

Coping With Pandemics In A Resource Constrained Environment: Towards An Integrative Framework

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ABSTRACT

Pandemics have existed from time immemorial but whenever they strike human society is always shaken by lack of a reliable model for coping with the scourge to prevent considerable loss of human life. COVID- 9 pandemic alone by 2022 resulted in roughly 7 million deaths globally, HIV and AIDS at its peak (2005-2012) killed 36 million people, 1968 flu pandemic killed 1 million people, 1956-1958 Asian flu killed 2 million, 1918 flu pandemic killed between 20-50 million people, 1910-1911 caused loss of life to 800 000 people and 1889-1990 flu pandemic killed 1 million people. Many empirically-based models have been developed for building community resilience and coping mechanisms against the various types of pandemics but as statistics on number of deaths indicate, whatever models have been developed did not achieve much in reducing fatalities from the pandemics, especially for populations in resource constrained environments. Seemingly there are more myths than realities informing the models adopted by each generation to cope with the pandemics of its time. This study problematizes the utility value of myths and models uncritically 'borrowed' from past experiences and adopted for coping with the COVID pandemic overlooking some communities' lack of access to resources that are regarded as critical for coping from a public health policy perspective and also their cultural embeddedness. Using a qualitative research methodology, the study interrogated the various strategies adopted by government for the nation to cope with the COVID pandemic in Zimbabwe. Results of the study were an unexpected scenario of the predominance of the indigenous knowledge system, the socially constructed nature of community resilience and rejection by local communities of norms and values prescribed as a panacea to the pandemic but perceived by them to be alien and antagonistic to their socio-economic cosmology. Insights from this study assisted in the development of an integrative framework (actionable public health guidelines) for protecting populations in resource constrained environments from the ravages of current and future pandemics.

Key words: *Community resilience, socio-economic cosmology, indigenous knowledge system, socially constructed, pandemic and Integrative framework*

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I. INTRODUCTION

Globally, pandemics have caused disruption to all social institutions and sectors of the economy. Projections are that pandemics are likely to continue disrupting livelihoods, deepening hardships already experienced by various groups in society, especially the vulnerable. Currently, societies across the globe are faced with significant health, economic, and social challenges exacerbated during the current global pandemic (Chakraborty & Maity, 2020). Grave concerns have risen in developing countries on the adverse effects of the current Covid-19 pandemic on vulnerable populations (Shanmugam et al., 2020; Yusof, 2021). As the current COVID-19 pandemic continues to unfold and wreak havoc among global communities, it has become apparent that pandemics and their associated problems are more than biomedical issues. Against a backdrop where modern medicine and contemporary strategies are being used to manage pandemics without much success, the current article advances the argument that indigenous knowledge systems though missing from current pandemic management thrusts are pivotal in the design of holistic and effective pandemic management frameworks. Many empirically-based models have been developed for building community resilience and coping mechanisms against the various types of pandemics but as statistics on number of deaths indicate, whatever models have been developed did not achieve much in reducing fatalities from the pandemics, especially for populations in resource

constrained environments. Past and present resilient frameworks or models have failed to provide lasting solutions in terms of coping with pandemics specifically in countries which are resource constrained (Litman, 2020; Qui et al., 2017). Seemingly there are more myths than realities informing the models adopted by each generation to cope with the pandemics of its time.

BACKGROUND TO THE STUDY

Throughout, the course of history, pandemics have wreaked havoc on communities (Lavell & Mansilla, 2020; Duan & Zhug, 2020; Lorec et al., 2020; Brooks et al., 2020; Li & Yang et al., 2020; Toroko & Baker., 2020). Indeed, very few phenomena throughout human history have shaped human societies and cultures the way outbreaks of infectious diseases have, yet, remarkably little attention has been given to these phenomena in social science studies (see Gilbert, 2020; Duan & Zhug, 2020; Lorec et al., 2020; John et al., 2015). More worrisome, however, is the successive failure of the various approaches adopted to deal with the pandemics (Alonge et al. 2008, Lavell & Mansilla, 2020). The effectiveness of response programmes on this pandemic has been brought to test. The Congressional Research Service (2020) argue that, unnecessary delays and inadequate preparation reduced the effectiveness of these responses, and communities face many practical problems in preventing infections and addressing the pandemic's social and economic impacts.

Pandemics are disease outbreaks that become widespread as a result of the spread of human-to-human infection. The pandemic related crises have been associated with enormous negative impacts on health, economy, society and security of national and global communities (see Noy & Shields. 2019; UNWTO, 2020; Lorec et al., 2020; Brooks et al., 2020; Armitage & Nellus., 2020). In addition, they have caused significant political and social disruption. In addition, the socioeconomic costs of these outbreaks are also reported to be increasing (Dobson et al., 2020). Besides the costs of lives and health, epidemics and pandemics have devastating effects on societal and individual wellbeing more largely. They strongly impact economies, livelihoods and psychosocial wellbeing across entire communities. Measures taken to mitigate them can come with threats to civil liberties and fundamental rights.

A number of pandemics recorded in human history, such as influenza pandemics are unpredictable but recurring events that can have severe consequences on societies worldwide (see Brooks et al., 2020; Li & Yang et al., 2020; Toroko & Baker, 2020). Influenza pandemics have struck about three times every century since the 1500s (Verikios, Sullivan, Stojanovski, Giesecke, & Woo, 2015). Recent years have seen at least six large-scale outbreaks—hantavirus pulmonary syndrome, severe acute respiratory syndrome, H5N1 influenza, H1N1 influenza, Middle East respiratory syndrome, and Ebola virus disease epidemic (see Xiao et al., 2019; Spinloven et al., 2020; Dawson et al., 2015; Qiu et al., 2017, Gostin et al., 2016). The influenza H1N1 2009 virus (A/2009/H1N1) was the first pandemic influenza of the 21st century. It has affected the whole world and caused more than 18,000 deaths (Rewar et al., 2015; Qiu et al, 2017). Ebola killed more than 11 000 people and cost the world more than USD \$2 billion, according to World Bank calculations (Maurice, 2016). In 2016, the Zika virus broke out and consequently threatened the health of people in 34 countries (Troncoso, 2016; Qiu et al., 2017). These outbreaks make scientists and governments worry about a repeat of the devastation of the Spanish flu of 1918 (Lin, McCloud, Bigman, & Viswanath, 2016). In fact, the rate of emerging infectious disease outbreaks seems to be increasing significantly over time (GPMB, 2019; Jones et al., 2008; Moon et al., 2017; Smith et al., 2014).

