# EVALUATION OF MARKETING COMMUNICATION FOR VACCINE-PREVENTABLE PUBLIC HEALTH RISKS IN WESTLANDS SUBCOUNTY, NAIROBI.

**By**

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## DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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The dissertation of ………………………………………………………was reviewed and approved on ……………………………………………by the following:

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## ABSTRACT

Travelers, migrants and host country populations face exposure to many diseases, including those preventable with vaccines such as Polio. Rapid evolution of globalization coupled with an exponential increase in number of international travellers has escalated the speed with which vaccine-preventable diseases spread globally consequently contributing to health insecurity in countries such as Kenya. This study interrogated the effectiveness of the various marketing communication strategies used in Westlands Subcounty by the Ministry of Health to raise awareness and generate demand for the polio vaccine in the year 2018. This was in order to get parents to appreciate the risk posed by vaccine-preventable disease to their children and consequently become persuaded to avail their children for inoculation during the vaccination campaigns. The study was grounded on the Theory of Reasoned Action and the Cognitive-Dissonance Theories and adopted a descriptive research design where questionnaires were administered to 403 mothers with children eligible for Polio vaccination. The sample consisted of mothers of children under the age of five who were eligible for vaccination within Westlands Sub County. Purposive sampling was used to generate a sample size 403 mothers to whom a standardized close ended questionnaire was administered. The data was analysed using SPSS for descriptive analysis through Logistic Regression. The results indicate that public address systems, health workers, Tv, radio and social media were the communication channels most effective in heightening the perception of risk of Polio transmission as well as persuading parents to avail their children for the vaccine. Social and psychological factors that influenced parent participation during campaigns were the dissenting opinions of Catholic clerics, educational qualifications of parents, government reassurances on vaccine safety and parents' understanding of the rationale behind the campaigns. The results of the evaluation concluded that overall, the campaigns were successful in terms of optimizing the number of parents who were persuaded to avail their children for vaccination. There is however need to engage contemporary marketing communication channels such as social media to address vaccination concerns in real time.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| AIC | African Inland Church |
| AIDA | Attention, Interest, Desire and Action |
| CHVs | Community Health Volunteers |
| CMYP | Comprehensive Multi-Year Plan |
| ECDC | European Centre for Disease Prevention and Control |
| IHR | International Health Regulations |
| KARF | Kenya Audience Research Foundation |
| KNBS | Kenya National Bureau of Statistics |
| MOH | MoH |
| NACOSTI | National Commission for Science, Technology and Innovation |
| SAGE | Strategic Advisory Group of Experts |
| SDA | Seventh Day Adventist |
| SMNet | Social Mobilization Network |
| TFR | Total Fertility Rate |
| UN | United Nations |
| UNICEF | United Nations Children's Fund |
| VPDs | Vaccine-preventable Diseases |
| WHO | World Health Organization |

# CHAPTER ONE: INTRODUCTION

## 1.1 Background to the Study

Travelers, migrants and host country populations risk infection to diseases including several that are preventable with vaccines (Gautret, 2012). A case in point was the measles outbreak in began in Romania in March 2017 and spread to neighbouring countries including Austria, Belgium and Ireland consequently infecting approximately 3,500 people (Gallagher, 2017). The European Centre for Disease Prevention and Control (ECDC) linked the greater regional outbreak of the disease in countries such as Austria, Belgium and Ireland to the outbreak in Romania (Gallagher, 2017).

Rapid evolution of globalization is seemingly developing into a catalyst to global health insecurity due to increased population movements occurring internationally that facilitate the evident ease with which diseases spread globally (Boggild, 2010). Many countries are additionally facing the serious challenge of increasing numbers of parents with a negative attitude towards vaccination (Dubé, 2015). Such attitudes retard the fundamental aim of disease outbreak containment: Attainment of herd immunity of children nationally, regionally and globally.

Herd immunity refers to the level of protection that is established whenever a high enough proportion of children in a population are immune. When the immunized children comprise the majority, they are then able to protect the few susceptible unvaccinated children because the pathogen is less likely to find a susceptible individual (Fine, 2011). During vaccine-preventable disease outbreaks, the proportion of the population that requires to be protected in order to achieve herd immunity protection depends on how transmissible the disease is. For diseases like Polio and Measles, 80% and 95% of the population at all times needs to be vaccinated against the two diseases respectively in order to achieve herd immunity (Fine, 1993).

To achieve this, Kotler and Keller (2016) recommend that marketing communication be adopted in such scenarios where the fundamental aim is informing, persuading, and reminding parents directly or indirectly about the benefits of vaccines in preventing diseases. Marketing Communication refers to the means adopted by organizations to convey messages about the products and services they sell, either directly or indirectly to customers with the intention to persuade them to purchase or consume (Kotler, 2005).

Studies by Krishnendhu (2019) support the views of Kotler and Keller (2016). During the 2017 Measles-Rubella (MR) campaign in India that targeted 35 million children, it was noted that acceptance of the children's parents to participate during the previous polio campaigns was much higher than acceptance levels during the 2017 MR campaign that was met with suspicion and apprehension (Krishnendhu, 2019). One of the key contributors to under performance during this vaccination campaign was ineffective integration and delivery of marketing communication activities (Krishnendhu, 2019).

The field of marketing communication for vaccination has historically had very few, if any, published evaluation frameworks that offer a comprehensive approach to identifying and organizing communication strategies used to improve childhood vaccination uptake during campaigns (Lewin, 2011). Consequently, Kaufman (2017) developed the inaugural taxonomy known as COMMVAC to address this challenge; the COMMVAC project aimed at building research evidence for improving communication with parents and communities about childhood vaccinations in low- and middle-income countries (Kaufman, 2017). The methods used to develop COMMVAC were semi-structured interviews, observations, and document analysis to collect information on communication strategies used to promote childhood vaccination uptake (Kaufman, 2017).

The COMMVAC study comprised qualitative data collection in Cameroon, Mozambique and Nigeria. The taxonomy reflects the multidirectional nature of marketing communication required during vaccination campaigns as well as the diversity of actors and channels of communication (Hill, 2009).

The COMMVAC taxonomy includes seven main categories of communication interventions (Kaufman, 2017). The first category is comprised of interventions that aim at informing or educating the public with a view to enabling consumers to understand the meaning and relevance of vaccination. The second category covers interventions that remind or assist parents in recalling previously disseminated information (Kaufman, 2017). The Teach Skills category encompasses interventions that aim to teach parents early parenting skills such as how to find access and utilise vaccination services (Kaufman, 2017).

Provision of Support is the fourth category where interventions are often personalised to assist people in addressing specific challenges to vaccination that arise within their day-to-day lives

(Kaufman, 2017). Facilitate Decision Making is the fifth category and here interventions aim at helping parents to understand the personal benefits or risks of vaccination and assist them to actively participate in decision making (Kaufman, 2017).

The Enable Communication Interventions category fundamentally aims to make communication possible, for example, through initiatives aimed at translating communication materials into local languages or employment of bilingual communicators (Kaufman, 2017). The final category is the Enhance Community Ownership category whose interventions target increase in community participation as well as promotion of interaction between the community and health services (Kaufman, 2017).

The COMMVAC model however has its weaknesses. The taxonomy adopts a qualitative approach which makes it difficult to quantify the magnitude of communication outcomes such as the proportion of parents who perceive a vaccine-preventable disease as a threat to their children's wellbeing compared to those who do not. Moreover, the categorization was based on studies undertaken in only three countries (Mozambique, Nigeria and Cameroon) and this may not be generalizable to countries such as Kenya. The study also does not make a correlation between the seven categories and the social and psychological changes that take place in parents before making the decision to vaccinate or not vaccinate their children.

Ames (2017) separately conducted a qualitative study in Cameroon and sought to appreciate stakeholder understanding of communication for childhood vaccination with a view to identifying areas with potential for optimization of demand for vaccination services. The stakeholders included parents, communities and health workers. The study focused on their preferred formats for communication, the communication style, medium and content of information about childhood vaccination.

The study found that one of the major barriers to vaccination uptake was a lack of appropriate information about the campaign due to inadequacies in the respective assessment categories. Secondly, it was realized that effective communication between healthcare providers and caregivers of children has the potential to improve childhood vaccination uptake and strengthen immunization services, particularly in low and middle-income (LMIC) settings where uptake and services may be poor.

The Ames (2017) assessment tool also has some similar weaknesses to the COMMVAC taxonomy. Being qualitative in nature, it becomes a challenge to quantify the effectiveness of communication activities. The study also does not seek to establish a correlation between the seven categories and the social and psychological changes that take place in parents before making the decision to vaccinate or not vaccinate their children. These are important in assessment of process outcomes that lead to a particular outcome metric.

Kaufman (2017) additionally developed a framework that can help in identifying potential outcomes of marketing communication strategies during campaigns. Most vaccination campaigns measure only vaccination-related end point outcomes like number of children vaccinated, making it difficult to unpack how communication interventions work or why they fail. Furthermore, Kaufman (2017) avers that there's a need to measure communication process outcomes in order to find out why an intervention did or did not influence vaccination outcomes. The three core areas in the framework are illustrated on Figure 1.1 and consist of the following: Psychosocial impact; health impact; and community, social, or health system impact. These encompass the key values of communication, reflecting principles of democratic participation and consumer empowerment in which ‘‘consumers are seen as equal partners and citizens’’ who ‘‘participate individually or collectively in health decisions’’ (Kaufman, 2017).

### 1.1.1 Psychosocial Impact

The psychosocial impact captures concepts underpinning the relationship between individuals' psychological characteristics and the social factors manifested in interpersonal relationships (Kaufman, 2017). The concepts include ‘‘knowledge or understanding,’’ ‘‘attitudes or beliefs,’’ and ‘‘decision-making’’.

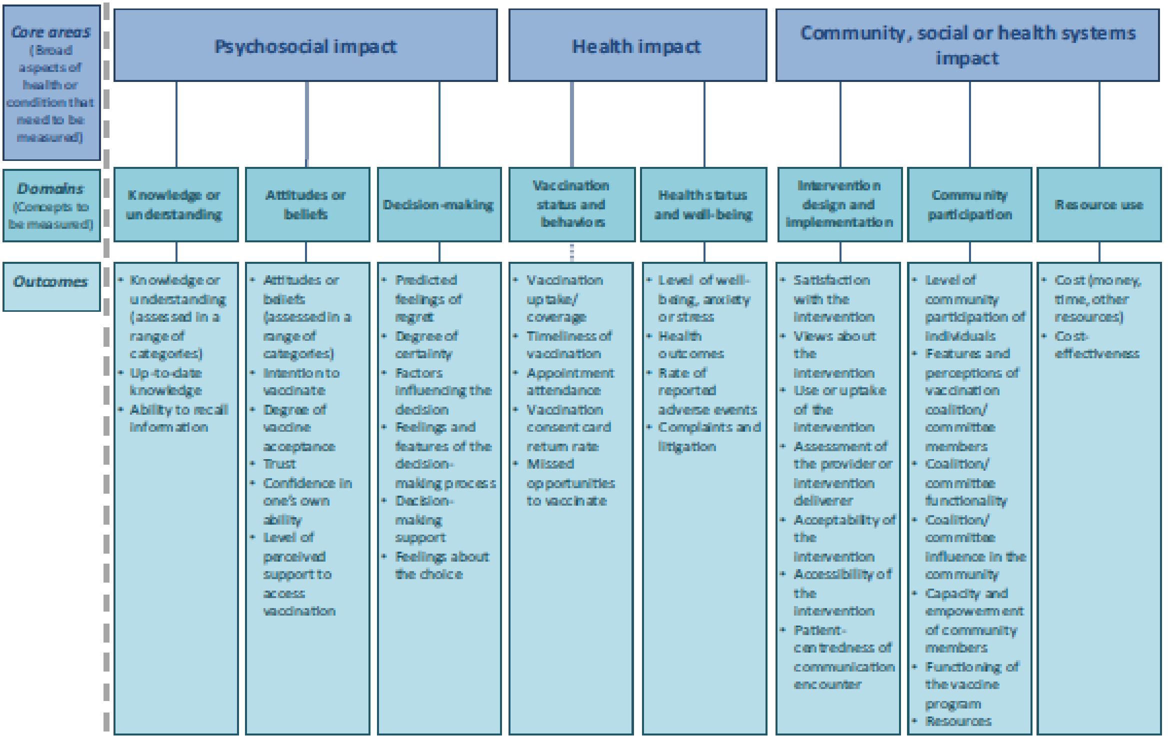
The knowledge and understanding are measured through ability to recall disseminated campaign information and how up-to-date the retained information is. Attitudes and beliefs are measured through the level of community trust in the communication deliverer and communication content. Decision-making is measured through the choices made (Kaufman, 2017). Here, caregiver feelings and confidence gained in the decision-making process are assessed as well as the perceived support received during the vaccination decision making process. Health impact is measured through the number of children who get vaccinated, number of children missed during the campaigns as well as number of children who suffer adverse events following immunization.

### 1.1.2 Community, Social or Health System Impacts

These are measured through acceptability of the vaccine and the level of empowerment and capacity that exists at community levels. Cost effectiveness of the communication interventions adopted are also measured in this category.

### 1.1.3 Health Impact

Health impact looks at vaccination status of children as well as their general health status and well-being. Disease morbidity or mortality associated with vaccines or vaccine-preventable diseases are measured as longer-term indicators of the success or failure of a vaccination communication effort (Kaufman, 2017).




. Overview of COMMVAC outcome taxonomy for childhood vaccination communication. COMMVAC, Communicate to Vaccinate.

**Figure 2-1 Overview of COMMVAC Outcome Taxonomy (Kaufman, 2017)**

The main weakness with this taxonomy is that save for the health impact category, the other two impact areas are purely qualitative thereby making it difficult to quantify the outcome results.

The three models (Kaufman, 2017; Ames, 2017 and Kaufman, 2017) however provided an opportunity to define marketing communication for this study as well as indicate what can variables can be used to measure it. Marketing communication in this study refers to the means adopted by the Ministry of Health (MoH) to convey messages about the vaccine either directly

or indirectly to parents of eligible children with the intention of persuading them to get their children inoculated during vaccination campaigns. The means adopted by the Ministry were interrogated and analysed quantitatively in this study through the marketing mix model where the P element for Promotion is discussed from a marketing-communication-during-vaccination-campaign perspective (Kotler, 2005).

The World Health Organization (WHO), the lead global UN agency concerned with international public health, has noted that marketing communication of risk posed by vaccine-preventable diseases is given token attention globally compared to the other disease control activities (WHO International Health Regulations Brief Number 1, 2005). This makes it difficult for protection to be achieved through herd immunity (Fine, 2011). They further state that communication tends to be amorphous while allocation of resources for communication activities does not always reflect ideal returns on investment in terms of number of people reached with lifesaving information during outbreaks (Toppenberg-Pejcic et al., 2018).

Marketing communication when conducted effectively, engenders a sense of ownership amongst parents and fosters health as a social public good especially when conducted over a long enough period prior to campaign commencement (Chaudhary, 2018). Failure to do so can result in poor performance when parents do not understand the rationale behind the campaigns. This can then potentially result in campaign fatigue amongst parents when campaigns are rolled out frequently (Chaudhary, 2018). Marketing communication activities therefore need to be complementary much as they are integrated and informed by evidence drawn from research if vaccination campaigns are to be consistently successful.

Integration of commercial and social marketing concepts into marketing communication for vaccine-preventable diseases is an emerging trend that seeks to address rising cases of hesitancy among parents (Nowak, 2015). Whereas commercial marketers pursue profits, public health vaccination programs focus on health rather than profit.

The social marketing approach to vaccination was successfully implemented by the Australian government in 1997 through its “Immunize Australia” campaign in response to a survey that indicated that only 33% of Australian children under the age of six were vaccinated (Carroll, 2002). Social marketing represented the “selling” of ideas, attitudes and behaviours that were

focused on improving the health and wellbeing of society (Lee, 2011). This includes selling of ideas such as getting children vaccinated, promotion of physical activity among others.

Secondly, social marketing plays the role of delivering a public good that benefits individuals and society at large; in this case having a society that is free of vaccine-preventable diseases (Suarez-Almazor, 2011). It can therefore work as an effective tool in identifying underlying reasons behind vaccine acceptance or hesitancy and their determinant factors. Dealing with vaccine hesitancy requires a good understanding of its magnitude and context as well as diagnosis of its root causes and subsequent development of tailored evidence-based marketing communication strategies that can address the causes (Lefebvre, 2013).

The Strategic Advisory Group of Experts for Immunization (SAGE), the principal advisors to WHO on vaccines and immunization, assert that community contexts determine the perception of the vaccine 'brand' and reasons underlying vaccine hesitancy and compliance during campaigns (SAGE, 2014). The contexts were grouped into three factors: Contextual influences that arise from historic, sociocultural, health system, economic or political factors; individual and group influences arising from personal perception of the vaccine or influences of the social/peer environment; and the third, vaccine or vaccination-specific issues that are directly related to vaccines or the vaccination process (SAGE, 2014).

#### 1.1.4 Polio Emergencies

Polio is a viral disease that can potentially lead to paralysis of upper and lower limbs and can also lead to death where the nerves that support respiratory functions are affected. The virus has the capability to replicate and spread extremely fast from child to child when infected faecal matter is consumed through contaminated food or water (Agarwal & Bhadauria, 2011).

Protection from Polio is normally acquired through routine immunization and complemented by at least three vaccination campaigns that target children under the age of five when routine immunization coverage is inadequate and following an outbreak of the disease (Hamborsky, 2015).

### 1.2 Kenyan Context

In the year 2017, a team comprising top level officials from WHO and Kenya's MoH conducted an evaluation of the nation's capacity to communicate risks posed by diseases during outbreak

situations. They identified gaps within the ministry's marketing communication programme that Kenya is expected to address for optimal delivery of communication services (WHO (2017a)). The areas include: Investment in planning for health marketing communication, advocacy, social mobilization and communication, public communication, engagement with affected communities and establishing mechanisms for detection and response to rumours, myths and misconceptions during disease outbreaks (WHO (2017a)).

The report of the WHO Joint Evaluation of Kenya's International Health Regulations (IHR) Capacities (2017) showed that given the gaps, it becomes difficult to predict and prioritize with certainty the most effective marketing communication channels that should be used during vaccination campaigns.

Moreover, there exists a pressing need to effectually utilize available communication resources during disease outbreaks in Kenya. In February 2016, the 14$^{th}$ meeting of the Technical Advisory Group (TAG) for Eradication of Polio in the Horn of Africa countries called on the Kenyan government to make adjustments to its marketing communication strategies during vaccination campaigns so as to better resonate with target audiences if Polio is to be eradicated (UNICEF, 2016).

The TAG's recommendation if not heeded therefore implies that the country will always remain vulnerable to vaccine-preventable diseases such as Polio from neighbouring countries where frequent outbreaks occur thereby necessitating multiple campaign roll outs. During such outbreak situations, communication is of the essence and needs to be properly planned in order to reach all parents of children that are vulnerable or at risk (Toppenberg-Pejcic et al., 2018).

Nairobi County was one of the counties targeted during the 2018 campaigns due to its susceptibility to Polio transmission according to records from the MoH (CMYP, 2018). Vaccination coverage against Polio disease in the county has persistently ranged between 60 to 70% which is lower than the 80% minimum threshold required to achieve protection through herd immunity (Fine, 1993) (See Appendix 1). This means that the whole of Nairobi County needs to have a marketing communication strategy for vaccine-preventable diseases in place to avert morbidity and mortality over the period the risk exists.

The Government of Kenya has however made efforts to incorporate risk communication in its National Disaster Response Plan though it is limited or incomprehensive in terms of marketing communication content for vaccine-preventable diseases (WHO (2017a)).

The MoH also has guidelines on risk communication in the National Preparedness and All-hazards Plan though there remains a need to develop a risk communication plan that specifically focuses on vaccine-preventable disease emergencies in addition to other public health emergencies (WHO (2017a)).

During the 2018 Polio campaigns, the Ministry relied on personal selling through community health volunteers (CHVs) and Immunization champions, advertising through print and electronic media and sales promotion as well as publicity as the marketing communication mix of activities geared to raise awareness nationally (MOH, 2018). Social media was an indirect communication channel where information was disseminated by social media consumers following communication from official ministry communication channels (MOH, 2018).

### 1.2.1 Advertising

The advertising industry in Kenya has experienced an evolution from previous reliance on traditional print and electronic media to the diversity of media channels now available including mobile phone based social media platforms that are popular with the youth (Woo et al., 2015). Evidence drawn from national surveys and carried out by firms such as the Kenya Audience Research Foundation (KARF) are usually the basis for engagement of advertising firms during vaccination campaigns (MOH, 2018). The most popular electronic and print media are usually engaged during Polio campaigns based on KARF survey reports. In 2015, KARF found that between the year 2007 and 2015, national daily reach of traditional media had shrunk. This is despite an increase in households that own TVs, growth in population and rise in living standards. The situation was attributed to increased access to media via mobile devices which are impacting on regular use of traditional media (KARF, 2015).

### 1.2.2 Personal selling

Personal selling is occurs when one person, the salesman, tries to convince the customer to buy a product or service. It is a promotional method by which the salesperson uses his or her skills and abilities in an attempt to make a sale. They aim to inform and encourage the customer to buy,

or at least try the product (Burrow, 2012). This aspect of marketing is executed during Polio campaigns in Kenya by immunization champions and community health volunteers (CHVs) who are present in all counties of Kenya. The immunization champions are well trained survivors of vaccine-preventable diseases such as Polio and Measles; they are therefore visible manifestations of the consequences of the diseases. CHVs are trained community members who are trusted and influential enough to encourage parent involvement during campaigns in their villages or settlements (UNICEF Real Lives, 2015).

### 1.2.3 Sales promotion

Sales promotion is the process of persuading a potential customer to buy a product or service. It is usually designed for use as a short-term tactic to boost sales and introduce new products and services into the market (Lamb, 2012). Over the two-week period prior to the launch of Kenya's Polio campaigns, messages on the benefits of the campaigns are broadcast through public address systems. Fliers, t-shirts, and posters are also disseminated to the public during this period. Meetings of stakeholders including chiefs, religious leaders and members of civil society are also convened to sensitize them on campaign dates and benefits of the vaccine (MoH, 2018).

### 1.2.4 Public Relations or Publicity

This is the fourth element of promotion mix is. In public relations, efforts are intended to create and maintaining good public image for products or services, organizations, celebrities, leaders among others (Lilien, 2012). Messages are conveyed with the objective of influencing opinions and creating favourable images for products, services and the organization to the public (Lilien, 2012).

A week prior to the launch of Polio campaigns in Kenya, national-level press conferences are convened by the Director of Medical Services for the media and other immunization stakeholders with the intention of creating nationwide awareness and persuading parents to avail their children for vaccination (MoH, 2018). In some instances, the public responds by spreading the word on the campaign through social media and Short Messages Services (SMS).

### 1.2.5 Social media

Social media refers to websites and applications that are designed to allow people to share content quickly, efficiently, and in real-time. Facebook is the most popular social medium in Kenya and globally (Duffet, 2015). Twitter is also popular and has been shown to provide faster updates in evolving emergencies such as Polio outbreaks compared to other channels including Facebook (Cassa, 2013). In the year 2018, social media sites in Kenya were avenues through which negative rumours on the Polio vaccine's alleged contents rapidly spread around the country leading to vaccine hesitance and refusals (MOH, 2018). This led to issuance of government press statements to address emerging concerns.

### 1.2.6 Research problem

A gap exists within the current context of marketing communication with regards to evaluation of the effectiveness of marketing communication methodologies used whenever there are risks posed by vaccine-preventable diseases during campaigns (WHO (2017a)). This poses a grave situation given that Kenya is highly ranked as one of the tier-1 nations together with Somalia and Nigeria in terms of risk of Polio transmission (GAVI, 2013). This is augmented by the fact that vaccination coverage by the year 2017 had reached a 15-year low as a result of parents not availing their children for vaccination as required (Business Daily, 2019). Furthermore, 450,000 children out of the 1.5 million targeted with vaccines are not inoculated nationally, a cause for concern due to the high risk of vaccine-preventable disease outbreaks presented by this statistic (CYMP, 2018).

