Rethinking Harare's Health Infrastructure under the Impact of COVID-19: An Agenda for Planning

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Abstract

The geometric increase of COVID-19 cases in some cities provides a clear signal to city authorities to prepare for international standard health infrastructure that accommodates more patients. Spiking figures of COVID-19 cases in towns also require city authorities to re-plan and re-orient health infrastructures guided by international health standards guidelines set by the World Health Organisations (WHO). Some of these pandemics are ground-borne and others are air-borne. This means that proper planning and orientation of health infrastructure is needed, taking into account issues of accessibility and affordability by its users. With this in mind, the outbreak of COVID-19 can be viewed as a game-changer in the planning of health infrastructure than just a passing phase. This article argues that current health infrastructure considers re-planning and orientation to cater for the voluminous increase in the number of patients to be accommodated, especially with the outbreak of COVID-19. The researchers used qualitative methodology and the study was an extensive desktop review of literature on re-planning of health infrastructure in light of pandemics. The research establishes that the health infrastructure needs re-planning for it to meet the WHO standards on COVID-19 in terms of safety health for both workers and the recipients of the health services provided by these infrastructures.

Keywords: *location, staffing, policy, management, physicalism*

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INTRODUCTION

Urban areas are epicentres of different forms of development. When these urban areas are planned, they are meant to cater to all aspects of human life that is, social, economic, political and cultural development. Barton (2009) asserts that the places where people spend most of their lives have a profound impact on their physical, mental, social, environmental and economic well-being. Of importance is the well-being of individuals in urban areas. However, COVID-19 has ravaged villages, urban areas and caused havoc in cities, prompting urban planners and developers to think of the re-planning of health infrastructure in cities and towns. COVID-19 has brought a myriad of problems to the economic, political and social setup of urban areas mainly because of large concentrations of populations and centres of activity.

Infrastructure (both hard and soft) is the mainstay of social, economic and political activities. Of particular importance, is the urban health infrastructure. Studies have shown the nexus between health infrastructure and planning. The voluminous increase in COVID-19 patients and fatalities overwhelmed health centres in urban areas, especially capital cities, such as Harare. This prompted urban pundits to think of the re-planning of health infrastructure.

The health infrastructure - primary, secondary and tertiary - available in most urban areas of Zimbabwe in the form of poly-clinics, referral hospitals and major hospitals and mobile clinics were not planned and sited with pandemics such as COVID-19in mind, but were meant to cater for a significant number of patients. However, COVID-19 is a different case as it spreads very fast and requires larger and easily accessible health infrastructure. Additionally, the location of these health infrastructures needs re-orientation as some of these are located far away from communities and others are at the centre of residential suburbs and it is very difficult for some people to access these health institutions. Despite accessibility, some residents complain about the location of infectious disease centres as they are within or in the vicinity of their neighbourhoods. Coordination and communication around the public health agenda are not only split between the planning and public health

disciplines, but are fragmented further between medical practices, social services, housing and regeneration (Crawford *et al.,* 2010).

In terms of capacity, some of these hospitals were not prepared to accommodate the voluminous increase in COVID fatalities and patients. This has seen the emergence of planning in the form of converting some disused infrastructure, tertiary institutions into health centres. However, in practice, there is a need to prepare for these pandemics since COVID-19 has provided urban pundits and other relevant authorities a clear signal for the need for more and re-orientation of health infrastructure. With this view, planning and re-planning of health infrastructure is important for the people's well-being. Crawford *et al.* (2010) argue that the nexus between health and planning is meant to strengthen the roots of planning and health, the urban planners' health inequalities and places planning and health at the centre of people and the planet. This article argues the need for re-planning of health infrastructure with COVID-19 lens to date back, several pandemics have been occurring and built environments must prepare for these pandemics.

In literature, there is deep concern about the impact of urban environments on health outcomes and the lack of a shared vision of supporting health styles *(ibid.)*. The relationship between health and the built environment goes far beyond physical factors *(ibid.)*. CABE and RTPI, (2009) identifies the planning contribution to health outcomes through its influence on environmental quality, social cohesion and social capital, for example, through inclusion, mixed-use, community infrastructure and design factors and economic activity, like the relationships between commercial land use and transport infrastructure. The study investigates whether the existing health infrastructure meets the WHO standards of COVID-19 in terms of safety health needs and establishing opportunities as well as challenges in re-planning the health infrastructure.