Even though insights in the exact impacts of the COVID 19 pandemic are tentative and evolving, it has already become clear that both the disease and some emergency countermeasures have had substantial socio-economic costs, often hitting the marginalised and most vulnerable in society the hardest (e.g. Bambra et al., 2020; ECDC, 2020; UN, 2020; Frutos et al., 2020). Besides the costs of lives and health, epidemics and pandemics have devastating effects on societal and individual wellbeing more largely. They strongly impact economies, livelihoods and psychosocial wellbeing across entire communities. Measures taken to mitigate them can come with threats to civil liberties and fundamental rights.

These successive pandemics have left regions, organisations and communities in distressed states, a situation which has led to calls for new approaches that ensure the resilience, continuity and growth of distressed communities across the globe. Musavengane and Leonard (2022) posits that most of the Southern African has been in a distressed state due to the long-existing social, economic and political challenges. High urbanisation, environmental injustices, inequalities, social ills, corruption and unbalanced development policies are manifestations of these challenges. Hence the need to re-evaluate the approaches being used in the management of pandemics.

PROBLEM STATEMENT

Resource constrained nations across the globe are finding it difficult to cope with pandemics (Alonge et al, 2019; Bene et al, 2016). In resource constrained countries in Africa specifically Zimbabwe, weakened healthcare systems are now facing unthinkable fallout of COVID 19 which needs to quickly adapt frameworks

to this new context (Dahab et al., 2020). The reality is that the impact of the coronavirus is likely to be more severe on communities in resource constrained nations who already are weakened by poor nutrition and vulnerabilities arising from the climate crisis. According to Chirombe, Benza, Munetsi and Zirima (2020), health systems in countries such as Zimbabwe are simply not equipped to cope and poverty and economic crisis further weaken the ability to fight a pandemic. These risks are intensified by the scantiness of pandemic plans that enable public health systems and communities to respond adequately and without delay. The effectiveness of existing institutions for management and containing the current global pandemic needs to be interrogated since current institutions and management frameworks seem to have failed to arrest its spread and impact especially among vulnerable populations. Very little has been done in order to understand the social construction of pandemics and resilience building in communities in order to develop an integrative framework for coping with pandemics especially in a resource constrained countries (Litman, 2020; Lavell & Mansilla, 2020; Twigg & Calderone, 2019). Despite the existence of a plethora of literature on pandemics (see Duan & Zhug, 2020; Lorec et al., 2020; Brooks et al., 2020; John et al., 2018; Li & Yang et al., 2020;), no known serious study has seen it worthy to interrogate the various strategies adopted by government for the nation to cope with the COVID pandemic in Zimbabwe. Devoid of such knowledge may result in failure of resource constrained nations to cope with not only the current COVID-19 pandemic but other future pandemics and disasters as well. Using a qualitative research methodology, this paper reviews and draws insights from existing literature to demonstrate that current conceptualisations and approaches to coping with pandemics are inadequate, that there is need to give attention to the role that the indigenous knowledge systems can play from a religious, spiritual and traditional perspective to prevent and deal with cases of pandemics in resource constrained nations such as Zimbabwe. This study problematizes the utility value of myths and models uncritically 'borrowed' from past experiences and adopted for coping with the COVID pandemic overlooking some communities' lack of access to resources that are regarded as critical for coping from a public health policy perspective and also their cultural embeddedness. Insights from the study point towards the need for an integrative framework in the management of pandemics in resource constrained countries.

RESEARCH OBJECTIVE

The current thrust of the paper is:

- To interrogate the various strategies adopted by government for the nation to cope with the COVID pandemic in Zimbabwe.

II. LITERATURE REVIEW

The corona virus pandemic caused by the SARS-COV-2 has painfully confirmed what many reports and papers expressed since the 2009 and 2014-16 Ebola pandemics that the world is gravely under-prepared for large outbreaks of emerging infectious diseases (Nuzzo, 2019) Even though insights on the exact impacts of COVID 19 pandemic are still tentative and evolving, it has already become clear that both the disease and some emergency counter measures have had substantial socio-economic costs, often hitting the marginalized and most vulnerable in society the hardest (Bambra, 2020; UN, 2020; Duan & Zhuang 2020).

Impacts of pandemics

Through centuries, pandemics have been known to have devastating impacts on communities. Evidence from the constellation of studies highlights that the outbreaks of pandemics can easily cross borders threatening economic and regional stability, as has been demonstrated by the HIV, H1N1, H5N1, SARS epidemics and pandemics (Verikios, Sullivan, Stojanovski, Giesecke & Woo, 2015; WHO, 2020). Beyond being devastating, and at times posing fatal consequences for those directly affected, pandemics have a range of negative social, economic and political consequences (Davies, 2013). Currently, the Covid 19 pandemic has led to a dramatic loss of human life across the world and presents an unprecedented challenge to public health, food systems and the world of work (WHO, 2020). Thus, overall pandemics can be said to have disruptive influences on societies social fabrics, with consequences that are in most cases fatal. The pandemic has created an interrelated of socio-economic problems (UNDP, 2020; Lorec, 2020).

Health Effects

Studies show that one of the devastating impacts of pandemics have been felt in the health sector across the world. The Covid 19 pandemic has caused an unprecedented global health crisis. It has brought the world to its knees, the global community was not even prepared for this crisis. Horemovic (2019) posits that pandemics have infected millions of people, causing wide-spread serious illness in a large population and thousands of deaths. Kern (2016) argued that, less developed nations, pandemics have the potential to, and the likelihood of deaths range within 5 to 10 percent. For instance, Wong and Leung (2007) found out that during the SARS outbreak in 2003, there were more than 8000 infected individuals, with over 700 deaths (almost 9%) globally in just 6 months.

Such statistics shows the devastating impacts and strains pandemics have on healthy systems across the world. Developing countries have borne the major impacts of pandemics due to limited health infrastructure.

WHO (2021) reported 176, 531,710 confirmed cases of Covid 19, including 3, 826,181 deaths as of 17 June 2021. The COVID 19 pandemic has been the center of attention and intrigue, as one of the greatest catastrophes ever, if not the greatest ones in the entire history of humankind (see Xiao, et al 2019, Brooks 2019, Spinloven et al 2020, Dawson et al 2015, Duan & Zhug 2020). The pandemic has triggered shock waves across the globe. Its impact on societies has generally been horrendous, to say the least (see Gilbert, 2020; Duan & Zhug, 2020; Lorec et al., 2020; John et al., 2015). The above statistics revealed the devastating health effects of pandemics including Covid 19. However, although greater emphasis has been given to the mortality of the pandemic, very limited research has been done to develop resilience strategies to mitigate the impact of these pandemics on societies. There remains a gap in knowledge as the social construction on pandemics and resilience building remain scant. The questions still remain on what should be done to make sure communities cope with the pandemics specifically those who are resource constrained.

