African beliefs and citizens' disposition towards COVID-19 vaccines: The belief guided choices

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Abstract

The emergence of COVID-19 virus at the onset of the year 2020 brought a global catastrophe, with countries that have the strongest health delivery systems being some of the hardest hit. With the cure seemingly not in sight, nations have pinned their hopes on the development of vaccines. Whilst most developed nations have embarked on mass vaccination of citizens, largely due to their ability to manufacture vaccines, the African continent has lagged behind. This paper, which is based on literature and documentary survey, explores the implications of African beliefs and related factors on the uptake of the COVID-19 vaccines, as well as articulating on how the governments can avert the consequences of belief guided negative perceptions on successful rollout of the COVID- 19 vaccination. The paper reveals that religious and cultural beliefs that do not subscribe to vaccination are the main drivers to vaccine hesitancy. Conspiracy theories surrounding the origins of the COVID-19 virus and social media misinformation have also heightened suspicion and mistrust over the efficacy of the vaccines. The paper recommends mass public awareness, community engagement, countering misinformation and exemplary leadership as prescriptive measures for vaccine hesitancy in Africa.

Keywords: Africa, COVID-19, cultural beliefs, religious beliefs, vaccine

Introduction

The COVID-19 disease has become the most potent pandemic to affect humanity since the beginning of the 21st century. Since the discovery of the disease in China's Wuhan City in December 2019, the virus has infected over 117 million people, leading to over 2.5 million fatalities across the globe (Worldometer, 2021). As of the 20th of February 2021, Africa had 3.8 million confirmed COVID-19 cases, though there have been concerns over underreporting on the African continent (Dzinamarira et al, 2021). The urgent need to deal with the pandemic has been necessitated by its impact on economies, social systems, physical and psychological wellbeing, and the overall health delivery systems of nations. At the early stages of the pandemic, nations took drastic measures such as shutting the countries' borders, implementing lockdowns which restricted citizens' movements, and enforcing mandatory testing and quarantine. Most African nations embraced these drastic measures as the most viable option, largely due to the perennial vaccine development challenges on the African continent, and the need to prevent a health catastrophe, especially given the fragile health delivery systems in most African countries. However, these drastic measures yielded unintended consequences such as acute economic challenges, socio-economic inequalities, mental health challenges, and overwhelming the health delivery systems (Dzinamarira et al, 2021). Whilst these measures were critical to stop the virus from spreading, the huge economic impacts, coupled with a continual rise in the cases, resulted in nations abolishing stringent restrictive measures. Most nations have now accepted the reality that people will have to live with COVID-19 virus for a prolonged period.

Given the absence of treatment for COVID-19, nations have pinned their hopes on vaccine development. Moreover, vaccination is a critical intervention during periods of disease outbreaks and pandemics. Though the process took long, developed nations took a leading role in developing COVID-19 vaccines, largely due to their capacity in terms of resources. To date, several vaccines have been developed and among them are Pfizer-BioNTech, Moderna, Johnson & Johnson/ Jansen, AstraZeneca and Novavax (Centre for Disease Control and Prevention (CDC), 2021). The vaccine development in these nations was preceded by huge investments in the research and development phases of the vaccines. Given that some of the COVID-19 vaccines have been certified as safe to use, developed nations have embarked on mass vaccination exercises, with the hope of ensuring that all citizens are vaccinated against COVID-19. Despite the fragile health delivery systems that characterise most African countries, Africa has not yet developed a vaccine against COVID-19 and has to rely on the vaccines developed in other continents. Importantly, African nations have also planned mass vaccination of citizens against COVID-19, with several nations having begun the planning for this mass vaccine roll-out. On a continental level, "the African Union had secured 1.27 billion doses of COVID-19 vaccines for the continent"

as of February 2021, with five countries having begun vaccination programmes (Samarasekera, 2021: 324).