Professions of planning and health can date back to the 18thcentury where the emergence of planning was a result of poor sanitation caused by squalid conditions. This view is supported by Crawford *et al*. (2010) who assert that the professions of urban planning and public health emanate

directly from the same services, which were a direct response to overcrowding and lack of adequate sewerage and water infrastructure in rapidly industrialising cities during the 19th century. According to the World Bank (2016) and Eurostart (2016), in the 21st century, cities around the world are facing new demographic and health challenges, including rapidly growing urban populations of 50% globally. However, in the UK, there were two major reforms introduced by the central governments (Carmichael *et al.,* 2019). These were in public health and spatial town planning. The reforms offered prospects for urban (spatial) planners in England and Wales to become enablers of urban health.

Inadequate health systems have a disproportionate and crippling effect on developing countries (Independent Commission Multilateralism (ICM)(2016). However, the crippling effects vary from one region to another and also in terms of scale. Jebwab (2020) argues that some diseases, such as the Black Death, claimed 45% of Europe's population between 1347 and 1352. Of importance is that Black Death was the largest demographic shock in modern history. He further adds that some regions and cities were spared, others were devastated. Statistically, England, France, Italy and Spain lost 50-60% of their populations in the first one or two years. The Black Death was also a comparatively pure population shock (Waldinger, 2015). Disasters, such as floods and fires, kill fewer people but in this scenario, physical geography is also considered. This follows that diseases, such as Malaria, HIV or the 1918 influenza pandemic, disproportionately kill sub-groups of the population, much like COVID-19 (Jebwab, 2020). Currently, this also goes well with the call for African cities to prepare for future disasters. This call was made by African leaders in the ordinary session of African Union 2021.

LITERATURE REVIEW

Infrastructure forms a critical part of health service delivery in any country. Of importance to this infrastructure are elements of availability, accessibility, affordability, equity and quality of services that are highly determined by the distribution, functionality and quality of infrastructure. A health system is composed of various elements, such as infrastructure, human resources, data system and financial system (Kleezkowski et al., 1984). Furthermore, the state of cities and shires is the outcome of

patterns of development that have yielded differing forms and locations of infrastructure and organisation of public buildings and public space, residential areas and services including health, recreational and cultural facilities (Chapman, 1997). During pandemics, like the Ebola in 2014, population movements between urban and rural areas and transnational movements are likely to increase, as people seek to return to their areas of origin, looking for informal safety and/or out of fear (Mishra, 2020). These systems are important networks for smooth health delivery. The concept of infrastructure is broad in nature. It includes buildings, equipment, supplies and communication equipment (Kleczkowski *et al.,* 1984). However, for this article, the term infrastructure is restricted to health "infrastructure" that enables the smooth delivery of health services.

Poor infrastructure has consequences for poor health service delivery. This will be evidenced by reduced health delivery, hospital patient congestion, shortages of medical equipment and, consequently, an increase in death tolls (Garret, 2003). This suggests the need for the re-planning of health infrastructure concerning the renovation of buildings to meet modern standards in light of pandemics, buildings that catch up with new technologically advanced diagnosing health equipment for a multitude of diseases and develop fast as well as reliable communication systems. However, all these developments are jacketed under the pillar of 're-planning of health infrastructure'. The re-planning of health infrastructure facilitates improved and good health service delivery, especially in this era of COVID-19.Barton (2009) argues that health and planning are historically linked. Modern planning originated in the 19th century to combat the unsanitary, overcrowded and inhumane conditions of the burgeoning industrial cities.

Cities hold the key to sustainable development, quality of life and a healthy human society. However, urban life is partly responsible for the global environmental crises. Healthy environments are certainly a precondition to quality of life in communities (European Sustainable Development and Health Series 2, 1997). Global pandemics present new frontiers issues at the intersection between urbanisation and globalisation. This crisis, and how it is managed, locally and globally, will require a rethinking of sustainable urban development models, influenced by a

rebalancing of the public and private sector as well as new ways of working and living (Mishra, 2020).