Different societies are said to be handling disasters in different ways, some far more efficiently than others (Litman, 2020). More worrisome, however, has been the successive failure of the various approaches adopted to deal with disasters on tourism in developing countries (Alonge et al. 2008, Lavell & Mansilla, 2020). Evidence from the extant literature points out that developing countries have borne the greater weight of the negative consequences of disasters. The effectiveness of response programmes on disasters have been brought to test and found wanting. The Congressional Research Service (2020) argue that, unnecessary delays and inadequate preparation reduced the effectiveness of these responses, and destinations and communities alike face many practical problems in preventing and addressing disaster social and economic impacts. Amidst such catastrophes people often ask, "Why were we not better prepared?" (Litman, 2020).

Economic Impacts

Pandemics pose severe threat not only to the population of the world, but also to its economy (Horemovic, 2019). For instance, the Ebola outbreak has severely destabilized the economics throughout West Africa. Gostin and Friedman (2015) found out that in Sierra Leone in 2015, USD 6 billion was recorded for direct costs (hospitals, staff, medication), and the direct costs alone amount to 3 years of funding for WHO, and were well over 20 times the cost of WHO's emergency response cuts in its 2014-15 budget. Kern (2016) opines that it has been calculated that there was an economic loss of USD 1.6 billion for Sierra Leone, Liberia and Guinea compared with the economic growth in 2014. The Global Health Risk Framework for the Future (GHRF) Commission estimates that annually, on average pandemic outbreaks cost the world about USD 60 billion in direct costs (Maurice, 2016). Such magnitudes of the costs involved can be said to have a debilitating effect upon struggling economies, especially in developing countries like Zimbabwe.

Evidence from extant literature highlights that pandemics not only leads to disruptions of economies, but further require vast amounts of resources to manage. The implications of such on developing countries is that in most cases pandemics end up having the most negative impacts as they struggle to contain them Hence, it can be said pandemics impacts are felt more in developing countries than in developed countries. Hence, the need to develop tailor made strategies to contain pandemics in these developing countries.

Social Impacts

A scan of existing literature highlights that the social impacts of pandemics are devastating. They in most cases include travel restrictions, and closure of schools, markets and sporting activities (Horemovic, 2019). Horemovic (2019) argues that, movement was a challenge and the travel comprising visiting families and friends, carrying goods to markets were restricted by military check points. The impacts of the closure of travel are felt more in developing countries which remain dependent upon tourism as a generator of income. Tourism in developing countries contribute more to GDP (WTO, 2018), hence its disruptions spells major challenges for the developing countries.

School closure is often considered the first non-pharmaceutical intervention for implementation in a pandemic, as students are effective in spreading the virus. School closure was also significant with the Covid 19 pandemic (UNAIDS, 2020). Whereas nations were and are still at different levels in their Covid 19 infection rates, globally, there are approximately more than 1.2 billion children in 186 nations negatively impacted by the closure of schools caused by the contagion or virus (Li & Lalani, 2020). It can be said that Africa was one of the continents whose educational systems were typically impacted by the fatal virus as more that 98% of teaching and learning activities were not carried out across the continent (Anofowashe, Aborode, Ayodele, Iretiayo & David, 2020). From the closure of schools and universities across Sub Saharan Africa, over ninety percent that were negatively impacted are primary and secondary school learners (Ngogi & Amp; Mahaye, 2020). In Zimbabwe, the national lockdown also led to the shutdown of learning institutions that encompassed primary, secondary and tertiary institutions. This caused learners to go on an indefinite holiday (Muchetu, 2020). School closure also raises a

range of ethical and social issues, particularly since families from underprivileged backgrounds are likely to be disproportionately affected by the intervention (Cauchemez et al., 2009).

The closure of schools especially in developing countries has resulted in increased numbers of school drop-outs, teenage pregnancies (WHO, 2020). Thus, one may conclude that closing schools remain a cosmetic strategy that does not address the elephant in the room. That of effectively managing pandemics in developing countries.

The public games including sporting like the Tokyo Olympic Games were cancelled because public gatherings are a major factor. Enforced close contact at work and household crowding were linked to a higher prevalence of self-reported influenza-like illness in the 2009 H1N1 pandemic (Kumar, Quinn, Kim, Daniel & Freimuth, 2012) and Covid 19 pandemic (WHO, 2020). Tradeoff between the social costs of interventions and the cost of uncontrolled spread of the virus were involved in the decisions to mitigate influenza outbreaks in Ebola outbreak (Prieto & Das, 2016).

The Covid 19 pandemic created an interrelated set of problems that include illness and deaths, healthcare system stress, travel restrictions, stay-at-home and isolation requirements, fear and confusion, mental and physical stresses, plus lost income to individuals and businesses which threaten local, national and global economic development (United Nation Development Programme, UNDP, 2020).

Thus, it can be said that current efforts to manage pandemics have proved ineffective, hence warranting the need to interrogate mechanism for managing pandemics. The failure of “the copy” paste system in the management of pandemics have failed, hence the develop an integrative framework for coping with pandemics in a resource constrained country. To this end, the social construction of pandemics remains in Zimbabwe remains uncharted waters. Hence, this study seeks to explore the social construction of pandemics in order to isolate the critical factors for positioning communities for resilience to impact of pandemics through the development of an integrative framework for coping with pandemics in a resource constrained country like Zimbabwe.

As disasters occur more frequently nowadays, the poor are more regularly confronted with setbacks that can trap them in a vicious circle of poverty. It is more difficult for them to cope with and recover from disasters as they have fewer resources themselves and receive less support from the public (HALLEGATTE et al. 2020, PFR (ed.) 2015). Accordingly, coping with disasters is regarded to be essential for increasing long-term wellbeing and is perceived by some as one of the most important objectives to reduce and end poverty (FAIETA 2017, ROWLING 2016, SHEPHERD et al. 2013). Hence the need to develop an integrative framework for coping with pandemics in a resource constrained country like Zimbabwe.