A study by Dabbagh (2016) concluded that vaccination campaign success is highest whenever elements of marketing communication are well identified and mixed or integrated. This view is complemented by the findings of the Kaufman (2017) COMMVAC study as well as the Ames (2017) study and the Kaufman (2017) study on the communication outcomes taxonomy, all highlighted in the background section. This study therefore aimed to identify the combination of channels that are best placed to persuade parents to accept vaccines for their children within the Kenyan context as well as identify the communication approaches that are currently effective.

Secondly, it is also currently difficult to quantitatively predict the extent to which the most useful marketing communication strategies can facilitate the real-time exchange of facts and advice between health experts and the parents facing threats to their children's welfare during outbreaks

(WHO (2017a)). This study therefore sought to identify the most appropriate marketing communication channels as well as predict the probability of likelihood of their success during vaccination campaigns.

### 1.2.7 Research Purpose

This study interrogated the communication strategies that most effectively contribute to heightening of the perception of risk posed by the pathogens that cause vaccine-preventable diseases. Secondly, the marketing communication efforts that are most effective in getting parents to cooperate by availing their children for inoculation during vaccine-preventable outbreaks were explored. Finally, the relationship between parent attitudes towards vaccination campaigns and the social and psychological pressures that determine their behavioural intention to either avail or not avail their children for immunization was probed.

With these outputs, it was expected that it would be possible to predict how parents behave upon reception of campaign information from MoH based on their pre-existing campaign attitudes and behavioural intentions.

## 1.3 Research Objectives

i) To determine the extent to which marketing communication resulted in Polio being perceived as a threat to the wellbeing of under-fives by their parents during the campaigns.

ii) To establish the extent to which marketing communication was effective in persuading parents to avail their under-five year old children to receive the vaccine.

iii) To determine and quantify the psychological and social factors that contribute to behavioural intention of parents to avail or not avail their children for vaccination during campaigns.

## 1.4 Research Questions:

i. What is the extent to which marketing communication strategies used contributed to parents perceiving Polio as a threat to their children's lives, if at all it is considered a threat?

ii. What is the extent to which the marketing communication strategies used were effective in persuading parents to avail their children to receive the vaccine?

iii. What were psychological and social factors that influenced behavioural intention of parents to avail or not avail their children for vaccination during campaigns; to what extent did they influence behavioural intention?

## 1.5 Scope

The contextual scope of this study was limited to evaluating the effectiveness of the ministry's marketing communication strategies implemented during the five Polio campaigns that took place in Westlands Sub County of Nairobi County in months of May, June, August, September and October in the year 2018. This is because there is limited knowledge on which of the strategies used was most effective and to what extent they were effective, or not effective during the campaigns. The channels currently used by MoH during campaigns include advertising through print and electronic media, personal selling by immunization champions and community health volunteers, public relations by senior MoH officials and sales promotions two weeks prior to the launch of the campaigns.

The marketing communication effectiveness was measured by assessing the proportion of parents who were able to develop the understanding that the Polio virus posed a risk to their children's health as well as identify the specific marketing channels that best conveyed this message. The proportion of parents who were not able to develop the understanding that the virus posed a risk to their children as well as channels that were not effective in passing this information were additionally identified.

Upon determining the extent of heightened risk perception, the proportion of parents who became persuaded following the information they received and in turn decided to avail their children for vaccination was established. The marketing communication channels that most effectively persuaded them were sought. Finally, the attitudinal and societal factors that determined their decision to participate in the campaigns were interrogated.

The geographical scope was Westlands Sub County of Nairobi County that hosts a population of 177,689 people. According to the Kenya Gazette (2016), it is one of the 17 sub counties in the urban county of Nairobi and spans an area of 72.4 square kilometres. It was chosen as the focus area for the study since it contains a rich population diversity in terms of socioeconomic demographics ranging from wealthy suburb areas such as Runda and Loresho, middle suburb areas such as Highridge as well as slum areas such as Kangemi, Githogoro, DeepSea and Mji wa

Huruma. Westlands is also located in Nairobi County which is at high risk of Polio transmission due to suboptimal routine immunization coverage (CMYP, 2018).

Westlands is additionally home to a diverse range of Kenyan communities from different tribes and cultures and will therefore, to an extent, provide a sampling frame that is representative of the cultural diversity found in Kenya. It is divided into the following wards and populations: Kitisuru (31,202 people), Parklands/ Highridge (38,344), Karura (26,453), Kangemi (45,564) and Mountain View (36,126) (Kenya National Bureau of Statistics, 2016).

## 1.6 Significance of the Study

The study is expected to come up with an evidence-based guide for policy makers in government on the most appropriate and cost-effective health marketing communication strategies for use during vaccine-preventable disease outbreaks. This is expected to translate into reduced mortality and morbidity from vaccine-preventable diseases.

The study is also expected to add to the Academic community's body of knowledge in as far as the subject of marketing communication for vaccine-preventable diseases is concerned. This includes the Public Health Research community where a need to develop marketing communication for vaccine-preventable diseases has been highlighted. Medical practitioners will also gain insights on their role in encouraging parents to avail their children for inoculation during vaccine-preventable disease emergencies.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

This section reviews existing literature related to the three objectives of the study and is divided into four sections. The first section discusses the theoretical underpinnings of the study; the second section interrogates the global literature with regards to the three respective objectives; the third section details the gaps that exists in the literature reviewed at this point; the fourth section summarizes the chapter contents and the fifth part illustrates and explains the conceptual framework for the study.

## 2.2 Theoretical Foundations of the Study

This study was anchored on the Theory of Reasoned Action that aims to explain the relationship between attitudes and behaviours within human action. The Theory of Reasoned Action is mainly used to predict how individuals will behave based on their pre-existing attitudes and behavioural intentions (Fishbein, 1967).

The study was also anchored on the Cognitive Dissonance Theory that explains possible reasons behind vaccine hesitancy. The Cognitive Dissonance Theory explains that individuals are likely to behave in a manner consistent with their attitudes towards certain beliefs about the outcomes of a specific behaviour (Brehm, 1962). Any new information that contradicts their beliefs introduces the element of dissonance, a mentally inconsistent situation that an individual strives to eliminate (Brehm, 1962). They can then either eliminate the dissonance by changing their attitudes to conform to certain expected behaviours or search for information that supports their current attitudes. During vaccination campaigns, mothers can be hesitant to participate in previous campaigns but experience cognitive dissonance should new information that challenges their beliefs come up through the government's marketing communication efforts.

### 2.2.1 Theory of Reasoned Action (ToRA)

The primary purpose of the ToRA is to understand an individual's voluntary behaviour by examining their underlying motivations, social norms and expectations as well as attitudes to perform an action. The theory explains why human beings act the way they do and what influences their decision making. The theory states that a person's intention to perform a behaviour is the main predictor of whether or not they will actually perform that behaviour (Gilmore, 2002).

ToRA requires that behaviour be clearly defined in terms of the following four concepts: Action (e.g. to avail their child), Target (e.g. vaccine), Context (e.g. from a health worker), and Time (e.g. within the five days of the Polio campaign) (Montano, 2008). Behavioural intention is the main driver of behaviour, while the two key determinants of behavioural intention are parent attitudes and subjective norms (Fishbein, 1975). By examining attitudes and subjective norms, researchers can gain an understanding as to whether or not one will perform the intended action (Fishbein, 1975).

Attitudes in the theory refer to the way people feel towards a particular behaviour (Ajzen, 2007). These attitudes are influenced by two factors: The strength of behavioural beliefs regarding the outcomes of the performed behaviour (i.e. whether or not a particular outcome such as conferment of protection to their child is possible through vaccination) and the evaluation of the potential outcomes (i.e. whether or not an outcome such as protection is positive) (Fishbein, 1975). Attitudes regarding a certain behaviour can either be positive, negative or neutral (Fishbein, 1967). Where individuals perceive a certain behaviour as potentially yielding a beneficial result, they are more likely to develop a positive attitude towards it and are likely to practice it. Alternatively, if the perception is harmful, they develop a negative attitude and are unlikely to practice it (Ajzen, 2007).

Subjective norms refer to the societal pressure to perform or not perform a behaviour and is based on the influence of individuals who can sway opinion of parents. These include family members, health workers, friends, and peers (Fishbein, 1967). Subjective norms consist of normative beliefs and individual motivation. Normative beliefs refer to the opinions and views of an individual that are acceptable within their social circles and that dictate whether behaving in a particular way is appropriate (Ajzen, 2006). Usually, the more likely the referent groups will

approve of an action, such as participation in a vaccination campaign, the more likely the individual is to perform the act. Conversely, the less likely the referent groups are to approve an action, the less likely the individual is to perform the act (Montano, 2008).

Motivation to comply addresses the fact that individuals may or may not comply with societal norms of their referent groups. An individual's motivations can result in them disregarding social pressures. Alternatively, lack of motivation can cause the individual to succumb to social pressures of performing the act (Montano, 2008).

Behavioural intention has recently been associated with behavioual control (Bandura, 1994). People are more likely to enact a certain behaviour when they feel confident they can enact it successfully. Behavioural controls comprise two dimensions: Self efficacy and controllability. The more confidence one has in their ability to perform a certain behaviour (self-efficacy), such as availing their child for vaccination, and their ability to be in control of the expected behavioural process (controllability) for example, granting consent to have their child vaccinated, the more likely they are to voluntarily behave as expected (Bandura, 1994).

The Theory of Reasoned Action has been successfully used in many studies as a framework for examining specific kinds of behaviour including communication behaviour, consumer behaviour and health behaviour (Yousafzai, 2010). The theory also contains elements that will appropriately underprop this study.

Critics have however exposed limitations such as the uncertainty that exists between behavioural intention and the multiple variables involved; for example some behaviours are more likely to present problems of behavioural control than others (Pinder, 2008). A mother whose child is in a school where parental consent is mandatory prior to vaccination is unlikely to exert similar control over the vaccination process compared to a mother whose child is enrolled in a public school where individual parental consent is not obligatory (Zagaja, 2018). The theory also does not take into account the fact that certain conditions that enable the performance of a behaviour are not available to individuals. It is also limited in terms of being able to predict behaviours that require access to certain opportunities, skills, conditions, and/or resources (Eagly, 1993).

### 2.2.2 Cognitive Dissonance Theory

The theory postulates that human beings strive for internal psychological consistency to function mentally in the real world (Festinger, 1957). Whenever an individual is faced with a decision to make that conflicts with their beliefs, feelings or values, a state of cognitive dissonance arises and the consequence is usually to dissipate this situation (Festinger, 1957). A person in this state experiences a tension between what they think and what they do or should do.

When the tension or internal inconsistency is large enough, an individual is motivated to reduce it by making changes to justify the stressful behaviour, either by adding new parts to the cognition causing the psychological dissonance or by avoiding circumstances and contradictory information likely to increase the magnitude of the cognitive dissonance (Festinger, 1957). In their efforts to avoid feelings of dissonance, people will avoid hearing views that oppose their own, change their beliefs to match their actions, and seek reassurance after making a difficult decision.

A parent with a negative perspective on vaccines and vaccination campaigns is likely to be vaccine hesitant prior to listening to communication from the MoH. Tension is created mentally whenever appealing messages nudge them to reconsider their attitude towards campaigns. To resolve the tension, they might either change the way they think based on how persuading the information received from the MoH's marketing communication is or try to influence their social circles to go against the Ministry's recommendations in a bid to earn support for their attitudes and decisions (Festinger, 1962).

The theory is potentially important for this study in explaining vaccine hesitance during campaigns as it enables researchers to trace the areas of resonance and dissonance stimulated in parents whenever marketing communication is effected prior to campaigns. Parents who are against the campaigns prior to their commencement are likely to discourage their peers from participating in order to maintain a state of cognitive resonance and avoid dissonance (Festinger, 1957).

The theory is however not without its detractors. Critics of the theory state that not enough evidence exists to prove that the theory cannot be proven as false in the event a certain behaviour contradicts the norm. If for example, following marketing communication efforts, a previously

disconcerted parent is convinced that vaccination is the way to go, the theory does not accommodate such an individual (Axsom, 1989).

## 2.3 Empirical Literature Review on Marketing Communication and Vaccine-Preventable Disease Emergencies

This section looks at the empirical literature available on marketing communication for vaccine-preventable diseases from a global perspective and with a focus on the study's objectives. The section is divided into three parts where discussion focused on the three objectives of the study.

### 2.3.1 Determining the extent to which marketing communication results in Polio being perceived as a threat to the wellbeing of under-fives by their parents during campaigns.

Perceptions of risk as well as perceptions of lack of risk can affect vaccine acceptance and hesitance; whenever there exists a large enough proportion of vaccine hesitant caregivers, the risk of vaccine-preventable disease outbreaks intensifies (SAGE, 2014). Marketing communication therefore aims at maximizing the number of mothers who appreciate the risk posed by vaccine-preventable diseases and thereby minimize the number of vaccine hesitant parents.

Vaccine hesitance is defined as a parent's delay in acceptance or refusal to avail their child or children to receive a vaccine that is readily available. It is affected by factors such as complacency, lack of confidence and convenience (Butler, 2015). Complacency sets in when the perception of disease risk is low and there's little felt need for vaccination. Some parents also express concerns about vaccine safety and the necessity of vaccines leading to hesitance (SAGE, 2014).

Increasing numbers of parents are requesting alternative vaccination schedules, postponing or out rightly declining vaccination (Dempsey, 2011). Whenever communication about the importance of vaccines is issued during campaigns, Edwards (2016) categorizes parents into the following groups in terms of perception of risk of disease, attitude towards vaccines and their willingness to participate:

**Table 2.1 Parent Risk Perception and Attitudes towards Vaccines (Edwards, 2016)**

| **Category** | **Risk Perception** | **Attitudes towards Vaccines** |
|---|---|---|
| Immunization advocate | High | Parents agree that vaccines are necessary and safe. Parents have a strong relationship with their health care provider. |
| Go along to get along | High | Parents do not question vaccines, would like to vaccinate their children, but may lack a detailed knowledge of vaccines |
| Cautious acceptor | Moderate | Parents may have minor concerns about vaccines but ultimately vaccinate their children |
| Fence-sitter | Low | Parents have significant concerns about vaccines and tend to be knowledgeable about vaccines. Parents may vaccinate their child or may refuse or delay vaccines. |
| Refuser | None | Parents refuse all vaccines for their child. Their reasons for refusal may include distrust in the medical system, safety concerns, and religious beliefs |

Artur (2017) asserts that effective communication strategies can address some of the hesitant attitudes listed on Table 2.2.1. This is by raising awareness on the benefits of immunization, correcting false beliefs, rumours or concerns that prevent people from getting immunized as well as informing them where they can get the services. Zimicki (1994) further observed that an increase in understanding of the rationale and justification for vaccination campaigns was related to well-crafted messages conveyed during mass-media campaigns. The messages need to address the risk posed by the disease pathogens, the role of vaccination in protecting their children, the effectiveness of the vaccines and their potential side effects (Ames, 2017).

Medina (2008) advises that the most successful marketing communication strategies are those that recognize that in order for the message to make an impact on the audience, it must be capable of getting their attention and engaging their minds in a way that leads to action. An emotional element is essential to both of these functions.

Additionally, Fam-Kim (2013) advises that the advertisement of a service can potentially generate the opposite of a desired outcome should it be executed in a manner that does not communicate all information that would be considered relevant by parents. Based on the contribution to vaccine hesitance made by adverse events and inexplicable frequency of campaigns, it would be beneficial if marketing communication for Polio also talked about campaign frequency and the possible adverse effects likely to arise and the fact that the side effects are minor compared to the paralytic effects of Polio disease (Hamborsky, 2015).

In Kenya, the study that most closely relates to this research's first objective was conducted by Gibson (2017) who used mobile phone text messages and monetary incentives to remind and educate parents on importance of vaccination as well as the dates the children were due for routine immunization. Between Oct 14, 2013, and Oct 17, 2014, the study enrolled 2018 parents and their infants from 152 villages. Overall, 86% of 1600 children who were successfully followed up achieved the primary outcome of full immunisation by 12 months of age. Children whose parents received the SMS and US$ 2 were significantly more likely to achieve full immunisation at 12 months of age.

Based on studies in Cameroon, Mozambique and Nigeria, Kaufman (2017) developed a comprehensive framework (COMMVAC) that was qualitative in nature and that integrates vaccination communication interventions with a view to conceptualizing the full range of possible interventions that are useful in heightening the perception of risk of vaccine-preventable diseases. Interpersonal communication, printed IEC materials, mails, phone correspondence, social media, edutainment activities at community level and mass media advertising were found to be most effective in informing and educating parents on the risk posed by vaccine-preventable diseases (Kaufman. 2017). These interventions enable people to understand the meaning and relevance of vaccination to their health and that of their family or community.

However, in Sri Lanka where high levels of knowledge of the dangers of vaccine-preventable diseases are present (Herath, 2018), hesitance to vaccination exists and has been attributed to anti-vaccination advocates who claim that vaccines pose greater harmful effects such as sterility and transmission of HIV compared to the detriment caused by the diseases they prevent. The study was conducted among 141 parents who were accompanying children to the health facility and 53.2% of the parents were realized to have average or above average knowledge on the

importance of vaccination. The levels of knowledge were positively correlated to level of education and it was therefore perplexing that this population segment was hesitant to have their children vaccinated (Herath, 2018).

Of note is that hesitancy to vaccination and perception of disease transmission risk does not always seem to be closely correlated to certain expected demographic factors such as levels of education attainment. Larson, et al (2016) conducted a 67-country survey on vaccine hesitancy in Europe. The study's objectives were identification of global research undertaken on vaccine hesitancy and identification of determinants of vaccine hesitancy in different settings as well as its impact. The study found that countries with high levels of education, good access to health facilities and information about the risk posed by vaccine-preventable diseases had negative attitudes towards vaccine safety even in the face of the threat caused by vaccine-preventable diseases. The European countries include eight out of 10 least vaccine confident countries in the world (France, Bosnia and Herzegovina, Russia, Ukraine, Greece, Armenia, Slovenia, Japan and Mongolia) (Larson, 2016).

The Larson (2016) study concluded that there is an emerging inverse relationship between vaccination acceptance and socio-economic status. The higher the socio-economic status the less likely the parents are to participate in vaccination campaigns. This ironical situation signifies a challenge to marketing communication experts since they need to adopt a consumer-centric approach to understanding causes of hesitance before vaccination campaign commencement given that resistance does not seem to segregate along some expected demographic confines. This view is supported by Benin (2006) who emphasized that presentation of basic medical information may not be sufficient to reassure parents about the safety and necessity of vaccines. He proposed that development of a trusting relationship with parents is important in influencing desired vaccination-related behaviour.

Health workers play an integral role in heightening the risk posed by the Polio virus during campaigns (Khan, 2015) since they are a direct source of information for parents through interpersonal communication. Where they are inadequately informed about the gravity of Polio disease and the need to conduct repeated vaccination campaigns, the efforts to mitigate the hazard through heightening parent risk perception are significantly eroded as Khan (2015) observed in Pakistan, a country that contributes 85.2% of total Polio cases reported globally. The study was

based in two hospitals aimed at assessing the knowledge and attitudes towards polio vaccination among health workers providing public education to general public on the dangers of the disease in Pakistan (Khan, 2015).

Verger (2015) further corroborates this point when he observes that one in four unacquainted general medical practitioners in France have no faith in the vaccines offered by the French Health authorities consequently increasing vaccine hesitancy among parents. This is in contrast to the high levels of vaccination uptake observed in countries where well informed health workers are able to educate and continuously remind parents on the threat posed by the diseases and the need to get their children vaccinated (Herath et al, 2018).

### 2.3.2 Establishing the extent to which marketing communication is effective in persuading parents to avail their under-five year old children to receive the vaccine.

Different marketing communication strategies work differently depending on national and subnational contexts. Bedada (2017) set out to identify the sources of information utilized by caregivers during polio campaigns in Somali, Ethiopia in 2014 and 2015. The study found that town criers were most effective during Polio campaigns where they were able to persuade 37% of targeted caregivers (Bedada, 2017). On average each town crier targets 1,000 people with messages alerting caregivers and parents of the polio campaign, dates and benefits of vaccination. Of note is that use of electronic and print media was not found to be a significant source of information for parents and caregivers in informing their decision to vaccinate their children.

Research conducted in Kenya following a measles campaign between 3rd and 7th November 2012 by Mbabazi (2014) documented the innovative and additional activity of using house-to-house inter-personal communication visits conducted by Red Cross Volunteers in Nairobi, Western and Nyanza regions. These were documented through a web-enabled mobile phone application to create a real-time platform for linking household and immunization service providers. It was realized that 56% of the 164,643 households visited had heard about the planned measles vaccination campaign 1–3 days before start dates (Mbabazi, 2014). Additionally, 25% of households were likely to miss the measles supplemental dose if they had not been reassured through a house visit. Evaluation of the communication outcomes showed that targeted communication reduced misconceptions, fear of injections and trust in herbal remedies. Finally,

house visits were more remembered (70%) as sources of information compared with traditional mass awareness channels like megaphones (41%) and radio (37%) (Mbabazi, 2014).

A study by Subaiya (2018) on the 2016 Measles- Rubella vaccination campaign concluded that the high awareness levels of the campaign (92%) were attributable to marketing communication strategies delivered by the MoH. The strategies included mass message dissemination through SMS, interpersonal communication (IPC) and mass media advertisements. Collectively, their findings highlighted the importance of employing a wide variety of well-planned communication methods to reach the target population.

In the USA, a cross-sectional observational study by Opel (2013) noted that engagement of health workers is crucial if parents are to be convinced about the risks of not getting their children vaccinated and consequently making the decision to have them immunized. This was following an observational study in the USA which found that when physicians continued to engage parents, up to 47% of parents ultimately became persuaded to accept vaccines after initially refusing them.

Dissemination of information and raised awareness about the risks posed by Polio during campaigns may however not always result in parents getting persuaded to avail their children for vaccination. This is because marketing communication is not always considered, planned or delivered in a rigorous, integrated and evidence-informed manner (Goldstein, 2015). Ahmad (2015) sought to delve deeper into this issue by conducting a cross sectional descriptive study in Gaya Local Government Area (LGA) of Kano state, Nigeria in order to assess the knowledge, attitude, perception and belief towards polio immunization among parents. The results showed that despite 95% of parents having high knowledge about the threat posed by the Polio virus in Nigeria, 66% had little faith that the vaccine confers protection against Polio and consequently rejected the vaccines. Of these, 51% of community members were hesitant to participate since they thought giving more than four doses of the vaccine can bring about adverse effects in children.

Persuasion of individuals to practice specific behaviours requires not only reasonable arguments and supporting data, but also messengers or communicators who are considered trustworthy and who pay undivided attention to their audiences (Aristotle, 2004). The messages also need to

resonate with the audience's emotions and need to be perceived as efforts aimed at satisfying the health interests of parents as their objective (Aristotle, 2004).

India overcame the vaccine hesitancy campaign obstacle through engagement of local celebrities who provided positive reinforcement of Polio campaign messaging (Parul, 2015). India has been Polio free since the year 2012 and this was against the backdrop of several vaccination campaigns that were frequently conducted much to the disgruntlement of the public who had become unfazed by regular communication. Given the heavy investment that went into communication with incommensurate persuasion of parents, the government adopted celebrity endorsement as a means of reigniting public interest in the campaigns. This was a marketing communication strategy that was expected to target parents with issues that resonated with them and was delivered by individuals they could relate to at personal levels (Parul, 2015).

