Public Perceptions of COVID 19 Vaccine Efficacy among Urban Dwellers in Tanzania - A Case of Temeke Municipal

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ABSTRACT

This study focuses on public perceptions of the efficacy of COVID-19 vaccines, among Tanzanians living in urban areas. Specifically, the study examined people's understanding of the COVID-19 pandemic, perceptions of people towards COVID-19 vaccination, socio-economic disparities in COVID-19 vaccine preferences, and mechanisms of coping with the COVID-19 pandemic. The study used both qualitative and quantitative approaches, such that questionnaires, interviews and documentary reviews were used for data collection. Results show that COVID-19-related concerns seemed to have a strong influence on the decision to vaccinate i.e., those who were highly concerned about being infected with the disease, such as the elderly, health workers, and those with chronic diseases - were less likely to refuse the vaccine compared to others. The analysis revealed that there are no large differences between men and women, such that both sexes either support the vaccination as safe, while others oppose it. Moreover, regarding the age of respondents and COVID-19 perceptions, the positive perceptions of the COVID-19 vaccine increase with the age of respondents. The elderly are large supporters of the vaccine compared to the youths. It was revealed that many young people are confident in their health/ body immunities and assume that COVID-19 is within their control, hence they consequently feel they don't need a vaccine. The study observed that occupational and working conditions play a significant role in COVID-19 mortality, particularly in occupations involving contact with patients or the public. However, there is also a substantial contribution from non-workplace factors. The study highlights some of the inputs that could be added to facilitate vaccination processes. The benefits of vaccines still outweigh the risks at present. Government agencies and vaccine developers should continue to take action to encourage vaccination and reduce public vaccine hesitancy. The Government should promote the preventive strategies. In the meantime, the public should not stop wearing masks, just as they did before in the first Covid 19 wave, and should continue taking other precautions, especially in densely populated areas.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

COVID-19 was declared a pandemic by the World Health Organisation in March 2020. As of June 15, 2021, more than 175 million COVID-19 cases, including over 3.8 million deaths, were reported in 221 countries and territories (WHO, 2021). In response to the COVID-19 pandemic, 102 candidate vaccines on 10 platforms are in clinical development, and 15 vaccines have already been licenced or approved for emergency use. International collaborative efforts have accelerated the development of COVID-19 vaccines. As of January 2022, five COVID-19 vaccines – all of which are spike protein based – were given conditional marketing authorisation by the European Commission, based on the scientific opinion of the European Medicines Agency (Harder *et. al.*, 2021): Comirnaty (BNT162b2), Spikevax (mRNA-1273), Vaxzevria (AZD1222), COVID-19 Vaccine Janssen (Ad26.COV 2.5) and Nuvaxovid (NVX-CoV2373). All vaccine products approved in the EU/EEA were initially registered for use in people aged 18 and older, with the exception of Comirnaty (approved for those aged 16 and older). Comirnaty and Spikevax indications were first extended to include children aged 12–15 and 12–17 years, respectively, and subsequently, Comirnaty indications were further extended to include children aged 5–11 years (WHO, 2021).

However, since the introduction of COVID-19 vaccines, there has been an emergence of different public opinions on their efficacy worldwide (Dodd *et al.*, 2021) and Tanzania was not an exception. As of May 9, 2021, about 0.6 billion people around the world had been vaccinated with at least one dose of a COVID-19 vaccine, accounting for about 7.8% of the world's population (WHO, 2021). COVID-19 vaccination coverage in Tanzania remains significantly lower than the global and regional targets established for countries (WHO, 2022). Up until July 2022, Tanzania had only managed to vaccinate 14% of the population aged 18 and above since vaccination began in July 2021 (WHO, June 2022). Key challenges responsible for low coverage of COVID-19 vaccination in Tanzania include delayed introduction of COVID-19 vaccines into the country; vaccination only commenced in July 2021 and limited vaccine supply received in the country (WHO, 2022). In addition to that, there was previously a lack of political will to support the COVID-19 pandemic movement as per WHO recommendations, as natural remedies were made as the country's priority, such that even the wearing of face masks outdoors, was discouraged. In addition, information concerning COVID-19 was not open and clear to the public (WHO, 2021).

Despite renewed efforts by the government of Tanzania to educate people on COVID-19, which include strongly urging the taking of precautions as well as getting vaccinated, risk perceptions are generally low, and people continue with business-as-usual. Misinformation on COVID-19 leads them to perceive it negatively. However,

understanding public perceptions of vaccine efficacy is critical to the successful implementation of the vaccination plan in Tanzania, and particularly in Dar es Salaam, which is the most affected area in the country. Accordingly, the risk of contracting COVID-19 in Dar es Salaam is extremely high compared to other regions, since there is a major trading route that passes through this region, including delivering goods from Zambia, which is landlocked (BBC, 2021). Trade and industry cover 67% of the economy of Temeke municipality. There are 164 large and medium-sized industries and 831 small industries, with production ranging from tools to consumer goods and income-generating commodities. Meanwhile, the informal sector accounts for 49% of the total active labour force of 66,607. Moreover, immigrants come to Dar es Salaam seeking jobs and have overpowered the capacity of the municipality to provide social security. They make settlements difficult to afford, population growth rate of 4.6 percent is higher than the national population growth rate of 2.8 percent per year. This increases pressure on service delivery and informal settlements, leading to poor road networking, poor transportation mechanisms, and unplanned street garages (Temeke Municipal Profile, 2020). All these are factors that heighten the risk of contracting COVID-19.

Equitable access to efficacious vaccines is critical in grappling with an unprecedented pandemic, which has engulfed the entire world since the beginning of 2020, and it is encouraging to see so many vaccines being developed. Since the outbreak, the World Health Organisation (WHO) has highlighted the pressing need to use social and behavioural data alongside biomedical data to mount an effective response to the pandemic (WHO, 2020). This has not been matched by perceptions of people around the world, and the situation in Tanzania is allegedly troubling given the slow rate of vaccination, which persists despite clearly communicating the scientific logic. Therefore, based on the abovementioned background, this study explored people's perceptions towards the efficacy of COVID-19 vaccines and their alternative mechanisms for combating the pandemic.

1.2 Rationale/Motivation for the Research Project

The rationale for this study is two-folds. First, it will contribute to the strong international coordination and cooperation between vaccine developers, regulators, policy makers, funders, public health bodies, and the Government on consequent interventions against COVID-19. The study will highlight the ways in which people in urban areas perceive the spread of COVID-19 and the coping strategies that can be integrated into policies or inform further interventions. Consequently, this study will contribute to the understanding as to why some people accept being vaccinated while others are foot-dragging - such that as of September 2021, only about a third of the million vaccines offered for free had been administered.

Secondly, this study will provide an opportunity to increase understanding of the vaccines in the context of the COVID-19 pandemic as it relates to the overall state of health among Tanzanians. Specifically, it explored people's experiences and perceptions of vaccination with reference to the ravaging pandemic and shed some light on how to break the impasse between sceptics and health professionals on the need to adhere to WHO directives vis-à-vis people's perceptions, supposedly not grounded in scientific reasoning.

1.3 Problem Statement & Initial Research Questions

COVID-19 vaccines are among the preventive measures for the Corona virus. It was quickly introduced to the world, it is from different nations, and it is approved as a rescue strategy by the WHO due to its impacts on the world (WHO, 2022). Since the emergency of the novel coronavirus disease (COVID-19) caused by SARS-Cov-2 in 2019, researchers have been on the move to find solutions to mitigate the spread of the virus. Various control measures have been put in place by governments under the guidelines and recommendations of key global agencies, with the World Health Organisation (WHO) leading in providing information to help fight the pandemic (Halim, 2021).

Tanzania is among the countries that adopted the use of vaccines from different nations, though its application was late compared to other countries. However, despite the efforts made by Tanzania's government to encourage its citizens to take vaccines, only 14 percent of its population had been vaccinated up to July 2022, and the remaining population had not taken the vaccine yet (WHO, June 2022). Temeke is the biggest municipality in Dar es Salaam with socioeconomic complexities, and its major economic activities are small businesses run in the concentrated areas (Temeke Municipal Profile, 2020), with minimal adoption of health precautions for COVID-19. However, little progress has been made in the study of public perceptions of COVID-19 vaccines efficacy in urban areas in the country, where none is documented in Tanzania. Thus, this study aimed to examine the public perception of COVID-19 vaccine efficacy among urban dwellers in Tanzania, which will have significant impact on future endeavours in disease control mechanisms.

1.4 Research Objectives

1.4.1 General objective

The overall goal of this study was to assess public perceptions of COVID-19 vaccines efficacy among Tanzanian urban dwellers.

1.4.2 Specific objectives

  i.   To determine people's understanding of the COVID-19 pandemic.
  ii. To measure the perceptions of people toward COVID-19 vaccination.
  iii. To determine the socio-economic disparities in COVID-19 vaccination preferences.
  iv. To identify the mechanisms of coping with the COVID-19 pandemic.

1.5. Research Questions

i.   How do ordinary people understand the COVID-19 Pandemic?
ii.   What are the perceptions of people towards COVID-19 vaccination?
iii.   What are the socio-economic disparities in COVID-19 vaccination preferences?
iv.   What are the alternative mechanisms for coping with COVID-19?

1.6 Conceptual Framework

The relationship between independent and dependent variables is identified in the conceptual framework. It was expected that socio-demographic determinants such as age, sex, and marital status, level of education, occupation, and religion can affect vaccine efficacy perceptions and individual decisions on vaccines. Also, it can collaborate with other factors such as risk perceptions of vaccines, attitudes and beliefs regarding vaccines, and knowledge and awareness of vaccines, which are constructed by the trust of information about COVID-19 vaccines. All these independent variables were expected to influence vaccine efficacy perceptions and individual decisions on vaccines.

Figure 1.1 Conceptual Framework

CORONA VIRUS VACCINE DETERMINANTS

SOCIO-DEMOGRAPHIC DETERMINANTS	**OTHER RELATED FACTORS**	**TRUST OF INFROMATION ON COVID 19 VACCINE**
i. Age ii. Sex iii. Marital status iv. Level of education v. Occupation vi. Geographical location vii. Religious belief	i. Risk perception of vaccine ii. Perceived iii. Attitude and beliefs on vaccine iv. Knowledge and awareness of Vaccine	i. Government Authorities ii. Information from Media iii. Friends and Family iv. Employer

VACCINE EFFICACY PERCPETION & INDIVIDUAL DECISION ON VACCINE

i. Accepting to be vaccinated
ii. Rejecting to be vaccinated
iii. Hesitating on whether to be vaccinated

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

According to WHO (2020), a vaccine against COVID-19 is a "vital tool' in the management of the current pandemic. Researchers such as Britton, Ball, and Trapman (2020) estimated that up to 82% of a country's population may need to be vaccinated to achieve herd immunity against SARS-CoV-2, and the emergence of new virus variants implies that individuals may need to be vaccinated repeatedly (Sanche et al., 2020). However, vaccine hesitancy has been on the rise in recent years in many countries (Dubé, Laberge, Guay, et al., 2013). Further studies show that, socio-demographic characteristics, misperceptions, and/or rumours about vaccine efficacy, safety concerns, price, and socio-cultural factors may influence individuals' willingness (Zhang, 2021; Zhu, 2019). Several countries have been experiencing a decline in vaccine coverage due to safety concerns, the effectiveness of vaccines, misinformation, religious beliefs, and levels of income (William, 2021; WHO, 2020).

Recently, and specifically with COVID-19, misinformation, conspiracy theories, and mistrust have been identified as potential factors that may influence individuals' decisions to not vaccinate (Islam et al., 2021; Roozenbeek et al., 2020). Vaccine hesitancy is a continuum that encompasses delay, reluctance, or refusal to receive a vaccine despite its availability (WHO, 2019). Several factors such as public perceptions, communication, and media environment were reported to play a role in vaccine hesitancy (Ogundele and Omotosho, 2020). The input from these resources was observed to affect the knowledge and attitude towards vaccines, hindering mass vaccination programs (Kempe *et al,* 2020). Several factors were reported to influence the general population's perception of the COVID-19 vaccine, such as adverse health consequences, lack of adequate knowledge about the safety and efficacy, long-term complications, and inadequate trust in the current health care systems (Dube and MacDonald, 2016).