Notwithstanding the need for mass vaccination against the COVID-19 virus, the success of the vaccine lies with the people's level of acceptance. This brings to the fore "vaccine hesitancy" as an impediment to the mass vaccine roll-out. Vaccine hesitancy is the reluctance to accept available vaccines (Ekwebelem, 2021; MacDonald, 2015). Vaccine hesitancy was listed by the World Health Organisation (WHO) as one of the top health threats in 2019 (WHO, 2019). Moreover, as early as mid 2020, public health experts had expressed concerns over COVID-19 vaccine hesitancy (Khunchandani et al, 2021). Whilst vaccine hesitancy has also been noted in developed nations, the African continent has been associated with high incidents of vaccine hesitancy. In a December 2020 study on the global attitudes on COVID-19 vaccine, it was noted that countries such as Australia, Brazil, China, United Kingdom and Mexico had a vaccine acceptance rate of above 75%, whilst South Africa had a 53% acceptance rate (Ipsos, 2020). In another South African survey that was conducted between 29 December and 6 January 2021, it was found out that 52% of the respondents indicated that they would definitely take the vaccine if it became available, whilst 14% indicated that they would probably take it (Bohler-Muller et al, 2021). A similar study in Uganda found a 54% acceptance rate for vaccination against COVID-19 (Echoru, et al, 2020). In a preliminary survey that was conducted in Zimbabwe, only 50% of the participants indicated that they would take the COVID-19 vaccine, whilst the other half indicated that they were either unsure (30%) or would reject the vaccine (20%) (Tozivepi et al, 2020). Whilst a research by the African Union Centre for Disease Control (AUCDC) showed that the overall acceptance rate of the COVID-19 vaccine stood at 79%, it is the wide disparity between countries that is a cause for concern. For example, despite a continental average acceptance rate of 79%, countries such as Ethiopia and Niger had an acceptance rate of 65% and 59% respectively (AUCDC, 2020). The low COVID-19 vaccine acceptance levels in Africa have been largely attributed to a belief system that does not subscribe to vaccination.

In this paper, we explore the implications of African beliefs on the acceptance of COVID-19 vaccines. Factors which have amplified these negative perceptions, such as religious and cultural beliefs, the conspiracy theories surrounding the vaccine, and the role played by social media platforms, are also examined. Finally, we proffer suggestions on how African governments can avert the consequences of belief guided negative perceptions on successful rollout of the COVID-19 vaccination. Though the paper adopts a continental perspective, more emphasis will be on South Africa and Zimbabwe- two neighbouring Southern African nations. While there has been "considerable enthusiasm and anticipation for the COVID-19 vaccine", not much is known about vaccine hesitancy (Khunchandani et al, 2021: 271). The two nations have already commenced their mass vaccine roll-out, with South Africa becoming the first country to receive a million doses of AstraZeneca/ Oxford

COVID-19 vaccine (Dzinamarira et al, 2021). For Zimbabwe, the first delivery of a Chinese manufactured vaccine- Sinopharm was on the 15th of February, and the vaccination roll-out commenced on the 18th of February. This paper gives relevant context-specific information regarding the challenges that will impede the control of a global pandemic on the African continent. The paper also focuses on a continent that has been characterised by weak health delivery systems and a host of other disease outbreaks. Importantly, the paper also adds to the growing body of knowledge on the control of a global health catastrophe.

Background to health delivery systems in Africa

Whilst the impacts in terms of fatalities and infections have been high in continents such as Europe, America and Asia, there has been a gradual rise of infections and deaths in Africa, with South Africa leading in terms of infections and fatalities. The prevailing macro-economic challenges in most African nations have diminished African nations' ability to deal with the disease, as nations struggle to fund the health sectors. The impacts of economic challenges on the health delivery systems have largely been felt in Zimbabwe, as evidenced by under-resourced health institutions. On several occasions during the COVID-19 pandemic outbreak, the nation of Zimbabwe had to contend with intermittent protest action by health personnel over a host of challenges such as absence of personal protective equipment, poor remuneration and poor working conditions (Cassim, 2020). Whilst South Africa has a better health delivery system compared to other African nations, the magnitude of pandemic in the nation has overstretched the health facilities.

