epidemic diseases. Urban service delivery relies on the functioning of urban governance systems therefore; good urban governance is a sign of urban service delivery (Muchadenyika 2014).

Poor urban delivery has seen the health sector in Zimbabwe deteriorate in delivery sound health care system leading to the rampant spread of diseases without control in the country. In an era marked by evolving global health challenges, shifting demographics and epidemiological transitions, the need for effective rehabilitation has become increasingly evident (Charumbira 2024). About one sixth person lives with some disability and 2-4% of them have a severe, permanent disability (World Health Organisation 2011). The exponential increase in chronic health conditions, aging populations, and humanitarian crises resulting from climate changes, armed conflicts and violence in addition the recent COVID-19 pandemic contributes to the growing prevalence of disability and associated functioning problems in people of all ages (Ambrosino *et al*. 2020; Groce 2018). The Global Burden of Disease consortium devised metrics, such as Years lived with disability (YLDs), to estimate and track the burden of disability in countries and globally (Jesus *et al*., 2019).

The way a health system is financed has a significant bearing on the performance of its key functions of stewardship, inputs creation, services provision and ultimately, the achievement of the health system goals (Mutopo 2017). Invariably, the goals of a functional health system include improved health service delivery and responsiveness to people's medical expectations (Kirigia *et al*., 2006). The major objectives of health financing are to make sure that funding for the health system is made available, ensure that all individuals have access to effective public health and personal health care (Fretheim *et al*., 2014). Developing economies are the major recipients of health care finance as they are more often beset with resources constraints faced with multitude of social objectives, governments in developing countries, as the custodians of funds, lack the capacity to drive health programmes (Mutopo, 2017). The World Health Report (2000) has argued that health human resources are key determinants of the success or failure of the health systems as the performance of health care systems is a function of the availability know-how, skills mix and motivation of personnel delivering services. Zimbabwe, like many other countries in the region, is badly affected by a shortage of health care facilities and health workers due to the mass exodus of the health care workers to high-income countries in search of a better living.

The growth of urbanisation in Zimbabwe compounded by poverty and poor economic performance of the country has caused a problem in the country as the number health facilities is less than the population living in the urban areas with some urban centres lacking health service delivery facilities leading to the uncontrolled spread of epidemics. The number of disease outbreaks in Zimbabwe's urban centres that the country's health system fails to contain presents a problem that signal the shortage of health facilities in urban centres of Zimbabwe. The population distribution, health facilities and epidemiological patterns in Zimbabwe presents a developmental problem as it all points towards underdevelopment in the post-colonial Zimbabwe that has a population that continues to rapidly grow outmatching the infrastructural development pace.

The study aims to understand the population distribution, health facilities and epidemiological patterns, towards policy and practical models to inform governance of urban health in Zimbabwe. The study examines the nexus between population distribution and health facilities in urban areas of Zimbabwe versus epidemiological patterns. The study adds to the existing literature pointing towards new direction on the infrastructural development or lack thereof in Zimbabwean urban areas as population growth has become a reality in the urban centres of Zimbabwe. The study is important as it can inform models of policy making in the governance of urban health in Zimbabwe. It is at the backdrop of the need for policy and practical models to inform governance of urban health in Zimbabwe.

The study concept of institutionalised social inequality as the conceptual framework that guided the study. The existence of social inequalities in health is well established with higher education status, and income have lower morbidity and mortality (Beckfield *et al*., 2015). Although social inequalities in health exist in all societies worldwide the degree of these inequalities varies spatially and notable differences exist within Africa (*ibid*.). Social institutions affect health inequalities the relationship between welfare state and the distribution of population health build on and contributes to developing of an institutional stratification (Taylor *et al*., 2004). Health services are not equally distributed in communities and there is an inequality in the responses to diseases in African institutions with less being done in

low-income areas to reduce some of the epidemiological challenges faced in these areas. The concept is relevant to the study as it points out to the formation of health inequalities and the increase in diseases burdens in the low-income urban communities leading to the mass mortality and morbidity in these areas affecting the national development agenda.