2.2. Factors affecting COVID-19 vaccine acceptance

2.2.1 Age differences

According to Lee *et al.*, (2021), vaccine acceptability was highest among those aged 21-24 years and lowest among those aged 55-64 years. These results are similar to the findings of a study conducted among adults in the United States, which showed that subjects aged 18–29 years had higher acceptability than those aged 50–64 years (Reiter et al. 2020). However, studies conducted by Malik (2020) and Fisher et al. (2020) have shown that acceptability increases with age. Likewise, older people are expected to be more willing to accept vaccination, due to higher risks of severe infections (Lazarus *et al.,* 2020). Furthermore, Bonanad *et al.* (2020) discovered that older adults

are more vulnerable to COVID-19-related complications and that more local public health strategies are needed to increase acceptance of a potential COVID-19 vaccine among them. An overwhelming preponderance of cases and deaths are observed within the elderly population, and especially in those with pre-existing conditions and co-morbidities. Aging causes numerous biological changes in the immune system, which are linked to age-related illnesses and susceptibility to infectious diseases (Yu *et al.,* 2020).

Bajaj *et al.,* (2021), state that age-related changes influence the host immune response and therefore not only weaken the ability to fight respiratory infections but also mount effective responses to vaccines. Senescence and inflammation-aging are considered key features of the ageing immune system wherein accumulation of senescent immune cells contributes to its decline and, simultaneously, increased inflammatory phenotypes cause immune dysfunction. Age-related quantitative and qualitative changes in the immune system affect cells and soluble mediators of both the innate and adaptive immune responses within lymphoid and non-lymphoid peripheral tissues. These changes determine not only the susceptibility to infections but also disease progression and clinical outcomes thereafter. Furthermore, the response to therapeutics and the immune response to vaccines are influenced by age-related changes within the immune system. Therefore, better understanding of the pathophysiology of ageing and the immune response will not only help understand age-related diseases but also guide targeted management strategies for deadly infectious diseases like COVID-19.

2.2.2 Sex Differences

Dror *et al,* (2020) observed that men are more likely than women to accept a potential COVID-19 vaccine, potentially due to sex-based differences in COVID-19 mortality. Similarly, the study conducted by Wang *et al* (2020) found that hesitation among females towards COVID-19 vaccinations was higher than that for males. Moreover, a study in China found that male participants were more likely to accept the COVID-19 vaccine (Callaghan *et al.* 2020). Males were more likely than females to accept vaccination against COVID-19, which is in line with the study done by Wong *et al.* (2020) and Malik (2020). Moreover, a study investigating vaccine willingness in the United States found that females were less willing to receive the COVID-19 vaccine than males (Tang, 2020). In addition, lower willingness among females as compared to males was also noted in a study investigating COVID-19 vaccine willingness in Israel (Hernández, et al., 2020).

2.2.3 Level of Education

Education is one of the demographic variables which may influence vaccine acceptance through other dimensions than complacency, such as confidence. Education is also linked to increased participation in pro-health behaviours (Alhmari *et al.* 2021, Dubé, 2013). Islam et al, (2021) observed that participants with higher

education levels were found to have more knowledge about COVID-19 vaccinations. This goes hand in hand with the work of Islam *et al.* (2021), who explained that individuals with a higher educational background showed more knowledge regarding COVID-19. It may be the case that more educated people are more knowledgeable and concerned about their health and well-being, through access to more information sources, and become more engaged in life events that could impact them, such as COVID-19 vaccinations (Dagan *et al.,* 2021).

Similar to that, Guay *et al.* (2019) found that lower education was associated with general vaccine hesitancy in Canada. Likewise, having a high education level was also a significant predictor of vaccine acceptance as education and knowledge about vaccination have been found to help build trust and confidence about vaccination (Betsch, 2012). Studies investigating COVID-19 vaccine willingness in various countries around the world have found that low education is associated with decreased willingness to receive the COVID-19 vaccine (Tang, 2020, Hernández, *et al.,* 2020,). However, the work of Wagner et al. (2019) explained that educational level was not associated with general vaccine hesitancy across five low-income and middle-income countries.

2.2.4 Occupation

Occupation is one of the factors associated with the COVID-19 vaccine hesitancy. The study by Ajibora et *al.* (2022) explained that the occupations of health workers within the medical field and their length of work experience were predictors of willingness to receive a COVID-19 vaccine.

2.3 Self-Perceived Risks of COVID-19

Risk perception is a central component of health-specific behavioural theories such as the health belief model and protection motivation theory (Compare *et al.,* 2021). People feel at risk when they perceive an event as uncontrolled, catastrophic, new, and unknown. It is known that there are two basic ways that people perceive risk: 'risk as feelings' and 'risk as analysis.' The risk as feeling model is a fast, instinctive and intuitive reaction to danger, while the analytical model is logical, reasoned, relatively slow and effortful (Slovic et al., 2004). Previous studies have shown that risk perception varies cognitively, emotionally, socially, culturally and between individuals (2020).

Understanding COVID-19 risk perception may help inform public health messaging aimed at encouraging preventive measures and improving countermeasures against the pandemic. Lazarus (2020), Dro (2020) Salali *et al.* (2020) and Hacquin (2020) found that self-perceived risks of COVID-19 positively predict acceptance of potential COVID-19 vaccines. Wong et al. (2020) argued that perceived susceptibility to infection predicted the intention to take a future COVID-19 vaccine. A study by Islam *et al.* (2020) revealed that people who had received any vaccine earlier were found to have more knowledge regarding COVID-19 vaccinations. A recent study in China evaluating COVID-19 vaccine acceptance found that people who were previously vaccinated

against influenza were more likely to accept the COVID-19 vaccine, which was also demonstrated in a study in Hong Kong (Wang *et al* 2020). Therefore, risk perception is associated with various factors, including socio-demographic characteristics. Many previous studies investigated socio-demographic determinants of COVID-19 risk perception. Women, the elderly, wealthy people and those with underlying diseases were more likely to have a higher risk perception of COVID-19 (Eyeberu *et al.,* 2021).

2.4 Political Attitude / Government Authority

Studies on virus vaccine hesitancy have found that hesitancy is integrated into a broader set of political attitudes and perceptions. As COVID-19 spreads across the world, governments turn a hopeful eye towards research and the development of a vaccine against this new disease. But it is one thing to make a vaccine available, and quite another task to convince the public to take the shot. Political ideology has been related to vaccine hesitancy as conservative individuals are less likely to trust authorities (Baumgaertner et *al.,* 2018). Furthermore, it is a standard finding in political science that individuals are less likely to accept decisions from other political parties than the one they identify with or vote for (Bolsen *et al.,* 2014). Thus, it is arguable that people who have voted for the government party/candidate are more likely to accept a vaccine since the vaccine programme is a part of the government's response to the pandemic.

How can these political opinions affect representations of a putative future vaccine against COVID-19? Indeed, most issues related to health are not commonly perceived as politicised. How do individuals come to include a vaccine in the list of objects and decisions upon which they apply their political understanding of the world? In his work on motivated reasoning, Kahan suggests two pathways via which worldviews and ideology come into play in people's perceptions: a) the person spontaneously perceives the issue as warranting a political-cultural interpretation, and b) the sources of information provide cues signalling the political-cultural nature of the issue at hand (Kahan, 2012; Kahan *et al.*, 2017).

2.5 Trust and Misinformation

Studies by Lazarius *et al.* (2020) and Lin, *et al.* (2020) found that trust, misconceptions, misinformation, and lack of knowledge among the community on vaccine-preventable diseases are considered influential determinants of lower levels of acceptance. This goes hand-in-hand with the study by Guay et al. (2021) that found distrust in public health authorities is associated with general vaccine hesitancy. Initial work on COVID-19 vaccines also demonstrates that those who have higher trust in scientists are more willing to get vaccinated (Roozenbeek *et al.,* 2020). According to Roozenbeek *et al.* (2019), the susceptibility to misinformation negatively affects people's acceptance of a vaccine against COVID-19. Also, Van der Linden (2017) observed that awareness of misinformation is positively associated with vaccine acceptance. A study by Islam *et al,* (2021) observed that most people in Bangladesh assume that the recently developed COVID-19 vaccines could have some side effects, which is similar to a study in the

United States (Callaghan *et al.,* 2020). This may be linked to rumours and misleading information which are spread through mass and social media and facilitate vaccine hesitancy and refusal (Islam *et al.* 2021, and Puri et *al.* 2020). According to a study conducted in Kilimanjaro by Chilongola *et al.,* 2022, misinformation about COVID-19 is one of the factors contributing to vaccine hesitancy, as the majority of respondents (nearly half of them, 48.3%) believe the rumours that COVID-19 is man-made.

According to some studies, vaccine hesitancy and refusal are associated with both misinformation on social media and attitudes about a specific illness not being preventable through vaccination (Bianco *et al.* 2019). Low perceived personal threat, concerns about accelerated vaccine development, side effects, misunderstandings about herd immunity, and beliefs that the virus is man-made or will be used for population control, may all contribute to vaccine hesitancy (Jennings, *et al.,* 2021). Similarly, Fadda *et al.* (2020) discovered that a lack of clear information on the duration of efficacy means that many people are still afraid of COVID-19 vaccines.

2.6 Knowledge and Attitude towards COVID 19 Vaccines

Knowledge and attitude towards coronavirus vaccines are affected by public perception, communication, and mass media, which play a big role in vaccine hesitancy (Bianco, A 2019, and Dubé, *et al.,* 2013). Furthermore, perceived lack of knowledge is associated with general vaccine hesitancy (Guay, 2020). According to Bianco (2019), lack of sufficient knowledge and misjudgment, as well as misinformation influenced by social media, are also reported to contribute significantly to vaccine hesitancy.

The level of knowledge about COVID-19 vaccinations is higher among people living in urban areas compared to rural areas. The study in Bangladesh demonstrates there is a significant correlation between COVID-19 knowledge and urban location (Balasuriya *et al.,* 2021), which is contrary to the study conducted by Islam *et al.,* (2021) - which found more accurate knowledge about COVID-19 among people in rural areas of Bangladesh.

2.7 Expected Contributions to Policy and Literature

Study Implications for Policy

The study identified different public perceptions towards COVID-19 vaccine efficacy in the context of when/where the world is affected socially and economically, to the extent of disruption of normal operation of things. Based on these findings (of the different perceptions), intervention by the government and nongovernmental organisations was conceived; and policies to address such differences could be developed.

The study revealed different ways in which people have developed resilient mechanisms against COVID-19 in the absence of vaccination. This will be used for

further government planning and policy making to strengthen awareness of COVID-19 vaccines.

Contribution to Literature

To our knowledge, this is the first study of the effect of public perceptions of vaccine efficacy in urban Tanzanian dwellers. The results of this study underline the two main transformations of the Tanzania vaccination process. First, the study adds to the body of knowledge about public perceptions of COVID-19 vaccine efficacy in urban areas. For example, people's understanding of the COVID-19 pandemic, socioeconomic disparities in COVID-19, vaccination preferences, mechanisms for coping with the COVID-19 pandemic, and households whose members are affected by COVID-19. This study will particularly add to the literature on the ways in which COVID-19 vaccines and other vaccines should be handled in the future.

2.8 Research Gap

Despite the effort made by Tanzania's government in influencing its citizens to get vaccinated, as of July 2022, only 14 percent of its population had been vaccinated (WHO, June 2022). Public hesitancy towards vaccines might be due to various reasons, which include the misinformation about the vaccine and the public attitude and perception of individuals regarding the vaccine (World Bank, 2022). Many studies in Africa, and Tanzania in particular, concentrated on information about the vaccine, knowledge, attitude, and behaviour of people towards COVID-19, which resulted in vaccine hesitance in the community (Chilongola. *et al.,* 2022). Little progress has been made in the study of public perceptions of COVID-19 vaccine efficacy in Tanzania urban areas, where none is documented. Thus, this study aimed to examine the public perception of COVID-19 vaccine efficacy among urban dwellers in Tanzania.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter analyses the research methodology; it is divided into four parts. The first part explains the selection and justification for selecting the study area. The second part explains the research methodology, focusing on research design, sample and sampling procedures, data collection and analysis methods. The third section explains the ethical consideration, and the last one provides the overall conclusion of the entire chapter.

3.1 Methodological Approach and Methods

A mixed approach (of qualitative and quantitative methods) was adopted for the collection and analysis of data. For the quantitative approach, we used a social/household survey and hospital data records to collect up-to-date information relating to vaccination during the COVID-19 pandemic. This includes the number of people vaccinated, their education levels, age, and other disparities. Meanwhile, cross-tabulation and regression analytical techniques were applied in quantitative data. Based on the preliminary findings of the household survey and with the help of local community leaders, qualitative data was also collected through in-depth interviews with selected stakeholders. Factors such as being vaccinated or not vaccinated, the elderly and other groups whose livelihoods were potentially most vulnerable to COVID-related disruptions, vaccination experts, etc. were investigated. Moreover, observations were made to appreciate illustrations of the mechanisms and strategies of coping with COVID-19. In-depth interviews (IDIs) and observations were conducted to ascertain the diversity of perceptions and interpretations of the COVID-19 vaccination and its effects on its mitigation in Tanzania. Inductive thematic approach analytical technique was employed in the analysis of data from in-depth interviews.