Many African countries have underlying health vulnerabilities that could make it difficult to deal with COVID-19 (United Nations Economic Commission for Africa (UNECA), 2020). The high HIV/ AIDS prevalence on the continent and high levels of chronic respiratory diseases in certain countries, along with tuberculosis and malnutrition, are a cause for concern (UNECA, 2020). West African nations have been affected by the Ebola virus (John-Langba & John-Langba, 2020), with a resurgence of the virus in some nations during the COVID-19 pandemic. For Zimbabwe, the nation is currently facing water problems in some of its major cities and towns (Mukeredzi, 2020), which is likely to lead to an upsurge in water-borne. Moreover, Zimbabwe is also grappling with a malaria outbreak and recorded 307 deaths between January and May 2020 (UNOCHA, 2020). These underlying health vulnerabilities are likely to overstretch the already limited resources, further dampening the prospects of a focused fight against COVID-19. Of particular importance is also the linkage between health delivery systems and conflicts on the African continent. Nations experiencing conflicts and post conflict nations have fragile health delivery systems, which diminish their ability to deal with the COVID-19 pandemic (John-Langba & John-Langba, 2020).

Given that most African countries have weak and fragile public health systems (Azevedo, 2017), the likelihood of health systems becoming overwhelmed due to the rapid virus spread is high. Moreover, for weak economies that characterise most African nations, prolonged lockdowns will retard economic activities, resulting in reduced revenues for funding health delivery systems. To this end, the answer to the COVID-19 pandemic lies in treatment and vaccination, with the latter being the only viable alternative due to absence of known treatment medicine for the virus. With the vaccine's availability, African nations have been presented "with a unique opportunity in the COVID-19 response" (Dzinamarira et al, 2021: 250). The availability of the COVID-19 vaccines will not only reduce the pandemic, but will also allow nations to lift restrictive measures that had been previously imposed to curb the virus' spread, as well as to revive deteriorating economies (Dzinamarira et al, 2021). Notwithstanding the imperative for vaccination, the African continent has not been able to develop any COVID-19 vaccine at the present moment, and is relying on vaccines from other continents. It is also important to highlight that the COVID-19 vaccination program is regarded as the African continent's largest-ever immunisation exercise, "and people will be asked to get vaccinated voluntarily, possibly in a way that they never have been asked before" (Ekwebelem et al, 2021: 4). However, the question is, "Will all Africans voluntarily accept to get vaccinated?" Contrary to the high acceptance of the COVID-19 vaccines in other continents, the African continent has been characterised by high levels of vaccine hesitancy and this has complicated the efforts to deal with the pandemic.

Push factors for vaccine hesitancy

Vaccine hesitancy is a complex global problem and research has shown that vaccine hesitancy is attributed to a myriad of factors. An analysis of the scope and magnitude of these factors is necessary in order to properly address hesitancy to the COVID-19 vaccine. Most researchers attribute vaccine hesitancy to social, cultural and individual factors which include emotions, norms, values, risk perceptions and beliefs (Dube et al, 2018; Ekwebelem et al, 2021; Larson et al, 2007). Unfavourable social influences have also been regarded by the WHO as the drivers to low vaccine uptake and such influences can "include beliefs about what others in one's social group do, or what they approve and disapprove of" (WHO, 2020: 1). If, for instance, some community members are sceptical about the vaccine and have a conviction against the efficacy of the vaccine, "they will give a negative signal to others who might otherwise be in favour of or neutral towards vaccination" (WHO, 2020:1). The opposite is also true and if majority of the community members are in support of the vaccine, this will yield to a positive signal on community members who may be unwilling to be vaccinated. Other authors attribute vaccine hesitancy to: perceived risks versus benefits of getting vaccinated, certain cultural and religious beliefs and inadequate knowledge about the vaccine (Karafillakis et al, 2017; Sallam, 2021). For Sevin et al (2016) citizens may opt not to get vaccinated for different reasons, and these include: belief that

the vaccine causes illness; belief that there is no need for vaccinating a healthy person; poor attitudes towards vaccines; and lack of trust in the health delivery systems. Other researchers summarise the factors into perceived vaccine safety and efficacy (For example, Barry et al, 2020; Bodeker et al, 2015).