This section presents a literature review based on past studies to inform the study on the health in other countries and Zimbabwe. improved health and wellbeing are the goals of healthcare delivery system in the world (Azetsop and Ochieng, 2015). The independent Zimbabwe inherited a racially divided health sector, skewed towards urban, curative health care as such it sought to redress colonial racial inequalities and improve social services provision and infrastructural base of the economy (Mhike and Makombe, 2018). For the black majority of Africans, health and education were key areas which had suffered decades of neglect and underfunding state-funded colonial formal health care was largely a preserve for white community and marginally directed towards African health (Matikiti, 2009). Health resources distribution followed the pattern of white settlement mainly in towns and mining areas as successive colonial governments adopted a curative health policy for Africans which was cheaper to operate as compared to preventive health (Mhike, 2017). The neglect of African care needs was most glaring in infrastructural disparities between white dominated urban centres and the rural areas where most Africans lived (Shoko and Zvobgo, 2016).

The post-colonial state of Zimbabwe encountered several issues in the provision of health care. Mangundu *et al.* (2023) observe how in developing countries like Zimbabwe, access to healthcare services is often influenced by long distances and travel times to health facilities, the availability of financial resources to travel or pay for care and the availability of medical drugs and competent healthcare workers. In Zimbabwe people in rural areas often have to walk between 10 km and 50 km to access the nearest health facility (Loewenson *et al.*, 2014). Access can further be impeded by a lack of infrastructure, such as dirty roads that are not maintained, resulting in poor road conditions and potholes that create barriers to transport (Broni *et al.*, 2014). In Zimbabwe, because of economic challenges, bridges that have collapsed because of rain are not repaired, hindering traveling of patients

during critical times and negatively affecting the timely delivery of medical drugs and medical supplies to rural health centres (Manjengwa *et al*., 2022).

Zimbabwe has been affected by a political crisis that translated into the most severe economic crisis in its history from 1999 to 2008 that led to the signing of the Government of National Unity in 2008 (Mangundu *et al*., 2022). The negative effects on the health care resources in Zimbabwe were evident as the population failed to receive health care services (Mackworth *et al*., 2021). The economic crisis resulted in the deterioration of health infrastructure such as health facilities, resulting in the closing of some public health facilities, either due to lack of medical supplies and health workers or financial resources for maintenance of health facilities (Makoni 2019). Even where medical services are available and affordable, access to medical drugs is limited there is often shortage in the supply of medical drugs especially in rural Zimbabwe (Nyazema, 2010). The economic crises in Zimbabwe has caused community outreach programmes to be closed, as they were likely to place a further burden on few available human resources (Mhere, 2013). The family planning distribution programmes in the rural areas has crumbled, as family planning drugs are not available and thus the birth rate has increased (Zimstat, 2016).

There were challenges with access to antiretroviral drugs for people living with HIV in the rural areas because of shortages, transportation challenges and nurses' attitudes at designated rural health facilities (Tafuma *et al*., 2018). Health facilities that were able to function experienced shortages of medical drugs and material resources such as cotton wool bandages, sutures and medical needles that are crucial in the offering of quality healthcare (Kidia, 2018). Zimbabwe lost, during this time large numbers of healthcare workers, including professional nurses and physicians (Makoni, 2019). The nurse ratio per 1000 of the population decreased from 2.5 in 2017 to 1.95 in 2019 the numbers are expected to decline due to economic hardships, forcing nurses to look of other opportunities (Kidia, 2018). In addition, the healthcare system was overwhelmed by intermittent strikes by health workers due to low remuneration and poor working conditions including a lack of medical equipment (Mackworth-Young *et al*., 2021; Amstrong *et al*., 2020). The economic crises affected the health delivery in Zimbabwe degrading the

profession of healthcare provision leading to the mass exodus of healthcare profession.

The study used a qualitative research approach with a case study research design. Creswell (2011) observes how qualitative research approach is a methodology of exploring and understanding the meanings of social facts ascribed to social problems as avails an opportunity to understand phenomenon in the natural setting. The allure of qualitative research approach is that it is good at simplifying and managing data without destroying complexity and context (Yin, 2011). The study used secondary information on the data collection. As Yin (2016) observes the literature review-based approach of data collection can help the researcher build new insights and fill in the blank gaps in the past studies while keeping up with the current trends in the field of study. The study used thematic data analysis to analyse the data and the information that emerged from the study. Thematic data analysis is the process of identifying patterns or themes within qualitative data Braun and Clarke (2006) observes how it is the first qualitative method that should be learnt as it provides core skills that were useful for conducting any other kind of analysis. The allure of thematic data analysis was that it identifies themes that is patterns in the data that are important and use them to address the research questions.