Additionally, urban areas face two key issues that show a clear pathway between land development policy and health outcomes. These issues are priorities for allocation of resources and poor urban design. However, at the advent of COVID-19 that does discriminate, these issues become a real story of peri-urban and rural to urban connections, in places that are often absent on the global map. UN-HABITAT (2009) asserts that spatial planning is linked to the achievement of development goals and has a great role to play in reducing the impact of COVID-19. With goal number 11 of sustainable cities, it is equally important for these cities to prepare for pandemics especially on health infrastructure. Crawford (2010) suggests that there are particularly deep concerns about the impact of urban environments on health outcomes and the lack of a shared vision of how to support healthy lifestyles. Social, economic and environmental contexts, contribute to the creation of a healthy human society, but do not operate in isolation or independently of each other. Rather, they are interacting and interdependent, and it is the complex interrelationships between them that determine the conditions that promote health (Chapman, 1997).

Kid (2007) argues that there are both economic and social drivers for a paradigm shift. He further adds that the contributors provide additional insights into emerging relationships between spatial planning and public health professionals and emphasise related shifts in professional paradigms. The links between environmental factors and health outcomes have been recognised and acted on since the early days of public health management (Chapman, 1997). Moreover, Crawford *et al.* (2010) adds that the relationship between health and the built environment goes far beyond physical factors.

Carmichael *et al.* (2019) assert that reforms in public health included the various institutions and new set boards were formed to integrate guidance over local population health. Another reform was a significant overhaul of the spatial or town planning system to make it less complex and more accessible. To do this, a New Town Planning Framework (NTPF) was

introduced. However, this policy specifically mentions the need to promote healthy communities and associated planning practices. This growth in populations has led to many urban doldrums, including the mushrooming of squalor and poor urban sanitation. This also follows that it is the era of global urbanisation, the rise of non-communicable diseases (NCDs) and rapid climate change (Carmichael *et al.,* 2019). Duhl et al. (1963) suggest that in the early times, planning was a process of pure survival, hunters and gatherers substituted by their understanding of available resources. Therefore, this means that the link with health has come after its concentration with resources.

Kline (2012) asserts that public health infrastructure is the underlying foundation that supports the planning, delivery and evaluation of public health activities and practices. In light of the pandemics, the planning of infrastructure leaves a lot to be desired. The link between the prospects of urban planning and public health springs directly from the source: that is the response to overcrowding and lack of adequate sewerage and water infrastructure in rapidly industrialising cities during the 19th century. However, in the 21st century, a comparable movement is occurring in industrialising nations, as spatially planning is linked to the achievement of development goals (UN-HABITAT, 2009). As far as the nexus between health and planning is concerned, the American College of Physicians (ACP) argues that public health works to protect and improve the health of communities through education, policy development, promotion of healthy lifestyles and research to improve chemical case as well as injury prevention. In addition, Kline (2012) encourages the development and implementation of a comprehensive, nationwide public health informative infrastructure, shared by all public health stakeholders. This will require significant investments in new and improved technologies, standard methodologies, human resources and education (Kline, 2012).

The meaning of city health and health of populations in a country concentrates on the health of the population rather than care of the individual patients. The public health action planning methods described consider health as an outcome of the effects of all the factors affecting the lives of individuals, families, and communities in different ways and

through different pathways (Chapman, 1997). However, Chapman (2007) argues that the view is a contrasting approach to the medical model, that underpins disease-focused interventions and the view makes health care services responsible for improving and maintaining health. Therefore, a linking of the models is fundamental to the good health and quality of life of residents in communities (Chapman, 1997).

Pandemics and endemics, such as malaria, polio, Ebola, tuberculosis and HIV&AIDS, resurgent diseases, like SARS, are threats to public health, particularly in developing countries ICM, (2016). These diseases have had a devastating effect on the social, economic and political development of countries. However, pandemics occur naturally some without warning. This means that the health infrastructure must put in place for such changes. These threats take place amid a lack of investment in health infrastructure and uneven burden-sharing during the global health crisis. It is important to also note that a robust health system lies at the heart of building a stable multi-lateral environment comprising countries that have healthy populations, healthy societies and healthy economies.