Messages were simplified and delivered by several celebrities including Amitabh Bachchan who also addressed parent concerns. The celebrities became the face of the Polio campaign in the media and would additionally visit various Polio booths to reinforce the message of immunization by personally administering the vaccine to children (Parul, 2015). Their impact in refocusing people's interest on the Polio campaigns at the time when fatigue was setting in was considered an important milestone in India. Parents by that time had lost interest in the campaigns due to their high frequency and apparent needlessness. Moreover, the public saw very few Polio victims, if any, though they didn't realize that this was the consequence of the success of the several prior campaigns (Parul, 2015).

Indian celebrities used expressions such as *"Kab tak karenge khilwaad apne bachhon ki zindagi se?"*(How long will we continue playing with our children's lives), that often struck an emotional cord with the target audiences (Chaturvedi, 2008). Tv spots showing an angry and exasperated Amitabh made the parents feel guilty of neglecting to take their children to the Polio booths. People felt that - 'It is our fault some of us do not manage to vaccinate our children every time' (Chaturvedi, 2008).

### 2.3.3 Social and psychological factors that contribute to behavioural intention of parents to vaccinate their children

Various marketing communication strategies also have different outputs and outcomes depending on national and subnational contexts. During India's 2017 Measles-Rubella campaign,

marketing communication resulted in creation of positive normative beliefs about the vaccine with peer pressure being created among the parents during the campaign periods. This was documented by Krishnendhu (2019) as being quite effective in maintaining the momentum required for a successful campaign. Parents quickly followed suit whenever they saw their peers participate during the campaigns.

Artur's (2017) studies in Nigeria also recognized that vaccine hesitancy was influenced by the following factors: Lack of trust in the vaccine and the health care workers who dispense them, parents having a nonchalant attitude towards the value of vaccines, limited access to health facilities, lack of knowledge on the various vaccines available, rumours propagated in the news, religious beliefs that discouraged immunization, illiteracy, and other social and political factors.

Following a global analysis on vaccination hesitancy, the SAGE Report (2014) on Vaccine Hesitancy summarized the factors that determine compliance. The determinant factors are grouped into three: Contextual influences that arise from historic, sociocultural, health system/institutional, economic or political factors; individual and group influences arising from personal perception of the vaccine or influences of the social/peer environment; and the third, vaccine or vaccination-specific issues that are directly related to vaccines or the vaccination process (SAGE, 2014).

#### 2.3.3.1 Contextual Influences

With regards to contextual influences, media and social media can create negative or positive vaccine sentiments and provide a platform for lobbyists and key opinion leaders to influence parents. Social media allows users to freely voice opinions and experiences and can generate enough support for or against vaccine campaign participation (SAGE, 2014). Influential community leaders and influencers, including religious leaders in some settings and celebrities in others, can all have a significant influence on vaccine acceptance or hesitancy (SAGE, 2013).

Within the context of African vaccination campaigns, engagement and cooperation of religious leaders contribute to minimizing hesitance during vaccination campaigns in Kenya (Njeru, 2016). In August 2015, the Catholic bishops in Kenya called for the boycott of the Polio vaccine by parents citing safety concerns following alleged contamination with family planning additives. A cross sectional survey was conducted in all the 32 counties that participated in the campaign

and a total of 90,157 children and 37,732 parents/guardians sampled to determine the vaccination coverage and reasons for missed vaccination. The results showed that the boycott negatively affected the campaign since the national vaccination coverage was 93% against the expected minimum coverage of 95% (Fine, 2011). The study recommended that engagement of Catholic clerics was important if the campaign targets were to be achieved in future campaigns.

In Nigeria, the greatest setback to the country's Polio eradication initiatives have been occasioned by rejection by Muslim religious leaders who are highly influential and whose efforts have resulted in anti-Polio propaganda, misconceptions and allegations that the vaccine was contaminated with HIV, carcinogens and sterilizing agents. This resulted in the campaign being completely halted in some states (Nasir, 2014). Recent active engagement with the leaders has however promoted the uptake of the vaccine in the country. The engagement was undertaken through formation of a coalition involving imams, Islamic school teachers, traditional rulers, doctors, journalists, and polio survivors. This initiative greatly assisted in bringing on board previously vaccine-hesitant parents in northern Nigeria (Jegede, 2007).

Polio campaigns conducted in India's Uttar Pradesh State were insufficient to stop transmission nationally before 2012. This was because of rumours about the vaccine that swirled within the localized Muslim communities increased refusal rates to 20% (Obregón, 2009). As a result, the disease burden among the Muslim community was disproportionately high, with about 59% of Polio cases occurring in Muslim children, despite constituting only 12% of the total Indian population. Engagement of Islamic religious leaders played a critical role in the country's communication strategy that contributed to Polio eradication in India (Obregón, 2009).

#### 2.3.3.2 Individual Level Factors

At individual level, past negative or positive experiences with a particular vaccination can influence hesitancy or willingness to vaccinate. Where parents know of someone who suffered from a vaccine-preventable disease due to non- vaccination they are likely to participate in the campaigns (SAGE, 2014). On the contrary, parents who have experienced or know of children who suffered adverse events following immunization are likely to be hesitant to participate during campaigns. Positive influence is further cemented through running adverts that are emotionally appealing and that resonate with parents (Stevens, 2018).

Vaccine acceptance and hesitancy can also be determined by the accuracy of information that parents have or misconceptions due to misinformation. Furthermore, trust or distrust in government authorities can affect parental confidence in vaccination programmes (SAGE, 2014). Pressure from peer groups as well as the social norms within parent's living environments are additional determinants of acceptance and hesitance (Ajzen, 2012).

The situation is especially grave in communities where vaccination rumours and misconceptions are prevalent, mistrust of health workers exists and knowledge of the threat caused by Polio disease is low. Studies have shown a direct correlation between the three factors and low vaccination coverage during vaccination campaigns (KAPS, 2014). In Nigeria for example, rumours peddled by politicians and religious leaders countering the MoH messages resulted in an increase of Polio incidence from 202 in 2002 to 1,143 in 2006 (Ghinai, 2013).

To address the myriad of campaign communication challenges, India developed the successful community engagement strategy known as the Social Mobilization Network (SMNet). SMNet contributed to the decline in vaccination hesitancy levels to less than 1% through community engagement activities. SMNet was based on engagement of more than 7,000 frontline community health workers who were tasked to advocate for vaccination in some of the most underserved, marginalized, and vulnerable communities in India where Polio transmission posed greatest risk. The network focused on generating demand for Polio vaccination and as a result of their efforts, an increase in vaccination coverage amongst the targeted populations was observed (Deutsch, 2017). The strength of the strategy lay in the fact that any rumours, myths and misunderstandings were captured in a timely manner and addressed at community level before hesitancy levels could escalate (Deutsch, 2017).

Oku (2017) further attests to the importance of skilled communication by personnel, especially at individual and community levels of the health system, in curtailing circulating negative information about vaccines. It is crucial to mobilize community support for vaccination programmes within the short periods campaigns are held. Health workers need to be trained on interpersonal communication in order to provide relevant and comprehensible information in a respectful and culturally appropriate manner (Weisbord, 2005).

#### 2.3.3.3 Vaccine and Vaccination-specific Issues

With regards to vaccine and vaccination-specific issues, the SAGE (2014) report indicates that negative experiences touching on vaccine safety can prompt individuals to hesitate, even following government reassurance. The manner through which a vaccine is administered can also influence vaccine hesitancy. Oral vaccines for example are more acceptable to parents who fear injections. Some parents may not have confidence in a vaccinator working on a house-to- house basis or injections administered outside a health facility environment.

Some parents also have little faith in campaign approaches driven by government (SAGE, 2014). Health facilities located too far away from parents can also result in vaccine hesitance due to the inconvenience of having to travel at the cost of competing household priorities (SAGE, 2014). Finally, parents may appreciate the importance of preventing individual vaccine-preventable diseases but can be reluctant to comply with recommended schedules when they don't understand their justification (e.g. multiple vaccination campaigns) (SAGE, 2014).

In Kenya, although awareness of Polio campaigns has been noted to be high, the following vaccine and vaccination-related concerns have been raised by parents (UNICEF, 2016): An unnecessarily high frequency with which the vaccine is given to children, doubts about the authenticity of the Polio vaccine and the qualifications of vaccinators giving it.

In February 2016, the Technical Advisory Group on Polio Eradication in the Horn of Africa Region indicated that addressing these communication gaps would greatly contribute to eradicating the disease in Kenya (UNICEF, 2016).

## 2.4 Research Gaps

This section brings out the findings and research gaps exposed from the literature reviewed for the objectives. Findings and research gaps are categorized based on the respective objectives.

**Table 2.2 Research Gaps**

| Author | Findings | Research Gap |
| --- | --- | --- |
| **Determining the extent to which marketing communication results in Polio being perceived as a threat to the wellbeing of under-fives by their parents during campaigns** | | |
| Gibson (2017) | SMS reminders and monetary incentives improved awareness and perception of risk of vaccine-preventable diseases. | Research mainly focused on SMS reminders as channel for marketing communication. |
| Kaufman (2017) | COMMVAC taxonomy is a framework that can be used to assess marketing communication effectiveness. | The tool is purely qualitative in nature therefore cannot be used to quantify research findings. |
| Herath, 2018 and Larson, 2016 | There's a positive correlation between levels of education and knowledge of dangers of vaccine-preventable diseases. This however does not directly translate into vaccine acceptance among these population segments. | Herath (2018) relied on a small sample size while the Larson (2016) study did not categorize the global factors contributing to vaccine hesitance nor did it establish any associations. |
| Khan, 2015 | There is a direct correlation between knowledge and attitudes of health workers on the dangers of the Polio virus and the knowledge and attitudes of parents on the dangers of the Polio virus. | The study was only based on two hospitals in Pakistan and the findings are not therefore generalizable in the rest of Pakistan nor are they generalizable globally. |

| Establishing the extent to which marketing communication is effective in persuading parents to avail their under-five year old children to receive the vaccine. | | |
|---|---|---|
| Bedada, 2017 | Town criers were the most significant source of campaign information followed by health workers and Kebele or traditional leaders. They were also the most persuasive in convincing parents to get their children vaccinated. | The author cites lack of investigation of social and psychological factors to assess their relationship with persuasiveness of the marketing communication channels used. |
| Mbabazi, 2014 | An effective form of marketing communication is the use of mobile phone apps to trace and document campaign performance together with house to house visits to persuade parents to avail their children for the campaign three days before it begins. | Study focused on interpersonal communication as the only form of marketing communication. |
| Subaiya, 2018 | Success of the campaign was attributed to high awareness levels that persuaded parents to avail their children. The marketing communication strategies found effective were interpersonal communication (by healthcare workers, community volunteers, immunization champions and community/religious leaders) , mass media advertisements (TV, radio, public address systems, newspapers, posters/banners, and social media) and SMS reminders | The primary objective of the survey was to classify vaccination in each of the 47 counties against the target of 95% coverage. Marketing communication was not incorporated in the study's methodology and was instead analysed using proportions where respondents who reported being persuaded by the respective communication |

| | | |
|---|---|---|
| | | channels were compare to the total number who were persuaded to participate. This type of analysis assumes that parents receive information from mutually exclusive marketing communication sources. |
| Opel, 2013 | Health workers play a key role in persuading parents to participate in vaccination. | The study had a small sample size of 16 providers from 9 clinics. The findings are therefore not generalizable. |
| Ahmad, 2015 | The results showed that despite 95% of parents having high knowledge about the threat posed by the Polio virus in Nigeria, 66% had little faith that the vaccine confers protection against Polio and consequently rejected the vaccines | The study did not bring out the specific marketing communication channels that resulted in 95% of parents having high knowledge about the threat posed by the Polio virus or how they came up with the 66% statistic. |
| **Social and psychological factors that contribute to behavioural intention of parents to vaccinate their children** | | |
| SAGE Report, 2014 | Study summarized the factors that determine compliance during vaccination | The report offers a comprehensive guide on |

| | campaigns: Contextual influences; individual and group influences and vaccine or vaccination-specific issues | areas to focus on when implementing vaccine demand creation activities. The report requires implementation at national and regional level in order to understand and quantify the different contexts that exist in different countries and regions. |
|---|---|---|

## 2.5 Chapter Summary

From the global literature reviewed concerning heightening of perception of the risk posed by Polio, it is apparent that the combination of anti-vaccination propaganda, rumours, misconceptions (Herath, 2018), misinformation and lack of information regarding vaccines (Verger, 2015) can conjure up situations where the perception of risk posed by vaccine-preventable disease can be eclipsed by issues that can be addressed through proper packaging and delivery of risk information. Lack of involvement of health workers in communication programming can also possibly reduce the perception of risk of transmission of polio (Khan, 2015). Sociodemographic factors such as age, religion, residential area, education that might possibly influence risk perception will also need to be probed (Larson, 2016; Benin, 2006). It is important to find out through research if the situations observed in other countries is similar in the Kenyan context with a view to understanding the population segments particularly affected and identifying mitigating measures through marketing communication.

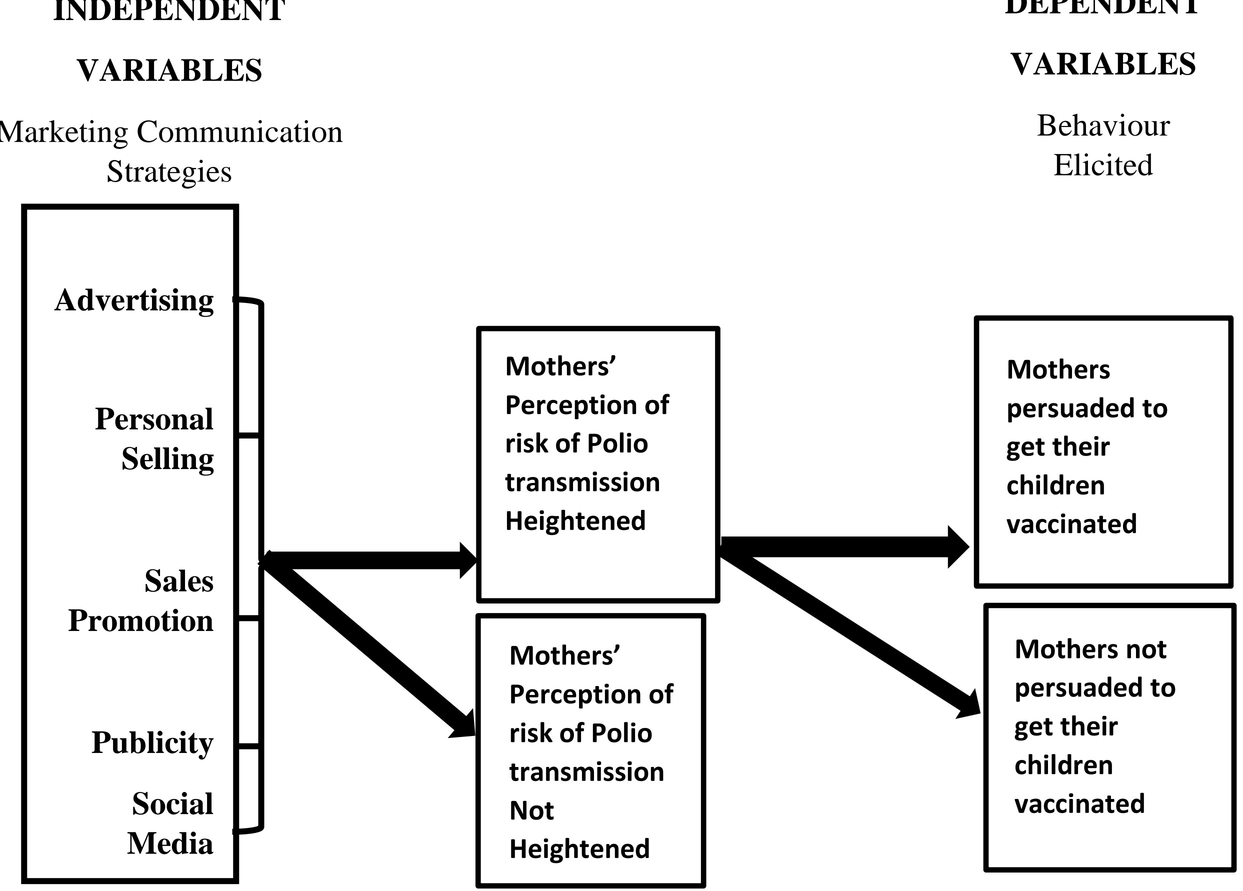
With regards to the second objective on persuasion of mothers to avail their children for vaccination, the literature reviewed shows that in order for marketing communication to be effective in terms of eliciting desired reaction from parents during campaigns, multi-faceted tactics to communication design and delivery are required (Opel, 2013; WHO, 2015; Ahmad, 2015). There's need to find out to what extent the current multi-faceted tactics are working or not working persuasively in Kenya during campaigns. Additionally, communication during

campaigns takes place in a multidirectional manner, simultaneously, intensely and within a short period of five days each (Oku, 2016). The literature reviewed from a number of countries reveals the underutilization of important stakeholders such as religious leaders and medical practitioners during their communication efforts thereby leading to suboptimal performance (Nasir, 2014; Njeru, 2016; Obregón, 2009). It is therefore critical to map out all relevant stakeholders, influencers and the most suitable range of communication channels available for convincing parents to avail their children once the messages are disseminated by Kenya's MoH (Ames, 2015; Parul, 2015).

Finally, with regards to the literature reviewed for objective three, given the dynamic nature of vaccine hesitancy and acceptance, there's a need to assess parental perceptions of vaccines given the varying and unpredictable attitudes on vaccination campaigns in different countries (Artur, 2017; Edwards, 2016). Minimal hesitancy during one campaign can evolve into great hesitancy during the next (SAGE, 2014). This study therefore aimed to identify the most pertinent factors within the Kenyan context that influence the behavioural intention of mothers to participate during campaigns. This required an assessment of existing attitudes as well as subjective norms that determine behavioural intention (Fishbein, 1967; Krishnendhu, 2019).

## 2.6 Conceptual Framework

The conceptual framework illustrates the relationship being examined between the marketing communication strategies (Independent variables) used during the 2018 campaigns and the behaviour elicited of either acceptance or rejection of the vaccines by mothers (Dependent variables). The marketing communication strategies delivered messages on the risk of Polio transmission to the parents' children; the information conveyed was then expected to increase or heighten the probability of the parents perceiving Polio as a risk to their children's health; some parents however did not perceive any danger of disease transmission. Out of those parents whose perception of danger of Polio transmission was heightened, a number of parents became persuaded to avail their children for vaccination while others were not persuaded. The underlying social and psychological factors behind vaccine acceptance and refusal/hesitancy were then probed.




Source: Author (2019)

***Figure 2-1 Conceptual Framework***

# CHAPTER THREE: RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter deals with the research methods that were used to investigate the effect of key marketing communication strategies that influenced parents to avail their children during Polio campaigns.

The section describes the research design, population and sampling, data collection methods, research procedures, data analysis and how research quality and ethical issues were considered and upheld. The data collection tools are affixed on appendices five and six.

## 3.2 Research Design

Research design refers to the sampling, collection, analysis and interpretation of data results. This was a descriptive study that sought to bring out the issues that contribute to vaccination hesitancy and acceptance behaviours; this was conducted through administration of questionnaires. The purpose of designing the study this way was to measure and analyse the dependent variables (parental decision to accept vaccine or not) and independent variables (exposure to marketing communication) and establish their degree of association.

The Unit of Analysis in the study is the care giver (parent) of a child (or children) under the age of five residing in Westlands Sub County of Nairobi County.

## 3.3 Population and Sampling Design

In this section, the population size, the sample size and the sampling techniques to be used in this study will be featured.

### 3.3.1 Population Size

The study's population size and sampling frame comprised of parents of children under the age of five living in Westlands Subcounty of Nairobi County. According to the Kenya Gazette (2016) the sub county's population was 177,689 in 2016 and based on Kenya's last Population Census (2009). According to KNBS (2014), under-fives account for 13.9% of Kenya's total urban population (See Appendix 2).

As at the year 2014 when the Kenya Health and Demographic Survey (KDHS, 2014) was conducted, the total fertility rate in urban areas was 2.7 births per woman.

**Calculation of Sampling Frame Population:**

According to KNBS (2014), under-fives comprise 13.9% of the urban population in Kenya. This translates to approximately 24,699 children being under the age of five in Westlands Sub County's 177,689 total population.

Given that 2.7 children are on average (KNBS, 2014) are expected to be born by each urban woman aged between 15 and 49 years in Nairobi, this translates to 24,699 children borne by 9,148 mothers (24,699 divided by 2.7). The sampling frame population size is therefore 9,148 mothers.

### 3.3.2 Sample Size

Sample size calculation requires determination of the standard deviation and mean of the sampling frame population (Malhotra and Birks, 2007). In a situation where prior surveys or similar researches have been conducted, the sample size can be calculated based on the sampling frame population (McDaniel and Gates, 2004). In this case, no similar study (at least to the researcher's knowledge), has been conducted in Nairobi County. This therefore necessitates the use of alternative means to calculate the population sample size.

According to Smith (2013), in order to calculate the sample size one requires the following:

*Standard Deviation* which is a measure that is used to quantify the amount of variation or dispersion of a set of data values. In a situation where a survey has not been conducted, Smith (2013) advises that the safe decision is to use a standard deviation of 0.5. This is considered the most "forgiving" number that ensures the sample population calculated will be adequate.

*Z Score* which is the number of standard deviations from the mean a data point is. For a study where a confidence interval of 95% is planned, the Z score is 1.96.

*The Margin of Error* is the statistic that indicates how many percentage points the results will differ from the real population value. In this case Smith (2013) advises the use of 5% meaning

that for a 95% confidence interval, a 5% margin of error means the results will be within 5% of the real population value 95% of the time.

**Formula: Necessary Sample Size = (Z-score)$^2$ * StdDev*(1-StdDev) / (margin of error)$^2$**

$$= ((1.96)^2 \text{ x } .5(.5)) / (.05)^2$$

$$= (3.8416 \text{ x } .25) / .0025$$

$$= .9604 / .0025$$

$$= 384.16 \text{ or Approximately 384 respondents}$$

Saunders (2016) also reaffirm that for a population frame of close to 10,000, 384 sample respondents are adequate.

### 3.3.3 Sampling Procedure and Techniques

Purposive Sampling Procedure was used. Purposive sampling is a sampling procedure where participants are selected based on characteristics of the population being studied and the objective of the study (Crossman, 2017). Westlands Sub County comprises heterogeneous parents from different socioeconomic backgrounds living in formal and informal settlements.

The researcher divided the population into five separate clusters based on the wards that constitute Westlands Sub County. Thereafter, mothers with children under the age of five were sought and interviewed across the wards from their respective households. A minimum of 77 respondents was targeted and achieved in each ward in order to reach the expected minimum of 384 respondents in Westlands Sub County.

## 3.4 Data Sources and Collection Methods

### 3.4.1 Primary Data Sources

Data was collected through administration of questionnaires (Appendix 5) to the parents. The questionnaire was designed in such a way as to capture all the research questions under

investigation and were issued face to face to the parents at household level. The questionnaires were administered by the principle investigator.

### 3.4.2 Supporting Data Sources

A number of supporting data sources were used including reports on ratings of Tv and radio stations from market surveys conducted by KARF as well as ratings from research conducted by Geopoll and Ipsos Market Survey companies. These data sources were of importance in assessing how study findings from objectives 1 and 2 compare to existing and current marketing communication survey data.

### 3.4.3 Data Collection Methods

The data collection tool for quantitative data analysis was a survey questionnaire (a sample is attached on Appendix 5). The questionnaire was constituted from the various factors collated from the literature review that influence parental decision to participate or not participate in the campaigns.

## 3.5 Research Quality

This study conformed to research quality standards by ensuring validity, reliability and objectivity. This was to ensure the research provides evidence that is robust, stands up to scrutiny and can be used to inform policy making. The principles of professionalism, transparency, accountability and auditability were adhered to (Shavelson & Towne, 2002).