The study aimed to population distribution, health facilities and epidemiological patterns: towards policy and practical models to inform governance of urban health in Zimbabwe. Worldometer (2024) observes how the population in Zimbabwe is 17,043,659 million people 36.7% of the population is urban (6.117,511 people). The Government of Zimbabwe (2018) observes how health care in Zimbabwe is provided by public facilities, nonprofit groups, church organisations, company-oriented clinics. Masuka *et al.* (2017) observe how the population of Zimbabwe 16 million (67% rural and 33% urban) with 6 central hospitals, 8 provincial hospitals, 15 Polyclinics, 96 City council clinics, 69 Private clinics. Mugwagwa *et al.* (2017) observes how Private Hospitals Association of Zimbabwe (PHAZ) was formed in 1996, and the founding members were The Avenues Clinic Harare, St Annes Hospital Harare, Borrowdale Hospital Marondera, Seventh Avenue Surgical Unit Mutare, Claybank Clinic Gweru and Colin Saunders Triangle. Mhandu *et al.*

(2016) observes how urban areas in Mashonaland West province have poor health services provision.

Chazireni (2018) observes how a large proportion of the administrative districts in Zimbabwe and urban Mashonaland West province have poor health conditions in both people's state of health and health service provision. Relief Web (2023) observes how in Zimbabwe most provinces have provincial hospitals except for Harare and Bulawayo that have central hospitals that work as referrals to treat people from other provinces. The Herald (9 April 2024) observes how the Government of Zimbabwe opened health centres in Stoneridge Harare and Cowdray Park in Bulawayo offering outpatient maternity, ART and inpatient facilities.

Tapfumanei *et al*. (2023) observe how in there has been epidemiology and microbiological pattern of cholera outbreak in the urban centres of Zimbabwe with Harare and Chitungwiza being the most affected areas due to poor service delivery in these urban settlements that lack water supply. Fernandez *et al*. (2012) observe how in a highly populated African urban area where clean water is a challenge like Harare with rampant sewage disposal running off the slopes cholera became the resultant disease in 2008-2009 compounded by the economic and political situation the epidemic disease claimed lives across Harare. Olatunji *et al*. (2024) observe how in Zimbabwean urban areas such as Harare and Chitungwiza due to clean water shortages cholera outbreaks have been reminders of the state of poor service delivery in the country's urban centres. Voice of America (24 January 2024) observes how in urban areas in Zimbabwe extreme climate conditions are causing cholera outbreaks.

UNAIDS (2020) observes how in major urban areas, of Harare, Bulawayo, and Chitungwiza HIV prevalence among antenatal clinic attendees tested increased Zimbabweland (27 September 2020) observes how in border towns like Chiredzi there is a mass spread of HIV and AIDS as unemployment is leading to transactional sexual relation with even the youths indulging in these risky behaviours. WHO (2017) observes how HIV prevalence in Zimbabwe has consistently been higher in urban areas as the country remains one of the 30 countries with the highest burden of TB, TB-HIV and drug-

resistant TB. Mugurungi (2007) observes how urban spaces in Zimbabwe have been affected by the HIV epidemic with impacts such as sustained crisis-level adult mortality among the economically abled age groups.

Nyabani (2021) observes how exacerbated by economic hardships Zimbabwean urban areas are leading in drug abuse strongly related mental disorders and communicable diseases resulting in the country having a double urban epidemiological burden. Marandure *et al*. (2023) observe how in the urban areas of Zimbabwe the disease burden has been increased by drug and substance abuse as it is resulting mental health challenges among the youths. Nhunzvi (2019) observes how in Zimbabwe the socio-economic hardships have pushed most youths to abuse drugs substances resulting in the epidemiological burden in the country as a result of mental health issues among the youths. Matunhu and Matunhu (2015) observe how the drug abuse problem in urban centres of Zimbabwe such as Harare has grown into a disease problem with most of the youths that use substances and drugs suffering mental health challenges.