THEORETICAL FRAMEWORK

Re-planning of city health facilities includes removal and eradication of old operational protocols and manoeuvre towards implementation of modern and sophisticated operational mechanisms (Jigyasu *et al.,* 2014). This does not only promote the delivery of services, but it also makes the human capital more effective and efficient towards health service delivery in hospitals. It is beyond reasonable doubt that global cities constitute the majority of the total population of any country. This is due mainly to rural-urban migration and cities as centres of activity. This means that the current status of urban areas no longer accommodates a modicum of change brought by COVID-19. Therefore, the idea of re-planning of health infrastructure plays an important role in promoting adequate health service delivery in cities providing inclusive health and accommodating other health changes caused by COVID-19 (Aghapour *et al.,* 2019).

Knowledge is derived from the understanding of the whole and not that of the single parts (Aristotle's Holism). With this in mind, this study shall adapt the systems theory that is going to underpin the study since the

study is of two important disciplines, namely planning and health disciplines though in the past, there was no clear disjuncture between planning and health. According to Mele (2010), systems theory is the interdisciplinary study of systems, which are cohesive groups of interrelated, interdependent parts that can be natural or human-made. This means that the idea of re-planning of health infrastructure is a multidisciplinary approach, bringing together interdependent and interdisciplinary systems, such as planning, infrastructure and health. He further argues that the focus is on the interactions and on the relationships between parts in order to understand an entity's organisation, functioning and outcomes (*ibid*., 2010).

Health buildings in a state of deterioration, are not only unattractive to staff and patients, but also could become positively dangerous. Critical areas, such as operation theatres (OT) and labour wards, could be sources of life-threatening infections if not maintained properly. Of importance, also, is the soft infrastructure aspect of health, including the human resource and related health policies that must be in place to support the entire health system (Hongoro, 2004). This suggests that the refurbishment of health infrastructure must also provide attention to soft infrastructures, such as human resources, supply of adequate equipment and financial systems. This fits well in the systems theory since Mele (2010) is of the view that every system is bounded by space and time, influenced by its environment, defined its structure and purpose, and expressed through its functioning. Bitner (1992) asserts that human resource is the essential tool in any organisation endeavouring to achieve its objective. If health facilities are equipped with a skilled workforce, this will enhance the delivery of quality health service. It is estimated that less than half of all medical equipment in developing countries is usable (WHO, 1984).

Among the key health infrastructure is Information and Communication Technology (ICT).This is an essential tool that must be highly considered in setting up a city health facility that is organised in logistics planning. ICT constitutes a supportive framework towards the delivery of quality health service. It has been noticed that in the past two years, Zimbabwe is one of African countries that has made significant strides in upgrading and

installing ICT in city health facilities. This was meant to facilitate an effective data-gathering, analysis and presentation of health service delivery.

Internet improves communication through emailing and video calling using Local Area Network (LAN) and in-depth research and diagnosis of diseases. However, Fitzsimmons (1994) argues that fax machines and emails are not common modes of communication in health institutions, but in some African countries, wireless radio call system has been and is used for communication between hospitals, while in Bangladesh and India, wireless communication is used mainly in the security sector by the police force. This paves the way towards the re-planning of health infrastructure concerning a communication system that is essential in a hospital setup to communicate emergencies and other services (Benjamin, 2004). Non-Governmental Organisations (NGOs), such as the Global Fund, play a pivotal role in the installation of internet services in governmental hospitals as a way of promoting the delivery of quality health service (Lucas, 2008). Therefore, for the proper functioning of health infrastructure, various systems must be connected, interdependent and connected together since systems theory is a theoretical perspective that analyses a phenomenon is seen as a whole and not as simply the sum of elementary parts (Mele, 2010).

Over the years, global governments, supported by organisations such as WHO, communities, philanthropists and religious organisations, have all been active in building health centres in cities. They have been driven by the desire to respond to the social obligation of providing health facilities to people. World Bank (1993) propounded that those overall observations indicate that delivery of Maternal and Neo-natal Health (MNH) services are also improving to address the needs of women and children. This observation is essential and it becomes a pillar towards the research towards re-planning of health infrastructure. Once city health facilities have been established, there is a need for close monitoring to notice the magnitude so that health service is delivered and ascertain the need for the re-planning to fill the loopholes.