### 3.5.1 Pilot Testing of Research Instruments

The questionnaire was initially piloted by conducting interviews that targeted 2% of the total sample population (8 respondents). The objective of the pilot test was to assess face validity by assessing if the questionnaire would elicit the accurate responses to questions as they were framed. The pilot also aimed at testing and confirming that the questionnaire contents were relevant, sufficient and to respondents' understanding.

It was however noted that due to non-response from respondents in some of the wards in Westlands, the proportion of respondents targeted in the pilot was increased to 5% of the population targeted (20 respondents). Bartlett (2001) advises that researchers need to incorporate

this kind of variance (that they have little direct control over) in their research design and as early in the study as possible. Cochran (1977) listed the use of pilot study results and use of data from previous studies of the same or similar populations to establish population variances for sample size determinations. In this case, given that a similar study has not been undertaken in Westlands (at least not to this researcher's knowledge), the non-responses from the initial pilot study informed the decision to increase the sample size by 20% from 384 respondents to 460 as guided by Salkind (1997). Sample size populations from each of the five wards in Westlands were therefore increased by 20% each to avoid selection bias.

Content validity was attained by sharing the questionnaire with academic supervisors to establish whether the constructs represented what was being measured (Saunders and Bristow, 2015).

The descriptive interview questionnaires were piloted and the following amendments were made: The requirement for the name of the caregiver was realized to be too sensitive and the question was expunged; the same applied to level of income earnings. The phrase, "Daktari wa Kijii" was found to be the term most appropriate in describing the community health volunteers who are the resident villagers that accompany the vaccinators during the campaign for purposes of advocacy. The ranking on the question, "On a scale of 1 to 10 (1 being least and 10 most), how much confidence do you have in the messages given by the MoH about the safety and effectiveness of the vaccines?" was adjusted to range from 1 to 5 for purposes of getting better accuracy of responses from the interviewees.

### 3.5.2 Internal validity

Internal validity was enhanced through collection of data from more than one source, i.e., primary data from the questionnaires issued in the study and also use of available and relevant supporting documents.

### 3.5.3 External validity

To ensure that the study is generalizable across settings, sound sampling procedures were used, and a large enough sample population identified (460) in order to be representative of the total targeted population. This was in a bid to ensure that biases were minimised. To further enhance the external validity of the study, the researcher segmented the sample size population based on five the wards in Westlands Sub County. A total of 92 respondents per ward were interviewed as

a minimum thereby ensuring that the inferences made were as much as possible representative of the population diversity of Westlands.

### 3.5.4 Reliability

Reliability is the agreement between two efforts to measure the same trait through employing the same methodology; it is also a measure of the internal consistency of the data collection instrument in terms of actually measuring what it intends to measure (Campbell and Fiske, 1967; Creswell & Creswell, 2017). A standardised questionnaire was used to ensure consistency of the data collected. A reliability test using Cronbach's alpha was also conducted on the coded responses assessing the use of specific communication outlets (Sijtsma, 2009). The score of 0.672 attained fell in the range that Johnson & Christensen (2008) consider as satisfactory (values between 0.6 and 0.7). The results are presented below on Table 3.1.

**Table 3.1 Cronbach Alpha - Marketing Communication Outlets**

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| .672 | .829 | 8 |

**Table 3.2 Total Statistics**

**Item-Total Statistics**

| Marketing Communication Variables | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| Radio | 1.31 | 2.129 | .137 | .180 | .666 |
| TV | 1.17 | 2.174 | .077 | .165 | .692 |
| Other Community Members (friends & family) | 1.56 | 2.003 | .624 | .434 | .647 |
| Posters | 1.55 | 1.910 | .727 | .541 | .620 |
| Doctors, Nurses, Community Health Workers (madaktari wa vijiji) | 1.27 | 2.099 | .148 | .225 | .665 |

| Public Address Systems | 1.49 | 1.972 | .457 | .300 | .667 |
|---|---|---|---|---|---|
| Religious Leaders | 1.55 | 1.989 | .609 | .393 | .646 |
| Social Media | 1.53 | 2.076 | .417 | .268 | .682 |

### 3.6 Data Analysis

The methodology that was considered most appropriate for analyzing the study was Multiple Logistical Regression. It is considered appropriate when dealing with binary, ordinal, nominal as well as polychotomous or multiple dependent variables (Harrell, 1985). It has also proven useful in predicting the probability of an event by a fixed time period, predicting whether or not a consumer buys a certain product, predicting an ordered response, e.g., "good", "better", "best" as well as testing for differences among several variables between two or more groups (Harrell, 1985).

Through this method, parents who received information on the dangers of the Polio virus and availed their children for vaccination were compared to those who received the same information and declined to avail their children. The subjective norms and attitudes of parents who participated and those who did not participate in the campaigns were also analysed.

### 3.7 Ethical Considerations

The study complied with ethical standards by safeguarding the autonomy of respondents, establishing fairness and trust, protecting them from harm and by acknowledging the contributors of published literature through citation. Confidentiality of respondents was maintained through protection of their identities to avoid undue embarrassment, harm or material disadvantage. The rights to anonymity and confidentiality of the participating parents was additionally respected and ensured in the data compilation process through appropriate coding.

Ethical approval was also sought and granted by the Strathmore University Ethics Board (See Appendix 8). A research license was also availed by NACOSTI (See Appendix 9). Finally, respondents were required to sign a consent letter confirming their understanding of the context of the research and their willingness to participate. See a sample attached as Appendix 4.

# CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

## 4.1 Introduction

This chapter provides an analysis of the data collected to address the objectives of the study. The chapter is demarcated into the following sections: Response rate, Descriptive Statistics, and Objectives one to three results of the study. Logistical regression analysis was used to analyse the data collected through use of the SPSS software. For ordinal data, ordinal logistical regression was used while nominal logistical regression was used to analyse nominal data.

## 4.2 Quantitative Interview Findings

### 4.2.1 Response rate

Following the pilot study results explained in Chapter Three, the new sample size for the study was 460 respondents who were sourced in equal numbers from each of the 5 wards in Westlands Sub County. The total number of responses received was 403 indicating that the response rate was 87.6%.

### 4.2.2 Demographic Statistics

This section provides a summary of the respondents' demographic information, the purpose of which is to provide insight into the characteristics of the respondents. The demographic factors assessed were level of education, religion, age, ward of residence and number of children.

#### 4.2.2.1 Level of education

Respondents who have completed secondary education comprised majority of respondents; 110 (28%) respondents were in this category (See Figure 4.1 below). Parents without formal education were the least populous with 16 (4%) respondents in the category.

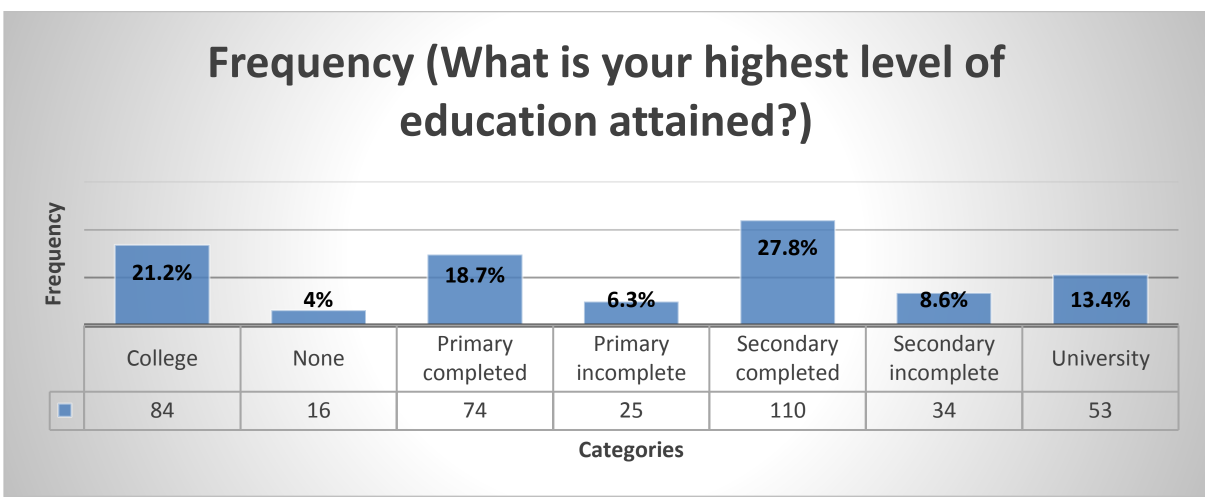



**Figure 4-1 Level of Education**

Source: Primary Data (2019)

#### 4.2.2.2 Religion

Most respondents were Christians, specifically Protestants (52%) followed by Catholics (30.1%) (See Figure 4.2 below). It was markedly difficult to gain access to the Hindu community who expressed a general disinterest in participating in the study. It was also noted that they did not participate even during the campaigns and this was evident from the lack of chalk markings on almost all household doors. After vaccination of children, all respective household doors are marked using chalk by vaccinators for monitoring and evaluation of campaign purposes.

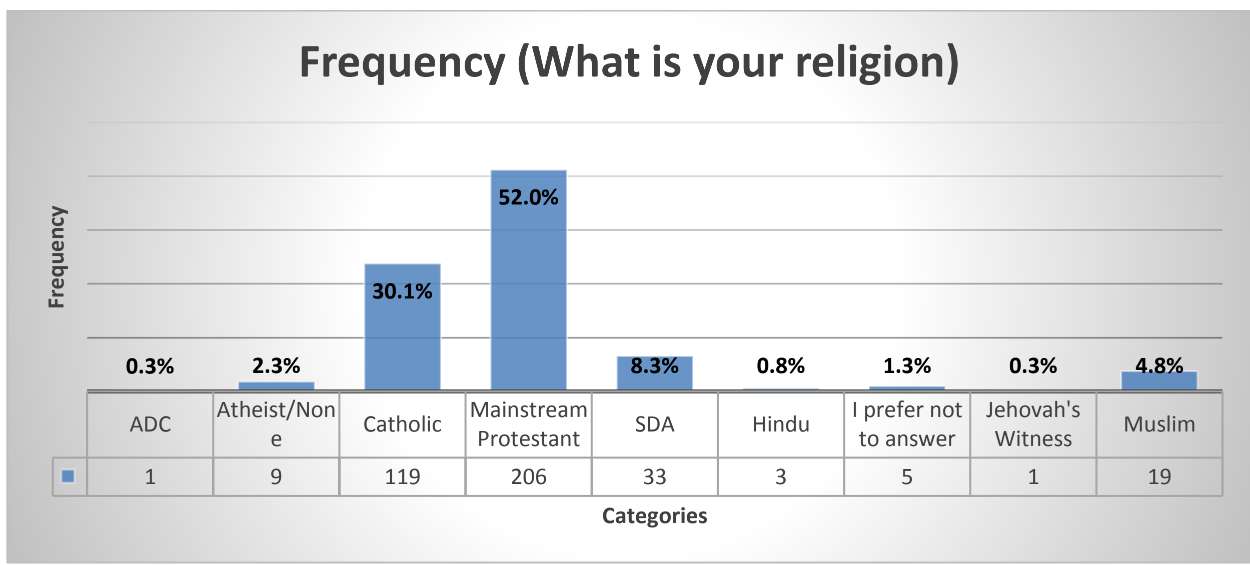
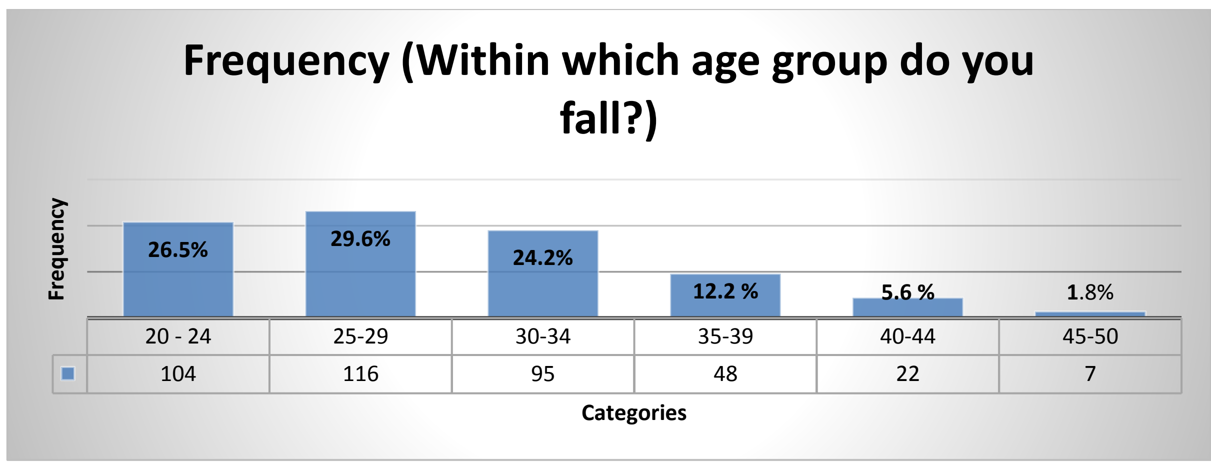



**Figure 4-2 Religion**

Source: Primary Data (2019)

#### 4.2.2.3 Age

Most respondents were in the 25 to 29 age category (29.6% of total respondents) with the fewest being in the 45 to 50 age range (1.8%). Most responses predominantly represent the views of a youthful population that comprises majority of Westland's population within the age-bearing cohort. Figure 4.3 below provides an illustration of the age categories.




| | 20 - 24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-50 |
|---|---|---|---|---|---|---|
| ■ | 104 | 116 | 95 | 48 | 22 | 7 |

**Figure 4-3 Age of Respondents**

Source: Primary Data (2019)

#### 4.2.2.4 Place of residence (Wards)

All five wards within Westlands Sub-county were presented by a minimum of 77 respondents so as to achieve the requisite minimum sample size of 403 respondents. More data than required was however collected from some regions; these were kept for inferential analysis as they were credible and thus there was no valid basis for eliminating them from the study. The summary of responses by region is indicated in Figure 4.4 below.

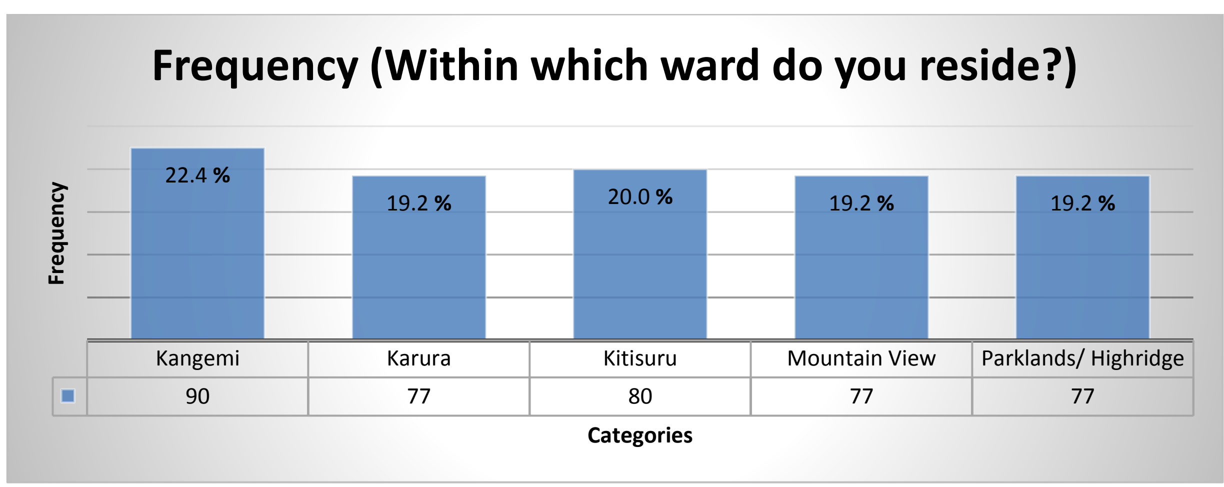



**Figure 4-4 Respondents Residence**

Source: Primary Data (2019)

#### 4.2.2.5 Number of children

Most families had one to two children under the age of five whereas only two families had more than three children under the age of five. The modal response category was indicative of one child under the age of 5 per family household (70.6% of respondents). The responses are illustrated in Figure 4.5 below.

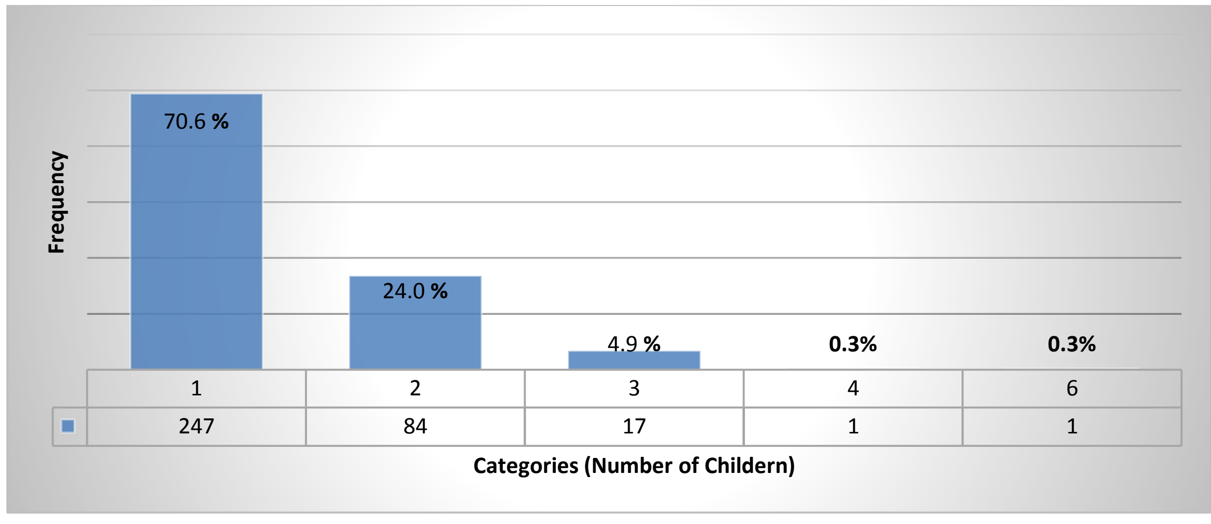



**Figure 4-5 Number of Children**

Source: Primary Data (2019)

### 4.2.3 The extent to which marketing communication resulted in Polio being perceived as a threat to the wellbeing of under-fives.

To address this objective, analysis was made based on responses to Question 10 A, "I believe the messages I've heard during the Polio campaigns indicate that my child (ren) are in danger of getting the disease"

Multiple ordinal logistic regression was conducted to analyse the results of this objective. For multiple ordinal independent variables, multiple ordinal logistic regression is used for analysis (Bender, 1997). The logistic function on which the model is based, provides estimates that must lie in the range between zero and one; negative values are categorized on the group whose results are contrary or opposite to those indicative of positive results (Kleinbaum, 2010).

For this objective, the levels of perception of threat was the dependent variable and the various modes of communication dummy coded (1 and 0 for presence of absence) representing the independent variables. The influence of each factor was then inferred from the log odds generated following the analysis. The results are illustrated on Table 4.1 below:

**Table 4.1 Communication Perceived Risk Parameters**

Parameter Estimates

| | | | | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|---|
| | | Estimate | Std. Error | Wald | Df | Sig. | Lower Bound | Upper Bound |
| Threshold | [Perceived Risk = 1] | -1.877 | .232 | 65.670 | 1 | .000 | -2.331 | -1.423 |
| | [Perceived Risk = 2] | -1.205 | .207 | 34.010 | 1 | .000 | -1.611 | -.800 |
| | [Perceived Risk = 3] | -.589 | .196 | 9.052 | 1 | .003 | -.973 | -.205 |
| | [Perceived Risk = 4] | 1.780 | .216 | 67.728 | 1 | .000 | 1.356 | 2.204 |
| Location | Radio | .326 | .224 | 2.110 | 1 | .146 | -.114 | .765 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| TV | .397 | .209 | 3.618 | 1 | .057 | -.012 | .807 |
| Other Community Members | -.444 | .472 | .885 | 1 | .347 | -1.368 | .481 |
| Posters | -.563 | .504 | 1.248 | 1 | .264 | -1.550 | .425 |
| Medical Practitioners/ Health Workers | .548 | .227 | 5.836 | 1 | .016 | .103 | .992 |
| P.A. Systems | .578 | .332 | 3.034 | 1 | .082 | -.072 | 1.228 |
| Religious Leaders | -.453 | .435 | 1.082 | 1 | .298 | -1.306 | .400 |
| Social Media | -.232 | .361 | .413 | 1 | .521 | -.939 | .475 |

**Link function: Logit.** Source: Primary Data (2019)

In ascending order of contribution to risk perception, use of radio, Tv, medical practitioners, and Public Address systems were the channels most associated with effectively communicating the high risk posed by the disease by log odds of 0.326, 0.397, 0.548 and 0.578 respectively.

Communication through religious leaders, social media, posters and other community members as credible sources of information was associated with a smaller perception of risk by factors of -0.453, -0.232, -0.563, -0.444. The implication of this finding is the channels are either least effective or sub optimally utilized in heightening the perception of Polio as a threat.

The use of medical practitioners (doctors, nurses and community health workers) was the only variable presenting a significance value lower than $\alpha = 0.05$ therefore it was the only statistically significant predictor of perception of threat. The inference therefore is that medical practitioners are the most reliable influencers of enhancing perception of Polio as a threat. The use of P.A. systems was the most influential across the board as it presented a log odds value of 0.578 (the highest of the communication channels) albeit its influence was not be confirmed at 95% significance level.

In Parklands/High-ridge, 84% of respondents agreed or strongly agreed with the observation that Polio was a serious threat to the children under the age of five. Most respondents who agreed

with the view identified medical practitioners as their most trusted source of information (40.3%). Contrariwise, parents from the rest of the wards were most influenced by Television (24.4%).

Out of all respondents in Kangemi who received information from all the communication channels, only 52% agreed or strongly agreed that Polio is indeed a threat compared to 48% who either disagreed or were unsure.

Disaggregated ward level illustrations of the levels of heightened perception of risk as well as variety of channels that respondents reported as having reached them during the Polio campaigns can be found in Appendix 6.

The ordinal logistic regression SPSS outputs for Objective 1 are presented on tables 4.2, 4.3, 4.4 and 4.5 below.

**Table 4.2 Case Processing Summary for Objective 1**

Case Processing Summary

| | | N | Marginal Percentage |
|---|---|---|---|
| I believe the messages I've heard during the Polio campaigns indicate that my child(ren) are in danger of getting the disease | 1 (Strongly disagree) | 24 | 6.1% |
| | 2 (Disagree) | 55 | 14% |
| | 3 (Neutral) | 27 | 6.9% |
| | 4 (Agree) | 185 | 47% |
| | 5 (Strongly Agree) | 102 | 26% |
| Valid | | 393 | 100.0% |
| Missing | | 10 | |
| Total | | 403 | |

Source: Primary Data (2019)

Most respondents (73%) indicated they agreed or strongly agreed with the view that the messaging efforts had resulted in perception of Polio as a danger to their children. Of the 403 respondents, 10 did not provide a response to the question whereas 37 indicated that they strongly disagreed with the view that Polio was a threat to their children's health following the messaging efforts.

**Table 4.3 Model Fitting Information for Objective 1**

Model Fitting Information

| Model | -2 Log Likelihood | Chi-Square | Df | Sig. |
|---|---|---|---|---|
| Intercept Only | 292.481 | | | |
| Final | 280.970 | 11.512 | 8 | .174 |

**Link function: Logit.** Source: Primary Data (2019)

Before we start looking at the effects of each explanatory variable in the model, we need to determine whether the model improves our ability to predict the outcome. We do this by comparing a model without any explanatory variables (the baseline or 'Intercept Only' model) against the model with all the explanatory variables. The "Intercept Only" describes a model that does not control for any predictor variables (Marketing communication channels in this case) and simply fits an intercept to predict the outcome variable (Level of perceived risk). An improved "Final" model is then analysed based on the effect of the predictor variables on the outcomes seen in the data, the "Final" model should improve upon the "Intercept Only" model.

