MAKERERE UNIVERSITY

COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES

(Co BAMS)

SCHOOL OF STATISTICS AND PLANNING

FACTORS AFFECTING IMMUNISATION BEHAVIORS IN LESS PRIVILEGED COMMUNITIES; A CASE STUDY OF KASOKOSO VILLAGE

BY

OWOMUGISHA ELIZABETH

BSTA

216001166

16/U/1072

A DISSERTATION SUBMITTED TO THE SCHOOL OF STATISTICS AND PLANNING IN PARTIAL FULFILMENT OF THE

REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELOR OF STATISTICS

OF MAKERERE UNIVERSITY

2019

DECLARATION

I **Owomugisha Elizabeth**declare that this is my dissertation and it only contains the original work made out of my own efforts and it has never been submitted to any university or institution of learning for any award.

..... Date: 2../09./..2019..

Owomugisha Elizabeth

APPROVAL

I approve that this dissertation has been done and submitted by Owomugisha Elizabeth (Reg. No. 16/U/10721) to school of statistics and planning under my supervision.

..... Date: 9/2/19

Dr. Andrew Muganga Kizito, Ph.D.

Lecturer (supervisor), School of statistics and planning.

DEDICATION

This research is whole heartedly dedicated to my beloved parent, who have been my source of inspiration at every step I take and who have given me a purposeful life.

To my mentors, friends and classmates who have shared their words of advice, encouragement and value addition to my study.

And lastly, I dedicate my research to the Almighty God who has given me good health, power of mind, protection and skills, all of these and more, I offer to you.

ACKNOWLEDGEMENT

Firstly, I would like to express my gratitude to the Almighty God for giving me knowledge, guidance, strength, and perseverance to enable me perform my research to full completion.

I greatly recognize and thank my supervisor Dr. Andrew Muganga Kizito for willingly devoting his time to guide and supervise me to full completion of this dissertation.

I am extremely thankful to Musinguzi Victor for his helpful insights, time to time and all my friends who have more or less contributed to my research

Lastly, my heartfelt appreciation goes to my parents Mr. Jackson Turyahurira and Mrs. Gladys Turyahurira for giving me advice, inspiration and support.

ABSTRACT

The main objective of the study was to examine the factors affecting immunisation behaviour in Kasokoso Village, Mbuya, Kampala district. A survey was conducted with the help of a questionnaire developed with Open Data Kit through face to face interviews from 96 respondents selected randomly from different households in Kasokoso village. The data collected was analyzed with the use of STATA packages and all inference made was entirely based on results of this analysis, descriptive statistics such as Mean, Standard Deviation, correlation tests and logistic regression were used to analyze the data that was collected.

This analysis revealed immunization behavior is significantly and positively influenced by radio usage, immunization awareness and married marital status for women while the awareness of basic vaccination and post-secondary significantly influenced immunization to the negative direction, all at 5% level of significance. Results showed that a unit increase in radio usage increases immunization behavior by 0.235 (coef = 0.235, p_value = 0.023), a unit increase in awareness of basic vaccination reduces immunization behavior by 0.204 (coef = -0.204, p_value=0.016), it was also discovered that a unit increase in immunization awareness increases immunization behavior by 0.195 (coef = 0.195, p_value = 0.011) and also that a unit increase in the number of married women increases immunization behavior by 0.173 (coef = 0.173, p_value = 0.046). It was also discovered that a unit increase in the number of women with post-secondary education decreases immunization behavior by 0.028 (coef = -0.028, p_value = 0.049).

Basing on the results from my analysis, women should engage more in income generating activities so as to increase immunization behavior in Kasokoso Village. Since it was observed that awareness of basic vaccination negatively affects immunization behavior, women are encouraged to change their attitude towards vaccination as this will increase a more positive attitude towards immunization behavior.

Only a few of the factors influencing immunization behavior were considered in this research and so researchers were advised to expand their scope in the proceeding studies so as to explore more of the factors that may have a significant influence on immunization behavior.