What is particularly important about these factors is that they all morph into a belief system that guides individual decisions about whether to take the vaccines or not. Unlike in other continents, Africa is a multi-cultural continent and this diversity "spreads across different states, nations, races and ethnic groups" (Ekwebelem et al, 2021:1; Ogundele et al 2020). Due to socio-cultural dynamics in Africa, people's beliefs are largely influenced by what others do or what others expect them to do. Thus the complexities that have been brought about by the socio-cultural dynamics have significantly resulted in vaccine hesitancy in Africa. Putting vaccine hesitancy into historical perspective, vaccine hesitancy in Africa has previously been witnessed during the administration of the polio vaccine in Nigeria, immunisation against cholera in Mozambique and vaccination against tetanus in East and West Africa (Ekwebelem et al, 2021). The Ebola vaccination experience in some African nations was characterised by socio-cultural, political and religious resistance (Masumbuko et al, 2019). In Zambia, Pugliese-Garcia et al (2018) noted vaccine hesitancy on cholera vaccination, which they attributed to cultural and religious beliefs. Zimbabwe also witnessed vaccine hesitancy for the measles-rubella vaccination and for other childhood diseases (Mukungwa, 2015)

Drivers to negative African belief systems against COVID-19 vaccines

Given the historical negative perceptions about vaccines on the African continent, the COVID-19 vaccines have also suffered the same concerns over vaccine hesitancy. In this section, we look at the underlying factors that contribute to the African beliefs that do not subscribe to vaccination. The section specifically focuses on religious and cultural beliefs; the conspiracy theories surrounding the origins of COVID-19 and COVID-19 vaccines; the influence of social media; and the attitudes of the government and government servants towards COVID-19 vaccines.

Religious and cultural beliefs

Research has shown that religious and cultural beliefs have a significance influence on vaccine acceptance (Masumbuko et al, 2019; Mukungwa, 2015; Ministry of Health and Child Care (MHCC), 2016). Citizens' sentiments regarding vaccines are a result of divergent and deep-seated beliefs, which emanate from "the tension between divergent cultural viewpoints and value systems" (Jiva-Doko, 2020:1), with most of these cultural beliefs not subscribing to vaccination. Some religious organisations do not subscribe to modern medicine in general, and vaccinations in particular, as these medicines are perceived as dangerous and causing diseases and deaths (MHCC, 2016). The negative perceptions on

vaccines are embedded in the religious beliefs that associate their use to lack of trust in God. They perceive all diseases and health challenges to be having spiritual dimensions. Thus, the spiritualisation of illnesses, in this case COVID-19, reinforces "radical beliefs" that shun modern medical care and vaccines. Religion-based objections to vaccination have also been attributed to ethical dilemmas that characterise the use of "human tissue cells to manufacture vaccines, and the belief that the body is sacred" (Jiva-Doko, 2020:2). In relation to the COVID-19 vaccines, these objections are amplified by the fact that not much is known by the public about the ingredients that are used to manufacture the vaccines.