The study aimed to population distribution, health facilities and epidemiological patterns: towards policy and practical models to inform governance of urban health in Zimbabwe. the study showed that a small proportion of the population in Zimbabwe reside in the urban areas with the greater part of the population residing in the rural areas. The study showed that only two cities in Zimbabwe have central hospitals that work as referrals for the people from provincial hospital. There is a lack of infrastructural development in the urban areas in Zimbabwe as there are Polyclinics not hospitals in these areas in Zimbabwe. The study shows that there is a lack of infrastructural development in the developing world. Concurrent with the study is Edoh (2021) that observes in low-and middle-income countries, the developing world there is poor development of health delivery services facilities with most of the urban areas lacking access to health services within an understandable distance. The lack of infrastructural development, the population growth, and the growth of urbanisation is exposing the urban dwellers to mortality as there are no health delivery services nearby. The implication of these findings on policy and practical models to inform governance of urban health in Zimbabwe is that they point towards the

decentralisation of the health sector through mass infrastructural development.

The study showed that there has been epidemiology and microbiology pattern of cholera outbreaks in the post-colonial Zimbabwe in the urban centres due to poor services delivery and underfunding of the health sector in the country. The study revealed that the urban areas in Zimbabwe have a pattern of being attacked by cholera in rain seasons as the sewage run off uncontrolled during these times causing deaths from cholera. There has been a lack of development in the sewer systems and the drainage system in the urban areas of Zimbabwe as most of the service deliveries that are in place were not prepared for the growth of urbanisation to the current state. Compounded by the poor health service delivery in Zimbabwe and the economic hardships that the country has endured the underdevelopment in the country has been exposed as cholera has seized to be a major health threat in the developed world. The study showed that inadequate access to clean water was the major cause for cholera outbreaks in Zimbabwe. in support of the study are Zerbo *et al.* (2020) that observes how cholera remain a major scourge in sub-Saharan African populatio0n as it is contracted by consumption of contaminated water and food in urban centres. The implication of these findings on urban policy and practical models of urban health governance is that of smart-water management that emphasis on the development of water re-use for non-domestic use and drilling of boreholes for safe drinking water.

The study revealed that Zimbabwe urban areas just like in any other developing countries have an epidemiological pattern of HIV prevalence. Compounded by the economic hardships transactional sexual relations in the urban centres were causing the disease burden for the underfunded urban health facilities. Concurrent with the study are Magadi *et al.* (2017) that observes how in Kenya HIV is high among urban dwellers with most of the youths in colleges being affected. The study showed that in the urban centres of Zimbabwe drug and substance abuse have presented another epidemic pattern of mental health challenges that are affecting most of the youths that are trying to escae the impacts of unemployment and other psycho-social challenges. The country has seen the development of a double burden through drug and substance abuse as it has resulted in investments in the drug abuse

eradication and mental health services. Concurrent with the study are Onaolao *et al*. (2022) that observes a a rapid increase in substance abuse causing mental health challenges that are burdening the poor health care delivery systems in developing countries. The implication of these findings on urban policy and practical models of urban health governance is that they point to the need for investments in the education of people on the health burdens that are associated with drug abuse and the provision of rehabilitation services in urban centres.

The study aimed to population distribution, health facilities and epidemiological patterns: towards policy and practical models to inform governance of urban health in Zimbabwe. The study revealed that in Zimbabwe with the growth of urbanisation a considerable proportion of people reside in the urban areas. The study showed that there are various disease patterns in the urban areas of Zimbabwe with some of them pointing towards a lack of development and poor service delivery in the country. The study concludes that the Zimbabwean health sector has been in the intensive care since the year 2000, as there has been a lack of funding and poor policy towards infrastructural development. The study concludes that the poor performance of the health sector in Zimbabwe is compounded by the poor service delivery in the urban centres that is establishing epidemiological patterns through diseases that points to lack of waste management and drainage system development. The study concludes that the epidemiological patterns established in the urban centres of Zimbabwe points to a developing problem of poor policy framework as the country continues to shine on state-controlled media whereas the reality on the ground speaks volumes of underdevelopment. The study concludes that the state of health facilities in the urban centres of Zimbabwe presents a genocide as the lack of development and improvement of service delivery betrays a sabotage of the urban poor by the state. The study recommends the crafting of smart-water management policies in the urban areas. The study recommends the greening of urban centres to reduce the impacts of climate change on urban areas and reduce the disease burden. The study recommends the implementation of policies that remodify the drainage systems in urban centres to match the population growth. The study recommends a zero tolerance to corruption policy to reduce the urban drug and substance abuse conundrum.