3.2 Rationale for Selecting the Study Area

Temeke District in Dar es Salaam Region was selected as a case study due to its being the largest municipal council in Dar es Salaam, compared to other municipals, which are Kinondoni, Ubungo, Kigamboni and Ilala. Most people in this district are of low income, which forces them to live below the poverty line in densely populated areas. The data revealed that the main economic activities in Temeke District are in the informal sector, which occupied 49 percent of the population, of which 24.4 percent are small businesses, especially street vendors, which are mostly carried out in the densely populated areas, which have a greater risk of the spread of COVID-19, as its spread is concentrated in areas where social distancing is virtually impossible. COVID-

19 vaccines are of great importance in densely populated areas, which influenced the study's choice of Temeke District to assess public perceptions of COVID-19 vaccine efficacy. Additionally, the rationale for the choice of Temeke was based on assumptions such as higher levels of literacy being associated with urban dwellers, access to health and access to information.

3.3 Geographical Description of the Study Area

Temeke Municipal Council was established on 10th November 1999 under the Local Government (Urban) Authorities Act. 1982 No. 8, Section 8 and 9. Temeke Municipal is one of the municipal councils of Dar es Salaam City in Tanzania. Other municipalities are Kinondoni, Ilala, Ubungo and Kigamboni. Temeke Municipal Council is in the south of Dar es Salaam City, borders the Coast Region in the south, Ilala Municipality in the north and west, while in the east it stretches along the coastal line of the Indian Ocean. The municipality under the authority of the council, is the largest in size compared to Ilala and Kinondoni Municipalities. It covers an area of 656 km² with a coastal line of 70 km length and lies between 39º12' - 39º33' east and 6º48' -7º33' south.

According to the nation's population census results of 2012, Temeke District had a total population of about 1,368,881. These statistics reveal that this was about 38 percent of the total Dar es Salaam population and makes Temeke Municipal Council the second most populous municipal council after Kinondoni, with an annual average growth rate of 4.9 percent. The impact of higher population densities is always associated with widespread poverty and other serious social problems such as crime, leading to unsustainable development.

Figure 3.1 Geographical Description of the Study Area
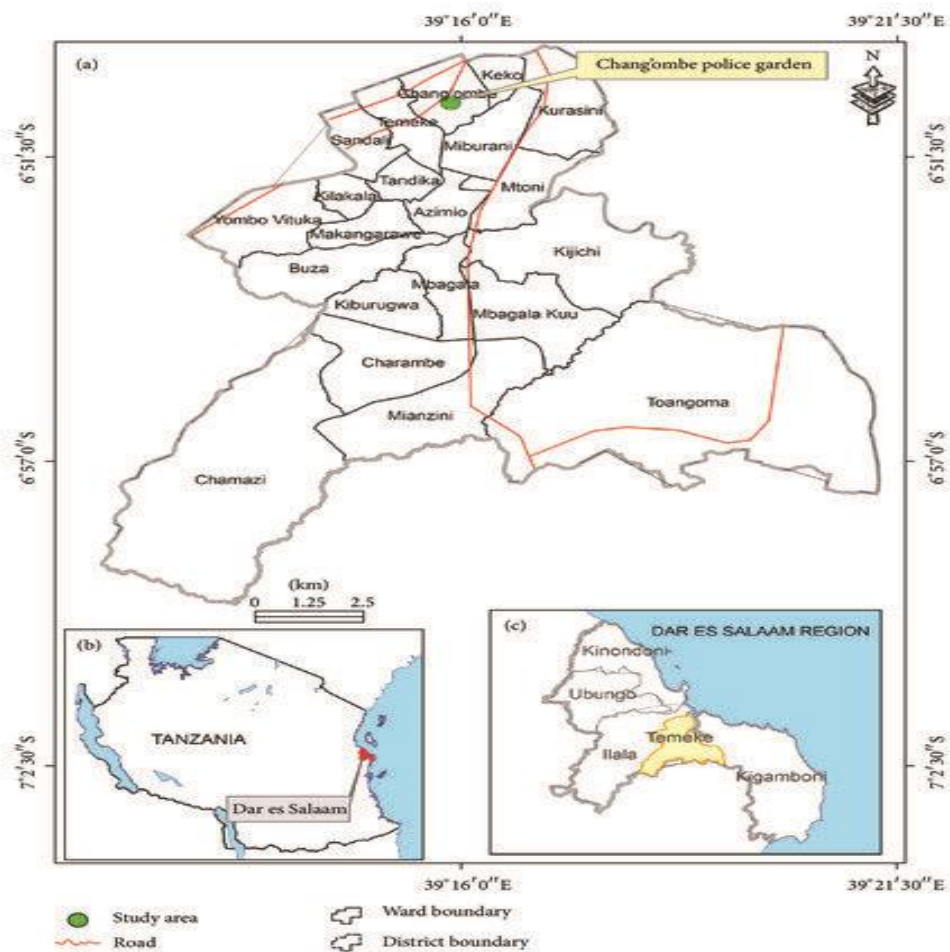
3.4 Data Collection Methods and Instruments

The study used mixed methods, which involve the use of both quantitative and qualitative approaches. A structured questionnaire and a documentary review were used to collect quantitative data. The quantitative data investigates population, socioeconomic activities, and the geographical description of the study area. Qualitative data was collected through in-depth interviews and direct observations. Qualitative and quantitative approaches were used since they complement each other to ensure the validity and reliability of the data. Moreover, the mixed methods approach is mostly used since it takes advantage of using multiple ways to explore the research problem (Creswell and Plano 2011).

3.5 Sample Size and Sampling Procedure

The study used a sample size of 384 individual respondents. The study used purposive sampling in the selection of wards in Temeke Municipality, due to the reasons that the study lies in town and some of the wards in Temeke Municipality have rural characteristics, thus Temeke and Tandika wards were purposively selected. The study

also used random sampling through the table of random sampling in the selection of streets in Temeke and Tandika wards, whereby Kilimahewa, Mabatini, and Maguruwe streets in Tandika ward were selected, whereas Temeke, Matumbi and Maganga streets were randomly selected in Temeke ward.

Calculation of sample size in the study area was done by Cochran (Tortora, 1978) that.

No $\dfrac{Z^2pq}{E^2}$

Whereby

no   sample size

Z   Confidence level (1.96) which is corresponds to 95% confident interval

P   Proportion of success (0.5)

Q   Proportion of failure (1_p)

E   Margin of error (5%)

Therefore.

N $\dfrac{(1.96)^2*0.5(1\_0.5)}{(0.05)^2}$ equal to 384

The calculated sample size of 384 was used to calculate number of households/respondents in selected streets. The calculation was as follows:

N_h $\dfrac{N_h\ n}{N}$

Where
 nh   proportional sample of each street
 Nh   the number of households of each street
 N   the total number of households in all streets
 n   Total sample size of the study population

Table 3.1 Sample size distribution

Ward	Street	Population	Household size	Sample
Tandika	Kilimahewa	14442	3912	107
	Mabatini	9496	2615	72
	Maguruwe	8532	2233	61
Temeke	Temeke	9015	2252	62
	Tatumbi	5032	1180	32
	Maganga	6608	1803	50
			Total	**384**

3.6 Data Processing and Analysis Methods

Data processing involved editing of the questionnaire, coding, classification, and data entrance, which was done on a computer using the SPSS programme to make a descriptive analysis of the data for interpretation. The data collected through questionnaires as quantitative techniques was analysed and presented through frequency tables, charts and graphs which show frequency count and percentage distributions. Cross-tabulations and regressions were used to show the correlation between age, occupation, religion, and sex in influencing public decisions to take COVID-19 vaccines. For qualitative data analysis, themes were developed to illustrate the COVID-19 vaccination efficacy and the alternative strategies for coping with the same. The qualitative information was categorised and coded based on study objectives in producing the final report. An inductive thematic approach was employed in the analysis of data from in-depth interviews in which the emerging issues were identified and connected to the data collected and their discussion.

3.7 Ethical Considerations

All procedures in the present study were carried out in accordance with the principles for human investigations and with the ethical guidelines of the Institutional Research Ethics. Formal ethics approval was granted by St. Augustine University of Tanzania, which was used to get an introduction letter from TAMISEMI, hence the research permit was granted by the Office of the Regional Administrative Officer of Dar es Salaam and later by the Temeke District Commissioner's Office and the Office of the Temeke Municipal Director. Participants in the study were informed about the procedure and purpose of the study and the confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection.

3.8 Limitations of the Study

There were some problems during the study, specifically in the acquisition of research permits and data collection. The limitations were:

First, the procedure of getting a study permit was complicated and took more than three months to obtain. This consequently delayed other processes in the study, such as data collection and report writing. However, the researchers managed to work hard and put in extra hours to manage the data collection and report writing to produce the first draft of the report to meet the project timeframe.

Second, the subject area of the COVID-19 vaccines makes people fear that if they share their views they could easily be identified and probably be put to task for going against the Government. The researchers managed to educate them and assure them of confidentiality during the whole process of this research.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.0 Introduction

This chapter presents analyses and discusses findings of the study on the public perceptions of COVID-19 vaccine efficacy among urban dwellers in Tanzania. The findings are presented and discussed in accordance with four research objectives, which are intended to; determine people's understanding of the COVID-19 pandemic, measure the perceptions of people towards COVID-19 vaccination, determine the socio-economic disparities in COVID-19 vaccination preferences; and identify different coping mechanisms towards COVID-19 vaccination; and identify different mechanisms of coping with the COVID-19 pandemic. Questionnaires, and interviews were used to collect primary data, while secondary data was gathered from World Health Organisation (WHO) publications, the Ministry of Health (MoH) website, Temeke hospitals, and dispensaries. The chapter is arranged into sections and sub-sections.

4.1 Socio Economic characteristics of Respondents

The study revealed that 76 percent of the respondents rent their homes, and most of them rent single rooms. 15 percent of the respondents live in their own houses, and 9 percent of the respondents live in family houses, in which most of them own a single room as an independent household. This shows that most of the respondents in the study area are people in lower socio-economic income brackets, as they live in a single room with all their family members (see figures 4.1 and 4.2 below). As observed in the study area, though they rent and share houses with others, they do not observe any of the preventive measures for COVID-19, which makes for a very high-risk environment. If just one person is infected with the virus, they can easily pass it on to another, and so the spread.