Religious leaders have also been instrumental in indoctrinating their congregants against receiving COVID-19 vaccines. Given the influence which the religious leaders wield over their followers, their negative sentiments towards the COVID-19 vaccine will sway their congregants' perception about the vaccine. In Zimbabwe, the government at one point had to censure some religious leaders who were preaching against the COVID-19 vaccine, highlighting that only professional health personnel were authorised to speak against the vaccine (Murwira, 2021). In a related incident, one prominent church leader released a 35-minute video denouncing the COVID-19 vaccine, indicating that those who used the vaccine would have long term side effects and would ultimately die (Murwira, 2021). Majority of Zimbabweans, and to a growing extend South Africans, are affiliated to the Apostolic Faith religion and the religion has confidence in rituals such as prayers, holy water, faith healing and prophetic healing. Therefore, affiliation to the Apostolic religion is a significant determinant on the attitude towards COVID-19 vaccine. This is especially true given that the Apostolic Faith community in Zimbabwe comprise about a third of the population, and the community is known to have poor health seeking behaviour, including vaccine acceptance (Dzinamarira et al, 2021; Mapingure, et al, 2021). Anti-vaccine sentiments have also been expressed by some religious leaders in South Africa, as reported in various media platforms. Recently, a prominent preacher spoke publicly against the COVID-19 vaccine and rallied his followers against accepting the vaccine (Dzinamarira et al, 2021). The influence of these religious leaders in shaping societal beliefs should not be ignored.

Closely linked to religious beliefs, cultural beliefs also contribute to vaccine hesitancy (Pugliese-Garcia et al, 2018). Given the citizens' lack of trust in the COVID-19 vaccines due to various reasons, citizens have turned to cultural practices to deal with the COVID-19 pandemic. One common cultural practice that has withstood the test of time is steaming. Though not backed by scientific evidence, most Africans have come to accept that steaming can be used for both the prevention and treatment of COVID-19. In Zimbabwe, there has also been a widely accepted belief that snuff tobacco (fine tobacco that is sniffed through the nose) can treat COVID-19 by causing an individual to sneeze, thereby clearing the respiratory tract. This snuff tobacco has huge cultural significance in Zimbabwe. However, as with steaming, the practice is not backed by any scientific investigation. There

has been widespread belief that traditional herbs such as "zumbani" (*lippia javanica*) are effective for preventing and treating COVID-19, and the herb is now being sold in many large retail outlets in Zimbabwe.

Conspiracy theories surrounding the origins of COVID-19 and the COVID-19 vaccine

The COVID-19 pandemic has been associated with various conspiracy theories and these conspiracy theories have not only shaped millions of people's beliefs about the virus but have also affected vaccination intentions (Bertin et al, 2020). Conspiracy theories are defined as "attempts to explain the ultimate causes of significant social and political events and circumstances with claims of secret plots by two or more powerful actors" (Douglas et al, 2019:4). Such beliefs largely exist during social crises situations, which are periods of increased collective uncertainty and fear (Bertin et al, 2020). The COVID-19 pandemic has provided a fertile ground for conspiracy beliefs to flourish, and the COVID-19 conspiracy beliefs have been characterised by misinformation. Research has shown a negative relationship between conspiracy theories and attitude towards scientific medicine (Bertin et al, 2020; Lamberty & Imhoff, 2018). This conspiracy mentality is also linked to a "preference for alternative medicines over evidence based, biomedical treatments" (Bertin et al, 2020:2; Lamberty & Imhoff, 2018). To this end, despite the medically validated efficacy of the COVID-19 drugs, most Africans would rather use alternative medication, even if it's traditional medicine, than to take COVID-19 vaccines. Compounding the conspiracy theories are the remarks by French researchers that "candidate vaccines should be tested first in Africa", and these remarks were "met with widespread outrage and accusations of racism" (Bhopal & Nielson, 2021:114). Though the researchers later apologised, "the damage to confidence in COVID-19 research on the continent may be difficult to repair" (Bhopal & Nielson, 2021:14).