STRATEGIES USED IN THE MANAGEMENT OF COVID 19

Grave concerns have risen in developing countries on the adverse effects of the Covid-19 pandemic on vulnerable populations (Shanmugam et al., 2020; Yusof, 2021). Rising trends of depression and anxiety, increased cases of reported domestic violence, marital distress, and a disproportionate spike in suicide rates and stress levels during the pandemic have been reported (Abdullah, 2020; Dorall, 2020; Togoh, 2020). Amidst these extraneous circumstances, culture appear to play a paradoxical role in shaping the communal cognition (“Why it happened?”) and responses (“What should we do about it?”) toward Covid-19.

In response to pandemics, different strategies have been used with limited success. However past and present frameworks or models have failed to provide lasting solutions in terms of coping with the pandemics specifically in countries which are resource strained like Zimbabwe (Litman, 2020).

Globally the vaccination program against COVID 19 from health centers was believed to be the most effective way of trying to minimize the spread of the disease (siyamombe,2018) but the question still remains the same "were all people managed to adhere to the vaccination program and was they useful to them?"

Public health policies namely use of masks, banning of gatherings, social distancing, curfew, lockdown, closure of schools which were imposed by the health department were said to be only effective on paper and were not even being followed by the majority (Siyambi, 2021; Lurec 2022). People especially in the rural communities preferred the use of indigenous knowledge systems (IKS) as they said that some of the public health policies were against their traditions as well as their social lives. Indigenous knowledge system (IKS) refers to the thoughts and beliefs existing among local indigenous people (Eyong, 2019; Siyambombe, 2020) that transcend generation, including knowledge of indigenous plants, food preservation and disease control (Odero, 2016).

Maniyaka(2019) also addressed the issue of closure of schools as he was against the 2 ideas that are closure of schools as well as the lockdown restriction. Lockdown had many challenges thereby leading to economic meltdown (Mereki 2018) since a lot of people were left jobless thereby failing to feed their families.

III. RESEARCH METHODOLOGY

This paper draws insights from existing literature to demonstrate that current conceptualisations and approaches to coping with pandemics are highly inadequate as statistics on number of deaths indicate, whatever models have been developed did not achieve much in reducing fatalities from the pandemics, especially for

populations in resource constrained environments. Little attention has been given to the role that the indigenous knowledge systems can play from a religious, spiritual and traditional perspective to prevent and deal with cases of pandemics. This study employed a general review of literature on the various strategies adopted by governments across the globe nation to cope with the COVID pandemic. Qualitative content analysis was used. Qualitative content analysis is a research method for the subjective interpretation of the content of a text data through the systematic classification process of coding and identifying themes or patterns (Hsieh & Shannon, 2015; Patton, 2016). Mayring (2002) argues that content analysis uncovers patterns, themes and categories important to social reality.

In order to get relevant articles in on the internet, the researcher used the following study focus related search terms: pandemics, impact of pandemics, pandemic management strategies, response to pandemics, cultural practices in pandemic management, role of culture in pandemic/diseases management, traditional pandemic coping strategies cultural resilience strategies to pandemics, effectiveness of pandemic management strategies among other similar terms. Search terms relating to IKS in coping with pandemics were also entered, including religion, spirituality, religiosity, and religious beliefs. Generally, the study focused on material published between 2010 -2023. Several journal articles were reviewed.

Finally, reference lists of studies that were identified by any of the aforementioned methods were searched for additional relevant studies. A total of 20 articles were utilised. This number is consumerate with content analysis (Nueundorf, 2016; Krippendorff, 2018).

IV. RESULTS: INTERPRETATION AND SYNTHESIS

This study problematizes the utility value of myths and models uncritically 'borrowed' from past experiences and adopted for coping with the COVID pandemic overlooking some communities' lack of access to resources that are regarded as critical for coping from a public health policy perspective and also their cultural embeddedness. Using a qualitative research methodology, the study interrogated the various strategies adopted by government for the nation to cope with the COVID pandemic in Zimbabwe. Results of the study were an unexpected scenario of the predominance of the indigenous knowledge system, the socially constructed nature of community resilience and rejection by local communities of norms and values prescribed as a panacea to the pandemic but perceived by them to be alien and antagonistic to their socio-economic cosmology. Insights from this study assisted in the development of an integrative framework (actionable public health guidelines) for protecting populations in resource constrained environments from the ravages of current and future pandemics.

Predominance of the indigenous knowledge system

Due to economic hardships in Zimbabwe, modern drugs are now out of reach for many poverty-stricken households resulting in most families sorely depending on traditional medicines for their health remedy needs. These herbal medicines throughout the ages have been manipulated for their properties as the first line of defence against various diseases (Asase et al., 2010; Au et al., 2008; Maroyi, 2011, 2013). Literature strongly indicates that traditional medicine over the ages has continued to play a pivotal role in healthcare. Today, as much as 80% of the world's population still depends on traditional medicine for their primary health care needs (Chauhan et al., 2014; Folashade et al., 2012; Hishe et al., 2016; Maroyi, 2013; Shetty, 2010). Thus it can be argued that African traditional herbal medicines still in today's world perform an essential role in satisfying basic health care of traditional communities. Maroyi (2013) asserts that Zimbabwe continues to experience an upsurge in demand for herbal medicines. This asserts the position of traditional medicine at the forefront of disease control especially in third world countries where synthetic drugs are expensive and beyond the reach of many. Herbal medicine is cost effective for poor resource countries such as Zimbabwe (Mafuva & Marima-Matarira, 2014). Thus, this is evidence that drug development from traditional medicine can pay a pivotal role in elevating the livelihoods of many poorer communities globally by providing affordable drugs. Escalating livelihood problems worsened by recurrent droughts, crumbling economy, joblessness and a poor health delivery system have all connived to prompt people to travel and consume traditional herbal medicine in Zimbabwe

Maroyi (2013) clearly indicates a widespread use of traditional medicine in Zimbabwe by both urban and rural communities as the scholar goes on to say that even today many patients are still remain committed to the consumption of African traditional herbal medicine. Thus it can be said that traditional medicine has remained the most affordable and easily accessible source of treatment for many poor communities in Zimbabwe. Evidence presented in literature asserts that many Africans remain pluralistic consumers (consuming both traditional medicine and western medicine) as western medicine has not replaced traditional medicine.

The risk of infection, and death, from pandemics such as Covid-19 was and still is being exacerbated by severe food shortages, perennial job action by medical personal due to poor wages and lack of personal protective equipment. These factors, among others, contributed to a dramatic rise in that is normally experienced with pandemic spread, and high fatality rate in many developing countries. In the past, communities using IKS, were able to manage and survive pandemics that bedevilled livelihoods at the time (Bhebhe & Rukuni, 2020).