The WHO embarked on a research to analyse the contributory factors behind the development and spread of pandemic diseases with regards to operational activities of health facilities. (source). Their research dovetails with the research of re-planning of health infrastructure because there can be a multiplicity of health facilities but their operation might be hindered by insufficient machinery, inadequate medication, poor operational facilities (lack of proper light systems, the challenge of electricity). Therefore, it is essential to go beyond and further interrogate and facilitate the need to re-plan health infrastructure and attain quality health service delivery.

Studies by WHO (2010) suggest that city health facilities need to be re-planned considering renovation and painting of buildings and improve communication systems and transport as a way of promoting the delivery of quality health services. However, the purpose of this study is to further interrogating the magnitude of improving health service delivery and promoting a friendly homogeneous working environment that is free from work-related accidents and incidents. Refurbishment of health facilities increases the health and safety of employees and this is explored in this research. This research focuses on great advantages that are brought by the practice of re-planning of city health facilities. Prior researches advocate that it is more prominent to capacitate health facilities for reducing deaths in hospitals, whereas this research further enhances the significance of re-planning of health infrastructure, giving concern towards employees' health in the workplace.

RESEARCH METHODOLOGY

The authors engaged qualitative methods, including key in-depth interviews and some key informant interviews with planning experts from the city health planning department. The researchers used mainly desktop review to obtain information on re-planning of cities and health. This information was obtained from a document review from renowned academic journals on public health, planning of cities and health infrastructure.

RESULTS

Even though the City of Harare has vast plans for health infrastructure, re-planning of health infrastructure is needed so that it caters to the vagaries caused by COVID-19. The City of Harare has been financed to the tune of millions of dollars plus other resources from council partners to kickstart major health infrastructure projects in Zimbabwe. This project will see the construction, refurbishment and upgrading of health facilities around the city. There are some marked improvements in the construction and refurbishment of health infrastructure in Harare. Up to date, Harare has vast plans of upgrading its health infrastructure, the plans involving construction of the state-of-the-art polyclinics in the four zones of the city (east, west, north and south) and refurbishment and upgrading of existing health facilities. The four clinics in the four zones will be enhanced polyclinics that are between a polyclinic and district hospital, save for admissions facilities. This is a significant move towards improving health infrastructure. However, there is a need to consider whether these plans are incorporating the doldrums of COVID-19.

Research has revealed that the City of Harare, using its own resources, has completed the construction of two clinics that had been lying idle, Kuwadzana Clinic Phase 5 and Budiriro Clinic, which had not been completed for many years. Additionally, a prototype of the new polyclinics has already been completed at Mabvuku Clinic and has been upgraded from a mere polyclinic to an enhanced polyclinic that is between a polyclinic and a district hospital. This means that the local authority has made a significant stride in improving the city's health infrastructure. Moreover, preparations for the construction of Glen Norah Clinic have been completed and they have also done refurbishments of Highlands Boundary Clinic, which are, however, not complete yet. The Council has also budgeted to set up a clinic in Stoneridge. This is a positive step in improving health infrastructure. However, the siting of these health institutions requires re-orientation.

Both the community and health workers who are manning these infrastructures are afraid of occupational health risks due to their exposure to COVID-19 patients. However, the WHO sets health guidelines important to mitigate hazards such as occupational infections with

COVID-19, exposures to toxins because of increased use of disinfectants, skin disorders and heat stress from prolonged use of Personal Protective Equipment (PPE). These standards include the need for well-coordinated and comprehensive measures for infection prevention and control and occupational health and safety (WHO Interim Guidance, 2021). However, according to the WHO Interim Guidance (2021), there is emerging evidence of transmission in settings outside of medical facilities, such as indoor, crowded, and inadequately ventilated spaces, where infected persons spend long periods of time with others.