To provide policy and workable models for managing urban health in Zimbabwe, the present chapter has examined epidemiological trends, health facilities, and population distribution. In order to influence governance policies, the study has attempted to explore the relationship between population distribution, health facilities, and epidemiological patterns as urbanisation increases. A case study design combined with a qualitative research methodology has been used. A sizable section of Zimbabweans live in cities, but some places continue to have subpar health care delivery. According to the survey, the main urban health issues include cholera, HIV & AIDS, and mental health issues. advancement, made worse by corruption. In order to enhance urban health governance and service delivery, the report suggested implementing new regional and municipal planning techniques.

Chapter 10: Health in Harare Metropolitan Region and the Future Direction

This monograph has presented a detailed exploration of how spatial and temporal factors affect health outcomes in Harare Metropolitan Region. This conclusion chapter integrates insights from the nine preceding chapters, summarising key findings, examining their implications for urban health governance, and offering recommendations for policy and practice. The analysis highlights the interplay between urbanisation, infrastructure, governance and health, providing a holistic understanding of the challenges and opportunities in improving public health in this rapidly growing city.

The examination of population distribution in Harare Metropolitan Region reveals a complex interaction between urban growth patterns and health outcomes. Rapid urbanisation has led to increased population densities, particularly in informal settlements and high-density suburbs. This growth has put immense pressure on existing healthcare facilities and services. The study found that areas with higher population densities often experience more significant health challenges due to the strain on infrastructure and resources. For instance, informal settlements in Harare face severe overcrowding that exacerbates health issues such as the spread of infectious diseases and limited access to healthcare services. The lack of proper housing and sanitation in these areas contributes to higher incidences of diseases like cholera that are closely linked to poor environmental conditions.

The assessment of health facilities across Harare Metropolitan Region highlights a critical gap between the healthcare needs of the population and the available services. Many districts suffer from inadequate healthcare infrastructure that impedes the effective delivery of essential health services. The study identified several key issues like uneven distribution, infrastructure deficiencies and service delivery challenges. Healthcare facilities are unevenly distributed across the city, with some areas having a surplus of services while others are underserved. This uneven distribution results in significant disparities in healthcare access and quality. Many existing health facilities are outdated and lack the necessary equipment and resources to provide

comprehensive care. This is particularly problematic in high-density areas where the demand for services is highest. The efficiency of service delivery is hampered by factors such as staff shortages, inadequate training, and limited financial resources. These challenges contribute to delays in receiving care and reduced quality of health services.

The analysis of epidemiological patterns in Harare Metropolitan Region reveals a range of health issues that are influenced by both spatial and temporal factors. Key findings including Cholera Outbreaks, HIV&AIDS Prevalence and Mental Health Disorders. Cholera remains a persistent issue, particularly in areas with inadequate water and sanitation infrastructure. The study highlights how spatial factors, such as proximity to contaminated water sources, contribute to the spread of cholera. The high prevalence of HIV&AIDS in urban centres reflects on-going challenges in addressing the epidemic. Despite various intervention programmes, the disease continues to impact a significant portion of the population, exacerbated by socio-economic factors and gaps in healthcare coverage. The rising rates of mental health disorders are linked to various factors, including economic hardship and substance abuse. The lack of adequate mental health services exacerbates these issues, leaving many individuals without the support they need.

We reflected on governance and urban planning and this provided critical insights into how deficiencies in these areas contribute to health challenges. The study found that poor governance structures and inadequate policy implementation hinder effective responses to health challenges. Issues such as corruption, lack of coordination, and weak enforcement of health regulations contribute to the persistence of health problems. Moreover, inadequate urban planning exacerbates health issues by failing to address the spatial distribution of health services and infrastructure. Rapid urbanisation without corresponding planning measures results in overcrowded areas and insufficient access to healthcare facilities.

The findings from the study highlight the urgent need to invest in and strengthen health infrastructure throughout Harare Metropolitan Region. This involves expanding healthcare facilities. There is a need to increase the number of healthcare facilities, particularly in underserved areas. New

facilities should be equipped with modern equipment and staffed adequately to meet the growing demand for services. Additionally, existing healthcare facilities should be upgraded to provide better care. This includes renovating outdated buildings, acquiring new medical equipment, and ensuring that facilities are well-maintained. Lastly efforts should be made to ensure that healthcare services are accessible to all residents, regardless of their location or socio-economic status. This may involve mobile health units, telemedicine services, and other innovative solutions to reach underserved populations.