RESPONDENTS PLACE TO LIVE

PERCENTAGE,
Family house,
9.4, 9%

PERCENTAGE,
Rent, 76.1,
76%

PERCENTAGE,
Other, 9.4, 9%

PERCENTAGE,
My own house
14.5, 15%

Number of rooms

Respondents
, more than
three, 32, 8%

Respon
, three, 2?,
7%

Respondents
, two, 66, 17%

Respondents
, one, 260,
68%

- one
- two
- three
- more than three
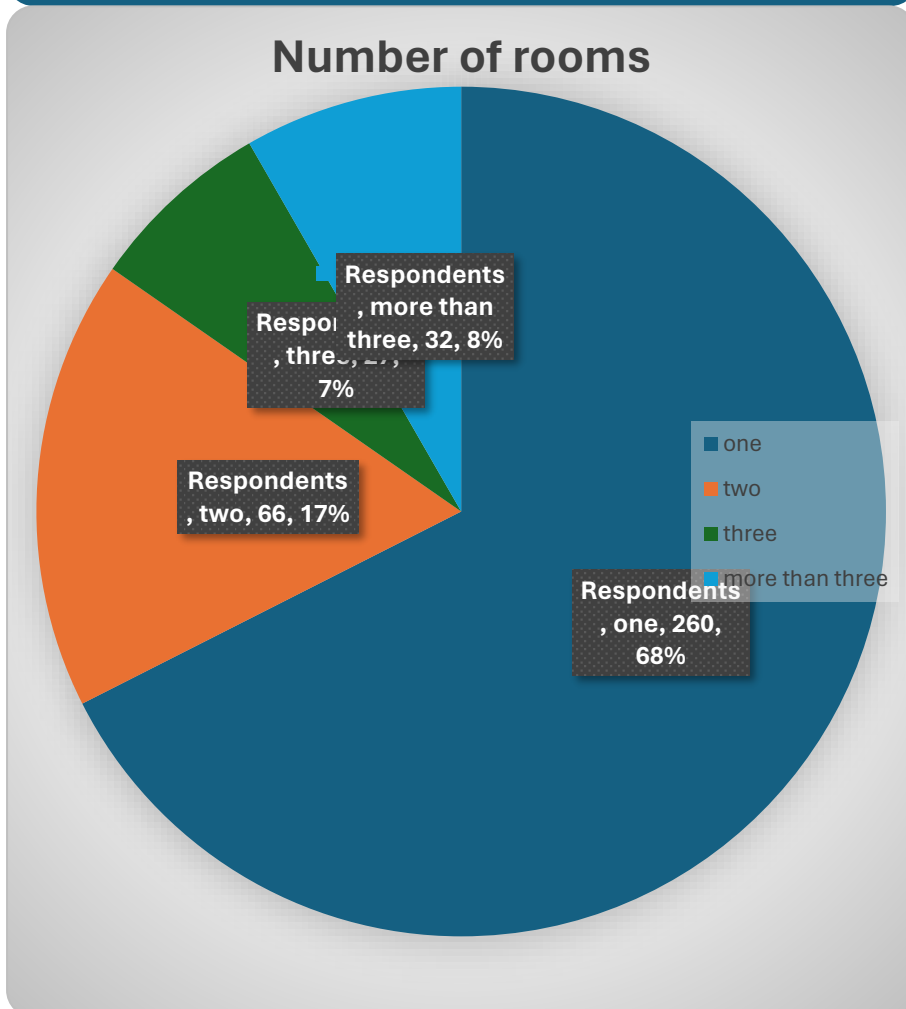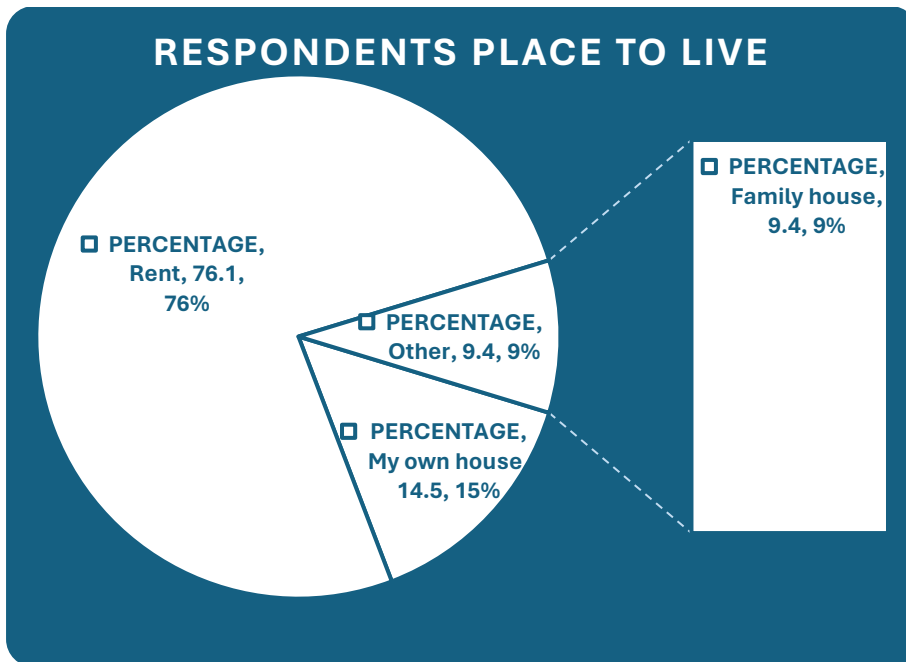
Figure 4.1 Place where the respondents lived Figure 4.2 Number of room own/rent.

4.2 People's Understanding of the COVID-19 Pandemic

The study was interested in knowing people's understanding of the COVID-19 pandemic. These are crucial determinants of people's perceptions and control mechanisms. These were assessed by looking at respondents' understanding of coronavirus prevention, vaccine distribution, and vaccine dosage. Based on this, the study findings revealed that 63.1 percent of respondents are aware that coronavirus can be prevented by vaccination, 27.3 percent are unaware, and 9.6 percent are unsure. Further findings revealed that 95.6 percent of the respondents in the study area understand that COVID-19 vaccines are provided free of charge for everyone who wants them, and only 4.4 percent of the respondents do not have such information. This shows that most people in urban areas have knowledge of COVID-19 vaccines in Tanzania. The study concurred with the study in Bangladesh, which demonstrates a significant correlation between COVID-19 knowledge and urban location (Hossain *et al.,* 2020).

However, 24.7 percent believe that COVID-19 vaccines have some negative effects on humans. In contrast, 45.7 percent trust vaccines because they believe there are no side effects. However, 29.6 percent of those polled are unsure whether the vaccines work on humans. 33.2 percent of respondents know that the vaccine was not given to an infected person, or a COVID-19 suspect, 35.4 percent do not know, and 28.3 percent are unsure. This concludes that most people do not have the correct information regarding COVID-19 vaccines, as most of them do not have trust in its efficacy. The study findings concur with the study of Chilongola *et al.* (2022) that found misinformation regarding COVID-19 appears to play a key role in vaccination reluctance.

Table 4.1 Respondents Understanding of COVID-19 Vaccine

a) Do you know that corona virus can be prevented by vaccine		
	Respondents	**Percentage**
Yes	243	63.1
No	105	27.3
Not sure	37	9.6
Total	385	100
b) Do you know that the vaccine is free		
	Respondents	**Percentage**
Yes	368	95.6
No	17	4.4

		Respondents	Percentage
	Total	385	100
c) Do you know that vaccine depends on type for its dosage			
		Respondents	**Percentage**
	Yes	238	61.8
	No	114	29.6
	not sure	33	8.6
	Total	385	100
d) Is it true that the vaccine has some effects			
		Respondents	**Percentage**
	Yes	95	24.7
	No	176	45.7
	Not sure	114	29.6
	Total	385	100

Source: Field data (2022)

According to secondary data from WHO (2022) in the United Republic of Tanzania, from 3 January 2020 to 30 May 2022, there have been 33,928 confirmed cases of COVID-19 with 803 deaths reported. The growth slowdown in Tanzania's main trade partners has reduced demand for and prices of its agricultural commodities, final manufactured goods and international travel bans and fear of contracting the virus are expected to inhibit the recovery of tourism, which has been one of the fastest-growing sectors in the economy (World Bank, 2020).

This study is interested in identifying people's understanding of the COVID-19 pandemic. These are crucial determinants of people's perceptions and control mechanisms. As it is revealed in the study area, people have a general understanding of the prevalence of COVID-19 in Tanzania. This includes the symptoms of the disease, how to control and mitigate those symptoms, as well as how the COVID-19 pandemic affects the livelihoods of various families and the community at large. As the interview with the key informant revealed, as the response asked about the COVID-19 understanding.

> *In Tanzania, the COVID-19 was first discovered in February 2020. Since then, it has affected people in different ways, including death. People have lost family members and other loved ones to this disease, but also many families have been economically impacted, as the pandemic affects their economic stability due to fear of overcrowding, especially during the first wave of the virus. (*Interview: KII.15/5/2022*).

The above statement concerning economic instability is further supported by WHO (2020) that global measures such as lockdowns and border closures affect aviation and inter-country buses the most because they limit freedom of movement between countries. On the other hand, the immediate effects of COVID-19 on public transportation emanate mostly from domestic factors. Generally, the pandemic is a health crisis, but that's not all. Tackling COVID-19 is also a humanitarian and development crisis that is threatening to leave deep social, economic, and political scars for years to come, particularly in countries already weighed down by fragility, poverty, and conflicts.

There are several methods individuals can use to prevent the spread of COVID-19. These include wearing face masks, social distancing, use of hand sanitizers, washing hands with soap and running water regularly, getting vaccinated and isolation. One can use one or more of these methods at a time. According to the study, most people understand more than one method of coping with the coronavirus, except for six people (which occupy 1.5 percent as seen in Table 4.2) of all respondents in the study area who do not understand any of the coping methods for the coronavirus. This demonstrates that the majority of people are aware of how to prevent COVID-19.

However, the study findings as shown in table 4.2 below revealed that 33.5 percent of people used face masks, while 33.5 percent of respondents also washed their hands with soap and water regularly, whereas 12 percent of the respondents did not opt for any methods, even though they knew the methods of COVID-19 prevention. Most of the respondents opt for the face mask and washing their hands with soap and running water regularly as the methods are easy for them to practice and they are most effective, per their understanding, and they also trust the methods they opt for most (see table 4.2). This is because the methods are commonly practised by many people compared to other methods such as social distancing and the use of hand sanitizers, though all methods are advocated equally by the MoH and other partners.

Table 4.2 Coping Mechanisms and Prevention of COVID 19

Ways of Coping with Coronavirus	Frequency	Percentage
Social distancing and face masks	3	0.8
Face masks and sanitizers	3	0.8
Washing hands and face masks	52	13.5
Hand sanitizers and face masks	3	0.8
Steaming	3	0.8
Social distancing, face masks, sanitizers and washing hands	315	81.8
Praying	4	1
I don't know	2	0.5
Total	**385**	**100**
Prevention of COVID 19		
	Frequency	**Percentage**
Social distancing	17	4.4
Face masks	129	33.5
Washing hands regularly	129	33.5
Hand sanitizers	26	6.8
Praying	5	1.3
Steaming	33	8.6
None	46	12.0
Total	**385**	**100**
c) Reasons for opting the Prevention Method		
	Frequency	**Percentage**
Easy to use	77	20
Costless	34	8.8
Most effective than the others	91	23.6
Due to nature of my work	44	11.4
My faith is in God	21	5.5
I trust most	89	23.1
None	29	7.6
Total	**385**	**100**

Source (Field data, 2022)

Further investigation revealed that COVID-19 was a cause of reduced intimate interaction between relatives. The study findings observed that the physical contact between relatives decreases as the fear of the disease increases, hence negatively affecting interpersonal relationships. Specifically, people performing non-essential jobs were obliged to work from home, funerals and wedding ceremonies were restricted, and other social activities were also restricted to people's homes, and social distancing was required. This was explained by one key informant during the interview:

> *Relationships, unity, and cooperation between friends and relatives have become largely minimal because people used to fear visitation and involvement in various events. Hence, normal interaction between people has decreased as people opt to stay at home and reduce unnecessary meetings* (Interview: KII.15/5/2022).

The study findings concur with <u>Montemurro</u> (2020), who observed that with COVID-19 regulations and the uncertainties that go along with them, many people are showing increases in emotional distress. The study findings revealed low efficiency in the working environment during the time COVID-19 was at its peak. Workers were fearful of COVID-19 transmission due to the high frequency of being in the offices. Information from different sources affects workers psychologically, and efficiency consequently becomes minimal. Meanwhile, religious services were also affected by poor attendance as many people feared contracting the virus. This is revealed by the responses from different key informants, including one elderly person from Tandika Ward.

> *In the workplace, efficiency was reduced to minimal, as people did not go to the office regularly, whereas in churches and mosques, attendance rates also reduced due to the fear of contracting the disease.* (Interview: KII.15/5/2022).

The above statement was also observed by quantitative data that COVID-19 affects people worldwide, directly, or indirectly. According to the study findings, 49 percent of respondents were affected by COVID-19, while 51 percent of the respondents were not affected at all. 38% were financially impacted, 28% were psychologically impacted, 4% were physically impacted, and 30% were both psychologically and economically impacted. This demonstrates that most people in the study area are affected economically and psychologically.

Table 4.3 How COVID 19 affects People

Affected by COVID 19	Frequency	Percentage
Yes	190	49.4
No	195	50.6
Total	**385**	**100**
How COVID 19 affects you	**Frequency**	**Percentage**
Economically	74	38
Health wise	8	4
Psychologically	54	28
Economically and psychologically	57	30
Total	**193**	**100**

Source (Field data, 2023)

The study, therefore revealed that the disease affects not only the economic but also the broader social lives of members of the community. Socially, COVID-19 has negatively impacted the social occasions and events involving community gatherings such as funerals, religious services, and wedding ceremonies. However, much has changed due to government restrictions and the status of the disease. This is because

the virus changes at the peak of people's responses to protection. Indeed, reviews of the available evidence show that people across the world report lower psychological well-being and higher depression and anxiety than before the pandemic (Vindegaard & Eriksen, 2020). COVID-19 patients report high levels of post-traumatic stress and depressive symptoms, and those in healthcare also report higher levels of psychiatric symptoms than they did pre-pandemic (Vindegaard & Eriksen, 2020). People changed their lifestyles as a response to COVID-19, and these changes involved economic, social, and psychological aspects.

The study findings, as revealed in the table 4.4 below, identify the sources of information for people about COVID-19. It was shown that about 30.1 percent of the respondents received COVID-19 pandemic information through social media, whereas 12.5 percent got it through public announcements from the MoH and other local authorities, and 43.4 percent got it through mass media such as television, radio, and newspapers. This means that due to their widespread coverage in urban areas, mass media such as television and radio, together with social media, are strong instruments in the dissemination of information regarding the COVID-19 pandemic in Tanzania. This is in line with the study by Chilongola *et al.* (2022) that show the combination of social media, news media, and newspapers are the strongest sources of information regarding COVID-19.