Moreover, some of these guidelines consider the implementation of engineering, environmental and administrative controls. It is also added that alternative to face-to-face outpatient visits use telehealth services wherever feasible and appropriate, providing sneeze screens, workplace modifications and natural or mechanical ventilation without reticulation, organic screening for early recognition of patients with suspected COVID-19. Despite the significant efforts being made to improve health infrastructure in Zimbabwe, some of these infrastructures reflect pre-colonial designs that are no longer commensurate with some changes in the health sector. Hence, re-planning for these infrastructures will bring relief to the health sector.

Provincial hospitals are found in all provinces of Zimbabwe, except Bulawayo and Harare, as these cities have central hospitals to treat referrals from other health facilities. Provincial hospitals receive referral patients from all provinces. These referral hospitals are located in urban areas; their capacity may be Overwhelmed by an upsurge of patients. Of these hospitals, there are major central hospitals that have the advanced equipment. These six central hospitals are in Bulawayo, Harare and Chitungwiza. These hospitals also have staff and pharmaceuticals for dealing with the most severe casualties. Nevertheless, these hospitals require re-planning of their structures and realigning these infrastructures with WHO standards. However, most health initiatives are taken principally for environments/reasons for improving human health. This helps to meet the required standards and caters to emergencies and disasters, such as COVID-19.

The location of hospitals for infectious diseases should be properly done and carefully chosen. This is because currently, the City of Harare has two important infectious diseases, namely Wilkins and Beatrice Road Infectious Diseases Hospital (BRIDH). Wilkins is located in the middle of a residential suburb, is Milton Park and BRIDH is located close to the Mbare residential area. Even though these hospitals are located close to their users, but because of the nature of COVID-19, some people are afraid of being close to these hospitals. Moreover, these hospitals were constructed in such a way that they would accommodate a small number of patients. This is a clear signal to the planning and designing of health infrastructure that more space should be allocated to the construction of health infrastructure and improving its design, to include the required technology. Therefore, the local government can demonstrate commitment to public health through its corporate and operational plans and other planning instruments such as local government planning schemes, and its effective administration and enforcement of public health-related legislation.

As noted by Ministry of Health and Child Welfare (MOCHW) representatives, Zimbabwe's healthcare system does not exist in isolation from other factors and organisations outside the health sector. When considering future actions to be undertaken to strengthen the health system, the following factors affecting the health system in Zimbabwe need to be taken into consideration (Osika *et al.,* 2010). Access to roads, communication technology, housing and a healthy environment are key determinants of health in Zimbabwe. The current infrastructure issues caused by the economic difficulties have limited the ability of some patients to travel to their nearest health care facilities (ibid. et al). Additionally, other factors include increases in fuel costs that can limit quick transportation of COVID-19 patients to the hospitals.

In Zimbabwe, the MOHCW also recognises that communication technology, especially as the availability of cellular phones continues to increase, presents opportunities in health communications, health data-sharing and contacting health services that are also part of the essential soft infrastructure that improves the health welfare of urban residents. Additionally, safe, quality and healthy housing is a strong need among

many Zimbabweans and can impact exposure to various unhealthy conditions and injuries. The affordability of residents has been viewed as crucial in the expansion of health infrastructure. Some residents cannot afford the costs of transport to emergency hospitals, and hence the location of health infrastructure must be within proximity to its users. This must be seen by an increase in infectious hospitals in the vicinity of neighbourhoods.

There are a wide range of factors influencing human health, from genetics and individual behaviours to upstream determinants such as socioeconomic status, the physical environment and climate change. However, among the determinants, affordability is a key issue for housing and may impact the economic, social and personal financial choices that an individual may take regarding their access to health services. This also needs to be considered when planning for health infrastructure. Higher costs in rent and purchasing housing, may leave a family with less income to expand on health services, or simply the inability to expend any income on health services, or medication. Secondary care hospitals receive patients via referrals from primary care facilities. Services at their level should provide adequate services to handle the emergencies referred from the primary care facilities (Makuto and James, 2007).

Health personnel in major and referral hospitals of Zimbabwe has been very low and inadequate to handle the COVID-19 situation. Additionally, on the soft infrastructure, the health workers need to be capacitated. This capacitation will range from skills of handling infectious diseases and social- psycho-support. In practice, the district and mission hospitals that have been designated district hospitals, represent about 3,6% of all health facilities in the health system (Osika *et al*, 2010).