Traditionally, collective effort was used, coupled by support received from traditional leaders and spirit mediums. Thus, IKS were used to cure diseases using medicinal plants, taken for granted by the current generation in most communities (Maroyi, 2013; Mafuva & Marima-Matarira, 2014; Bhebhe & Rukuni, 2020).

Rejection by local communities of norms and values prescribed as a panacea to the pandemic.

Evidence from the synthesis of literature point towards the rejection by local communities of norms and values prescribed as a panacea to the pandemic. Generally, especially in African societies and Zimbabwe in particular the modern ways of pandemic management have been perceived to be alien and antagonistic to their socio-economic cosmology. Public health policies namely use of masks, banning of gatherings, social distancing, curfew, lockdown, closure of schools which were imposed by the health department were said to be only effective on paper and were not even being followed by the majority (Siyambi, 2021; Lurec 2022). People especially in the rural communities preferred the use of indigenous knowledge systems (IKS) as they said that some of the public health policies were against their traditions as well as their social lives. Indigenous knowledge system (IKS) refers to the thoughts and beliefs existing among local indigenous people (Eyong, 2019; Siyambombe, 2020) that transcend generation, including knowledge of indigenous plants, food preservation and disease control (Odero, 2016).

Public health policies that were adopted to inform were to a lesser extent appropriate and effective as a lot of people were against them and rather adhered to the use of traditional medicines in curing the pandemic. Literature strongly indicates that traditional medicines over the ages had continued to play a pivotal role in healthcare. Today as much as 80% of the world's population still depends on traditional medicine for their primary healthcare needs (Chauhan 2014; Folashade et al 2018). Thus it can be argued that African traditional herbal medicines still in today's world perform an essential role in satisfying basic health care of traditional communities.

Herbal medicine is cost effective for poor resource countries such as Zimbabwe (Mafuva ,Marima-Matarira 2018) clearly indicates a wide use of traditional medicine in Zimbabwe by both urban and rural communities as the scholar goes on to say that even today many patients remain committed to the consumption of African traditional herbal medicines. Evidence presented in literature asserts that many Africans remain pluralistic consumers (consuming both traditional medicines and Western medicine) as western medicine has not replaced traditional medicine.

Another angle which showed the ineffectiveness and inappropriateness of the public health policies was that the led to the disintegration of families thus affecting the socio-economic way of living. The social impacts of pandemics were devastating, thus in most cases include travel restrictions and closure of schools, markets and sporting activities (Horemovic, 2019). Movement was a challenge and the travel comprising visiting families and friends, carrying goods to the markets were restricted by military checkpoints (Shingende, 2019). The closure of airports and cancellation of flights and other ports of entries affected a lot of peoples travel, livelihoods and family life (Wong &Leung, 2018)

V. DISCUSSION OF RESULTS

Four major themes emerged from the study; the inadequacy of current modern pandemic management in practices dealing with pandemics, IKS used in coping with pandemics, the effectiveness of IKS in coping with pandemics and the need for an integrative approach in the ,management of pandemics. The implications of harnessing IKS in the management of pandemics cannot be over emphasized.

Effectiveness of IKS in coping with pandemics

Pandemics have affected many countries' health systems, and became a significant threat to human security compared to other diseases such as the deadly diseases notably HIV/AIDS, cancer, and diabetes. African governments need to adopt innovative management of the health systems through the inception of IK and herbal medicines to fight the pandemics (Olawale & Olaopa, 2019). Indigenous knowledge (IK) is traditional or local knowledge, an in the area of medicine and healthcare, is used to treat many diseases and ailments inherited from previous generations in human societies without any proper evidence of the effectiveness of the ideas (Mafongoya & Ajayi, 2017). Control of pandemics such as the current COVID-19 have lacked effective vaccines or drugs as such calling for appropriate interventions. Indigenous knowledge has been a source of medicinal agents for thousands of years, as such could help circumvent the threat of pandemics such as COVID-19 (Fokou & Ducos, 2020).

Although IK faced criticism at first, with most doctors and health authorities disregarding the use of IK remedies, the idea gained popularity because most people had seen its effectiveness in the treatment of other diseases such as cancer, and sexually transmitted infections (STIs) (Green, 2012; Ellen & Harris, 2020). The effectiveness of IK remedies in treating other diseases made it well accepted by many people in the treatment of pandemics such as 6he current COVID-19, and the high rate of recoveries from the coronavirus suggested that IK remedies were effective in fighting the coronavirus. The western and orthodox scientific means appeared to have

failed to produce sustainable ideas in controlling the coronavirus as it has taken long to develop a vaccine. The vaccines also fail to show effectiveness as populations continue to be infected, and rely on IK remedies to boost their immunity, and find life again. The Indigenous knowledge system is a local idea rooted in a particular place and can be borrowed to other places by many people but can only be understood by its effectiveness by people in the area it was developed (Ellen & Harris, 2020).

The use of IK is thus of paramount importance in the control of pandemics; it is much more effective than using modern medicines which regard viral diseases as incurable. IK has thus been used to cure viral infections, a good example being use of the *Lippia javanica*, and Neem leaves to control coronavirus in Zimbabwe and Madagascar (Bhebhe & Rukuni, 2021; Khan, 2021) respectively. The use of orthodox scientific ideas need not be side-lined because there is need to have them integrated with IK, or vice versa to improve its effectiveness (Mafongoya & Ajayi, 2017).

Integration of IKS and modern medicines: The proposed integration framework

Integration of IKS and modern medicines can be a good move for most rural people who are resource poor and not able to raise funds to buy full package of modern-day medicines. IKS medicines contain various chemicals which play a major role in fighting against pandemics such as the current COVID-19. A good example is the use of Zumbani which contain zinc and vitamin C which are major micro-nutrients to fight against viruses (Mafongoya & Ajayi, 2017). Taking up tablets like Azithromycin and integrate with Zumbani may speed up fight against the virus reducing days to recovery.

To improve the use of IK remedies and their effectiveness, African governments need to fund the commercialisation of IK in most of these countries as well as improve their use. These remedies can be used to produce tablets that are effective against the virus. Still, there is a need to do laboratory experiments. It can only be done by legalising IK remedies, funding and research (Thomford et al., 2018; Dzobo & Chirikure, 2021). Research in IKS can be central in advancing the effectiveness of IK remedies and medicines used in controlling pandemics such as the current COVID-19.