Table 4.4. Sources of Information

Sources of Information	Respondents	Percentage
Social media	116	30.1
Public announcement from ministry of health (MoH)	48	12.5
Health practitioner	6	1.6
Media (TV, Radio)	167	43.4
No information	48	12.5
Total	**385**	**100**

Source (Field data, 2022)

4.3 Perceptions of people toward COVID-19 vaccination

People's perceptions of COVID-19 are a major determinant of the vaccination process's success or failure. The study findings revealed that among male respondents, 57 percent responded that the vaccine is safe, while 17 percent responded 'unsafe,' and 6 percent 'very safe.' Furthermore, 52% of female respondents believe vaccines are safe, 14% believe they are very safe, and 18% believe they are dangerous. The analysis

of the findings revealed that both males and females supported the vaccine as safe compared to those who responded as unsafe and very unsafe. Further analysis revealed that there is no great variation in perceptions between the sexes, hence people's confidence in vaccination - though there is a need for more efforts in educating people so that they understand the benefits of COVID-19 vaccination, as shown in table 4.5 below.

Table 4.5 Perceptions of COVID 19 Vaccines

Gender	Variables	Frequencies	Percentage
Male	Safe	108	57
	Very Safe	11	6
	Unsafe	31	17
	Very Unsafe	15	8
	Not Sure	23	12
	Total	**188**	**100**
Female	Safe	103	52
	Very Safe	27	14
	Unsafe	35	18
	Very Unsafe	8	4
	Not Sure	24	12
	Total	**197**	**100**

Source: Field data (2022)

The above findings reveal that though the Government is putting more effort towards acquiring more vaccines from different partners, people's confidence in COVID-19 vaccines is still very low. Secondary data from the Ministry of Health (March 2022) revealed that Tanzania received 1,000,000 dozes of SINOVAC from Turkey instead of 4,000,000 doses, which will be received in other phases, thereby bringing the number of vaccine doses to 10,845,774 including Sinopharm, Janssen, Modema, Pfizer, and Sinovac, which can vaccinate about 6,381,327 people. According to the minister responsible for health, up to March 23, 2022, about 3,016.551 people were completely vaccinated out of 30,740,928 people over 18 years of age, which is equal to 9.81 percent. The Government's aim is to reach 70 percent of the population. As of May 21, 2022, a total of 7,967,468 vaccine doses had been administered in Tanzania. Assuming every person needs two doses, that's enough to have vaccinated about 6.9 percent of the country's population.

Therefore, the Government's efforts to acquire more vaccines should go hand-in-hand with the provision of education about the importance of vaccination. Interviews with different key informants revealed the existence of different views on COVID-19 vaccines. As one participant revealed in the following statement, there are varying views and opinions on vaccines, including the view that death cannot be prevented by a vaccine, but it is God's will.

> *Everything is in God's hands. If you die of corona or malaria, it is all God's will. Even if you get vaccinated, when your time comes, you will die in spite of the vaccine* (KII, Temeke ward, 15th May 2022).

The above response, which essentially states that if God wills it, you will die, is indicative of the failure to grasp the human role in maintaining a sound public health. Human efforts towards disease control and prevention should be the cornerstone of people's thoughts. Further study on the analysis of the same revealed different perceptions towards COVID-19 vaccination, as revealed below:

> *Perceptions about vaccination are divided into three groups: The first group is for those who prefer vaccination. They understand the importance of vaccination. That's why they have come forward to get vaccinated. The second group includes people who see vaccination as irrelevant, and that vaccines are potentially problematic, as they have side effects on human health, be it in the short or long-term. This group has a negative perception of COVID-19 vaccines. The third group is in a dilemma because they do not support vaccination and do not know what to do. If sufficient education is given regarding vaccines, they can opt to get vaccinated, as they do not have enough understanding regarding the vaccines* (Interview: KII.16/5/2022).

The Ministry of Health (MoH) does in fact communicate various, positive facts regarding COVID-19 vaccines on its website, but still more has to be done for people to get a clearer understanding and be motivated to action. It was discovered that there is an understanding that though COVID-19 vaccines were developed in a relatively short period of time, as there was still adherence to the strictest safety standards possible to minimize health effects on the human body. Governments and private companies shared resources to develop COVID-19 vaccines. Researchers and developers worked on different phases at the same time while still following strict safety and clinical standards. Years of research on viruses like the one that causes COVID-19 also helped accelerate the process. (Ministry of Health (MoH) website, 2022). The secondary data from the MoH indicates that the above factors allowed faster vaccine development while keeping the studies rigorous and making sure that the vaccines are safe. Though the MoH provides facts and figures about the vaccines, there are still some rumours about side effects that deter many from being vaccinated.

Further study findings revealed that the Government aims to protect all its people against COVID-19 by providing effective and scientifically acceptable preventive measures, including the provision of safe, efficacious, and quality vaccines, though this has been questioned by some. The secondary information from the MoH stipulates that the efforts of COVID-19 vaccination in Tanzania are in line with the National COVID-19 Response Plan, which recommends the use of COVID-19 vaccines as part of preventive measures against the COVID-19 pandemic. This is due to an increase in morbidity and mortality rate due to COVID-19, inadequate capacity for the country to handle severe and critical cases, the emergence of new viral variants, and as part of the global response. Also, the introduction of COVID-19 in the immunisation services

is in line with the National Immunisation Strategy (NIS) of Tanzania from 2021 to 2025 (URT, 2021).

Nevertheless, as revealed in the above paragraphs, the government's efforts are still challenged by people who are suspicious of the efficacy and safety of the vaccines. The responses from one key informant revealed the dilemma on the efficacy of the vaccine in the state of viruses' mutations as follows:

> *What kind of vaccination is appropriate for the viruses, as every day we hear that the viruses mutate from time to time, from the first wave to the fourth? In that case, there should be a variety of vaccines to respond to and address those changes* (KII, Temeke, 16/May/2022).

The study findings observed that people hesitate to get vaccinated. The respondents mentioned the reasons for hesitation in Tanzania, particularly in Temeke municipality, as follows: 21 percent of the respondents mention lack of correct information on COVID-19 and the vaccines themselves as being one of the reasons for vaccine hesitation; 3 percent of the respondents mention the effectiveness of traditional medicine as being the reason; 33 percent mention that fear of vaccines is the reason for hesitation; 39 percent of respondents cite a lack of knowledge about the vaccines as one of the reasons for their hesitation, and 4 percent cite the vaccines' ineffectiveness to people, stating that whether or not everyone gets vaccinated, everyone is still at risk of contracting COVID-19. (See figure 4.3 below).

Figure 4.3 Reasons for COVID-19 vaccine hesitation
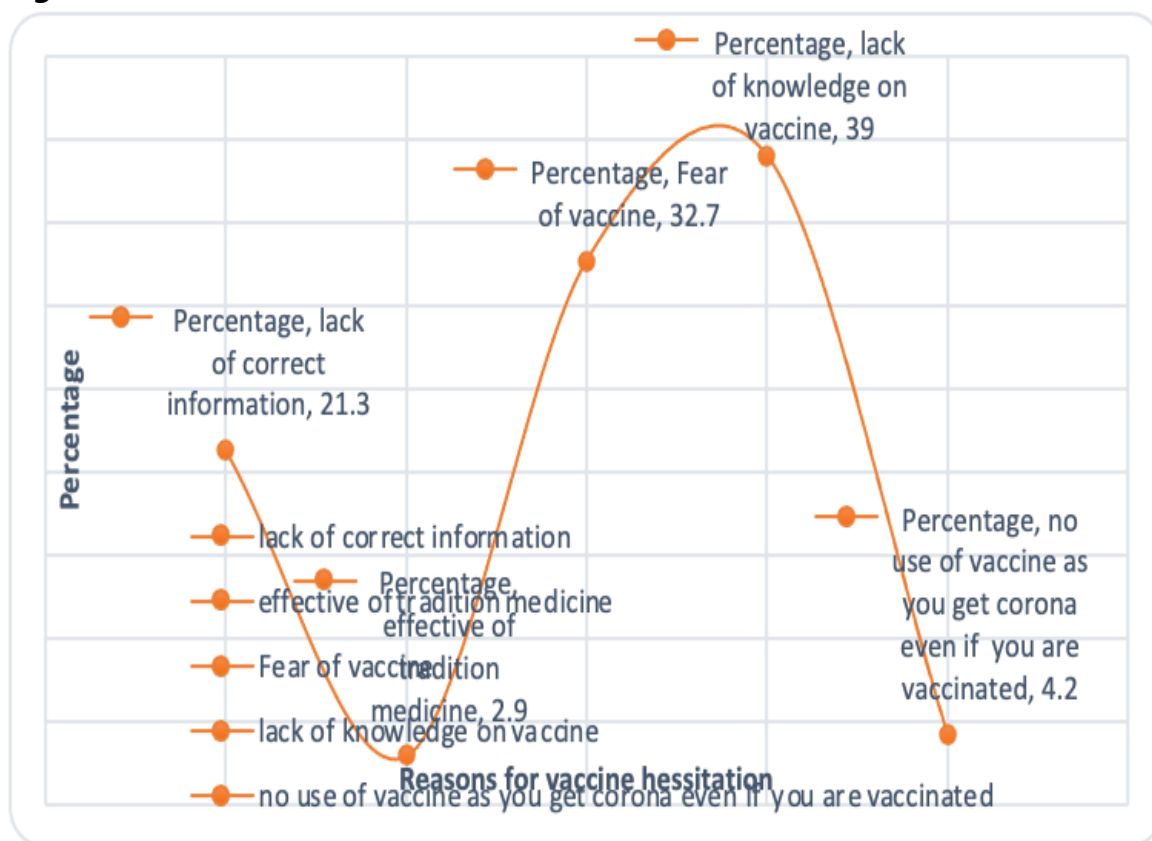
In response to the above, several studies conducted during the COVID-19 pandemic among healthcare workers established that social influences were also at play in the acquiescence or apprehension toward vaccination. It was perceived that if others (such as family, friends, and colleagues) want you to be vaccinated or have already been vaccinated themselves, this positively influences the intention to be vaccinated (Zijtregtop *et al.,* 2009). It was also presented that the source of information plays an important role in shaping knowledge and motivating vaccination compliance. Higher levels of knowledge are associated with enhanced vaccination uptake (Pogue *et al.,* 2020). Individuals who obtained information about the vaccination from their healthcare provider or public health department were found to have an improved uptake of vaccination.

4.4 Socio-economic Motives Disparities in COVID-19 Vaccination Preferences

4.4.1 Age Group and Vaccination

It is important to ensure that all groups have access to the vaccines, especially the disadvantaged, who are more susceptible to infection from COVID-19 and at greater risk of severe morbidity and mortality. Where vaccines are available, it remains to be seen whether those in greatest need and most affected by the pandemic will be willing and able to access the vaccine. Also, having knowledge of the groups who have lower vaccination uptake will help to focus more efforts on educating those groups.

Information from the key informants revealed the higher vaccination uptake among women and the elderly compared to the youth as follows:

> *Elders are at the forefront of vaccination, while young people do not fully understand the vaccines. This is because teenagers are as confused about vaccination, as they get different information from different sources* (KII, Tandika, 16/May/2022).

Strategies to address vaccination inequity will need to identify barriers, provide targeted information, and include trust-building in disadvantaged communities. Most young people have an assumption that the people most affected by COVID-19 are the elderly. This prevents them from participating in the vaccination, despite the advice by health workers and other Government officials. Contrary to this, adults are more likely to get very sick from COVID-19. Getting very sick means that the more elderly people who contract COVID-19 might need hospitalisation, intensive care, or a ventilator to help them breathe, or they might even die. The risk increases for people in their 50s and even more so for those in their 60s, 70s and 80s. People aged 85 and older are the most likely to get very sick. Further investigation revealed that people under the age of 60 had a higher rate of vaccine uptake than those over the age of 60. It is clear that people below 60 outnumber those aged 69 and above. However, there are weaknesses in Temeke Municipality data as they categorise age into only two groups, which makes it difficult to analyses the disparities. See table 4.6 below.