DISCUSSION

Diseases shape cities (Klaur, 2020). This view has been seen from the most iconic developments in urban planning and management, especially in the 19th century, for instance, the development of the London Metropolitan Board of Works in the mid-19th century as a result of a poor sanitation system. It was developed in response to public health crises such as Cholera outbreaks, the Spanish flu of 1918 in New York and

Mexico City or the Ebola virus disease in West Africa in 2014. All these have enduring marks on urban spaces. While urban living offers prospects of better economic opportunities and infrastructure, including health care facilities, the way cities diversify and expand plays a huge role in the spread of infectious diseases (Chapman, 1997). However, the coming in of COVID-19 presented a myriad of challenges in urban areas, especially where informal settlements are increasing. Informal settlements and slums are particularly vulnerable because of their overcrowding, lack of access to water, sanitation and formal health services, and food insecurity. The known solutions to slow transmission of the virus (self-isolation, quarantine, physical distancing, contact tracing) are very hard to apply in these settings (Mishra, 2020). Moreover, as the urban poor have no financial buffer, the need to combine the best possible health response with socio-economic mitigation measures will be extremely acute in informal settlements and slums (*ibid.*).

The interaction of urban design and public health is an increasingly critical territory. Several studies have been done on understanding the urban planning dimensions of pandemic preparedness (Klaur, 2020). Therefore, the outbreak of diseases implies enlightening the shape and the way cities are designed since these infectious diseases have given warnings in urban areas. With the outbreak of COVID-19, people have seen the overwhelming of public hospitals have been overwhelmed by COVID-19 patients. However, in this era of global urbanisation, the rise of NCD and rapid climate change, research has identified several urban planning principles essential to deliver human health and well-being outcomes. The built environment, including the human settlements, transport and green infrastructure, has been identified as an important determinant of health worldwide. Additionally, urban planning is central to managing complexity, that is socio-economic, environmental and territorial context and securing win-win policy solutions.

Cities hold the key to sustainable development, quality of life and healthy human society. However, urban life is responsible for the global environmental crises. Health environments are certainly a precondition to quality of life in communities (Davey, 2001). The initiative taken principally for environmental reasons, improves human health, although

this may not be explicit. In explaining new crises in cities and towns, the World Health Organisation Cities Project represents the relationships between municipal departments, other bodies, the community and the policy framework as pillars of health. This means that the city health has its foundation deeply rooted from the national level that is at WHO. The outbreak of COVID-19 has intensified the need to understand and link the way settlements are planned. creating healthier cities requires an integrated approach to planning at the local level (Chapman, 1997). However, it is noted that local governments are at the frontline of the epidemic but their capacity to respond rapidly depends heavily on the governance context and the financial health of the local government and its budgetary authority (Mishra, 2020). Furthermore, support to local governments and service providers is essential and the vehicle to link the natural response with what the local private sector and communities themselves can do.

Through effective planning is complex and demanding (Chapman, 1997), proper planning and designing of health infrastructure are crucial. This will provide a safety net for urban residents. However, Davey (2001) argues that effective planning is complex and demanding as it involves developing a climate with the political will for planning for health. That means the strategies must accommodate the unique political context of cities and their organisation. Planning is a key public activity for regulating land development, harnessing local knowledge through consultation, interpreting health evidence and regulating urban design. Research shows that policies for regulating land use, connectivity and density, transport and green infrastructure, offer a pathway to improved health outcomes.

Research has revealed that if publicly owned and managed health facilities are of poor standards and not geared enough to cater for changes brought by infectious diseases, people opt for the private sector (private hospital) and this leads to scrambling for limited resources. The situation is likely to lead to an increase in health prices as the law of demand and supply prevails. This means that health facilities will be accessed only by those who can afford (the haves) while the poor (have-nots) will have no option other than resorting to home remedies or dying.