The model fitting information indicated a significance value higher than α = 0.05; this therefore indicated that at 95% confidence level, there is no evidence of a statistical difference between the generated model – explaining the influence of communication channels on perception of threat – and a null model (one without predictors). The implication of the finding therefore is that the log odds values for each of the independent variables could not be interpreted as being statistically valid at the 95% confidence level. Cautious interpretation is therefore required.

**Table 4.4 Goodness of Fit for Objective 1**

Goodness-of-Fit

| | Chi-Square | Df | Sig. |
|---|---|---|---|
| Pearson | 200.310 | 196 | .401 |
| Deviance | 164.236 | 196 | .952 |

**Link function: Logit.** Source: Primary Data (2019)

The Goodness of fit test helps in deciding whether the model is correctly specified by assessing how well a model fits the data. It is usually applied after a "final model" has been selected through the Model Fitting Information. The tests produce a p-value which if low (below .05), you reject

the model. If it's high, then your model passes the test. Under the Goodness of Fit test, the null hypothesis (no correlation) is that the generated model interpreted from Table 4.5 is adequate in predicting values of the dependent variable relative to a perfect model. This is because the significance value was higher than the p-value 0.05 meaning there is not enough evidence to reject the null hypothesis indicating that there was no significant difference between the perfect predictor model and the generated model under study; the generated model is therefore valid. This test offers evidence contrary to that indicated in the model fitting information. The implication herein is that the generated model had a strong enough predictive power as compared to one that accurately predict all values of the dependent variable as it was not significantly different from the perfect model that would accurately predict all the values of the dependent variable through the independent variable. This therefore offers statistical justification for the interpretation of the log odd values generated at a 95% confidence level.

The Chi-square test is intended to test how likely it is that an observed distribution is due to chance. It is also called a "Goodness of Fit" statistic, because it measures how well the observed distribution of data fits with the distribution that is expected if the variables are independent. It tests the null hypothesis that the variables are independent. The test compares the observed data to a model that distributes the data according to the expectation that the variables are independent. Wherever the observed data doesn't fit the model, the likelihood that the variables are dependent becomes stronger, thus proving the null hypothesis incorrect. For interpretation the calculated value of Chi-Square goodness of fit test is compared with the table value. If the calculated value of Chi-Square goodness of fit test is greater than the table value (as is the case here), we reject the null hypothesis and conclude that there is a significant difference between the observed and the expected frequency. If the calculated value of Chi-Square goodness of fit test is less than the table value, we will accept the null hypothesis and conclude that there is no significant difference between the observed and expected value.

**Table 4.5 Pseudo R-Square for Objective 1**

Source: Primary Data (2019)

| | |
|---|---|
| Cox and Snell | .029 |
| Nagelkerke | .031 |
| McFadden | .011 |

The Pseudo R-Square summarizes the proportion of variance in the dependent variable associated with the predictor (independent) variables, with larger $R$ 2 values indicating that more of the variation is explained by the model, to a maximum of 1.

The variability accounted for by the model in this case was moderately strong at 31% as indicated by the Nagelkerke output (Hu, 2006). The implication of this finding is that the independent variables under consideration as depicted in the generated model did not sufficiently address the variance in the dependent model. It is however noteworthy that the pseudo r-squared values are not strictly to be interpreted as the traditional r-square value presented in standard logistic regression. The model, on account of a suitable goodness of fit rating, was therefore considered valid for interpretation at $\alpha = 0.05$.

### 4.2.4 Extent to which marketing communication was effective in persuading parents to avail their under-five year olds for vaccination.

For this objective, an analysis was made based on responses to Question 9, "Have you had your children vaccinated every time you have heard about 2018 campaigns announced by the Ministry of Health?"

A nominal logistic regression model was run to assess the influence of the various communication avenues on parents choosing to have their children vaccinated every time they have heard of an ongoing campaign. The dependent variable was whether the children were availed for vaccination or not while the independent variable was the channels of communication. The results of the analysis are illustrated on Table 4.6 below.

**Table 4.6 Parameter Estimates Communication and Persuasion**

| Parameter Estimates<br>Have you had your children vaccinated every time you've have heard about ongoing campaigns announced by the MoH this year (2018)?[a] | | B | Std. Error | Wald | Df | Sig. | Exp(B) | 95% Confidence Interval for Exp(B) Lower Bound | Upper Bound |
|---|---|---|---|---|---|---|---|---|---|
| Blank | Intercept | -1.394 | .623 | 5.010 | 1 | .025 | | | |
| | Radio | -2.731 | 1.172 | 5.429 | 1 | .020 | .065 | .007 | .648 |
| | TV | -2.515 | .934 | 7.257 | 1 | .007 | .081 | .013 | .504 |
| | Other Community Members (friends & family) | -18.966 | .000 | . | 1 | . | 5.795E-9 | 5.795E-9 | 5.795E-9 |
| | Posters | -17.660 | .000 | . | 1 | . | 2.139E-8 | 2.139E-8 | 2.139E-8 |
| | Doctors, Nurses, Community Health Workers (madaktari wa vijiji) | -2.111 | .939 | 5.057 | 1 | .025 | .121 | .019 | .763 |
| | Public Address Systems | -20.429 | .000 | . | 1 | . | 1.342E-9 | 1.342E-9 | 1.342E-9 |
| | Religious Leaders | -19.272 | .000 | . | 1 | . | 4.270E-9 | 4.270E-9 | 4.270E-9 |
| | Social Media | -1.157 | 1.203 | .925 | 1 | .336 | .314 | .030 | 3.324 |
| No | Intercept | -3.297 | .524 | 39.592 | 1 | .000 | | | |
| | Radio | .143 | .594 | .058 | 1 | .810 | 1.154 | .360 | 3.697 |
| | TV | -.262 | .563 | .217 | 1 | .641 | .769 | .255 | 2.321 |
| | Other Community Members (Friends and family) | .385 | 1.039 | .137 | 1 | .711 | 1.470 | .192 | 11.269 |
| | Posters | .306 | 1.205 | .065 | 1 | .799 | 1.359 | .128 | 14.406 |
| | Doctors, Nurses, Community Health Workers (madaktari wa vijiji) | .792 | .560 | 2.000 | 1 | .157 | 2.208 | .737 | 6.616 |
| | Public Address Systems | -.907 | 1.093 | .690 | 1 | .406 | .404 | .047 | 3.435 |
| | Religious Leaders | .266 | 1.038 | .066 | 1 | .798 | 1.304 | .170 | 9.982 |
| | Social Media | -.126 | .939 | .018 | 1 | .893 | .881 | .140 | 5.555 |

**a. The reference category is: Yes.** Source: Primary Data (2019)

The channels most associated with persuading parents to participate in all five 2018 vaccination campaigns were Tv (0.769 odds ratio), social media (0.881) and public address systems (0.404) in descending order or contribution. This is a reflection of return on investment the Ministry has made on these marketing communication channels.

The channels that did not contribute as much in terms of persuasion included dissemination of information through health workers with an odds ratio of 2.208, radio (1.154), other community members (1.47), posters (1.359), and religious leaders (1.304).

Finally, it was noted that Tv, the channel most effective in heightening the perception of risk of Polio, was also most effective in persuading parents to avail their children for inoculation. Tv was most popular in this regard except in Parklands-Highridge ward where medical practitioners were most influential (45.5% of parents influenced). In Kangemi, the most persuasive source of information among this population was television standing at 44%. In Karura, the most influential source of information in the region was television (57%). The most trusted news source in Kitisuru was television 53.8%. In Mountain View, TV was most preferred as a trusted news source (35.1%).

Ward level illustrations of the most influential channels of communication as well as variety of channels that respondents reported as having reached them during the Polio campaigns can be found in Appendix 7.

The ordinal logistic regression SPSS outputs for Objective 2 are presented on tables 4.7, 4.8 and 4.9 below.

**Table 4.7 Case Processing Summary for Objective 2**

Case Processing Summary

| | | N | Marginal Percentage |
|---|---|---|---|
| Have you had your children vaccinated every time you have heard about ongoing campaigns announced by the MoH this year? | Prefer not to answer | 9 | 2.2% |
| | No | 18 | 4.5% |
| | Yes | 376 | 93.3% |
| Valid | | 403 | 100.0% |

| Missing | 0 | |
|---|---|---|
| Total | 403 | |
| Subpopulation | 52[a] | |

a. The dependent variable has only one value observed in 42 (80.8%) subpopulations.

Source: Primary Data (2019)

Out of 403 respondents interviewed, 376 or 93.3% availed their children during the campaigns every time they heard them announced. Nine people declined to indicate whether they have had their children vaccinated whereas 18 did not have their children vaccinated.

**Table 4.8 Model Fitting Information for Objective 2**

Model Fitting Information

| | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| Model | -2 Log Likelihood | Chi-Square | Df | Sig. |
| Intercept Only | 115.383 | | | |
| Final | 96.104 | 19.279 | 16 | .254 |

Source: Primary Data (2019)

The model fitting information indicated a significance value higher than $\alpha = 0.05$; this therefore indicated that at 95% confidence level, there is no evidence of a statistical difference between the generated model – explaining the influence of communication channels on perception of threat – and a null model. This therefore suggests that the relationship between the dependent and independent variables depicted in the model could not be confirmed at the confidence level.

**Table 4.9 Likelihood Ratio Tests for Objective 2**

Likelihood Ratio Tests

| | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| Effect | -2 Log Likelihood of Reduced Model | Chi-Square | df | Sig. |
| Intercept | 157.989 | 61.885 | 2 | .000 |
| Radio | 103.481 | 7.377 | 2 | .025 |
| TV | 104.170 | 8.067 | 2 | .018 |
| Other Community Members (friends & family) | 97.677 | 1.573 | 2 | .455 |
| Posters | 96.694 | .590 | 2 | .744 |
| Doctors, Nurses, Community Health Workers (*Madaktari wa Vijiji)* | 103.779 | 7.675 | 2 | .022 |
| Public Address Systems | 102.360 | 6.256 | 2 | .044 |
| Religious Leaders | 98.133 | 2.029 | 2 | .363 |
| Social Media | 97.182 | 1.079 | 2 | .583 |

Source: Primary Data (2019)

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0 or that there is no significant difference between the observed and expected values.

The null hypothesis under test in the likelihood ratio test is that indicating that the generated model has no statistically significant difference from a perfect model. Whereas three predictors were found to be non-significant at $\alpha = 0.05$, four were found to be significant – communication by other community members, posters, medical practitioners, religious leaders and social media. The implication of the finding therefore is that, according to this test, only four relationships observed were considered significant at a confidence level of 95%.

### 4.2.5 To determine the factors that contribute to behavioural intention of parents to avail or not avail their children for vaccination during campaigns.

To assess the effect of other factors affecting behavioural intention to accept vaccines – attitude (Questions 10 B, C, D and E), subjective norms (Question 11) and demographics (Question 13), a multinomial logistic regression model was run. Multinomial logistic regression is a simple extension of binary nominal logistic regression and allows for more than two categories of the dependent or outcome variable (Starkweather, 2011). It uses maximum likelihood estimation to evaluate the probability of categorical membership (Chan, 2005; Kwak, 2002).

The independent variables education, age, perception of danger, confidence in government communication, and influence of significant others were coded through Likert scale values 1 to 5 as applicable and included as covariates in the analysis. Any variable that is measurable and considered to have a statistical relationship with the dependent variable qualifies as a potential covariate.

The various communication variables were dummy coded and also included as covariates. All other independent variables were included as factors in the model. The dependent variable considered was 'intention to participate in future vaccination efforts' with possible responses being "yes", "no" and "maybe". The summary of responses on future intent are presented below. Tables 4.11, 4.12 and 4.13 below contain the Model Fitting information, Pseudo R-square and Likelihood ratio test results drawn from the regression output.

The likelihood-ratio test is a hypothesis test used in multinomial logistic regression to help in choosing the "best" model between two nested models (King, 1989). "Nested models" means that one is a subset of the other. For example, in Table 4.13, level of educational attainment is nested within the multinomial variables being assessed in the whole table. The test assesses the goodness of fit of two competing statistical models based on the ratio of their likelihoods, specifically one found by maximization over the entire parameter space and another found after imposing some constraint (King, 1989). If the constraint (i.e., the null hypothesis) is supported by the observed data, the two likelihoods should not differ by more than sampling error (King, 1989).

**Table 4.10 Case Processing Summary**

| | | N | Marginal Percentage |
|---|---|---|---|
| Do you intend to avail your children for vaccination during any Polio campaigns the MoH may offer next year? | Blank | 14 | 3.5% |
| | Maybe | 9 | 2.2% |
| | No | 16 | 4.0% |
| | Yes | 364 | 90.3% |

Source: Primary Data (2019)

**Table 4.11 Model Fitting information for Objective 3 – Intention and Factors**

Model Fitting Information

| | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| Model | -2 Log Likelihood | Chi-Square | df | Sig. |
| Intercept Only | 184.921 | | | |
| Final | 138.290 | 46.631 | 324 | 1.000 |

Source: Primary Data (2019)

The model fitting information indicated a significance value higher than α = 0.05; this therefore indicated that by this test, at 95% confidence level, there is no evidence of a statistical difference between the generated model – explaining the influence of communication channels on perception of threat – and a null model. The implication therefore is that at 95% confidence level, the values depicting the relationship between the variables as generated by the regression model could not be confirmed. Therefore, though interpreted by the researcher, they are understood not to bear a statistically justifiable relationship at the confidence level as suggested by this test.

**Table 4.12 Pseudo R-square for Objective 3 – Intention and Factors**

Pseudo R-Square

| | |
|---|---|
| Cox and Snell | .150 |
| Nagelkerke | .316 |
| McFadden | .252 |

The model presented a Nagelkerke Pseudo R-square value of 0.316 therefore indicating that based on this metric, the generated model accounted for 31.6% of the variance in the dependent variable.

**Table 4.13 Likelihood Ratio Tests for Objective 3 – Intention and Factors**

Likelihood Ratio Tests

| Effect | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| | -2 Log Likelihood of Reduced Model | Chi-Square | df | Sig. |
| Intercept | 138.290[a] | .000 | 0 | . |
| What is your highest level of education attained? | 138.974[b] | .684 | 3 | .877 |
| Within which age group do you fall? | 138.421[b] | .131 | 3 | .988 |
| How many children under the age of 5 years live in her household? | 137.961[b] | . | 3 | . |
| On a scale of 1 to 5 (1 being least and 5 most), how much confidence do you have in the messages given by the MoH about the safety and effectiveness of the vaccines? | 139.669[b] | 1.379 | 3 | .710 |
| On a scale of 1 to 5 (1 being agree and 5 disagree) When it comes to vaccination campaigns, I want to do what those important to me think I should do. | 138.716[b] | .426 | 3 | .935 |
| Radio | 138.222[b] | . | 3 | . |
| TV | 141.447[b] | 3.157 | 3 | .368 |
| Other Community Members (friends and family) | 139.257[b] | .967 | 3 | .809 |
| Posters | 137.215[b] | . | 3 | . |
| Doctors, Nurses, Community Health Workers (madaktari wa vijiji) | 141.559[b] | 3.268 | 3 | .352 |
| Public Address Systems | 140.467[b] | 2.177 | 3 | .536 |

| | | | | |
|---|---|---|---|---|
| Religious Leaders | 139.416[b] | 1.126 | 3 | .771 |
| Social Media | 138.245[b] | . | 3 | . |
| What is your religion | 164.340[b] | 26.050 | 24 | .351 |
| I believe the messages I've heard during the Polio campaigns indicate that my child(ren) are in danger of getting the disease | 141.417[b] | 3.127 | 12 | .995 |
| The MoH has conducted enough campaigns to fight against Polio | 137.281[b] | . | 9 | . |
| I believe that my children are fully protected from Polio when they receive: | 152.666[b] | 14.376 | 12 | .277 |
| Have you heard of any negative effects that the vaccine may have? | 140.647[b] | 2.357 | 6 | .884 |
| If yes, kindly tick against the negative effects you've heard about: | 84.426[b] | . | 123 | . |
| A. When it comes to the health of your children, who are the important people you consult? | 81.343[b] | . | 48 | . |
| Within which ward do you reside? | 140.906[b] | 2.615 | 12 | .998 |
| Regarding my participation during campaigns, most people I consider important to me consider my participation in the exercise as... | 159.548[b] | 21.258 | 15 | .129 |
| If the Ministry was to roll out similar campaigns in the year 2019, would you be in a position to go out of your way to participate in the vaccination? | 124.198[b] | . | 6 | . |
| Is it entirely up to you to decide whether your child will participate in the vaccines that will be offered by the Ministry in 2019? | 61.965[b] | . | 12 | . |

Source: Primary Data (2019)

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

b. Unexpected singularities in the Hessian matrix are encountered. This indicates that either some predictor variables should be excluded or some categories should be merged.

The null hypothesis under test in the likelihood ratio tests that indicating that the generated model has no statistically significant difference from a perfect model. All predictor variables have significance values higher than $\alpha = 0.05$ thereby indicating that there was not sufficient evidence to reject the null hypothesis. The model was thereby deemed, by this test, to be adequate in the evaluation of relationships between the variables.

#### 4.2.5.1 Demographic factors

The parameters on demographic factors are presented below following multinomial logistic regression analysis. – Category No. Reference Category, Yes.

**Table 4.14 Intention and Socioeconomic Factors Inferential**

| | | Std. Error | Wald | Df | Sig. | Exp(B) | 95% Confidence Interval for Exp(B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | B | | | | | | Lower Bound | Upper Bound |
| Intercept | -1.6 | 10.9 | 0.0 | 1.0 | 0.9 | | | |
| What is your highest level of education attained? | 0.0 | 0.4 | 0.0 | 1.0 | 1.0 | 1.0 | 0.4 | 2.2 |
| Within which age group do you fall? | 0.0 | 0.4 | 0.0 | 1.0 | 1.0 | 1.0 | 0.4 | 2.3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| How many children under the age of 5 years live in her household? | -0.328 | 1.064 | 0.095 | 1 | 0.758 | 0.720 | 0.089 | 5.797 |
| [What is your religion= ] | -9.3 | 9.7 | 0.9 | 1.0 | 0.3 | 0.0 | 0.0 | 17710.4 |
| [What is your religion=ADC] | -18.6 | 11579.1 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | .[b] |
| [What is your religion=Atheist/None] | 1.1 | 5.9 | 0.0 | 1.0 | 0.9 | 2.9 | 0.0 | 309289.9 |
| [What is your religion=Christian – Catholic] | 1.0 | 4.3 | 0.1 | 1.0 | 0.8 | 2.6 | 0.0 | 11936.9 |
| [What is your religion=Christian – Mainstream Protestant (Anglican, Presbyterian, AIC, Methodist, etc.)] | 1.5 | 4.2 | 0.1 | 1.0 | 0.7 | 4.4 | 0.0 | 16240.7 |
| [What is your religion=Christian – SDA] | 1.5 | 4.3 | 0.1 | 1.0 | 0.7 | 4.3 | 0.0 | 21171.9 |
| [What is your religion=Hindu] | 32.5 | 0.0 | | 1.0 | | 129944682900774.0 | 129944682900774.0 | 129944682900774.0 |
| [What is your religion=I prefer not to answer] | 3.1 | 10.9 | 0.1 | 1.0 | 0.8 | 21.8 | 0.0 | 42850214036.4 |
| [What is your religion=Muslim] | 0[c] | | | 0.0 | | | | |
| [Within which ward do you reside?=Kangemi] | 1.668 | 1.907 | 0.764 | 1 | 0.382 | 5.300 | 0.126 | 222.779 |
| [Within which ward do you reside?=Karura] | 1.218 | 1.948 | 0.391 | 1 | 0.532 | 3.381 | 0.074 | 153.931 |

| [Within which ward do you reside?=Kitisuru] | -0.021 | 2.027 | 0.000 | 1 | 0.992 | 0.979 | 0.018 | 51.976 |
|---|---|---|---|---|---|---|---|---|
| [Within which ward do you reside?=Mountain View] | -0.328 | 2.404 | 0.019 | 1 | 0.891 | 0.720 | 0.006 | `80.062 |
| [Within which ward do you reside?=Parklands/ Highridge] | $0^c$ | | | 0 | | | | |

Source: Primary Data (2019)

A one level increase in education (e.g. from secondary school to university) resulted in 1.0 odds of hesitancy to participate in the campaigns. This implies that areas with high education levels such as Mountain View would be less accepting of vaccines (53.33% graduates) compared to areas with lower education levels such as Karura (33.33% graduates). It is therefore necessary to use different outreach methods to appeal to respondents in areas such as Mountain View as compared to Karura that reported the lowest number of college and university graduates.

Religion played a role in participation and hesitance during the 2018 campaigns. Muslims were most receptive while Catholics were least receptive despite constituting a significant proportion of the Westlands population. This could perhaps be explained by the media reports and controversies between the Catholic Church and MoH with regards to the safety of the vaccines. The ascending order of acceptance, by odds, of vaccination among Christians was as follows: Catholics (2.6), Atheists (2.9), SDAs (4.3) and mainstream Protestants (4.4). Of note was that Protestants comprised the largest number of parents in all wards except in Kangemi where Catholics were the majority. The findings are a pointer to the need to adequately engage religious leaders before campaigns in order to obtain ideal support of their congregants.

#### 4.2.5.2 Attitude

The parameter estimates on factors relating to attitude of respondents are indicated below following multinomial logistic regression analysis.

Category – No; Reference category – Yes.

**Table 4.15 Intention and Attitude Factors**

| | | Std. Error | Wald | df | Sig. | Exp (B) | 95% Confidence Interval for Exp(B) | |
|---|---|---|---|---|---|---|---|---|
| | B | | | | | | Lower Bound | Upper Bound |
| [I believe the messages I've heard during the Polio campaigns indicate that my child(ren) are in danger of getting the disease=1] | -1.910 | 2.648 | 0.520 | 1 | 0.471 | 0.148 | 0.001 | 26.585 |
| [I believe the messages I've heard during the Polio campaigns indicate that my child(ren) are in danger of getting the disease=2] | -2.795 | 3.127 | 0.799 | 1 | 0.371 | 0.061 | 0.000 | 28.018 |
| [I believe the messages I've heard during the Polio campaigns indicate that my child(ren) are in danger of getting the disease=3] | -0.911 | 2.406 | 0.143 | 1 | 0.705 | 0.402 | 0.004 | 44.911 |
| [I believe the messages I've heard during the Polio | -1.538 | 1.679 | 0.839 | 1 | 0.360 | 0.215 | 0.008 | 5.773 |

| campaigns indicate that my child(ren) are in danger of getting the disease=4] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| [I believe the messages I've heard during the Polio campaigns indicate that my child(ren) are in danger of getting the disease=5] | 0[c] | | | 0 | | | | |
| [The MoH has conducted enough campaigns to fight against Polio=I don't know] | 0.089 | 2.904 | 0.001 | 1 | 0.976 | 1.093 | 0.004 | 323.918 |
| [The MoH has conducted enough campaigns to fight against Polio=The number of campaigns is sufficient] | 0.428 | 1.716 | 0.062 | 1 | 0.803 | 1.534 | 0.053 | 44.283 |
| [The MoH has conducted enough campaigns to fight against Polio=The number of campaigns needs to be increased] | 0.795 | 1.983 | 0.161 | 1 | 0.689 | 2.214 | 0.045 | 107.807 |
| [The MoH has conducted enough campaigns to fight against Polio=There have been too many campaigns] | 0[c] | | | 0 | | | | |
| [I believe that my children are fully protected from Polio when they receive:= ] | 17.316 | 14.455 | 1.435 | 1 | 0.231 | 33137032.418 | 1.646E-05 | 6672594705887350000000.000 |
| [I believe that my children are fully protected from Polio when | -1.667 | 3.419 | 0.238 | 1 | 0.626 | 0.189 | 0.000 | 153.547 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| they receive:=Not sure or I -+don't know] | | | | | | | | |
| [I believe that my children are fully protected from Polio when they receive:=Routine vaccine and a few of the vaccines offered during campaigns] | 1.022 | 1.604 | 0.406 | 1 | 0.524 | 2.780 | 0.120 | 64.430 |
| [I believe that my children are fully protected from Polio when they receive:=Routine Vaccine only] | 1.003 | 1.892 | 0.281 | 1 | 0.596 | 2.726 | 0.067 | 111.174 |
| [I believe that my children are fully protected from Polio when they receive:=Routine Vaccines and all vaccines offered all the time during each and every campaign] | $0^c$ | | | 0 | | | | |
| On a scale of 1 to 5 (1 being least and 5 most), how much confidence do you have in the messages given by the MoH about the safety and effectiveness of the vaccines? | -0.091 | 0.729 | 0.016 | 1 | 0.901 | 0.913 | 0.219 | 3.815 |
| [Have you heard of any negative effects that the vaccine may have?=No] | -1.119 | 2.690 | 0.173 | 1 | 0.677 | 0.327 | 0.002 | 63.616 |
| [Have you heard of any negative effects that the vaccine may have?=Yes] | $0^c$ | | | 0 | | | | |

Ironically, respondents who strongly agreed that Polio was indeed a threat were less likely to participate in the campaigns compared to those who disagreed that Polio was a threat (odds ratio

0.061). It was counterintuitive that the more parents agreed that Polio is a threat, the less likely they were to participate in the campaign exercise.