Table 4.6 Vaccination According to Age

Groups and Type of vaccine		Number of Vaccinated			
		Dose 1		Dose 2	
		Male	Female	Male	Female
Age	Age below 60	3992	4175	708	766
	Age above 60	1038	605	78	51
	Total	**5030**	**4780**	**786**	**817**

Source: Temeke Hospital (May 2022)

Furthermore, field findings revealed that youth were more hesitant to get vaccinated. About 16 percent of the age group between 18 and 24 accept vaccines, whereas 80 percent reject them. Also, about 36 percent of those aged between 25 and 31 agreed to getting vaccinated, while 59 percent were not ready to be vaccinated and 6 percent were already vaccinated. Furthermore, between the ages of 32 and 38, 28 percent agreed to take get vaccinated, 57 percent rejected vaccination, and 15 percent were already vaccinated, whereas those aged between 39 and 45, 42 percent agreed to be vaccinated, 42 percent rejected, and 16 were already vaccinated. The biggest differences are seen in people aged 60 and up, where 69 percent have already been vaccinated, 12.5 percent agree to be vaccinated, and 18.8 percent refuse (see figure 4.4)

Figure 4.4 Vaccination perceptions by Age
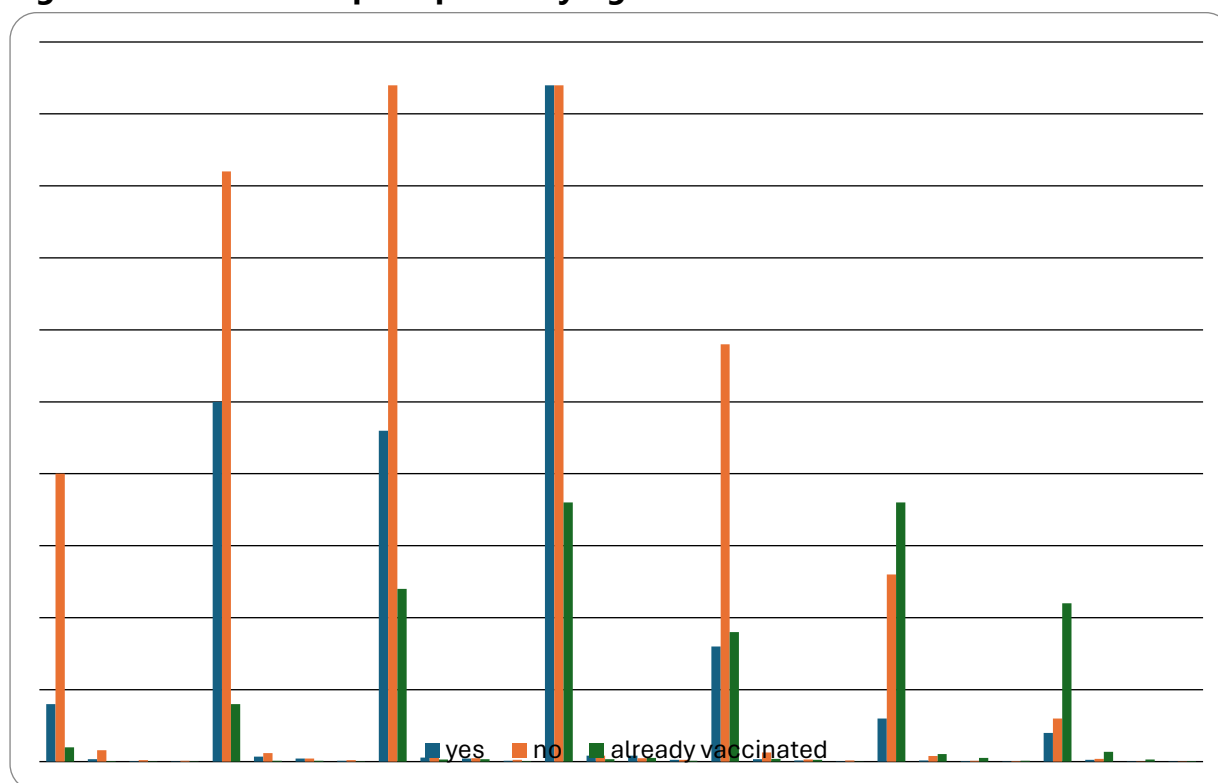
Source: Field data (2022)

4.4.2 Vaccination According to Occupation

Secondary data from Temeke hospital revealed a higher uptake of vaccination among health workers compared to other sectors, as seen in Table 4.7 below. Further analysis revealed that health workers are at a higher risk of contracting COVID-19, compared to other sectors. In line with that, protecting health workers is of paramount importance to WHO, as seen in table 4.7 below.

Table 4.7 Vaccination according to sector

Groups and Type of Vaccine		Number of Vaccinated			
		Dose 1		Dose 2	
		Male	Female	Male	Female
Specific Sector	Health	126	164	12	17
	Immigration	25	4	9	0
	Tourism	3	0	1	0
	Security	10	2	4	0
	Education	49	42	8	4
	Others	5233	4143	752	796
	Total	**5446**	**4355**	**786**	**817**

Source: Temeke hospital (May 2022)

The level of interaction and face-to-face contact are the main determinants of COVID-19 transmission. As it is revealed in table 4.5 above, the health sector has a large number of people who are already vaccinated compared to immigration, tourism, security and education. It is followed by the education sector. Education and health workers are the occupations that have a higher risk of infection compared to other occupations. The study agrees with URT (2021) that the Government aims to protect all of its citizens from COVID-19 by providing effective and scientifically acceptable preventive measures, such as the provision of safe, efficacious, and high-quality vaccines, and by prioritising COVID-19 vaccination of high priority and special group populations, such as healthcare workers. But as for now, anyone who is 18 years of age or older can be vaccinated.

4.4.3 Vaccination According to Chronic Diseases & Types of Vaccines Administered

Further study analysis revealed chronic diseases to be a major determinant of up-taking vaccines. One third of those who receive a vaccine in Temeke District have chronic diseases, while the rest are disease-free. This again depends on the number of people who are suffering from chronic diseases, otherwise it does not show statistical significance. Other factors can also make people more likely to get severely ill with COVID-19, such as having certain underlying medical conditions. If someone has an underlying medical condition, he/she should continue to follow a treatment plan, unless advised differently by their healthcare provider.

Table 4.8 Vaccination according to chronic diseases

Groups and Type of Vaccine		Number of Vaccinated			
		Dose 1		Dose 2	
		Male	Female	Male	Female
Age	With chronic diseases	1257	1762	205	414
	Without chronic diseases	4205	2683	581	403
	Total	**5562**	**4445**	**786**	**817**

Source: Temeke Hospital (May 2022)

All the above vaccinations were administered using different types of vaccines, as shown in table 4.9. Among all the vaccines, J&J is administered as a single dose, while the rest are required to be administered in two doses. The first vaccine to arrive in Tanzania was Jonson & Jonson (J&J), which was administered as a single dose. Table below shows that J&J is the vaccine that is predominantly used, followed by Sinopharm, then Pfizer and Moderna, as shown in table 4.9 below. All COVID-19 vaccines are manufactured with as few ingredients as possible and with only the necessary amounts of each ingredient. Nearly all of the ingredients in COVID-19 vaccines are also the ingredients in many foods—fats, sugars and salts. Each ingredient in the vaccines serves a specific purpose (WHO, 2021). As of 5:10pm CEST, June 9, 2022, there have been 531,550,610 confirmed cases of COVID-19, including 6,302,982

deaths, reported to WHO, globally. As of June 6, 2022, a total of 11,854,673,610 vaccine doses have been administered (WHO, 2022).

Table 4.9 Type of Vaccine

Type of vaccine		Number of Vaccinated			
		Dose 1		Dose 2	
		Male	Female	Male	Female
Type of Vaccine	J&J	4947	3821	0	0
	Moderna	38	60	16	16
	Pfizer	45	50	116	116
	Sinopharm	532	514	654	654
	Total	**5446**	**4355**	**786**	**817**

Source: Temeke hospital (May 2022)

4.4.4 Vaccination by Sex

This study also intended to understand vaccination by sex. The study revealed that about 36 percent of males are ready to uptake vaccines, 49 percent are not ready and about 14 percent are already vaccinated. Further analysis revealed that 22 percent of female are ready to take be vaccinated, 54 percent are not ready, while 24 percent are already vaccinated. The observation revealed that a majority of female respondents, about 54 percent, are not ready to uptake a vaccine, compared to 49.5 percent of male participants, as shown in table 4.10.

Table 4.10 Vaccination by Sex

Sex	Variables	Frequencies	Percentage
Male	Yes-Ready to uptake vaccine	68	36
	No-Not ready to uptake vaccine	93	49.50
	Already vaccinated	27	14.40
	Total	**188**	**100**
Female	Yes-Ready to uptake vaccine	44	22
	No-Not ready to uptake vaccine	107	54
	Already vaccinated	46	24
	Total	197	100

Source: Field data (2022)

4.4.5 Vaccination by Marital Status

The study findings revealed that 49 percent of married couples are not ready to be vaccinated, while 32 percent are ready, while 19 percent are already vaccinated. This means that about 51 percent of respondents are in favour of COVID-19 vaccines. Also, among divorced people, 50 percent are ready to be vaccinated and the same percent are not. The observations among separated couples revealed that 64 percent were not ready to be vaccinated, while 27 percent were ready. Whereas among widowed and widowers, 51 percent were already vaccinated, 37 percent were not ready to be vaccinated and 11 percent were ready to be vaccinated. Further analysis

revealed that 68 percent of singles are not ready to be vaccinated, 28 percent are ready, whereas only 4 percent are already vaccinated or being vaccinated. This means that single people are more hesitant to get a COVID-19 vaccine than married, separated, or divorced people (See table 4.11).

Table 4.11 Vaccination by Marital Status

Marital status	Variables	Frequencies	Percentage
Married	Ready to uptake vaccine	84	32
	Not ready to uptake vaccine	130	49
	Already vaccinated	51	19
	Total	**265**	**100**
Divorced	Ready to uptake vaccine	1	50
	Not ready to uptake vaccine	1	50
	Already vaccinated	0	0
	Total	2	100
Separation	Ready to uptake vaccine	3	27
	Not ready to uptake vaccine	7	64
	Already vaccinated	1	9
	Total	**11**	**100**
Widowed/Widower	Ready to uptake vaccine	4	11
	Not ready to uptake vaccine	13	37
	Already vaccinated	18	51
	Total	**35**	**100**
Single	Ready to uptake vaccine	20	28
	Not ready to uptake vaccine	49	68
	Already vaccinated	3	4
	Total	**72**	**100**

Source: Field data (2022)

4.4.6 Household Incomes and COVID 19 Vaccines

The study is also aimed at assessing household incomes in relation to COVID-19 vaccines. About 64 percent of the respondents with an income below average replied "no" to getting vaccinated, while 22 percent said "yes" and 15 percent said they were already vaccinated. However, positive responses to vaccines exist among those with average and above-average incomes (Table 4.12). The study findings suggest that public health initiatives to combat vaccine hesitancy should consider these socioeconomic determinants and deliver personalised messages to people experiencing socioeconomic hardships and/or belonging to sociocultural minorities.

These disparities are also common in terms of a country's level. The statistics revealed that only 16% of people in low-income countries have received a single vaccine dose compared to 80% in high-income countries. In certain lower-income countries, many of the most at-risk people in society such as healthcare workers, the elderly and those with underlying health conditions are going unprotected while young, healthy adults receive booster doses in wealthier countries. The world must act urgently to close this equity gap.

Table 4.12 Household income and COVID 19 Vaccine

Household Income	Variables	Frequencies	Percentage
Below average	Yes	22	22
	No	65	64
	Already vaccinated	15	15
	Total	**102**	**100**
Average	Yes	36	32
	No	78	54
	Already vaccinated	**31**	**21**
	Total	145	100
Above Average	Yes	54	39
	No	57	41
	Already vaccinated	27	19
	Total	**138**	**100**

Source: Field data (2022)

4.5 Mechanisms for Coping with COVID-19

Coronavirus disease 2019 (COVID-19) has disrupted virtually every aspect of daily living, engendering forced isolation and social distancing, economic hardship, fear of contracting a potentially lethal illness and feelings of helplessness and hopelessness (Polliz *et al.,* 2020). Unfortunately, there is no formula or operating manual for how to cope with the current global pandemic apart from vaccines and preventive measures. The study intended to identify the different mechanisms people used to cope with the disease. It was revealed that there are different mechanisms of coping with the COVID-19 pandemic. One of the key informants revealed that vaccination should be mandatory rather than voluntary so that everyone is vaccinated.

> *Vaccination should always be treated as necessary; the government should choose one vaccine and issue a statement that vaccination is compulsory for everyone so that no one can oppose it. Us Tanzanians have been raised to listen to the government since the days of Nyerere. Education should also be provided to all age groups, especially the youth* (Interview, KII, 17/05/2022).

Vaccines are one of the most effective tools for protecting people against COVID-19. Consequently, some governments and organisations have made COVID-19 vaccination 'mandatory' to increase vaccination rates, discharge what are perceived to be duties of care to at-risk populations, and/or achieve public health goals (WHO,

2022). Others may be considering whether they ought to do the same, and if so, under what conditions, for whom, and in what contexts. Mandatory vaccination would ensure the health of every individual in the nation, which is the role of the government.