Improving water and sanitation systems is critical for preventing waterborne diseases and improving overall health outcomes. Key actions include investments in water supply and sanitation infrastructure are essential for ensuring access to clean water and effective waste management. This includes repairing and upgrading existing systems and expanding coverage to informal settlements. Moreover, Public education campaigns on hygiene practices, such as handwashing and safe water usage, can help reduce the incidence of waterborne diseases. Regular monitoring and maintenance of water and sanitation systems are necessary to prevent contamination and ensure the continued safety of water supplies.

Addressing the socio-economic factors that impact health is crucial for improving overall health outcomes. This includes firstly, reducing poverty and inequality. Policies aimed at reducing poverty and economic inequality can help address some of the root causes of poor health. This includes measures such as improving access to education, job creation, and social safety nets. Secondly, improving housing conditions in informal settlements and other underserved areas can reduce health risks associated with overcrowding and inadequate sanitation. And last but not least, promoting economic development. Supporting economic development initiatives can help create job opportunities and improve living conditions that in turn can positively impact health outcomes.

Effective urban planning is essential for managing the spatial distribution of health services and addressing the challenges of rapid urbanisation. Key strategies include integrating health into urban planning. Urban planning processes should incorporate health considerations to ensure that healthcare

facilities are strategically located and accessible. This involves planning for future population growth and addressing existing disparities. Additionally, Developing Health-Focused Policies. Policies should be developed to guide urban planning decisions and ensure that health infrastructure is prioritized in development projects. This includes zoning regulations that consider health impacts and support the establishment of healthcare facilities in high-density areas. Sustainable development practices can help mitigate the negative impacts of urbanisation on health. This includes green spaces, improved public transportation, and infrastructure that supports healthy lifestyles.

Strengthening governance structures and ensuring effective policy implementation are critical for addressing health challenges. Actions include improving transparency and accountability in health governance can help address issues such as corruption and mismanagement. This includes implementing measures to monitor and evaluate health programmes and ensuring that resources are used effectively. Enhancing coordination between government agencies, non-governmental organisations, and other stakeholders can improve the effectiveness of health interventions. This includes establishing clear roles and responsibilities and fostering collaboration on health initiatives. Policymakers should be supported in developing and implementing evidence-based policies that address health challenges. This includes providing training, resources, and technical support to ensure that policies are effective and responsive to local needs.

This monograph suggested several recommendations some of which are highlighted in this section. The book recommends that there should be development of a comprehensive urban health policies. Policymakers should focus on developing comprehensive urban health policies that address the specific needs of Harare Metropolitan Region. These policies should prioritise investments in healthcare infrastructure, including the expansion and upgrading of facilities. additionally, there is need to ensure that healthcare services are accessible to all residents, particularly those in underserved areas. Policy makers should also take health considerations into urban planning processes to ensure that healthcare facilities are well-distributed and accessible.

The book also recommends that there should be Investment in health infrastructure. Government and non-governmental organisations should prioritise investments in health infrastructure, including the construction of new healthcare facilities in underserved areas to meet the growing demand for services. The upgrade and modernisation of existing healthcare facilities to improve service delivery and patient care and ensure that healthcare facilities are equipped with the necessary resources and staff to provide quality care.

Future initiatives should prioritise public health education, focusing on three critical areas. First, comprehensive sanitation and hygiene programs are essential to empower residents with the knowledge and practices needed to prevent waterborne diseases. These programs should emphasize handwashing techniques, proper waste disposal methods, and the safe handling of water. Second, accessible and informative sexual health campaigns are vital for reducing the incidence of sexually transmitted infections and promoting responsible sexual behavior. These initiatives should provide accurate information on HIV prevention, contraception, and safe sex practices. Finally, mental health awareness programs should be implemented to address the rising rates of mental health disorders within the community. These programs should aim to reduce stigma, increase understanding of mental health issues, and promote the availability of mental health support services.

There is need to enhance collaboration between stakeholders. Collaboration between various stakeholders is essential for addressing health challenges effectively. Actions to enhance this collaboration include fostering partnerships among government agencies, non-governmental organisations, and community groups to pool resources and expertise that can lead to improved health outcomes. Additionally, it is crucial to coordinate efforts to ensure that health interventions are integrated and aligned with broader health policies and strategies. Engaging communities in the planning and implementation of health programmes is also important, as it ensures that interventions are both relevant and tailored to the specific needs of the population.