Whilst the conspiracy theories surrounding COVID-19 origins and COVID-19 vaccine have trended across the whole globe, it is on the African continent that the theories have been taken seriously. A wide range of misinformation has been circulating to the effect that COVID-19 vaccines "will be used to moderate the rising global population, inject microchips to track people people's daily lives" (Ekwebelem et al, 2021:4; Johnson et al, 2020), and "spread COVID-19 across Africa, where COVID-19 case loads have been unexpectedly low" (Ekwebelem et al, 2021:4). There have also been conspiracies as regards the origins of the COVID-19 virus, with one of the theories pointing to the fact that COVID-19 is a bacteriological weapon (Bertin et al, 2020), whist another theory, which widely trended, is the opinion that COVID-19 was a result of 5G technology. A survey by the African Centre for Disease and Control found out that many Africans believed that COVID-19 was a "planned event by foreign actors", and Africans are being used "as guinea pigs in vaccine trials" (Samarasekera, 2021:324). Because of these unsubstantiated conspiracy theories most Africans have grown to have negative perception on anything pertaining to the COVID-19 pandemic and the COVID-19 virus, with some Africans believing that the African

continent is just a victim of global geopolitics and power play. Consequently, endorsement of these conspiracy beliefs will breed negative attitudes towards the COVID-19 vaccines. Given that China was implicated in some of the conspiracy theories, this could have possibly led to heightened vaccine hesitancy among Zimbabweans, who had to be vaccinated using a Chinese manufactured COVID-19 vaccine- Sinopharm at the initial phases of mass vaccine rollout.

Social media and misinformation

Whilst social media is frequently used to disseminate vaccine-related information, it has also provided easy access to incorrect information and misinformed opinions along with denial of scientific studies (Nuzhath et al, 2020). Social media platforms have been instrumental in the spread of misinformation about the COVID-19 vaccine and such misinformation has also strengthened negative perceptions about the COVID-19 vaccines on the African continent. Misinformation and negative sentiments are highly contagious and can potentially reduce vaccine uptake rates (Salathe et al, 2013). The impact of media misinformation on vaccine roll-out is not a new phenomenon in Africa, Ebola vaccine trials had to be halted in Ghana, "in response to media accusations that researchers were infecting participants with Ebola" (Bhopal & Nielsen, 2021:114; Kummervold et al, 2017). Moreover, most researchers have contended that misinformation on various social media platforms is to blame for the mistrust and suspicion around COVID-19 vaccines in Africa (for example, Burki, 2020; Samarasekera, 2021). A survey on social media anti-vaccine movement by the Centre for Countering Digital Hate (CCDH) established that "31 million people follow anti- vaccine groups on Facebook, with 17 million people subscribing to similar accounts on YouTube" (Burki, 2020:504). The growing anti-vaccine movement could negatively impact on the roll-out of any future COVID-19 vaccine, and this problem compounded by the continued hosting of known misinformation content about the COVID-19 vaccines (Burki, 2020).

The influence of social media on vaccine acceptance has been multi-pronged. For example, social media has become the platform for spreading conspiracy theories that have been discussed in the preceding section. Anti-vaccine sentiments by prominent religious leaders are also being spread through social media platforms such as YouTube and Facebook. Lastly, social media platforms are being used to spread false information about the effects of COVID-19 vaccines. As regards the misinformation about the vaccine side effects in Zimbabwe, the Sinopharm vaccine was at the receiving end on most social media sites. One post that trended on most social media platforms had a heading, "China's Sinopharm vaccine most unsafe in the world with 73 side effects". One of the side effects that were noted in the post entailed loss of vision. Despite efforts by the government to dispel the misinformation, the damage had already been done, especially given the fact that most Zimbabweans are now relying on social media platforms for news.