Table 4.13 Public opinion on the improvement of the COVID 19 vaccine provision

Public opinion on the improvement of the corona vaccine provision	Frequency	Percentage
Provision of proper education on COVID-19 vaccines	131	34
Government should do research on COVID-19 vaccines before introducing to the public	46	11.9
Regular mobilization of COVID-19 vaccination	78	20.3
Having one type of COVID-19 vaccine as a nation	32	8.3
COVID-19 vaccines of all types should be at the centre of all the time needed	25	6.5
COVID-19 vaccines to be mandatory	17	4.4
No need of vaccine, better stop	51	13.2
None	5	1.3
Total	**385**	**100**

Source: Field data (2022)

The responses that COVID-19 vaccines should be mandatory are further observed in the quantitative data, whereby 4 percent of the respondents who were asked to provide their opinion on the improvement of the COVID-19 vaccine provision. Further observations revealed that 34 percent of respondents received proper COVID-19 vaccine education, 30 percent received regular COVID-19 vaccine mobilisation, 13 percent suggested no need of vaccine, better stop, 6.5 percent revealed COVID-19 vaccines of all types should be at the health centre all times, and 20 percent suggest regular COVID-19 vaccine mobilisation (Table 4.13).

Furthermore, as it was revealed above, education among different community members is a prerequisite to ensuring a reasonable number of people who are willing to take get vaccinated, especially the young, who are generally more reluctant. Despite the rigorous vaccine approval process, the spread of misinformation and 'fake news' has led many Tanzanians to be skeptical of COVID-19 vaccines, which has major implications for public health. Social media attacks are one of the tools used in opposition to vaccination efforts, with a plethora of misinformation spread on popular sites such as *Instagram*, *Twitter* and *Facebook*. Research supports that misinformation and conspiracy theory campaigns are motivated by the spread of distrust in the government rather than any goal relating to health or safety (Bliss and Morrison, 2021). These attacks are a serious threat to the success of the COVID-19 vaccination drive, as they create fear through misleading information for the public. Despite it all, vaccination has been recognised as a vital step for containing the COVID-19 outbreak. To ensure the success of immunisation efforts as a public health containment measure,

a high level of public vaccination compliance is essential. Targeted COVID-19 educational programmes can be improved to accommodate attitudes toward vaccination and increase the public's uptake of protective measures.

4.6 Household with Family Member Affected By Coronavirus

FAMILY MEMBER AFFECTED BY CORONA

yes, 20.5

Total, 100

no, 79.5

How they know about infection

15.2
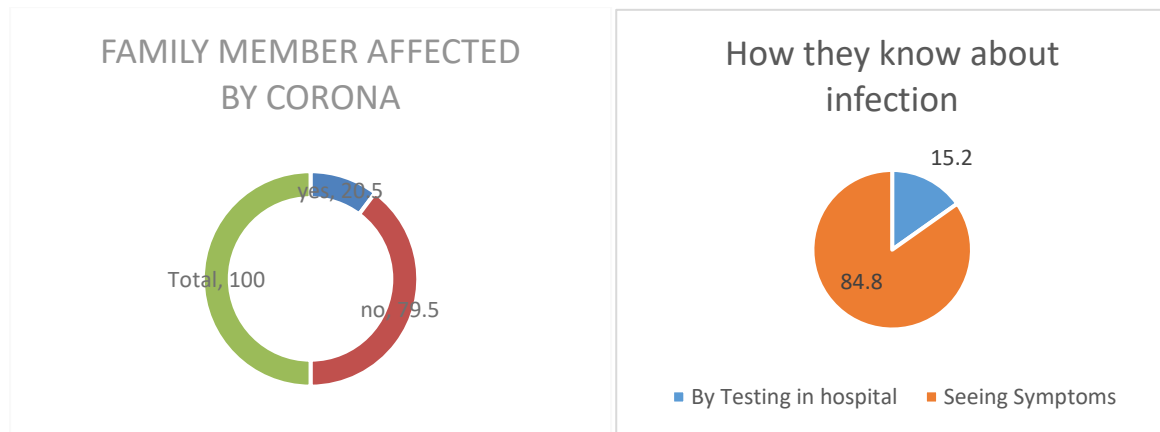
84.8

■ By Testing in hospital   ■ Seeing Symptoms

Figure 4.5 Number of the family affected by corona Figure 4.6 Criteria used to know

The study further observed that 20.5 percent of households have at least one member affected by the coronavirus and the remaining 79.5 percent of the households have none of their members affected by the coronavirus (figure, 4.5). Only 15.2 percent are aware of their coronavirus status as a result of hospital testing, and 84.8 percent accept their infection as a result of coronavirus symptoms (figure 4.6). This indicates that most people start to treat themselves after seeing symptoms, while not everyone infected with COVID-19 would always see symptoms, and not all the symptoms suspected to be COVID-19 are actually indicative of infection - due to the fact that some other diseases have the same symptoms as the COVID-19. This is confirmed by the study done by WHO (2021), which found that both COVID-19 and influenza are respiratory diseases, and they both share similar symptoms, including cough, runny nose, sore throat, fever, headache, and fatigue. Some people may have these symptoms, and some may display no symptoms.

4.7 Relationship among Variables (Case 1. Logistic Regression)

The Chi-square test was used to select independent variables through cross-tabulation. All variables that were found to be significant were included in the logistic regression model. A logistic regression was performed to ascertain the effects of age, sex, marital status, educational level, household size and the first time people heard about COVID-19 on the likelihood that participant responses on needs for testing COVID-19. It was observed that 2 (24) = 69.439, p.0000, was the statistical significance of the logistic regression model. The model explained 26.4% (Nagelkerke R2) of the variance in needs for testing COVID-19 and correctly classified 74.5% of cases (see

appendix 1). Increasing age was associated with an increased likelihood of testing for COVID-19. Children under the age of 18 were less likely to be tested for COVID-19. Furthermore, education levels are positively related to COVID-19 testing. Those with primary, secondary and college education levels are more likely to test for COVID-19, compared to those with university level education. Also, those who did not attend school are less likely to test for COVID-19, compared to those with university level education. Additionally, people who are employed are more likely to test for the COVID-19, compared to other types of occupation. However, married people are more likely to test for COVID-19, compared to single people, but single people are more likely to test for COVID-19 compared to those who are widowed, divorced, and separated. Regarding household size, households with more than six people are less likely to get the COVID-19 vaccination, compared to households with fewer than seven people. Furthermore, those who first heard about COVID-19 in 2019 and 2020 are more likely to test for COVID-19 compared to those who heard about COVID-19 more recently.

4.7.1 Readiness for COVID-19 Vaccination (Case 2. Logistic Regression)

After cross tabulation, the variables of age, education levels, occupation, marital status, where people live and number of family members, were found to have a significant relationship with readiness for the COVID-19 vaccination and were included in the logistic regression model. A logistic regression was performed to ascertain the effects of age, sex, marital status, education level, number of family members and place of residence on the likelihood that participant responses were on-time for COVID-19 vaccination. The logistic regression model was statistically significant with a p-value of.0000 of 2(24 = 71.723). The model explained 24.6% (Nagelkerke R2) of the variance in readiness for COVID-19 vaccination and correctly classified 69.9% of cases (see appendix 2). Older people were less likely to get vaccinated against COVID-19, compared to younger people.

Furthermore, those with lower education levels, i.e., below university level, are more likely to get vaccinated, compared to those with university level education. Additionally, people who are employed are less likely to get the COVID-19 vaccine compared to other types of occupations. According to the findings, single people are also more likely to receive COVID-19 vaccination than people with other marital statuses. Also, those who live in family houses are more likely to get a COVID-19 vaccine, compared to those who own and those who rent houses. Regarding household size, households with more than six people are less likely to get a COVID-19 vaccine, compared to households with fewer than seven people.

4.7.2 Efficacy of COVID-19 Vaccines (Case 3. Multinomial Regression)

Results from multinomial regression show that the likelihood ratio chi-square of 103.346 with a p-value < 0.0001 (see appendix 3). This means that the model as a

whole fits significantly better than an empty model (i.e., a model with no predictors). The age for both sets of coefficients is not statistically significant in explaining participants' responses to the statement if the vaccine prevents people from getting COVID-19. In comparison to employees, farmers are less likely to respond 'yes' than those who respond 'not sure' to the question "Can the vaccine protect you from the coronavirus?" Furthermore, married people are more likely than singles to respond 'yes' rather than 'not sure' to the question "Can vaccines protect you from COVID-19?" Furthermore, it is less likely to respond 'yes' than 'not sure' to the question "Can a vaccine protect you from COVID-19?" Meanwhile, the majority agreed to hearing about the coronavirus for the first time in 2019 and March 2020 rather than not remembering the first actual day of hearing about COVID-19.

Furthermore, people who did not attend school or had only primary or secondary education, are less likely to say 'no' to the question "Can a vaccine prevent COVID-19?" than those who say 'not sure.' Furthermore, if someone is married rather than single, they are more likely to respond 'no' rather than 'not sure' to the question "Can vaccines prevent you from getting COVID-19?" Additionally, if the household status is a permanent block house rather than a mud house, it is more likely to respond 'no' rather than 'not sure' to the statement "Can the vaccine prevent you from getting COVID-19?"

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This section presents the conclusions, and recommendation of the study.

5.1 Conclusions

The study findings conclude that COVID-19-related concerns seemed to have a strong influence on whether or not to vaccinate: those who were highly concerned about being infected with the disease, such as the elderly, health workers, and those with chronic diseases, were less likely to refuse vaccination, compared to others. Also, youth who see themselves as healthier and more energetic, consider vaccines to be useless because of their perceived better immunity to COVID-19. Moreover, the study observed that the efficacy of the vaccines puts people in a dilemma about whether the vaccines are safe or not. The analysis revealed that there are no significant differences between men and women, whereby both sexes either support the vaccines as safe, while others oppose it. Moreover, with regard to the age of respondents and COVID-19 perceptions, positive perceptions of COVID-19 vaccines increase with the age of respondents. The elderly are large supporters of the vaccines, compared to the youth. It was revealed that many young people are confident in their health and assume that COVID-19 is within their control, hence they don't need the vaccines. The study observed that occupation and working conditions play a role in COVID-19 mortality, particularly in occupations involving contact/ exposure with patients or the public. However, there is also a substantial contribution from non-workplace factors.

Further observation revealed that the greatest concern with regard to COVID-19 vaccines, for both workers and the general public, are fears regarding the vaccines' safety. These concerns result from the accelerated vaccine development, with the primary safety considerations noted being quality control, potential side effects and associated COVID-19 illness. Going forward, the review highlighted the need for advocacy with high-level political, community, and religious leaders and increased access to COVID-19 vaccination. In addition, a mass campaign to scale up vaccination activities with adequate resource mobilisation is strongly required. The study does not deny the view of a few people, about 17 percent of respondents, who proposed the vaccine be made mandatory for all, and that the Government to choose one type of vaccine that would be administered to all.

Nevertheless, the findings of this study have valuable implications for the ongoing government efforts towards vaccinations. The study highlights some of the inputs that could be added to facilitate the processes. The benefits of vaccination still outweigh the risks, at present. Government agencies and vaccine developers should continue to

take action to encourage vaccination and reduce public vaccine hesitancy. The Government should not ignore these preventive strategies. As for now, people should stop wearing masks and take other precautions in most populated areas like before.

5.2 Recommendations

The study highlights the following recommendations for the future process of vaccination in Tanzania.

i.   The study recommends that education be decentralised to the ward and village levels to be a convenient and effective means for improving attitudes toward vaccination, and it should be utilised to overcome the vaccine hesitancy hurdles in the COVID-19 context and any other possible future outbreaks.

ii. The Government, through the Ministry of Health (MoH), should ensure communication regarding COVID-19 vaccines is expanded through radio and television programmes to community level, by using public address systems and medical professionals from district wards and village levels. This will help to increase understanding among community members on the importance of COVID-19 vaccines.

iii. Build communication skills through interpersonal communication and community dialogue that will help to get views from different people about their fears and motives towards COVID-19 vaccines.

iv. Develop strategies which will help civil society organisations (CSOs), development partners and religious institutions to work hand-in-hand with the MoH on any cases concerning COVID-19 vaccination and other outbreak diseases, to take stern action against those who mislead the public about vaccines.

v.   The community should be made aware, and their consciousness levels raised at the ward and district levels, and they should act on any barriers to vaccination and report any problems to the appropriate authorities for further clarification.

vi. Public education about coping strategies, the utilisation of effective methods of coping and resources for practical help are expected to be useful. This is likely to be a long-term process that needs to be started during and be continued after the pandemic.

vii. People should continue taking precautions. As things stand now, people continue without taking precautions - in the market, on public transport, in churches and mosques and other densely populated areas.

viii. According to the study, before introducing any new vaccine to the public, the Government, in collaboration with other stakeholders, should provide adequate information regarding vaccines, by providing proper education. Political leaders should communicate clear and consistent messages to the public to avoid contradictions and confusion. This will help reduce, if not eliminate, the negativity towards vaccines. To ensure that future interventions are geared to

manage perceptions, vaccine information should come from an authorised organ or person rather than rely on rumours on social media.