The book has also stressed the need to monitor and evaluate health interventions. Regular monitoring and evaluation are crucial for assessing the

effectiveness of health interventions and ensuring their continued improvement. Key actions in this process involve collecting and analysing health data to inform decision-making and enhance service delivery. It is important to assess the impact of health programmes and policies to identify their strengths and areas for improvement. Based on evaluation findings, making necessary adjustments to health interventions is essential to maintain their effectiveness and address any emerging challenges.

Future research should focus on investigating long-term trends in epidemiological patterns to understand how spatial and temporal factors influence health outcomes over time. This research could involve conducting longitudinal studies that track health trends over extended periods to identify patterns and changes in disease prevalence. Additionally, examining the impact of ongoing urbanisation on health outcomes and infrastructure needs is crucial. Another important area of investigation is the exploration of how environmental changes, including climate change and pollution, affect health.

Research into innovative approaches to health service delivery can provide valuable insights into improving healthcare access and outcomes. Areas of interest include investigating the use of technology, such as telemedicine and mobile health applications, to enhance healthcare delivery. Exploring community-based health models that leverage local resources and knowledge to improve health services is also important. Furthermore, studying the integration of health services with other sectors, such as education and housing, can address the broader determinants of health.

Future research should evaluate the impact of policy changes on health outcomes to understand the effectiveness of interventions. This could involve policy analysis to assess the implementation and impact of urban health policies and programmes, identifying best practices and areas for improvement. Comparative studies could be conducted to compare the effectiveness of different health policies and interventions across various urban settings. Additionally, collecting feedback from stakeholders, including healthcare providers and community members, is essential to evaluate the impact of policy changes on health service delivery.

To conclude, the spatial-temporal patterns of epidemiological incidences in the Harare Metropolitan Region, Zimbabwe provide a thorough analysis of the factors influencing health outcomes in Harare Metropolitan Region. The study highlights the critical challenges faced by the city, including inadequate healthcare infrastructure, uneven service delivery, and the impact of rapid urbanisation on health. The recommendations outlined in this conclusion offer a roadmap for improving health governance and addressing the root causes of health issues. By investing in health infrastructure, enhancing water and sanitation systems, addressing socio-economic determinants of health, implementing effective urban planning, and improving governance, policymakers and practitioners can work towards building a more resilient and equitable healthcare system. Future research will play a crucial role in informing ongoing efforts to improve health outcomes and ensure that interventions are effective and responsive to the needs of Harare Metropolitan Region's residents. The insights and recommendations presented in this book underscore the importance of a holistic approach to urban health, one that integrates health considerations into all aspects of urban planning and governance. Through collaborative efforts and evidence-based policies, it is possible to address the challenges identified and create a healthier, more equitable urban environment for all residents of Harare Metropolitan Region.

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Synopsis

Effective health services are key in addressing the challenges of rapid urbanisation. Key strategies include integrating health into urban planning by embracing future population growth and addressing existing disparities. Zoning regulations that consider health impacts and support the establishment of healthcare facilities in high-density areas can help mitigate the negative impacts of urbanisation on health. This includes green spaces, improved public transportation, and infrastructure that supports healthy lifestyles. as well, strengthening governance structures and ensuring effective policy implementation are critical. Actions include improving transparency and accountability in health governance can help address issues such as corruption and mismanagement. Policymakers should be supported in developing and implementing evidence-based policies that address health challenges. This includes providing training, resources, and technical support to ensure that policies are effective and responsive to local needs. This monograph suggests several recommendations some of which are highlighted in this section. Specifically, policymakers should focus on developing comprehensive urban health policies that address the specific needs of Harare Metropolitan Region. These policies should prioritise investments in healthcare infrastructure, including the expansion and upgrading of facilities. investments in health infrastructure, including the construction of new healthcare facilities in underserved areas to meet the growing demand for services is primal. The upgrading and modernisation of existing healthcare facilities to improve service delivery and patient care and ensure that healthcare facilities are equipped with the necessary resources and staff to provide quality care. This was reduction of epidemiological challenges with the intent to complete eradication are noblest aims.

About the Author

Halleluah Chirisa is a holder of an MSc in Population Studies (University of Zimbabwe) and a BScEd specialising in Geography and Mathematics (Bindura University of Science Education). Currently pursuing a higher degree in medical geography with the University of the Free State (South Africa). She is the Director of Research and Innovation at the Zimbabwe Ezekiel Guti University. Her research interests are climate, public health, innovative thinking and urban marginality.