Government and government employees' attitude towards the vaccine

The attitude of the government and key government employees towards the COVID-19 vaccines has significant influence in shaping the citizens' beliefs towards the vaccine. One classical case is the halting of the roll-out of AstraZaneca/ Oxford vaccine at the early roll-out stages in South Africa due to concerns over the vaccine efficacy (Fihlani, 2021). The roll-out was halted in February after the release of results that showed the vaccine had low efficacy against the 501Y.V2 variant which is common in South Africa (Dzinamarira et al, 2021; Heywood, 2021). Whilst the government may have been taking a cautionary approach to COVID-19 vaccination, the halt in the vaccine roll-out further diminished "public trust in COVID-19 vaccinations, as an impression was generated that vaccines may not be effective after all" (Dzinamatira et al, 2021:3). In Zimbabwe, the onset of the vaccine roll-out was characterised by negative sentiments from some government officials and opposition political leaders. For example, in a tweet that was received with mixed feelings, a government spokesperson posted the following tweet;

> "As earlier announced, the lockdown has been extended by 2 more weeks. Priority of the vaccine will be given to essential workers. *Tikakuona mutown tikukubaya* experimental injection. *Handi uri* essential worker *here* (translated to: if we see you in town, we will inject you with an experimental injection since you regard yourself as an essential worker)". Posted: 16 February 2021 at 12:00PM.

Though the tweet could have been posted in jest, the tweet heightened the already simmering public hostility towards the COVID-19 vaccine. In Zimbabwe, there are media reports that thousands of nurses and other health workers in public hospitals are reportedly refusing to be vaccinated against the COVID-19 virus using the Sinopharm vaccine due to fears of side effects (Pindula News, 2021). This is largely attributed to lack of adequate information regarding the vaccine. Given the significant role that the health workers play in the whole vaccine roll-out process, their hesitancy in taking the vaccine will send negative signals to the ordinary citizens, who look up to the health workers on health related choices. In an incident that received global media coverage in South Africa, the Chief Justice, who is also a devout Christian, prayed against what he termed "Satanic" COVID-19 vaccines. Given his stature as a top public servant, his sentiments had a bearing not only among South African but other African citizens' perceptions about the COVID-19 vaccines. Moreover, concerns quickly arose, especially given that new medical interventions have often been controversial, "that people might avoid vaccination as a result of the comments" (Reuters, 2020).

Dealing with vaccine hesitancy in Africa

Whilst the vaccine roll-out in most African nations is yet to go into full-swing, it is important to address the belief induced hurdles that will impede the vaccine roll-out on the continent. In dealing with belief-induced vaccine hesitancy in Africa, solutions should focus

on addressing the religious and cultural beliefs, the misinformation and the attitude of public servants towards the vaccine- issues that have been discussed in the preceding discussion. We discuss four ways of dealing with vaccine hesitancy in Africa, namely: Mass public awareness; community involvement; countering misinformation; and exemplary leadership.

Mass public awareness

Given that most of the sentiments against the COVID-19 vaccines are due to lack of adequate information about the efficacy of the vaccines, mass public awareness becomes imperative. Mass public awareness campaigns should be grounded on a sound understanding of why people reject vaccines, as "this will help identify types of effective communication and awareness campaigns that might successfully convince people to accept vaccination services" (Ekwebelem et al, 2021:4). Popular social media sites should be used by governments to raise public awareness on the benefits of taking the COVID-19 vaccines. There should be development of awareness campaign material that is specifically tailored to social media users, "and the use of emotive language and imagery, may also help raise COVID-19 vaccine awareness" (Dzinamarira et al, 2021:7; Puri et al, 2020). Traditional media platforms such as television, radio, newspapers and magazines will also be of substantial value in reaching the citizens with information pertaining to the COVID-19 vaccines (Dzinamarira et al, 2021). In order to augment the social media and traditional media's role in mass public awareness, vaccinators and healthcare providers also need to be equipped with good interpersonal communications skills to address "trust issues that might prevent vaccination compliance in communities" (Ekwebelem et al, 2021:4).