Parents who indicated that children should receive routine vaccines, and a few offered during campaigns were least likely to participate in the exercise compared to those who indicated that children should receive all vaccines (odds ratio 2.780). This finding potentially pointed to reservations on the part of parents to avail their children on account of multiplicity of vaccines without understanding the underlying justification. Further examination through focus-group interviews was therefore required.

Government assurances on safety of the vaccine correspondingly increased parent perceptions of its safety. This was associated a decrease in hesitance (odds of 0.913). Government reassurance therefore played a key role in reinforcing confidence of parents in the vaccine's safety.

Those that had not witnessed negative effects of the vaccine were most likely, with odds of 0.327, to have their children vaccinated. This therefore indicated an increased likelihood of non-participation on account of perceived danger.

Amongst all the variables discussed, the highest spread in odds was observed in the factor assessing combination of important vaccines that should be given to children, i.e., routine vaccination only versus all issued campaign vaccines including routine vaccines (2.780). This was therefore the factor contributing most to positive or negative parent attitude towards vaccination campaigns. In descending order, the other significant factors were: Attitude towards the number of campaigns held (2.2); safety concerns about the vaccine despite government assurances (0.9) and finally the perception of Polio as a threat (0.4) being the least contributor to negative attitude towards the vaccine.

#### 4.2.5.3 Subjective norms (Normative Beliefs and Motivation)

This section highlights the influence of subjective norms on intention to participate in vaccination efforts following multinomial logistic regression analysis.

79% of parents indicated that the most influential group of persons in determining participation in vaccination efforts were health practitioners. With regard to important influential persons around the parents, Figure 4.6 below highlights the frequency by quotation of the most influential figures.

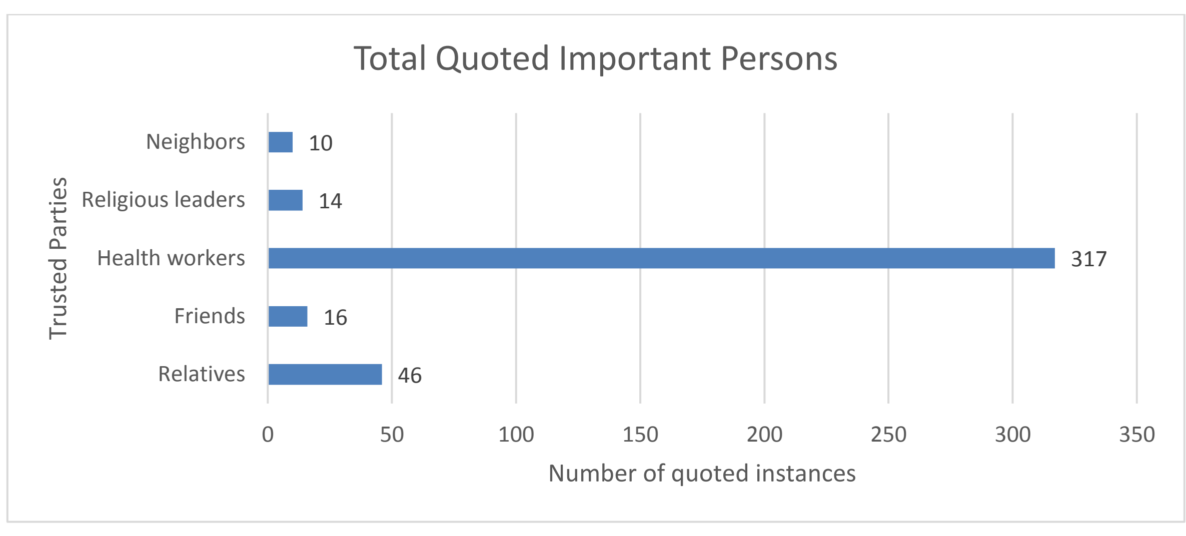



**Figure 4-6 Total Quoted Important Persons**

Source: Primary Data (2019)

The following are the behavioural intention and subjective norm results following multinomial logistic regression analysis.

Parameter estimates category No.

Reference category, 'Yes'.

**Table 4.16 Intention and Subjective Norms**

| | B | Std. Error | Wald | df | Sig. | Exp(B) | 95% Confidence Interval for Exp(B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower Bound | Upper Bound |
| [Regarding my participation during campaigns, most people I consider important to me consider my participation in the | -6.410 | 3.522 | 3.312 | 1 | 0.069 | 0.002 | 1.651E-06 | 1.638 |

| exercise as...=Extremely important] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| [Regarding my participation during campaigns, most people I consider important to me consider my participation in the exercise as...=Harmful] | 9.169 | 195.797 | 0.002 | 1 | 0.963 | 9590.906 | 2.086E-163 | |
| [Regarding my participation during campaigns, most people I consider important to me consider my participation in the exercise as...=Important] | -6.836 | 3.341 | 4.188 | 1 | 0.041 | 0.001 | 1.540E-06 | 0.749 |
| [Regarding my participation during campaigns, most people I consider important to me consider my participation in the exercise as...=Inconsequential] | -7.055 | 391.412 | 0.000 | 1 | 0.986 | 0.001 | 0.000 | .[b] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| [Regarding my participation during campaigns, most people I consider important to me consider my participation in the exercise as...=Somewhat important] | $0^c$ | | | 0 | | | | |
| On a scale of 1 to 5 (1 being agree and 5 disagree) When it comes to vaccination campaigns, I want to do what those important to me think I should do. | 0.256 | 0.411 | 0.38 9 | 1 | 0.53 3 | 1.292 | 0.578 | 2.890 |

Source: Primary Data (2019)

In terms of normative beliefs, health practitioners contributed most in terms of swaying social pressure to participate or not to participate in the campaigns. Those whose important influencers considered the vaccination exercise to be harmful were most likely to be refrain from the campaigns by an odds ratio of 9590.906 compared to those who considered the vaccine to be important or somewhat important.

A one unit decrease in the influence of "important others/figures/persons" was associated with a 1.292 decrease in odds of influence to participate in the vaccination exercise. The influence of important figures was therefore likely to influence parents to participate in the vaccination exercise.

# CHAPTER FIVE: DISCUSSION OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

This section delves into the meaning, importance and relevance of the study results. It will focus on explaining and evaluating the results, showing how they relate to the literature review and research objectives. A final argument in support of the overall conclusion will be made followed by the recommendations from the findings, limitations of the study and areas for further research.

## 5.2 Discussion of the Findings

This section demonstrates how the study findings tie in with the study objectives and the literature reviewed.

### 5.2.1 Objective 1: To determine the extent to which marketing communication resulted in Polio being perceived as a threat to the wellbeing of under-fives by their parents during the campaigns.

Parents in Westlands Sub County to a great extent (73%) consider Polio to be a threat to the wellbeing of their children. This is however below the 80% minimum threshold required to ensure that the possibility of Polio disease outbreaks is reduced to a minimum through herd immunity (Fine, 1993). Based on this study's findings, the priority in terms of financial spend for heightening perception to risk should rank as follows in descending order of potential benefits: Public Address Systems, health workers and Tv.

These results demonstrate the need for marketing communication to adopt the most appropriate multi-faceted tactics in a simultaneous and intense manner in order to be effective in terms of eliciting desired reactions from parents during campaigns as recommended by WHO (2015).

The socioeconomic and demographic contexts of the targeted populations also need to be considered. The marketing communication strategies that will work in Kangemi may not be appropriate for Parklands for example as (Bedada, 2017) concluded the study on campaigns in Ethiopia. Research by Chen & Hsieh (2012) emphasizes the need to identify advertising channels of choice based on evidence from market research if they are to be successful. Online based adverts have also been realized to be effective when targeting youthful consumers while traditional media tend to best resonate with older generation consumers (Woo et al., 2015).

Conventional health workers such as clinicians and nurses are currently not factored in the communication budgetary process and this might require revisiting with a view to intimately incorporating them into the communication process given their value as elucidated in this study. This further highlights the positions held by Weisbord (2005) and Herath (2018) who stressed the need to consider health workers as first ports of call, not just during administration of the vaccine, but also when it comes to educating them on how to communicate the risk posed by the disease. Khan (2015) emphasized that health workers form an integral part of Polio campaigns since they are a direct source of information for parents through interpersonal communication. Where they are inadequately informed about the gravity of Polio disease and the need to conduct repeated vaccination campaigns, the efforts to mitigate the risk have been significantly eroded as he observed in Pakistan (Khan, 2015).

This result also ties in with Verger's (2015) who pointed out the dangers of not inculcating health workers during communication planning since they can potentially play down the importance of government vaccinations should they lack faith in them as was the case in France, a country that has been adversely affected by vaccine hesitancy due to unacquaintance of health workers.

Religious leaders, social media, posters and community members convey the risk of Polio to a much smaller extent and financial investments should be reflective of these findings. There's need to relook at the strategies employed to communicate using these channels to see whether they are ineffective, inappropriately designed or are unnecessary in heightening risk perception. Given that a significant amount of financial and technical resources goes into development of posters, there's perhaps a need to reapportion funds so as to ensure health worker communication channels that have proven valuable are optimally financed.

Secondly, the study has shown that the religious leaders require prior engagement for cooperation due to their potential to reduce parent confidence in the vaccines should they feel discontented. Catholic respondents emerged as hesitant parents due to the disagreements that played out in the media between the MoH and Catholic bishops (Njeru, 2016). Religious leaders can therefore introduce a potential moderating variable through controversy that can impede the success of campaigns, an observation validated by Nasir (2014) in Nigeria and by Obregón (2009) in Uttar Pradesh state, India.

Finally, informal settlements such as Kangemi contribute greatly to the number of unvaccinated children (UNICEF, 2018) and findings from this study indicate that only 52% of parents from this populace are cognizant of the level of risk Polio poses. This finding is of concern since Polio emergencies tend to erupt in areas where there are large numbers of unvaccinated children such as Kangemi slums (Global Polio Eradication Initiative, 2013).

This means that the effective communication channels identified need to pay greater emphasis on religious leaders as stakeholders in order for them to understand the need to cooperate whenever campaigns are rolled out. At the moment, it seems that the obligatory nature of the campaigns and mass vaccine administration in public schools (Zagaja, 2018) is what counters the danger presented by lack of understanding of risk among parents in Kangemi.

Given that community health volunteers or "village doctors" play a key role in parent mobilization in informal settlements, a strategy similar to the globally acknowledged successful Social Mobilization Network (SMNet) tactic employed in India should be adopted in order to realize similar success within this high-risk informal settlement population segment (Deutsch, 2017). This would be through engagement of a larger number of frontline community health workers to advocate and generate demand for vaccination in areas where Polio transmission poses greatest risk. The strategy would also play a strong role in demystifying any rumours, myths and misconceptions in a timely manner while addressing them at community level before hesitancy levels escalate.

### 5.2.2 Objective 2: To establish the extent to which marketing communication was effective in persuading parents to avail their under-five year old children to receive the vaccine.

A similar trend is observed between the channels that heighten risk perception as well as persuade parents to avail their children. However, as was realized by Ahmad (2015) and in this study, knowledge about Polio and the threat it poses does not equate to participation during the exercise. Within Westlands Subcounty, 73% of parents perceived Polio as a risk to the wellbeing of their children while paradoxically 93% actually had children who were vaccinated during the campaigns. This could be attributed to the convenience of door to door campaigns offered by the Polio vaccination exercise, the fact that the vaccine is offered at no cost or because of the high

number of children reached in public schools rather than through parent authorization at household level (SAGE, 2014) or other reasons requiring further investigation.

The implication of this finding is that low turnout is likely to be observed where vaccination exercises require parents to actively go out of their way and travel to health facilities during campaigns featuring injectable vaccines (such as Measles). This is compared to oral Polio vaccines which can be administered from house to house. A low perception of risk of disease transmission can potentially result in low actual turnouts at health facilities (SAGE, 2014). Consequently, there's need to ensure that the proportion of parents who perceive a vaccine-preventable disease as a risk is commensurate to that required to achieve herd immunity protection (Fine, 2011). In this case, the perception of risk of Polio to child wellbeing should be above 80% rather than the current 73%.

Some parents can still have reservations due to lack of confidence in the vaccine (Butler, 2015) that would compel them to seek a second opinion from significant others such as health workers (SAGE, 2014). Of note was that in the more affluent parts of Westlands Sub County such as Parklands as well as Kitisuru and Mountain View, parents are particularly influenced by health workers whom they consult for confirmatory sentiments upon receiving the campaign messages from the Ministry.

Edwards (2016) opined that such parents have intentions to vaccinate their children but lack detailed knowledge of the vaccines that are perhaps not communicated to their expectations.

They therefore approach health workers as their most trusted source of information for purposes of acquiring detailed knowledge of vaccines. This information reveals the need for the Ministry to develop interpersonal communication strategies aimed at long-term engagement and cooperation from different population segments that would desire elaboration on particular aspects of the campaigns that they are concerned about (Landau, 2015).

Oku (2017) stressed the need to ensure that skilled communicators are present at community levels of the health system in order to promptly contain the spread of malicious anti-campaign propaganda. Personal selling is an effective marketing promotion strategy can be utilized for interpersonal communication by relying on Immunization champions such as Harold Kipchumba (UNICEF Media Kenya, 2018) and technical experts from government to persuade parents. The sellers selected should be those able to promote the vaccine through their attitude, appearance and specialist knowledge on the product, or vaccine in this case. They can adopt one-on-one

interactions with influential community leaders or converse with the broader community through mass media with a view to informing and encouraging parents to avail their children (Burrow, 2012).

Secondly, much as social media does not rank highly as a channel of increasing risk perception, it features prominently as a strategy that should be employed to persuade and mobilize parents. It would be beneficial to spend more on social media than on posters which the study showed are not generating as much return on investment as would be desired.

Social media strategies therefore need to be embraced and influencers identified and engaged if mobilization is to be effective. This would tie in with documented success stories such as in India where local respected celebrities were conscripted into campaigns when hesitancy and fatigue set in (Parul, 2015). The approach is also applicable to Kenya's marketing communication environment given that Facebook is the most popular and influential social medium (Duffett, 2015). Aggressive Twitter campaign broadcasts can also be combined given that Kenyans are amongst Africa's most active consumers of Twitter services (Twiplomacy, 2013).

Moreover, feasibility of a social media approach is supported by findings made by Kenya Audience Research Foundation (KARF) study of 2015 where it was realized that between the year 2007 and 2015, a 91% increase in access to information via mobile devices (8.7 to16.6 million users) occurred as did an increase in smart phone penetration that stood at 4.8 million Kenyans.

Finally, health workers were noted to be of much greater benefit in heightening risk potential compared to their ability to mobilize parents to avail their children for vaccination. Health workers are utilized by the Ministry a lot more in communicating the risk of Polio as a disease (MOH, 2018) than in mobilizing parents to avail their children for which print and electronic media are relied on; their low contribution to objective 2 was therefore not unexpected.

### 5.2.3 Objective 3: To determine the factors that contribute to behavioural intention of parents to avail or not avail their children for vaccination during campaigns.

This study enhanced the understanding of parent voluntary behaviour by examining the underlying motivations, social norms and expectations as well as attitudes to perform the expected action of vaccine participation. This section provides conclusions on parent intentions

to perform the behaviour expected during vaccination campaigns in order to predict whether or not they intend to participate in future campaigns (Gilmore, 2002).

With regards to demographic information, differences in levels of education were observed to determine level of participation in the campaigns. Mountain View ward had the highest number of graduates (53.33% graduates) compared to Karura (33.33% graduates) where education attainment levels were least and an inverse relationship was observed between participation levels and levels of education. The more educated parents were, the less likely they were to participate. This was a phenomenon similarly observed by Larson's 2016 67-country survey on vaccine hesitancy in Europe where perception to risk of the threat of vaccine-preventable diseases does not seem to be related to level of education. The more affluent and educated households in Kenya are therefore likely to exhibit similar negative attitudes and behaviours despite high levels of access to health facilities. High levels of education are a possible mediating variable and specific strategies need to be established specifically targeting this demographic, not just for the present populations, but for future generations who are likely to reach similar educational statuses as Kenya develops.

With regards to religion as a demographic variable, the study showed that Kangemi had the highest level of hesitance and consequently the lowest likelihood of parents to participate in the campaigns. The opinions of dissatisfied Catholic religious leaders during campaigns stood out as being potentially the most prominent reasons behind hesitancy in this informal settlement population segment. Majority of parents in Kangemi ward are Catholics and perhaps the recurrent anti-vaccination campaign stand of the Catholic Church was the underlying reason behind the hesitancy (Njeru, 2016). This is also corroborated by similar findings from the 2014 report of the Strategic Advisory Group of Experts Report on Vaccine Hesitancy (2014).

It was also noted that a substantial number of parents' attitudes were prejudiced by uncertainty about the number of vaccines that are required for children; some thought the routine vaccine was fully adequate while others thought only a few more campaign vaccines were required rather than all offered by the government. This supports the finding in Nigeria (Ahmad, 2015) where parents thought administering more than four doses of the vaccine could have negative ramifications such as adverse effects on their children. It is imperative that marketing

communication addresses these issues as comprehensively as possible in order to mitigate the hazards posed by this lack of information.

Finally and as documented in the SAGE (2014) report, communication by the government regarding safety of the vaccine was realized to convey confidence in the effectiveness and protection offered by the vaccine, an indication of general trust in government services by parents. This was however countered by occurrence of adverse events following vaccination that ended up discouraging parents from future campaign participation due to perceived danger and lack of a general understanding of why the vaccination campaigns are frequently offered.

### 5.3 Conclusions

Parents are assumed to have the best intentions for their children on matters health. Given that they actively avail their children for routine immunization, the same enthusiasm should be seen during vaccination campaigns for all demographic segments. Marketing communication approaches need to be comprehensive enough to eliminate chances of low perception of disease risk being attributed to either misinformation, misunderstanding or any negative vaccine-related propaganda that plays out in the media.

The converse also applies to the reasons why parents are likely to avail their children for vaccination. There’s need to maintain and keep developing the strategies that work so as to ensure parents are well equipped with properly packaged and understandable information that is delivered from their trusted and reliable sources. In doing so, herd immunity will be sustainably maintained, and the risk of vaccine-preventable disease outbreaks as well as need for multiple campaigns would be significantly diminished.

Secondly, there’s need to ensure that convenience with which the vaccine is made available to parents and the confidence that they have in the vaccines themselves is as high as possible. This is with a view to ensuring that the proportion of parents with a heightened risk of threat of disease is similar to those that actually intend to avail their children for vaccination. This way, parents would be less inclined to make trade-offs between the benefits of the vaccines and perceived harm based on circulating rumours and misconceptions.

Third, because social media is well penetrated and pervasive in Kenya, there’s need to identify means of tapping into its full potential so as to focus on engaging parents with thoughtfully

presented evidence-based information in real time. Other than the use of health workers to disseminate information, the communication channels identified as most useful in this study have a limited scope for interpersonal communication. Social media presents unique benefits that can be tapped into and consequently have it serve as a forum for direct response marketing through which interpersonal communication can be improved.

Finally, the psychological and social factors identified in this study were drawn from elements of the Theory of Reasoned Action and Cognitive Dissonance Theory and they propose explanations for the underlying causes or influences of vaccine hesitance and acceptance. The study therefore provides researchers and policy makers with a new lens through which to look at the attitudes and behaviours of parents during vaccination campaigns. The study findings can therefore assist in predicting how individuals will behave based on their pre-existing attitudes and behavioural intentions in future vaccine-preventable disease campaigns.

## 5.4 Recommendations

During the 2018 Polio disease outbreaks, Kenya's MoH did particularly well in mobilizing parents to avail their children during the vaccination campaigns. This could be due to effectiveness of the media channels used for communication during campaigns or due to the fact that vaccinators make it convenient for parents to participate by conducting door-to-door type of campaigns.

There is however need to ensure that the proportion of parents whose perception of risk for vaccine-preventable diseases such as Polio is commensurate to the minimum number who are actually expected avail their children (Herd immunity threshold). From this study, Public Address Systems, health workers and Tv and radio (in descending order of priority) are the most effective channels for communicating risk and mobilizing parents; resource allocation by the MoH therefore needs to reflect this during campaigns.

The same applies to incorporation of social media as a mobilization tool for parent participation and as a resource for mitigating against and addressing vaccination campaign rumours and misconceptions. This could be done through use of big data analytics of popular social media platforms to identify prevailing issues before, during and after campaigns and respond to them

in real time. This could potentially have the ultimate result of building trust and help parents understand the rationale behind the frequent campaigns.

Parent attitudes regarding vaccine acceptance can be improved upon when all communication from the MoH explicitly explains the rationale behind the campaigns, their multiplicity as well as their relation to vaccines given during routine immunization. Most parents have a positive attitude towards communication issued by the Ministry and this has significantly contributed to vaccine acceptance whenever doubts on vaccine safety are cleared. The study has also revealed that the communication should always adequately inform parents about the possibility and range of side effects that are likely to occur following inoculation.

There's also need to ensure audience segmentation and stakeholder mapping during risk communication message development. Demographic factors such as socioeconomic background and religion are potential mediating and moderating variables respectively during campaigns. Special attention therefore needs to be paid to them with a view to averting the risk of vaccine hesitance.

Finally, with regards to subjective norms, health workers have been shown to most reliably heighten the risk of Polio to parents compared to other parent referent groups and therefore need to be more intimately involved during communication aspects of vaccination campaigns. Given that 79% of parents expressed confidence in health worker opinions on the campaigns, they are potentially also best placed to motivate parents to participate even when societal normative beliefs are against the campaigns.

## 5.5 Limitations of the Study

The study focused on women as parents and respondents and excluded male parents. This was because government data available such as fertility rates and that is required to calculate the sample size population focuses on women only. There's therefore a possibility that exclusion of male parents during the interviews may have introduced systematic bias.

## 5.6 Recommended areas for further research

The study focused on the marketing communication strategies undertaken by Kenya's MoH and as such, the findings can only be interpreted based on the channels used in the 2018 campaigns.

The contribution to vaccine hesitancy made by complacency, inconvenience and lack of confidence in vaccines by parents during campaigns is a potential area for future research. This would be beneficial in identifying possible vaccination campaigns that are likely to be adversely affected hesitancy despite appropriate marketing communication efforts.

The impact of social media during vaccination campaigns is also an area for further research given the results of this study. Social media portends an affordable and effective marketing communication strategy that is widely utilized by youths in Kenya and who make up 75% of Kenya's population (KNBS, 2014).