Recommendations for Further Studies

i. This study is based on an assessment of public perceptions of COVID-19 vaccines efficacy among urban dwellers in Tanzania. Therefore, similar studies could be conducted in other parts of the world to gain a broader and more specific understanding that would go a long way in curbing this pandemic, which essentially affects the entire world.

ii. This study focused on urban area. It is recommended that a similar study be conducted by making an assessment of the public perceptions of COVID-19 vaccines efficacy among rural communities in Tanzania.

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APPENDIXES

APPENDIXES I

Relationship among variables

	B	S.E.	Wald	df	Sig.	Exp (B)
qn3			16.333	6	.012	
qn3(1)	-2.429	1.230	3.901	1	.048	.088
qn3(2)	-1.458	1.143	1.626	1	.202	.233
qn3(3)	-2.005	1.150	3.038	1	.081	.135
qn3(4)	-2.839	1.143	6.172	1	.013	.058
qn3(5)	-2.215	1.147	3.734	1	.053	.109
qn3(6)	-2.040	1.151	3.142	1	.076	.130
qn5			18.426	4	.001	
qn5(1)	-18.622	8689.009	.000	1	.998	.000
qn5(2)	2.334	1.245	3.514	1	.061	10.320
qn5(3)	1.582	1.223	1.672	1	.196	4.866
qn5(4)	-.024	1.318	.000	1	.986	.977
qn6			13.952	3	.003	
qn6(1)	-1.035	.489	4.472	1	.034	.355
qn6(2)	-1.454	.476	9.328	1	.002	.234
qn6(3)	-1.305	.377	12.006	1	.001	.271
qn7			3.279	3	.351	
qn7(1)	.156	.353	.194	1	.659	1.168
qn7(2)	-.145	.803	.032	1	.857	.865
qn7(3)	-1.145	.810	2.000	1	.157	.318
qn11			7.035	2	.030	
qn11(1)	1.942	.905	4.606	1	.032	6.975
qn11(2)	1.286	.902	2.033	1	.154	3.619
qn13			5.942	2	.051	
qn13(1)	1.546	1.142	1.834	1	.176	4.695
qn13(2)	2.241	1.184	3.584	1	.058	9.400
Constant	-2.878	1.904	2.285	1	.131	.056

Source: Field data (2022)

APPENDIXES II

Table: Readiness for COVID-19

	B	S.E.	Wald	df	Sig.	Exp(B)
qn3			13.118	6	.041	
qn3(1)	2.719	1.061	6.564	1	.010	15.158
qn3(2)	1.494	.933	2.563	1	.109	4.455
qn3(3)	1.564	.918	2.901	1	.089	4.776
qn3(4)	1.020	.898	1.289	1	.256	2.772
qn3(5)	1.645	.917	3.218	1	.073	5.181
qn3(6)	.662	.836	.628	1	.428	1.939
qn5			9.851	4	.043	
qn5(1)	.163	1.464	.012	1	.911	1.178
qn5(2)	1.296	1.201	1.163	1	.281	3.654
qn5(3)	.516	1.196	.186	1	.666	1.676
qn5(4)	.823	1.234	.445	1	.505	2.278
qn6			10.752	3	.013	
qn6(1)	1.204	.467	6.659	1	.010	3.335
qn6(2)	1.246	.430	8.407	1	.004	3.477
qn6(3)	1.035	.365	8.064	1	.005	2.816
qn7			3.080	3	.379	
qn7(1)	-.562	.340	2.721	1	.099	.570
qn7(2)	-.449	.729	.379	1	.538	.638
qn7(3)	-.832	.583	2.036	1	.154	.435
qn8			5.521	2	.063	
qn8(1)	-.898	.572	2.470	1	.116	.407
qn8(2)	-1.093	.466	5.489	1	.019	.335
qn11			.295	2	.863	
qn11(1)	.161	.582	.077	1	.782	1.175
qn11(2)	.007	.584	.000	1	.991	1.007

Constant	-1.730	1.594	1.178	1	.278	.177

APPENDIXES III

Efficacy of COVID-19 Vaccines

can vaccine prevent you long from corona virus		B	Std. Error	Wald	df	Sig.	Exp(B)
	Intercept	-1.754	1.778	.973	1	.324	
	[qn3=1]	-.867	1.091	.632	1	.427	.420
	[qn3=2]	-1.197	1.015	1.391	1	.238	.302
	[qn3=3]	-.518	.999	.269	1	.604	.596
	[qn3=4]	-.064	.982	.004	1	.948	.938
	[qn3=5]	-.149	1.039	.021	1	.886	.862
	[qn3=6]	-1.240	.941	1.734	1	.188	.289
	[qn3=7]	0b			0		
	[qn5=1]	-.659	1.394	.224	1	.636	.517
	[qn5=2]	-.896	1.050	.728	1	.394	.408
	[qn5=3]	-.096	1.025	.009	1	.926	.909
	[qn5=4]	-.134	1.094	.015	1	.902	.874
	[qn5=5]	0b			0		
YES	[qn6=1]	1.791	.602	8.854	1	.003	5.996
	[qn6=2]	.286	.484	.350	1	.554	1.331
	[qn6=3]	.146	.428	.117	1	.732	1.158
	[qn6=5]	0b			0		
	[qn7=1]	-.949	.432	4.816	1	.028	.387
	[qn7=2]	1.073	1.204	.793	1	.373	2.924
	[qn7=3]	.394	.741	.282	1	.595	1.483
	[qn7=4]	0b			0		
	[qn9=1]	.299	.365	.672	1	.412	1.349
	[qn9=2]	0b			0		
	[qn13=1]	2.849	.962	8.764	1	.003	17.274
	[qn13=2]	3.101	1.012	9.393	1	.002	22.212
	[qn13=4]	0b			0		
	Intercept	-17.473	1.354	166.575	1	.000	
	[qn3=1]	-.826	1.160	.508	1	.476	.438

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		B	S.E.	Wald	df	Sig.	Exp(B)
	[qn3=2]	.712	1.023	.484	1	.487	2.038
	[qn3=3]	.948	1.016	.871	1	.351	2.581
	[qn3=4]	.703	1.009	.486	1	.486	2.020
	[qn3=5]	1.224	1.048	1.364	1	.243	3.400
	[qn3=6]	-1.429	.974	2.152	1	.142	.240
	[qn3=7]	0b			0		
	[qn5=1]	17.958	1.083	274.854	1	.000	62949196.764
	[qn5=2]	17.623	.521	1145.466	1	.000	45019525.702
	[qn5=3]	17.618	.516	1167.702	1	.000	44830031.034
	[qn5=4]	18.360	0.000		1		94133170.443
	[qn5=5]	0b			0		
NO	[qn6=1]	1.112	.604	3.385	1	.066	3.040
	[qn6=2]	-.907	.523	3.010	1	.083	.404
	[qn6=3]	-.183	.428	.183	1	.669	.833
	[qn6=5]	0b			0		
	[qn7=1]	-1.225	.412	8.827	1	.003	.294
	[qn7=2]	.449	1.222	.135	1	.713	1.567
	[qn7=3]	-.379	.725	.273	1	.601	.684
	[qn7=4]	0b			0		
	[qn9=1]	-.805	.330	5.952	1	.015	.447
	[qn9=2]	0b			0		
	[qn13=1]	1.109	.732	2.295	1	.130	3.031
	[qn13=2]	.397	.809	.241	1	.623	1.487
	[qn13=4]	0b			0		

Source: Field data (2022)

JAMHURI YA MUUNGANO WA TANZANIA
Ofisi ya Rais
TAWALA ZA MIKOA NA SERIKALI ZA MITAA

MKOA WA DAR ES SALAAM
Anwani ya Simu:
Simu: 2203156/58
Fax: +25522203213
Tovuti: www.dsm.go.tz
Barua Pepe: ras@dsm.go.tz
Unapojibu Tafadhali taja:

OFISI YA MKUU WA MKOA
3 Barabara ya Rashidi Kawawa,
S.L.P 5429,
12880 - DAR ES SALAAM.

Kumb.Na. EA.260/307/01A/71

11 Aprili, 2022

Wakurugenzi wa Manispaa,
Temeke, Kinondoni na Ubungo,
DAR ES SALAAM.

Waganga Wafawidhi,
Temeke na Mwananyamala,
DAR ES SALAAM.

YAH: UTAMBULISHO WA UTAFITI UNAOHUSU KUTATHMINI MTAZAMO
WA JAMII KATIKA UFANISI WA CHANJO YA UVIKO-19

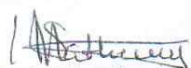Tafadhali husika na kichwa cha habari hapo juu.

2.   Ofisi ya Mkuu wa Mkoa wa Dar es Salaam inautambulisha utafiti tajwa hapo juu ambao umepewa kibali kutoka NIMR Ofisi ya Rais – TAMISEMI (Na.AB.307/323/01) kuanzia tarehe 15 Machi, 2021 hadi tarehe 15 Novemba, 2022. Utafiti huu unasimamiwa na Chuo Kikuu cha Stella Maris Mtwara.

3.   Lengo la utafiti huu ni kuangalia mtazamo wa Wataalam wa Afya na Jamii juu ya Chanjo ya UVIKO – 19.

4.   Utafiti huu umepangwa kufanyika katika Hospitali ya Rufaa ya Mkoa Temeke na Mwananyamala, Manispaa ya Kinondoni, Temeke na Ubungo hususan kwa wataalam wa Afya wa Kada mbalimbali pamoja na Wananchi ngazi ya Jamii. Katika Manispaa ya Temeke, Kinondoni na Ubungo Kata mbili zitatembelewa na wanajamii kushirikishwa katika tafiti baada ya kutoa ridhaa.

5.   Kwa barua hii, utafiti tajwa hapo juu kupitia **Dkt. Jackson Mushumbusi** wamepewa kibali kwa kuwa ndio waliopewa dhamana ya kusimamia utafiti huu.

Nashukuru kwa ushirikiano.

Dkt. Rashid S. Mfaume
Kny; Katibu Tawala Mkoa
DAR ES SALAAM

Nakala: Katibu Tawala Mkoa,
             DAR ES SALAAM. — Aione katika jalada

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TEMEKE MUNICIPAL COUNCIL

ALL COMMUNICATIONS TO BE ADDRESSED TO MUNICIPAL DIRECTOR

P.O.Box. 45232
Tel: 2850142

TEMEKE MUNICIPAL MEDICAL
OFFICE OF HEALTH
DAR ES SALAAM
TANZANIA.

Date: 29.04.2022

WEO'S
TANDIKA WARD
TEMEKE WARD
....
....

REF; PERMISSION TO CONDUCT HEALTH RESEARCH ACTIVITIES IN
TEMEKE MUNICIPALITY.

Please refer to the above heading.
Extension of Permission has been granted to
Mr./Mrs./Ms./Prof./Dr. Researchers
from (Institution) STELLA MARIS COLLEGE Address MTWARA to
Tel. No to collect data for research work in your area.

The research title is
Kutathimini mtazamo wa jamii katika
Ufanisi wa chanjo ya UVIKO-19

She/he has submitted the proposal for the mentioned study to the MMOH Office
as a pre-condition prior to authorisation.

The researchers have been instructed and agreed to submit the research progress
reports and final results to the MMOH prior to any publications.

Data collection will restart on 02|05|D22 to 24|D5|D22
Sample size.........../....................

This research work is part of Academic fulfilment for Diploma/Advanced
Diploma/Degree/master /PhD it is part of ongoing research in your
institution

I am kindly requesting you to give him/her the necessary assistance so as to
accomplish this task timely.

Yours Sincerely

FOR MUNICIPAL MEDICAL OFFICER
OF HEALTH
TEMEKE

AGNES KYAMBA
For; Temeke Municipal Medical Officer of Health

Kumb. Na. MOH/TRRH/TMM/60/1/87   Tarehe: 22/04/2022

Dkt. Jackson Mushumbusi
Chuo cha Stella Maris
MTWARA.

YAH: KIBALI CHA KUFANYA UTAFITI UNAOHUSU KUTATHMINI MTAZAMO WA JAMII KATIKA UFANISI WA CHANJO YA UVIKO 19

Tafadhali rejea barua yako ya tarehe 11 Aprili, 2022 kuhusu somo tajwa hapo juu.

Napenda kukutaarifu kuwa ombi lako la kuja kufanya utafiti unaohusu kutathmini na mtazamo wa jamii katika ufanisi wa chanjo ya UVIKO 19 limekubaliwa.

Kwa barua hii unaruhusiwa kuja kufanya utafiti kama ulivyoomba.

Nakutakia utekelezaji mwema.

Dr. Hudson Manyanga
Kny: MKURUGENZI
HOSPITALI YA RUFAA YA MKOA YA TEMEKE