There is need for 'integrative' medicines in the treatment and control of pandemics such as COVID-19, where indigenous and western 'science' are incorporated. Integration has been adopted to control diseases by some Asian countries such as China in their health systems (Chinese Journal of Integrative Medicine, 2011). It is undisputed that both indigenous and modern methods are vital in the management of pandemics such as COVID-19. IKS and modern methods can be combined in the management of diseases and pandemics. Medicines identified by spirit mediums, diviners and herbalists can be subjected to laboratory tests in order to establish their efficacy. The drugs and vaccines can be distributed to end users through both traditional and modern channels such as herbalists and pharmacies. Integrating IK and scientific methods will help in containing pandemics considering that the majority of African use traditional medicines. Today, as much as 80% of the world's population still depends on traditional medicine for their primary health care needs (Chauhan et al., 2014; Folashade, Omoregie, & Ochogu, 2012; Hishe et al., 2016; Maroyi, 2013; Shetty, 2010). Maroyi (2013) asserts that Zimbabwe continues to experience an upsurge in demand for herbal medicines yet the traditional remedies remain untapped for their economic potential both at domestic and national level. Nkatazo (2010) asserts that about 80% of Zimbabweans still depend on herbal medicine. Herbal medicines are said to be affordable for economically poor countries like Zimbabwe (Mafuva & Marima-Matarira, 2014).

The challenges associated with pandemic vaccines such as the struggle in developing effective COVID-19 vaccines makes it clear that integrating IK and modern science is unavoidable (Tan et al., 2021).

However, despite the purported efficacy of traditional practices of diseases management in developing countries, there remains a lack of systematic information on the prevalence, efficacy and safety of herbal plants used as an intervention (Ghazeeri et al., 2012). In-depth systematic studies to discover and authenticate the ethno-medicinal pharmacological compounds of interest are imperative in order to improve the primary healthcare of local communities (Chipungu et al., 2018; Maroyi & Cheikhoussef, 2015). Thus literature clearly shows that a lot remains to be done in the field of traditional medicine before they become accepted in mainstream medical practice. These studies may provide the break-through in the discovery of novel drugs. Only a few studies have been carried out in a systematic manner (Maroyi, 2013). This is the reason why Maunganidze (2016) suggest that indigenous traditional medicines have been neglected by research at the expense of western based health research.

From the analysis of literature, it can be argued that traditional medicine has great potential in terms of anchoring development of resilient strategies against pandemics as well as drug development. To emphasise the potential such traditional herbal remedies have, Maroyi (2013) further posits that significant levels of global pharmaceutical knowledge such as the discovery of drugs like quinine came as a result of observations made on traditional medical practices. However, in the absence of any scientific proof of their effectiveness, the validity of these remedies remains questionable (Chipungu et al., 2018). In the absence of scientific validation, people remain sceptical to consume these traditional herbal remedies. Thus it can be said that there is still need to conduct studies

to increase the knowledge concerning traditional medicine so that communities globally can benefit immensely from this unexplored resource.

VI. CONCLUSION

Evidence from both extant literature and study findings suggest that IKS can has been a vehicle for diseases management among communities since time immemorial. Thus, it can be concluded from the study findings that IKS can be instrumental in providing sustainable ways of managing pandemics especially for struggling economies like Zimbabwe. The bottom line is that this paper was principally meant to provoke responsible authority in in diseases management as well as communities to become aware and to start thinking of the potential of harnessing their IKS as an alternative form of healthcare in the fight against pandemics such as the current COVID-19 in Zimbabwe. Collaboration between local authority stakeholders, government agencies, businesses and communities is urgently needed. Collaborative policies in pandemic management planning need attention to be more proactive in developing integrated coping strategies taking cognisance of current IKS practices in diseases management.

Findings reveal that current practices are inadequate to deal with the growing frustrations of managing the current COVID-19 pandemic. There is need to revamp current initiatives and inject new thoughts into how these IKS's can be harnessed for an integrative sustainable pandemic management strategies in Zimbabwe. There should also be symbiotic and synergistic solutions involving all stakeholders on strategy to manage pandemics. This is a sine qua non for establishing effective strategy system for managing pandemics in resource constrained countries like Zimbabwe.

VII. IMPLICATIONS FOR FURTHER RESEARCH

The fact that the aspects touched are not exhaustive, at least in the case of Zimbabwe, implies that authorities and communities still have a very broad field in which to select effective IKS or practices which need to be reinforced in the pursuit of sound and sustainable pandemic management strategies. Thus, there is need to conduct exhaustive studies on current IKS or practices so that they can be mainstreamed to reinforce modern practices of pandemic management.