The literature reviewed and this study's findings indicate that health workers are an underutilized resource in marketing communication. Their influence in as far as subjective norms are concerned suggest that their greater engagement would potentially yield greatest success during marketing communication for future vaccination campaigns.

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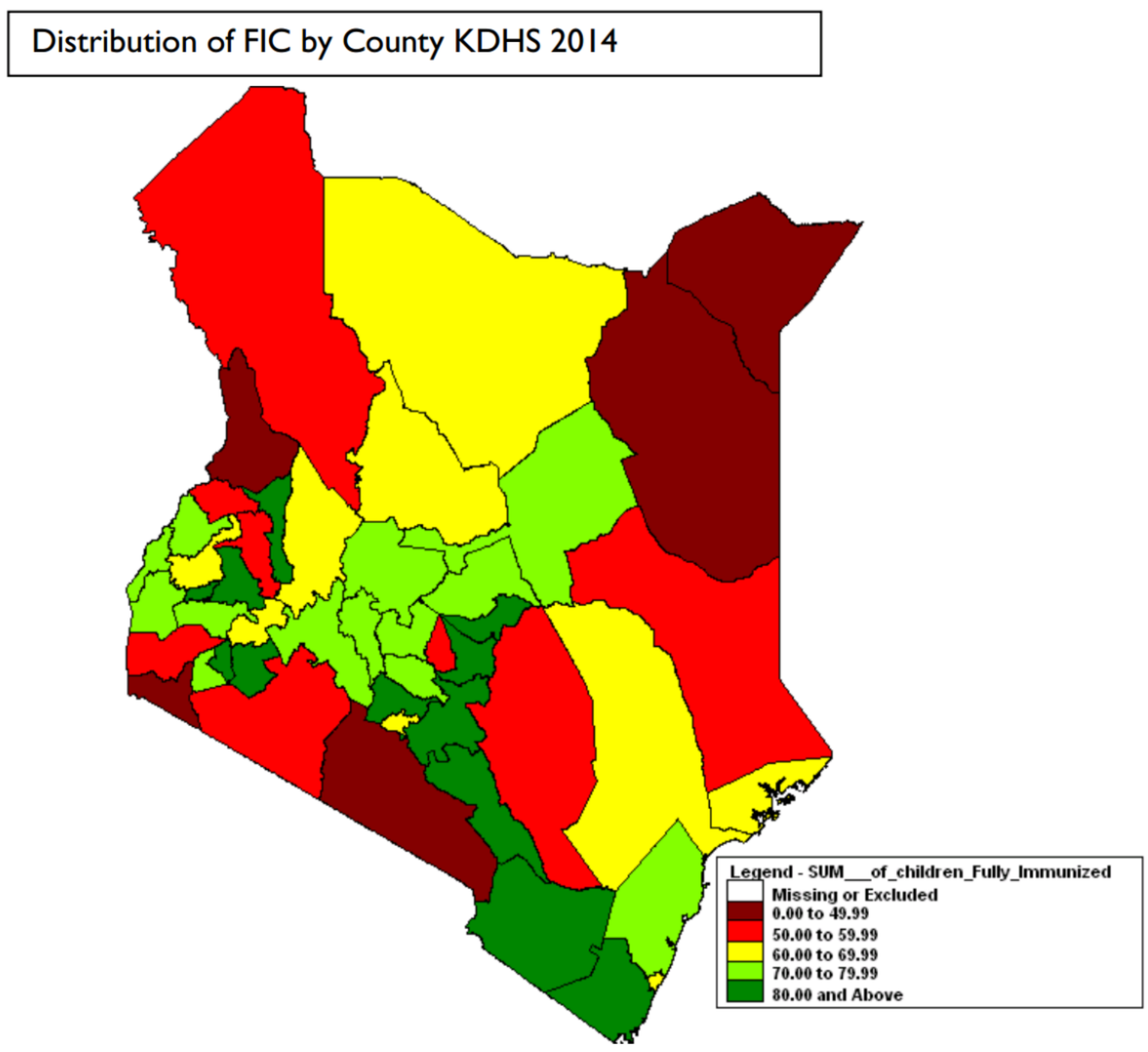
# APPENDICES

## APPENDIX A: Vaccination Coverage by County in Kenya (MoH)



**APPENDIX B: Household Population by Age, Sex and Residence in Kenya KNBS (2014)**

Table 2.8 Household population by age, sex, and residence

Percent distribution of the de facto household population by five-year age groups, according to sex and residence, Kenya 2014

| | Urban | | | Rural | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| <5 | 13.8 | 13.9 | 13.9 | 15.6 | 13.9 | 14.7 | 15.0 | 13.9 | 14.4 |
| 5-9 | 12.6 | 12.5 | 12.5 | 17.4 | 16.3 | 16.8 | 15.7 | 15.0 | 15.3 |
| 10-14 | 10.3 | 10.4 | 10.4 | 16.0 | 14.8 | 15.4 | 14.0 | 13.3 | 13.7 |
| 15-19 | 7.3 | 8.3 | 7.8 | 10.5 | 8.9 | 9.7 | 9.4 | 8.7 | 9.0 |
| 20-24 | 10.0 | 12.0 | 11.0 | 6.3 | 6.8 | 6.6 | 7.6 | 8.6 | 8.1 |
| 25-29 | 11.8 | 12.8 | 12.3 | 5.8 | 7.0 | 6.4 | 7.9 | 8.9 | 8.4 |
| 30-34 | 9.8 | 9.0 | 9.4 | 5.2 | 5.5 | 5.4 | 6.8 | 6.7 | 6.7 |
| 35-39 | 7.1 | 6.1 | 6.6 | 4.7 | 5.2 | 4.9 | 5.5 | 5.5 | 5.5 |
| 40-44 | 5.3 | 4.2 | 4.7 | 3.8 | 4.2 | 4.0 | 4.3 | 4.2 | 4.3 |
| 45-49 | 3.3 | 2.8 | 3.1 | 2.9 | 3.5 | 3.2 | 3.1 | 3.2 | 3.2 |
| 50-54 | 3.0 | 2.9 | 3.0 | 2.9 | 3.7 | 3.3 | 3.0 | 3.4 | 3.2 |
| 55-59 | 2.3 | 1.6 | 1.9 | 2.2 | 2.8 | 2.5 | 2.2 | 2.4 | 2.3 |
| 60-64 | 1.3 | 1.1 | 1.2 | 2.2 | 2.3 | 2.3 | 1.9 | 1.9 | 1.9 |
| 65-69 | 0.8 | 0.8 | 0.8 | 1.6 | 1.7 | 1.7 | 1.3 | 1.4 | 1.4 |
| 70-74 | 0.6 | 0.7 | 0.6 | 1.1 | 1.2 | 1.2 | 0.9 | 1.0 | 1.0 |
| 75-79 | 0.3 | 0.4 | 0.3 | 0.7 | 0.9 | 0.8 | 0.6 | 0.7 | 0.6 |
| 80 + | 0.4 | 0.6 | 0.5 | 0.9 | 1.4 | 1.2 | 0.7 | 1.1 | 0.9 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Number | 23,574 | 23,871 | 47,445 | 43,865 | 46,470 | 90,335 | 67,439 | 70,341 | 137,780 |

## APPENDIX C: Introduction Letter

Friday, 23 November 2018

To whom it may concern

Dear Sir/ Madam,

**RE: FACILITATION OF RESEARCH –SAMMY NGECHU**

This is to introduce Sammy Mahugu Ngechu who is a Master of Business Administration student at Strathmore Business School, admission number MBA/110039/18. As part of our MBA Program, Sammy is expected to do applied research and to undertake a project. This is in partial fulfilment of the requirements of the MBA course. To this effect, he would like to request for appropriate data from your organization.

Sammy is undertaking a research paper on-: **"An Assessment of the Effectiveness of Marketing Communication for Vaccines during Public Health Emergencies: Case Study of 2018 Polio Vaccination Campaigns in Nairobi's Westlands Subcounty."** The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MBA seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and we shall be willing to provide any further information if required.

Yours sincerely,

Caroline Tiara.
Manager – MBA Programs

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## APPENDIX D: Informed Consent

PARTICIPANT INFORMATION AND CONSENT FORM

Principle Investigator: Sammy Mahugu

**INFORMATION SHEET–THE STUDY**

**1. Why is this study being carried out?**

The study is centred on the assessment of the effectiveness of marketing communication conducted by the MoH during Polio campaigns. The questions that you will respond to will be beneficial in providing valuable information regarding this research and your response is very important to us. We assure you of full confidentiality on all information given and anonymity.

**2. Do I have to take part?**

No. Taking part in this study is entirely optional and the decision rests only with you. If you decide to take part, you will be asked to complete a questionnaire. You are free to decline to take part in the study from this study at any time without giving any reasons.

**3. How long will it take to participate?**

The Questionnaire should take no more than 20 minutes to complete. Your participation in this study is voluntary and you are free to withdraw from participating at any time.

**5. What will taking part in this study entail for me?**

Questionnaires will be presented to particular individual parents to fill out data relevant to how they responded to information regarding the messages they received on the Polio campaigns. Another group will be approached to participate collectively in groups of five to seven respondents for discussions around the subject of Polio campaigns. Depending on the category you'll fall in, if you are satisfied that you fully understand the goals behind this study, you will be asked to sign the informed consent form (this form) and then taken through a questionnaire to complete.

**7. Are there any risks or dangers in taking part in this study?**

There are no physical risks in taking part in this study. There are however risks to participating in this study that you need be aware of. Once I am done with the interview, there's a small risk

of anxiety or guilt once I explain the reasons why all children under the age of five need to be vaccinated against Polio. All the information you provide will be treated as confidential and will not be used in any way to penalize or victimize you.

**8. Who can I contact in case I have further questions?**

You can contact me, Sammy Mahugu by e-mail (Mahugusammy@gmail.com), or by phone (0726350808). You can also contact my supervisor, Dr. Nancy Njiraini, at the Strathmore Business School, Nairobi, or by e-mail (Nnjiraini@strathmore.edu).

I have had the study explained to me. I have understood all that I have read and have had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage.

Please tick the boxes that apply to you; Participation in the research study

□I AGREE to take part in this research

□I DO NOT AGREE to take part in this research

□I AGREE to have my completed questionnaire stored for future data analysis

□I DO NOT AGREE to have my completed questionnaire stored for future data analysis

Participant's Signature:

Date://

Participant's Name:

I (Name of person taking consent) certify that I have followed the SOP for this study and have explained the study information to the study participant named above, and that she has understood the nature and the purpose of the study and consents to the participation in the study. He/She has been given an opportunity to ask questions which have been answered satisfactorily.

Investigator's Name: Signature:

Date:

## APPENDIX E: Quantitative Analysis Questionnaire

**Interviewer: First assess whether there is a child/children under the age of 5 years, then seek to speak to the FEMALE parent of that child.**

Screener Questions

Q1. Have you heard of any messages on the Polio campaigns conducted by the Ministry of Health this year?

| Yes | 1 | Continue |
|---|---|---|
| No | 2 | Terminate |

Q2 Are you currently taking care of a child aged 5 years and below?

| Yes | 1 | Continue |
|---|---|---|
| No | 2 | Terminate |

Q3 Can I speak with the female parent (Above age of 18) of a child under the age of five years?

| Yes | 1 | Continue |
|---|---|---|
| No | 2 | Terminate |

Background Information

**Interviewer: Please fill in this demographic information about the respondent.**

Q5. Within what age range is the parent?

| 20 - 24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-50 |
|---|---|---|---|---|---|

Q6. What ward within Westlands Sub County does the parent live in?

| |
|---|

Q7. How many children under the age of 5 years live in your household?

**ENTER NUMBER BELOW**

| Number of children under the age of 5 years | | |
|---|---|---|

Q8. Sources of Campaign Information

Out of these, what are your most trusted sources of information during vaccination campaigns?

| | Station/Media they heard message on Polio campaign | Most trusted source (Celebrities, government leaders, religious leaders, etc) |
|---|---|---|
| Radio | Specify…………… | |
| TV | Specify…………… | |
| Doctors, Nurses, Community Health Workers (madaktari wa vijiji), immunization champions | Specify…………… | |
| Other Community Members (friends & family) | | |
| Posters | | |
| Public Address Systems | | |
| Religious Leaders | | |
| Social Media | Specify…………… | |
| Other (Specify)…………………… ________ | | |

**Q9.** Have you had your children vaccinated every time you have heard about the 2018 campaigns announced by the Ministry of Health?

Yes ☐ No ☐ Prefer not to answer ☐

**Q10. Attitude Testing**

A. I believe the messages I've heard during the Polio campaigns indicate that my child(ren) are in danger of getting the disease

| **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ |

B. The Ministry of Health has conducted enough campaigns to fight against Polio

**There have been too many campaigns** ☐ **The number of campaigns is good** ☐

**The number of campaigns needs to be reduced** ☐ **I don't know** ☐

C. I believe that my children are fully protected from Polio when they receive:

**a.** Routine Vaccine only **b.** Routine vaccine and a few of the vaccines offered during campaigns **c.** Routine Vaccines and all vaccines offered all the time during each and every campaign **d.** Not sure or I don't know

D. On a scale of 1 to 5 (1 being least and 5 most), how much confidence do you have in the messages given by the Ministry of Health about the safety and effectiveness of the vaccines?

**1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐

E. Have you heard of any negative effects that the vaccine may have?

**Yes** ☐ **No** ☐

If yes, kindly tick against the negative effects you've heard about:

**Diarrhoea** ☐

**Flu** ☐

**Infertility** ☐

**Poor feeding/ breast feeding** ☐

**Rash** ☐

**Fever** ☐

**Others** ☐

**Q11. Subjective Norms Testing**

**I. Normative Beliefs**

A. When it comes to the health of your children, who are the important people you consult?

**a. Relative (Specify)** ☐

b. **Friends** ☐
c. **Health Workers** ☐
d. **Religious leaders** ☐
e. **Neighbours** ☐
f. **Others** ☐

B. Regarding my participation during campaigns, most people I consider important to me think that it's

**Extremely important**☐ **Important** ☐ **Not important** ☐ **Opinion doesn't' matter** ☐ that I avail my children for vaccination during the campaigns.

**II. Motivation**

C. Based on your answers from **section I A** above, and from a scale of 1 to 5 where 1 is agree and 5 is disagree please answer:

When it comes to campaign vaccination, I want to do what ……(e.g mother-in-law)……………….. thinks I should do. Agree :___1_:___2__:___3__:___4__:___5__ disagree

**Q12. Behavioural Intention**

Do you intend to avail your children for vaccination during any Polio campaigns the Ministry of Health may offer next year?

Yes ☐ No ☐ Maybe ☐

**Q. 13 Demographic assessment**

Q1. What is the highest level of education attained?

| LEVEL OF EDUCATION | CODE |
|---|---|
| None | 1 |
| Primary incomplete | 2 |
| Primary completed | 3 |

| Secondary incomplete | 4 |
|---|---|
| Secondary completed | 5 |
| College | 6 |
| University | 7 |

Q2. What is your religion?

| Christian – Catholic | 1 |
|---|---|
| Christian – Mainstream Protestant (Anglican, Presbyterian, AIC, Methodist, etc.) | 2 |
| Christian – SDA | 3 |
| Muslim | 4 |
| Hindu | 5 |
| Atheist/None | 6 |
| Other (specify)__________ | 7 |
| Refused to answer | 8 |

## Appendix F: Objective 1 Results

### Parklands/High-ridge

Most people in Parklands/High-ridge agreed or strongly agreed with the observation that Polio was a serious threat to the children under the age of five. Most respondents who agreed with the view identified medical practitioners as their most trusted source of information (40.3%).

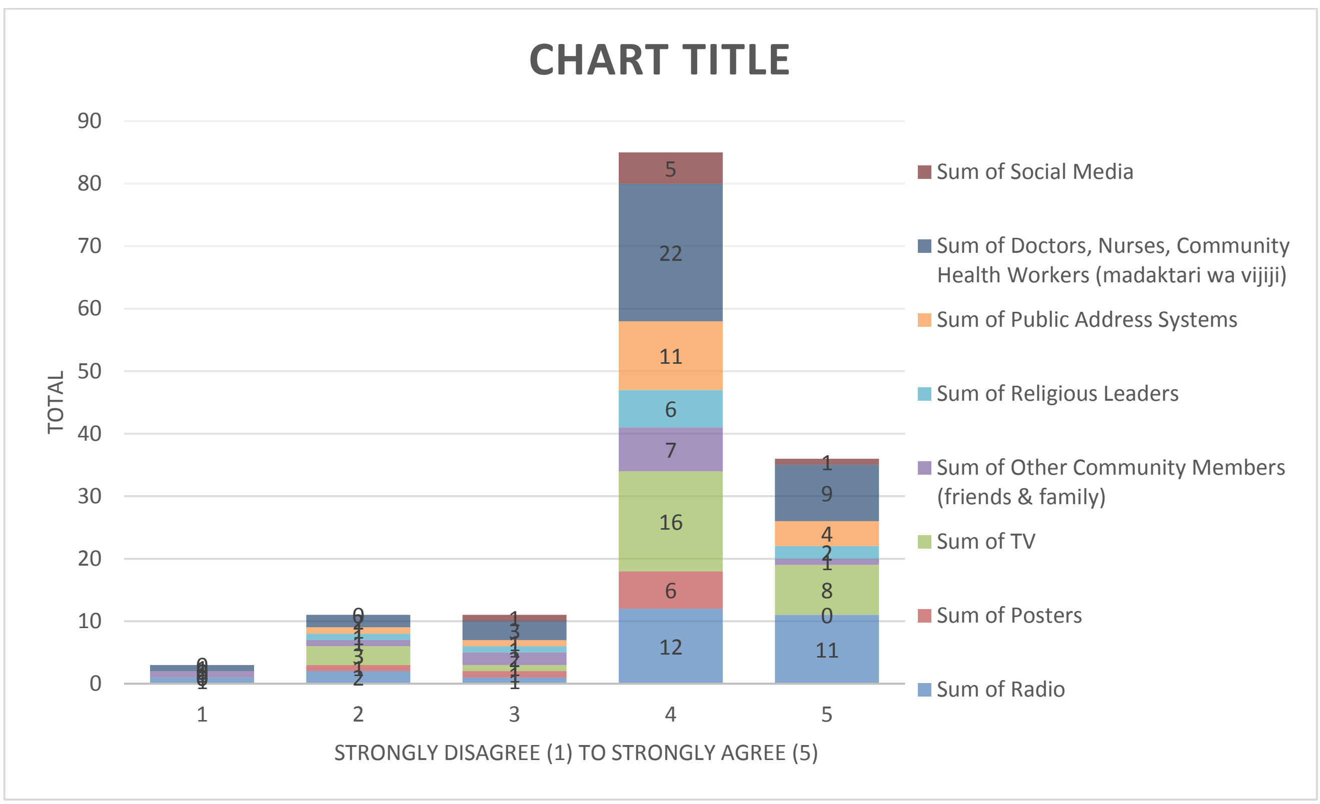


**Figure F-1 Perception of Polio – Parklands & Highridge**

### Kangemi

Most of the people who agreed with the view that Polio was a threat received information through television (24.4%). The region however had the greatest number of people indicating the view that Polio was not perceived as a threat.

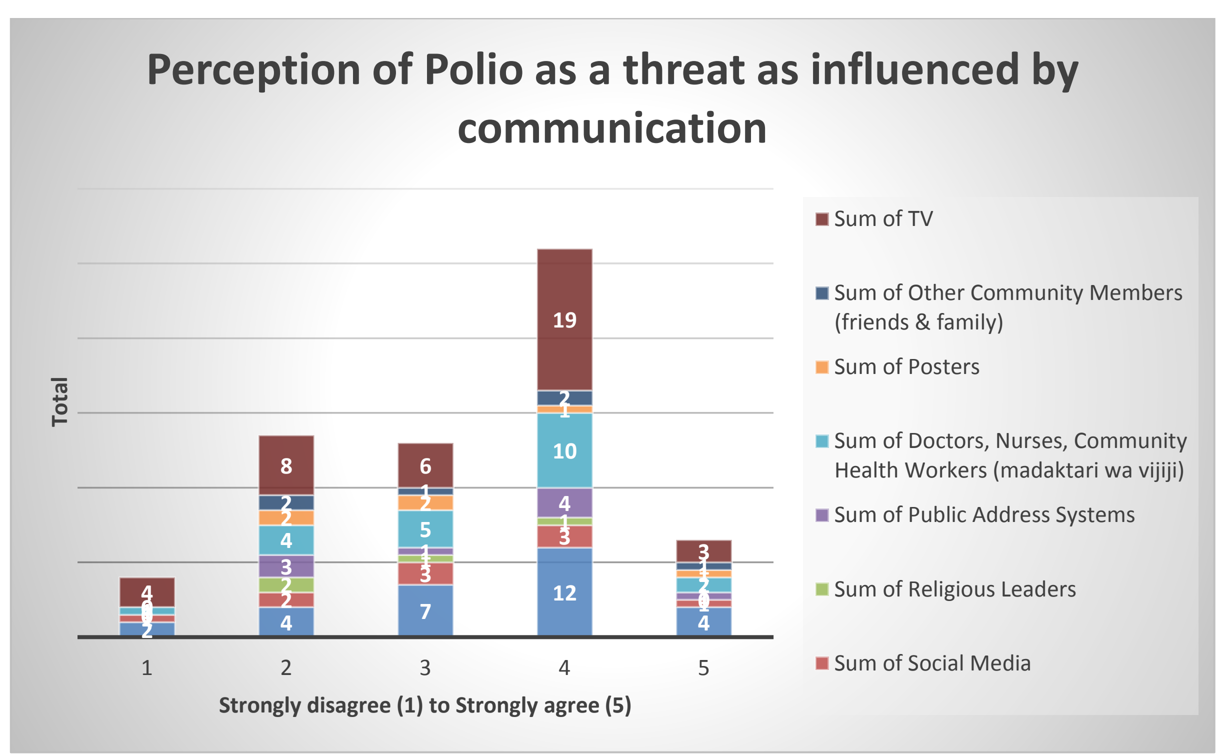


**Figure F-2 Perception of Polio – Kangemi**

## Karura

Most people in Karura viewed Polio as a threat following the communication exercise; of these most were reached through televisions (27 %) and health workers (16%).

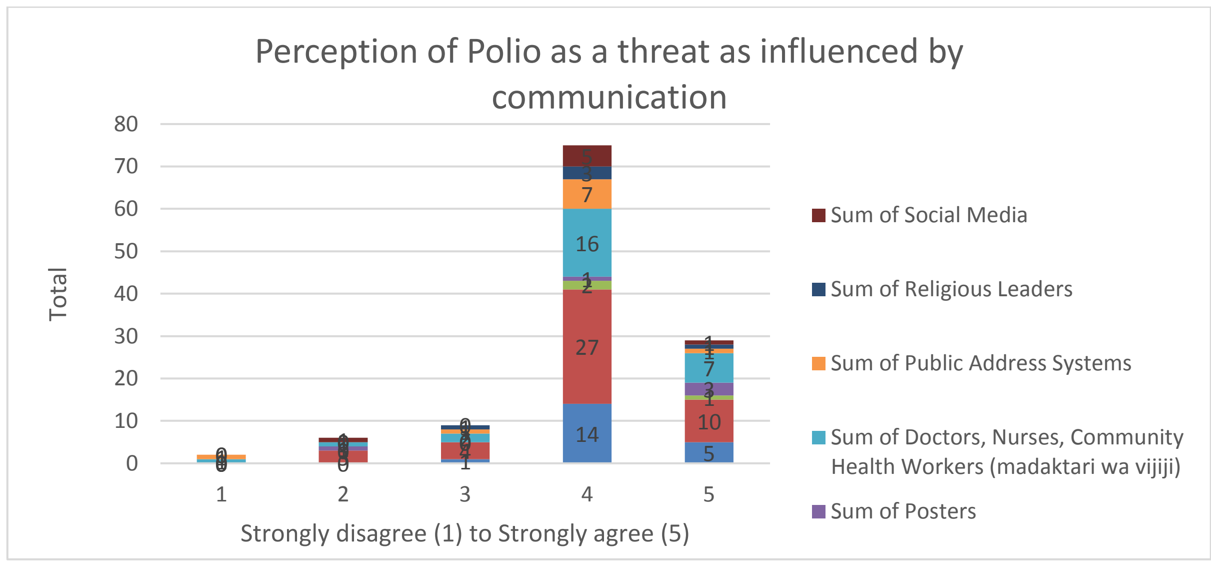


**Figure F-3 Perception of Polio – Karura**

### Kitisuru

Preference for TV (42.5%) and radio (33.8%) was evident. Most people in the region viewed Polio as a threat.