Community engagement

Community engagement offers "a promising approach to addressing COVID-19 vaccine hesitancy" (Afolabi & Ilesanmi, 2021:4). The engagement of influential members of society, such as religious leaders, traditional leaders and musicians should be prioritised (Dzinamarira et al, 2021), as these influential people play a significant role in shaping society's beliefs regarding the COVID-19 vaccines. African nations such as Nigeria, Ghana, South Africa and Zimbabwe are characterised by prominent religious leaders who draw large numbers of followers and as earlier highlighted, their influences over their followers may be counter to vaccine acceptance. Therefore, there should be efforts to enlighten these mega-preachers in order to ensure that "they spread the correct information about the COVID-19 vaccines to their followers" (Dzinamarira et al, 2021:7). Also, given the influence that traditional leaders, civil-based organisations and community health workers play in moulding societal beliefs, they should also be engaged prior to mass vaccine roll-out (Afolabi & Ilesami, 2021). Community mobilisation in this regard is aimed at aimed at achieving two goals: first, to correct the misinformation on the COVID-19 vaccine and ensure health education on the benefits of the COVID-19 vaccine; and second, to necessitate an increased uptake of all the COVID-19 vaccines when they become available

(Ilesanmi & Afolabi, 2020). Moreover, community participation will also "enhance planning for the structure and modalities for making vaccines available in each African setting, and enable location of vaccine collection points in community-wide acceptable areas" (Afolabi & Ilesami, 2021:4; Ilesanmi & Afolabi, 2020).

Countering misinformation

Whilst the media should play an instrumental role in mass awareness campaigns, the platforms should also be used to dispel all the misinformation about the COVID-19 vaccines. It is also important to highlight the importance of dispelling misinformation through the same platforms that were used to propagate the misinformation. To this end, if social media platforms are the main spreaders of misinformation about the COVID-19 vaccines, the same platforms should be used to dispel the misinformation and to disseminate accurate information. Media partnerships should also be strengthened so as to control inaccurate and hazardous media content, and to disseminate credible information targeted to promote uptake of COVID-19 vaccines (Nuzhath et al, 2020).

Exemplary leadership

The national political leadership needs to play a key role in the promotion of the COVID-19 vaccine uptake. This is especially true given Nuzhath et al (2020)'s averment that vaccine related conspiracy theories and misinformation gains traction when key societal leaders spread them. The converse is true and when the political leadership shows its support for the vaccine, vaccine acceptance will also gain traction amongst communities. The national leadership's support for vaccination is needed during the initial phases of the vaccine roll-out campaigns. They should not only preach about the benefits of vaccination, but they should walk the talk by receiving their vaccine jabs in full view of ordinary citizens. This move, which has been embraced in most developed countries, where the presidents would be the first persons to receive the vaccines, will convince ordinary citizens about the efficacy of the vaccines.

Conclusions

Despite low infection and mortality statistics as compared to other continents, the African continent has suffered huge socio-economic costs due to the COVID-19 pandemic. The COVID-19 pandemic also comes at a time when most African nations are characterised by fragile health delivery systems. In the absence of known treatment for COVID-19 virus, Africans governments have pinned their hopes on various COVID-19 vaccines that have been developed in other continents. However, mass vaccine roll-out has been hampered by belief-induced hesitancy among African citizens. Religious and cultural beliefs which do not subscribe to vaccination have derailed the efforts to curb the COVID-19 pandemic through mass vaccination of citizens. These beliefs, coupled with unsubstantiated conspiracy theories surrounding the origins of COVID-19 and the COVID-19 vaccine, have

been amplified through various social media platforms. Moreover, negative attitudes by African governments and key public servants about the COVID-19 vaccines have also heightened the African citizens' negative perceptions about the COVID-19 vaccines. What is particularly strange is that most Africans who do not subscribe to vaccination fear the COVID-19 vaccine more than the COVID-19 virus itself. To this end, African governments find themselves in a dilemma of having to deal with the deadly pandemic amidst a hesitant population. Mass public awareness campaigns, community engagements, countering misinformation and exemplary leadership are some of the strategies that can be used to improve the citizens' perceptions about the COVID-19 vaccines.

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