REFERENCE LIST

- [1]. Powers, J.H., & Xiao, X. (2008). *The Social Construction of SARS. Studies of a Health Communication Crisis*. John Benjamin Publishing Company.
- [2]. Ahmadi, I., Habel, J., Jia, M., Lee, N. and Wei, S., 2021. Consumer stockpiling across cultures during the COVID-19 pandemic. *Journal of International Marketing*, p.1069031X211037590.
- [3]. Ahmed, M.S., Coulibaly, D., Karanfil, F., Kinani, H., Moreno, A.B., Omgba, L.D. and Vu, N., 2020. Impact of the covid-19 pandemic on migrant workers in the informal sector and spin-off effects in their destination and home countries. *T20 Saudi Arabia*.
- [4]. Alonge, O., Sonkarlay, S., Gwaikolo, W., Fahim, C., Cooper, J.L. and Peters, D.H., 2019. Understanding the role of community resilience in addressing the Ebola virus disease epidemic in Liberia: a qualitative study (community resilience in Liberia). *Global Health Action*, 12(1), p.1662682.
- [5]. Amusan, O. O. G. , Sukati, N. A. , Dlamini, P. S. , & Sibanze, F. G. (2010). Some Swazi phytomedicines and their constituents. *African Journal of Biotechnology* , 6 , 267–272
- [6]. Asase, A. , Akwetey, G. A. , & Achel, D. G. (2010). Ethnopharmacological use of herbal remedies for the treatment of malaria in the Dangme West District of Ghana. *Journal of Ethnopharmacology* , 129 (3), 367–376.10.1016/j.jep.2010.04.001
- [7]. Au, D. T. , Wu, J. , Jiang, Z. , Chen, H. , Lu, G. , & Zhao, Z. (2008). Ethnobotanical study of medicinal plants used by Hakka in Guangdong, China. *Journal of Ethnopharmacology* , 117 (1), 41–50.10.1016/j.jep.2008.01.016
- [8]. Bandura, A., 2006. Toward a psychology of human agency. *Perspectives on psychological science*, 1(2), pp.164-180.
- [9]. Brook, B., Harbeson, D.J., Shannon, C.P., Cai, B., He, D., Ben-Othman, R., Francis, F., Huang, J., Varankovich, N., Liu, A. and Bao, W., 2020. BCG vaccination–induced emergency granulopoiesis provides rapid protection from neonatal sepsis. *Science Translational Medicine*, 12(542), p.eaax4517.
- [10]. Chauhan, N. S. , Sharma, V. , Dixit, V. , & Thakur, M. (2014). A review on plants used for improvement of sexual performance and virility. *BioMed Research International* .
- [11]. Chipungu O, Mamimine PW, Chitindingu K (2018) A situational analysis of health tourism for the appropriation of indigenous herbal sexual stimulants and fertility enhancers in Zimbabwe. A situational analysis papers. *Cogent Social Sciences Journal* 4: pp. 1440498.
- [12]. Chirombe, T., Benza, S., Munetsi, E., & Zirima, H. (2020). Coping mechanisms adopted by people during the COVID-19 lockdown in Zimbabwe. *Business Excellence and Management*, 10 (5), 1-8.
- [13]. Congressional Research Service (2020). *Global Economic Effects of Covid 19*. Retrieved from: www.crs.gov.org 11 August 2020
- [14]. Dahab, M., Van Zandvoort, K., Flasche, S., Warsame, A., Ratnayake, R., Favas, C., Spiegel, P.B., Waldman, R.J. and Checchi, F., 2020. COVID-19 control in low-income settings and displaced populations: what can realistically be done?. *Conflict and health*, 14(1), pp.1-6.
- [15]. Duan, L. and Zhu, G., 2020. Psychological interventions for people affected by the COVID-19 epideDijkstra, J.M., Frenette, A.P. and Dixon, B., 2021. Most Japanese individuals are genetically predisposed to recognize an immunogenic protein fragment shared between COVID-19 and common cold coronaviruses. *F1000Resea*
- [16]. Folashade, O. , Omoregie, H. , & Ochogu, P. (2012). Standardization of herbal medicines—A review. *International Journal of Biodiversity and Conservation* , 4 (3), 101–112.
- [17]. Folayan, M. and Brown, B., 2015. Ebola and the limited effectiveness of travel restrictions. *Disaster medicine and public health preparedness*, 9(1), pp.92-92.