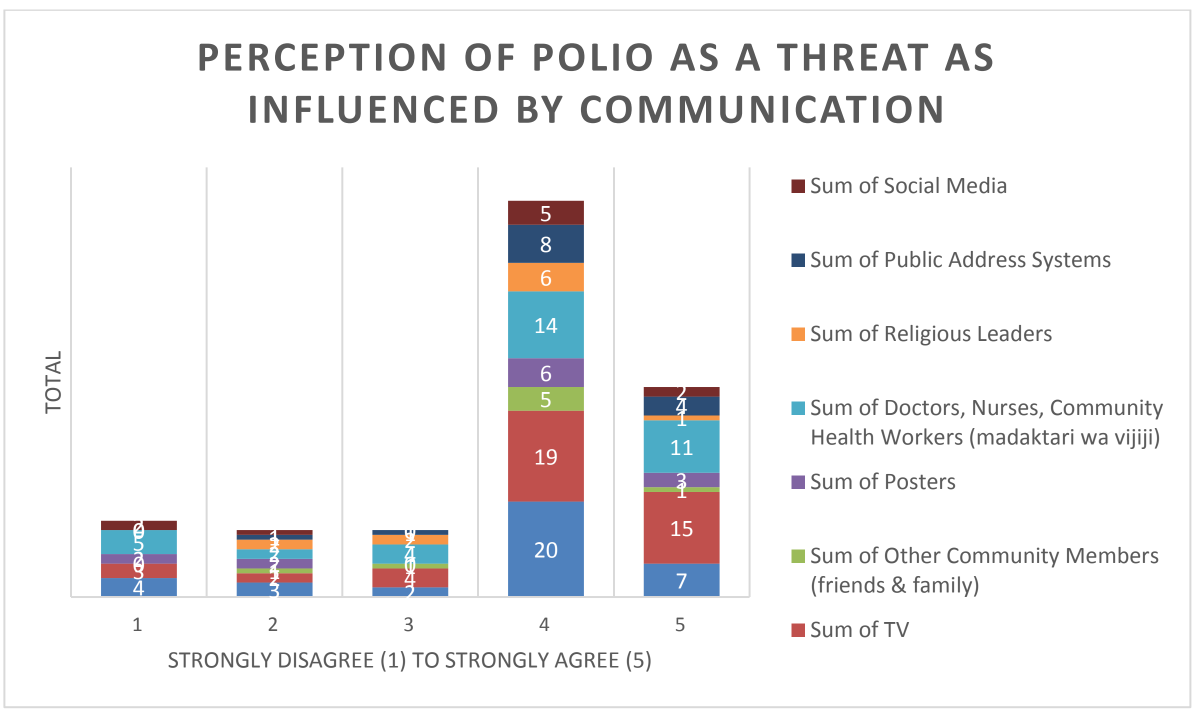


**Figure F-4 Perception of Risk – Kitisuru**

### Mountain View

The most preferred source of communication was television. There was an equal proportion (20.8%) of people who strongly agreed with the view that Polio was a threat as there were people who strongly disagreed with the view. Television was the most quoted trusted source of information in the region (28.6%).

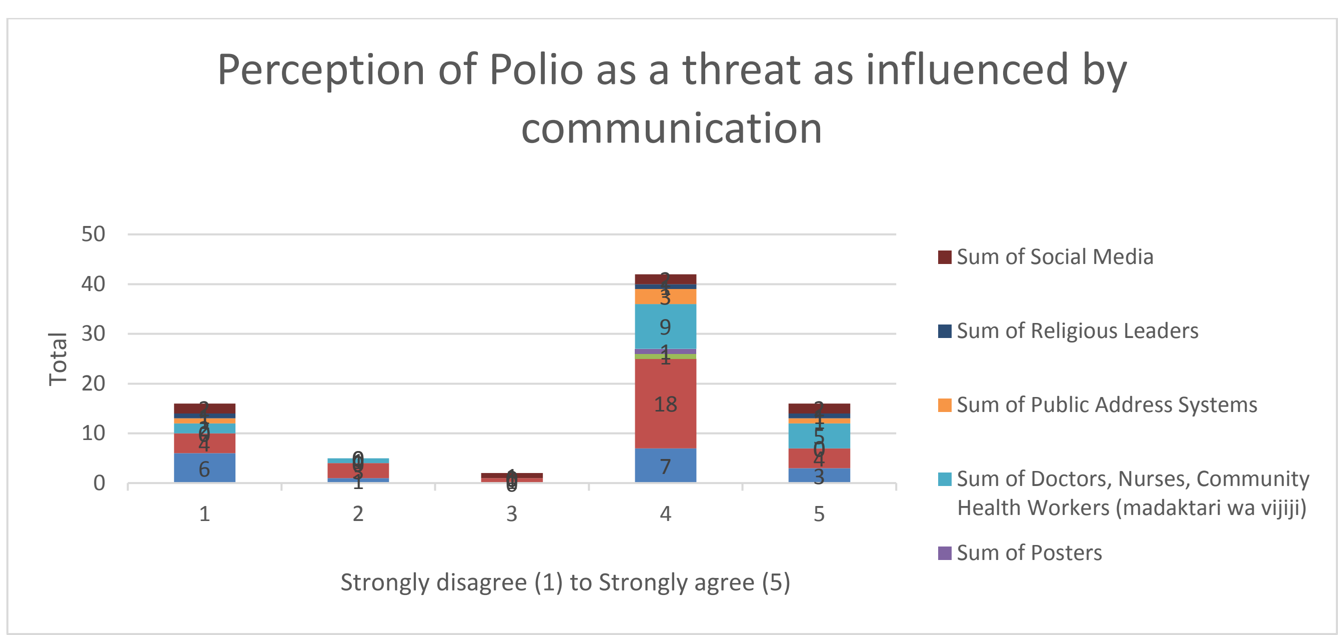


**Figure F-5 Perception of risk – Mountain View**

## Appendix G: Objective 2 Results
### Parklands and High-ridge

The most persuasive source of information in Parklands and High-ridge areas was medical practitioners (45.5%) with radio (32.4%) and TV (31.1%) being second and third respectively. Most respondents indicated that they had their children vaccinated during campaigns.

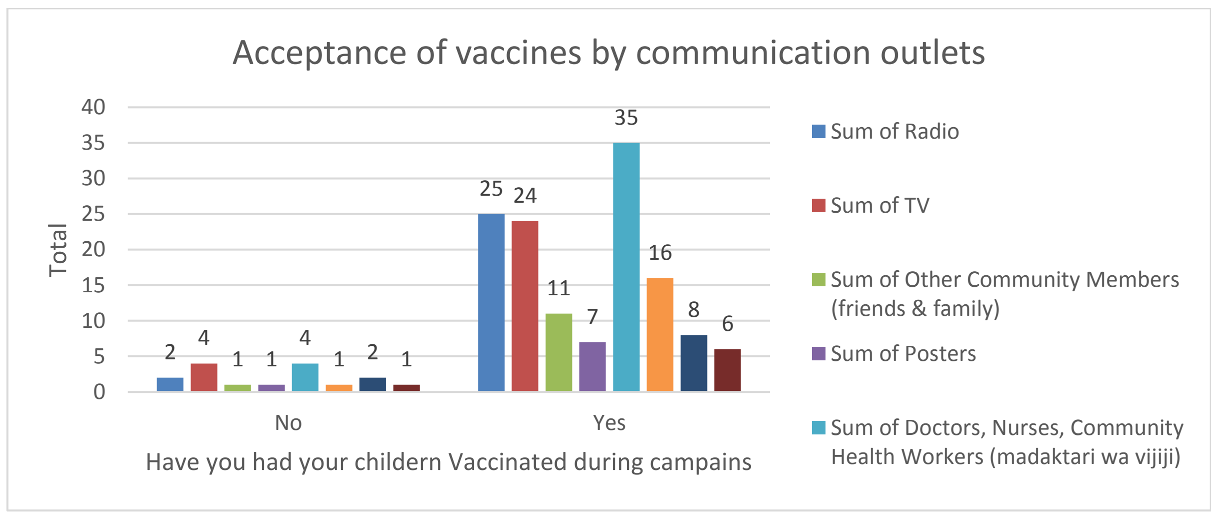


**Figure F-6 Acceptance and communication – Parklands and High-ridge**

### Kangemi

The most persuasive source of information among this population was television standing at 44%.

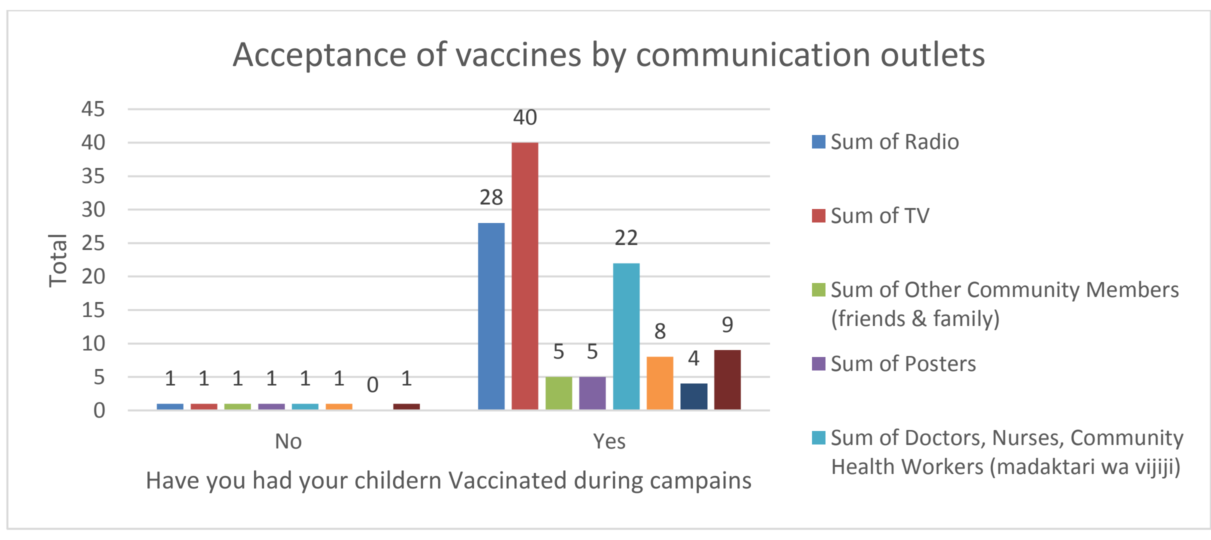


**Figure F-7 Acceptance and Communication – Kangemi**

### Karura

All people in Karura indicated that they have been availing their children for vaccinations. The most trusted source of information in the region was television (57%).

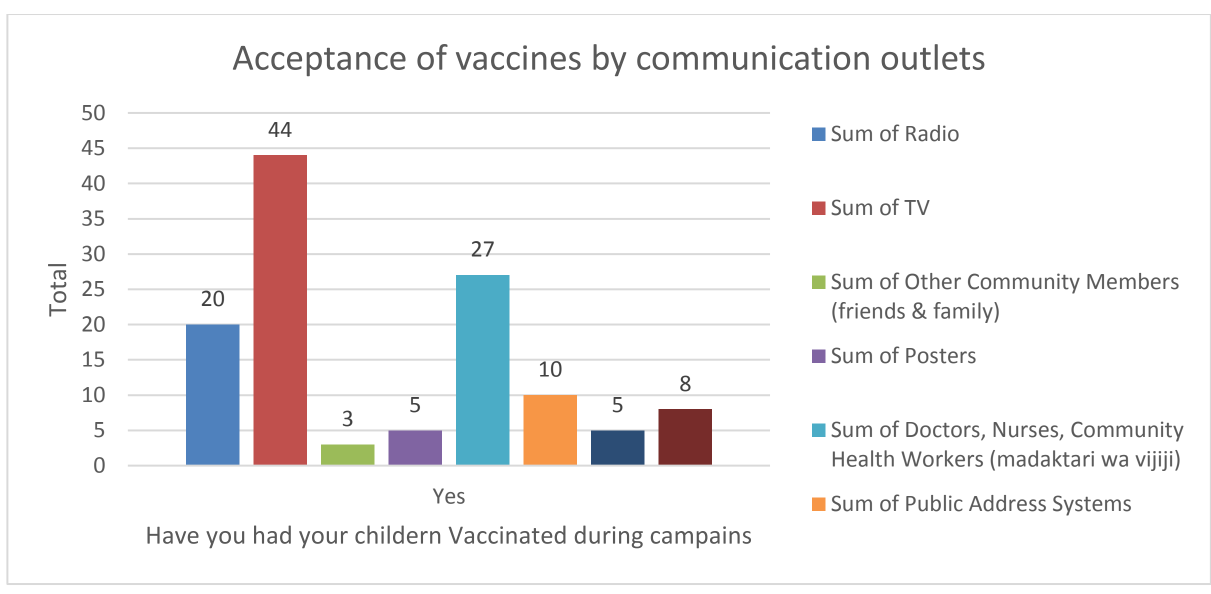


**Figure 4.8 Acceptance and communication – Karura**

### Kitisuru

Respondents indicating that they have had their children vaccinated during campaigns presented a similar pattern to that observed in Karura. The most trusted news source was television 53.8% and, other community members 10%, the least.

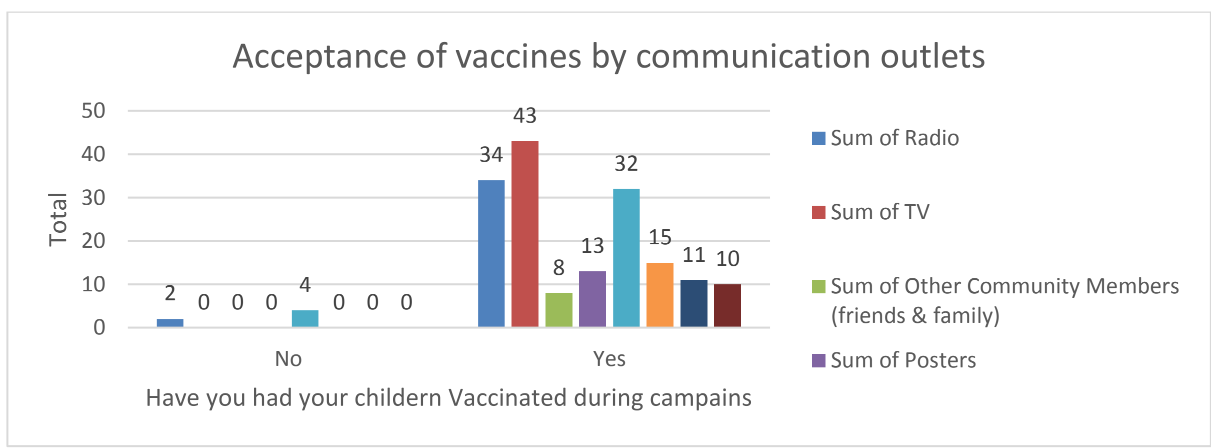


**Figure F-9 Acceptance and communication – Kitisuru**

## Mountain View

As was the case with the other four locations, most respondents had their children vaccinated and preferred TV as a trusted news source (35.1%). Other community members and poster were the least trusted communication channels. Mountain View ward had the least diversity of communication channels reaching respondents with Polio messaging.

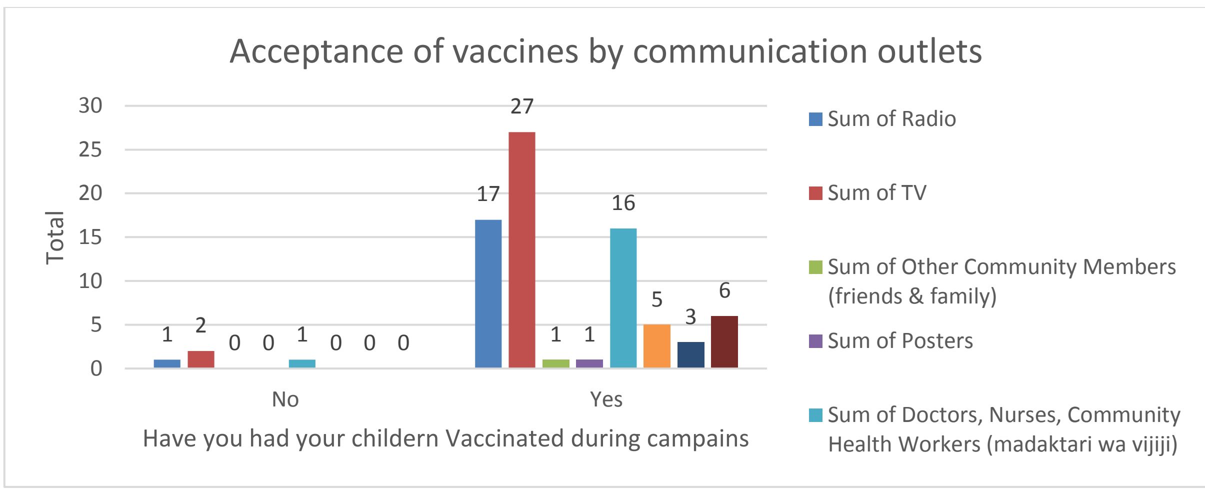


**Figure F-80 Acceptance and Communication – Mountain View**

## Appendix H: Strathmore University Ethics Approval

4th January 2019

SU-IERC0287/18

**Dr Sammy Mahugu Ngechu**
P.O BOX 18382-00100
Nairobi

Email: mahugusammy@gmail.com

Dear Dr Mahugu,

**REF** **Student Number:** 110039/18 **Protocol ID:** SU-IERC0287/18
**MARKETING COMMUNICATION FOR VACCINE-PREVENTABLE DISEASES DURING PUBLIC HEALTH EMERGENCIES: A CASE STUDY OF THE 2018 POLIO VACCINATION CAMPAIGNS IN NAIROBI'S WESTLANDS SUBCOUNTY**

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We acknowledge receipt of your application documents to the Strathmore University Institutional Ethics Review Committee (SU-IERC) which includes:

1. Research Proposal dated December 16, 2018
2. Participant information sheet and informed consent form dated December 16, 2018
3. Focus Group Discussion Interview Guide dated December 16, 2018
4. Study Questionnaire dated December 16, 2018
5. Study Budget
6. CV

The committee has reviewed your application, and your study *"Marketing Communication for Vaccine-Preventable Diseases during Public Health Emergencies: A Case Study Of the 2018 Polio Vaccination Campaigns in Nairobi's Westlands Subcounty"* has been granted **approval**.

This approval is valid for one year beginning **4th January 2019** until **3rd January 2020.**

In case the study extends beyond one year, you are required to seek an extension of the Ethics approval prior to its expiry. You are required to submit any proposed changes to this proposal to SU-IERC for review and approval prior to implementation of any change.

SU-IERC should be notified when your study is complete.

Thank you

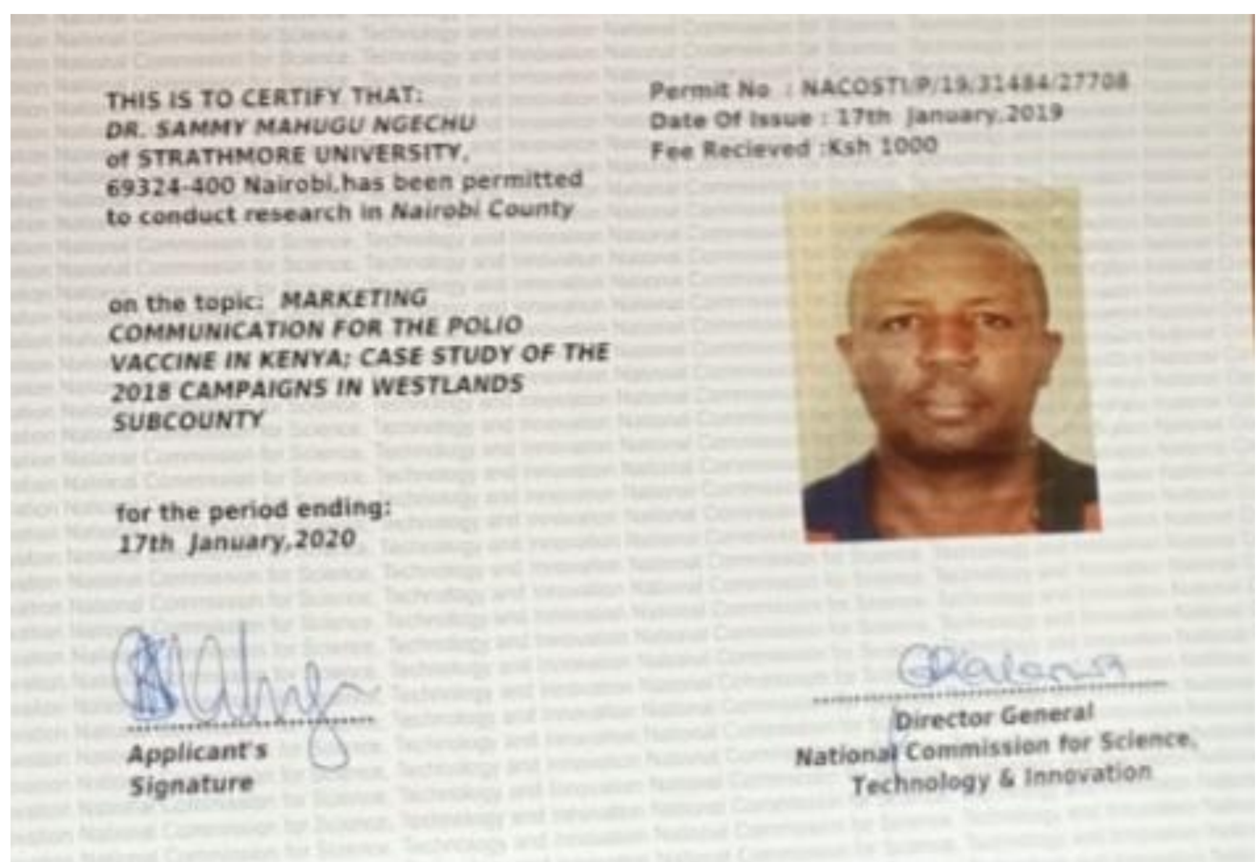
Sincerely,

Amina Salim
**Regulatory Affairs Fellow**

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
04 JAN 2019
TEL: +254 (0)703 034 000
P. O. Box 59857 - 00200
NAIROBI - KENYA

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email info@strathmore.edu www.strathmore.edu

## Appendix I: NACOSTI Permit



THIS IS TO CERTIFY THAT:
*DR. SAMMY MAHUGU NGECHU*
of STRATHMORE UNIVERSITY,
69324-400 Nairobi,has been permitted
to conduct research in *Nairobi County*

on the topic: *MARKETING COMMUNICATION FOR THE POLIO VACCINE IN KENYA; CASE STUDY OF THE 2018 CAMPAIGNS IN WESTLANDS SUBCOUNTY*

for the period ending:
*17th January,2020*

Permit No : NACOSTI/P/19/31484/27708
Date Of Issue : 17th January,2019
Fee Recieved :Ksh 1000

Applicant's
Signature

Director General
National Commission for Science,
Technology & Innovation