This view was further supported by Marlock *et al*. (2004) who assert that the existing health system faced many problems, including the ineffective geographical distribution of resources. It is further added that the under-utilisation of hospitals because of their social size and lack of resources in rural areas (World Bank, 2003) will worsen the situation. Moreover, there is also an unbalanced allocation of resources, for example, a hospital may have a general surgeon but not an anaesthesiologist, which makes it impossible to perform operations because of a shortage of specialists. However, these situations are referred to as soft health infrastructure that needs to be improved in all hospitals. Osika (2010) asserts the concern that the shortage of specialists in Zimbabwe due to outmigration has led to serious cases, referred from the primary and secondary level (National Health Strategy 2009-2013).

However, Osika *et al.* (2010) posit that overall, it is intended for patients to first present at primary care facilities and then move up via referrals to the appropriate level of the health care system. But, for the past 10 years, the referral system has crumbled, with numerous patients seeking primary care at all facility levels due to geographical convenience. According to the National Health Strategy (2009-2013), many Zimbabweans have a perception that primary care facilities lack supplies, staff, and ability to provide services. So, they seek primary care at secondary, tertiary and quaternary healthcare facilities.

This means the need for reforms in the health sector have to be enlightened by COVID-19 and its various waves. In some developing countries, reforms in health institutions have been put in place. Developed countries have already introduced several reforms including the UK central government that offered prospects for urban (spatial) planners in England and Wales to become enablers of urban health (Carmichael, 2019). The first reform was the re-organisation of public health functions *(ibid.)*. This is evidence that the health infrastructure, both soft and private was not prepared for such disasters. Also, there was the second reform in the UK, significant overhaul of the spatial or town and country planning system, ostensibly to make it less complex and more accessible *(ibid.)*.

CONCLUSION AND RECOMMENDATIONS

This research entails the impact of re-planning of health infrastructure towards improving the delivery of quality health services and the creation of a healthy and safe environment that is not hazardous and minimises operational incidents and accidents for the workforce. Through this research, insight on ways to improve health facilities in cities is provided. City health infrastructural developments include renovation and painting of buildings, sufficient transport, improvement of communication systems, and increase in both technical and mechanical hospital equipment. However, not only the face outlook of structures is needed to achieve re-planning of cities. The recommendations by Mishra (*ibid*.) hold value in the re-planning of cities in the wake of COVID-19. Mishra (2020) asserts that the lack of pre-crisis resilience and lack of progress against the SDGs calls for a strong focus on early recovery planning and its comprehensive strengthening of resilience against all hazards (pandemics, economic, shocks and climate) (*ibid*.).

The socio-economic impact of COVID-19 and health response measures, such as lockdowns in urban areas are not limited to only reduced incomes as loss of livelihood. The strong relationship between the informal and formal economy often remains a challenge in combating the pandemic and mitigation measures will be extremely acute in informal settlements and slums. For this research, soft infrastructure in the form of proper urban frameworks is required. Moreover, a comprehensive approach also requires a focus on the immediate impact of access to adequate housing to those in informal settlements, taking into account the need for safe mobility to access livelihoods, as working from home is, in most cases, not an option for those in the informal economy.

Furthermore, mapping and spatial analysis are key to informing planning and health decisions. It is crucial to map and understand the emergence of hotspots and their relationships to essential services. This promotes local area planning. Mishra (*ibid*.) opines that mapping of hotspots can also help to predict and monitor population movements. This mapping and analysis can shape and localise response, re-organise informal markets and urban transport hubs, allocate space or buildings to be repurposed for

emergency health services. In places where informal settlements are mushrooming, there is need to promote integrated community-driven responses in informal settlements and slums. This is because most of the urban poor live daily with no cover from sustained crises. Therefore, a health focused response must be accompanied by a non-stressful social economic approach that addresses the daily survival need to access livelihoods, food, basic amenities and health services. This helps the workforce and urban dweller to feel comfortable in working in an environment that makes them valuable than becoming redundant and idle. It can be concluded that the status of cities requires collaboration efforts from different departments, ministries and academic institutions. These institutions must work together towards the improvement of the health infrastructure in line with COVID-19 health guidelines. This will enable a safe and healthy working and interactive social environment. Furthermore, urban planning must provide consistency for major infrastructure and land development and social health planning must be an important factor in the city re-planning process.

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