- [18]. Ghazeeri, G. S. , Awwad, J. T. , Alameddine, M. , Younes, Z. M. , & Naja, F. (2012). Prevalence and determinants of complementary and alternative medicine use among infertile patients in Lebanon: A cross sectional study. *BMC Complementary and Alternative Medicine* , 12 (1), 129.
- [19]. Hishe, M. , Asfaw, Z. , & Giday, M. (2016). Review on value chain analysis of medicinal Plants and the associated challenges. *Journal of Medicinal Plants Studies* , 4 (3), 45–55.
- [20]. Hsieh, H.-F. , & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research* , 15 (9), 1277–1288.10.1177/1049732305276687
- [21]. Hung, I.F., To, K.K., Chan, J.F., Cheng, V.C., Liu, K.S., Tam, A., Chan, T.C., Zhang, A.J., Li, P., Wong, T.L. and Zhang, R., 2017. Efficacy of clarithromycin-naproxen-oseltamivir combination in the treatment of patients hospitalized for influenza A (H3N2) infection: an open-label randomized, controlled, phase IIb/III trial. *Chest*, 151(5), pp.1069-1080.
- [22]. Kumar, S., Quinn, S.C., Kim, K.H., Daniel, L.H. and Freimuth, V.S., 2012. The impact of workplace policies and other social factors on self-reported influenza-like illness incidence during the 2009 H1N1 pandemic. *American Journal of Public Health*, 102(1), pp.134-140.
- [23]. Kumar, S., Quinn, S.C., Kim, K.H., Daniel, L.H. and Freimuth, V.S., 2012. The impact of workplace policies and other social factors on self-reported influenza-like illness incidence during the 2009 H1N1 pandemic. *American Journal of Public Health*, 102(1), pp.134-140.
- [24]. Kumar, S. , Dobos, G. J. , & Rampp, T. (2016). The significance of ayurvedic medicinal plants. *Journal of Evidence-Based Complementary & Alternative Medicine* , 22 (3), 494–501.
- [25]. Kurman, J. and Hui, C., 2011. Promotion, prevention or both: Regulatory focus and culture revisited. *Online Readings in Psychology and Culture*, 5(3), pp.1-16.
- [26]. Lavell, A., Mansilla, E., Maskrey, A. and Ramirez, F., 2020. The Social Construction of the COVID-19 pandemic: disaster, risk accumulation and public policy. *Red de estudios sociales en Prevención de desastres en América Latina (LA RED)*.
- [27]. Lin, L., McCloud, R.F., Bigman, C.A. and Viswanath, K., 2016. Tuning in and catching on? Examining the relationship between pandemic communication and awareness and knowledge of MERS in the USA. *Journal of Public Health*, 39(Moss, R.B., 2012. 2009H1N1 influenza in immunocompetent and immunocompromised patients. *Infectious Diseases: Research and Treatment*, 5, pp.IDRT-S9226.2), pp.282-289.
- [28]. Litman, T., 2020. Pandemic-resilient community planning. *Victoria Transport Policy Institute.rch*, 10.mic. *The lancet psychiatry*, 7(4), pp.300-302.
- [29]. Liu, J., Kamarudin, K.M., Liu, Y., Zou, J. and Zhang, J., 2022. Developing a Behavior Change Framework for Pandemic Prevention and Control in Public Spaces in China. *Sustainability*, 14(4), p.2452.
- [30]. Lucey, D.R. and Gostin, L.O., 2016. The emerging Zika pandemic: enhancing preparedness. *Jama*, 315(9), pp.865-866. Maurice, J., 2016. Cost of protection against pandemics is small. *The Lancet*, 387(10016), p.e12.
- [31]. Mafuva, C. , & Marima-Matarira, H. T. (2014). Towards professionalization of traditional medicine in Zimbabwe: A comparative analysis to the South African policy on traditional medicine and the Indian Ayurvedic system. *International Journal of Herbal Medicine* , 2(2 Part C), 154–161.
- [32]. Maroyi, A. & Cheikhoussef, A. (2015). A comparative study of medicinal plants used in rural areas of Namibia and Zimbabwe.
- [33]. Maroyi, A. (2011). An ethnobotanical survey of medicinal plants used by the people in Nhema communal area, Zimbabwe. *Journal of Ethnopharmacology* , 136 (2), 347–354.10.1016/j.jep.2011.05.003
- [34]. Maroyi, A. (2013). Traditional use of medicinal plants in south-central Zimbabwe: Review and perspectives. *Journal of Ethnobiology and Ethnomedicine* , 9 (1), 31.10.1186/1746-4269-9-
- [35]. Maunganidze, L. (2016). A moral compass that slipped: Indigenous knowledge systems and rural development in Zimbabwe. *Cogent Social Sciences* , 2 (1), 1266749.
- [36]. Maurice, J., 2016. Cost of protection against pandemics is small. *The Lancet*, 387(10016), p.e12.
- [37]. Mayring, P. (2000). Qualitative content analysis. *Forum: Qualitative Social Research* , 1 (2). Retrieved July 28, 2008, from <http://217.160.35.246/fqs-texte/2-00/2-00mayring-e.pdf>
- [38]. Nabarro, D. and Wannous, C., 2016. The links between public and ecosystem health in light of the recent Ebola outbreaks and pandemic emergence. *EcoHealth*, 13(2), pp.227-229.
- [39]. Navarro, J.A., Kohl, K.S., Cetron, M.S. and Markel, H., 2016. A tale of many cities: a contemporary historical study of the implementation of school closures during the 2009 pA (H1N1) influenza pandemic. *Journal of health politics, policy and law*, 41(3), pp.393-421.
- [40]. Nkatozo, L. (2010, March 5). 80% of Zimbabwe uses traditional medicine. *Newspaper, The Zimbabwean*.
- [41]. Nuzzo, J.B., Meyer, D., Snyder, M., Ravi, S.J., Lapascu, A., Souleles, J., Andrada, C.I. and Bishai, D., 2019. What makes health systems resilient against infectious disease outbreaks and natural hazards? Results from a scoping review. *BMC public health*, 19(1), pp.1-9.
- [42]. Oman, D. and Syme, S.L., 2018. Social and community-level factors in health effects from religion/spirituality. *Why Religion and Spirituality Matter for Public Health*, pp.81-110.
- [43]. Patton, M. Q. (2002). *Qualitative research and evaluation methods* . Thousand Oaks, CA: Sage.
- [44]. Poon, W.C., Brown, A.T., Direito, S.O., Hodgson, D.J., Le Nagard, L., Lips, A., MacPhee, C.E., Marenduzzo, D., Royer, J.R., Silva, A.F. and Thijssen, J.H., 2020. Soft matter science and the COVID-19 pandemic. *Soft matter*, 16(36), pp.8310-8324.
- [45]. Prieto, D. and Das, T.K., 2016. An operational epidemiological model for calibrating agent-based simulations of pandemic influenza outbreaks. *Health care management science*, 19(1), pp.1-19.
- [46]. Qiu, W., Rutherford, S., Mao, A. and Chu, C., 2017. The pandemic and its impacts. *Health, culture and society*, 9, pp.1-11.-2146.
- [47]. Rewar, S., Mirdha, D. and Rewar, P., 2015. Treatment and prevention of pandemic H1N1 influenza. *Annals of global health*, 81(5), pp.645-653. Young, J., Pritchard, R., Nottle, C. and Banwell, H., 2020. Pets, touch, and COVID-19: Health benefits from non-human touch through times of stress. *J. Behav. Econ. Policy*, 4, pp.25-33.
- [48]. Roger, K. and Hatala, A.R., 2021. Chronicity, mental wellness, and spirituality: An introduction. *Spiritual, Religious, and Faith-Based Practices in Chronicity*, pp.1-15.
- [49]. Ross, A.G., Olveda, R.M. and Yuesheng, L., 2014. Are we ready for a global pandemic of Ebola virus?. *International Journal of Infectious Diseases*, 28, pp.217-218.
- [50]. Sewani-Rusike, C. R. (2010). Plants of Zimbabwe used as anti-fertility agents. *African Journal of Traditional, Complementary and Alternative Medicines* , 7 (3).
- [51]. Shetty, P. (2010). Integrating modern and traditional medicine: Facts and figures, science and development network. Retrieved September 3, 2017, from [Google Scholar]

- [52]. Ting, R.S.K., Aw Yong, Y.Y., Tan, M.M. and Yap, C.K., 2021. Cultural responses to COVID-19 pandemic: religions, illness perception, anHsu, E., 2021. Lessons learnt from a pandemic: outline. *Journal of the Anthropological Society of Oxford Online*, 13(1).d perceived stress. *Frontiers in psychology*, p.2815.
- [53]. Ting, R.S.K., Aw Yong, Y.Y., Tan, M.M. and Yap, C.K., 2021. Cultural responses to COVID-19 pandemic: religions, illness perception, and perceived stress. *Frontiers in psychology*, p.2815.
- [54]. Troncoso, A., 2016. Zika threatens to become a huge worldwide pandemic. *Asian Pacific Journal of Tropical Biomedicine*, 6(6), pp.520-527.
- [55]. Varma, J., Maeda, J., Magafu, M.G. and Onyebujoh, P.C., 2020. Africa Centres for Disease Control and Prevention is closing gaps in disease detection. *Health security*, 18(6), pp.483-488.
- [56]. Verikios, G., Dixon, P.B., Rimmer, M.T. and Harris, A.H., 2015. Improving health in an advanced economy: An economywide analysis for Australia. *Economic Modelling*, 46, pp.250-261.
- [57]. World Health Organization . (2008a). Traditional Medicine. Fact Sheet No. 134. Revised December 2008: WHO, USA.
- [58]. UNDP. (2020). Policy Brief: A Preliminary Assessment of the Socio-Economic Impact of Coronavirus (Covid 19) on Zimbabwe-No.0011 (2020).
- [59]. UNICEF (2020, March 2020). Risk Communication and Community Engagement for Covid 19 Engaging With Children and Adults with Disabilities. www.unicef.org
- [60]. WHO (2020) WHO Strategic Plan for Pandemic Influenza. World Health Organisation
- [61]. WHO (2020). Covid 19 Strategy Update. World Health Organisation
- [62]. World Bank (2020). Covid 19 Strategic Preparedness and Response Programme and Proposed 25 Projects under Phase 1. Using the Multiphase Programmatic Approach.