Contents

LIST OF TABLES

LIST OF FIGURES

1 CHAPTER ONE

1.1 INTRODUCTION

Immunisation is a proven tool for controlling and eliminating life threatening infectious diseases crucial in reducing infant and child mortality. Immunisation is the most effective public health intervention available against the eight vaccine-preventable diseases [tuberculosis, diphtheria, whooping cough, tetanus, hepatitis B, polio and measles] Its one of the most cost effective health investments, with proven strategies that make it accessible to even the most hard to reach and vulnerable population.

It is no wonder that, The Global Vaccine action plan(GVAP) 2011-2020 (WHO, Uganda National Expnded Programme on Immunisation, 2010) endorsed by the 194 Members of State of the World Health Assembly in May 2012 – was a framework put in place to prevent millions of deaths by 2020 through more equitable access to existing vaccines for people in all communities, the plan is expected to reduce global childhood mortality, surpassing the United Nations Millennium Development Goal 4 with a target to reduce by two thirds the under-five mortality rate (WHO, Millenium Development Goals(MDGs), 2000).

With the existence of the Uganda National Expanded Programme on immunisation (UNEPI) since 1983 with a mandate of ensuring that infants and women of child bearing age are fully immunised (WHO, Uganda National Expnded Programme on Immunisation, 2010), there is still a current concern by government and development partners that Uganda is experiencing declining trends in immunisation taking into consideration coverage with gains that had been achieved were reversed by reported cases of high infant mortality rate which attributed to vaccine preventable diseases therein a need to understand the factors affecting immunisation behaviours by studying attitude, knowledge and decision making towards immunisation of infants by mothers or for that matter parents.

Rather than looking at the country as a whole, this study will focus on less privileged communities with individuals leaving in resource deprived communities or where immunisation coverage is lower as compared to the rest of the country. These communities face parental barriers such as transportation, multiple children and other family related barriers that make it difficult to seek immunisation services.

1.2 PROBLEM STATEMENT

Immunisation protects the entire community by preventing the spread of diseases and providing protection for those who cannot be vaccinated. These vaccine preventable diseases return with devastating consequences if we allow immunisation coverage rates to fall. Groups most affected by under immunisation are those infants living in “pockets of need” or underserved communities (JM, 2000).

Despite measures that have been put in place to prevent against the immunisable diseases, some parents are still reluctant to take children for immunisation, contributing to the high infant mortality rates, these communities face parental barriers such as transportation, multiple children and other family related barriers that make it difficult to seek immunisation services. Also poor child health still persists in these communities arousing a lot of public interest to investigate factors affecting immunisation behaviours.

1.3 OBJECTIVES OF THE STUDY

The main objective of this study attempts to:

Investigate factors affecting immunisation behaviours in Kasokoso village

1.3.1 Specific objectives

1. To examine the relationship between age and the immunisation behaviours
2. To examine the relationship between Marital Status and the immunisation behaviours.
3. To examine the relationship between the Education level and the immunisation behaviours.
4. To examine the relationship between the Income level and the immunisation behaviours.
5. To examine the relationship between owning a radio and the immunisation behaviours.
6. To examine the relationship between owning a television and the immunisation behaviours.
7. To examine the relationship between distance to an immunisation centre and the immunisation behaviours.
8. To examine the relationship between knowledge about immunisation and the immunisation behaviour.
9. To examine the relationship between attitude towards immunisation and the immunisation behaviour.

1.4 Hypothesis

1. Older individuals are more likely to take their children for immunisation as compared to younger individuals
2. Married couples are more likely to take children for immunisation as compared to unmarried individuals.
3. The higher the education level, the more likely it is to take children for immunisation as compared to individuals with lower education level
4. Higher income earners are more likely to take children for immunisation as compared to lower income earners.
5. Individuals who a radio are more likely to take children for immunisation as compared to those who do not own a radio.
6. Individuals who a television are more likely to take children for immunisation as compared to those who do not own a television.
7. Individuals who are in close proximity to an immunisation centre are more likely to take children for immunisation as compared to individuals who are not in close proximity to an immunisation centre.
8. Individuals who are more knowledgeable about immunisation are more likely to take children for immunisation as compared to individuals who are less knowledgeable about immunisation
9. Individuals with are positive attitude towards immunisation are more likely to take children for immunisation as compared to individuals with a negative attitude towards immunisation.

2 CHAPTER TWO

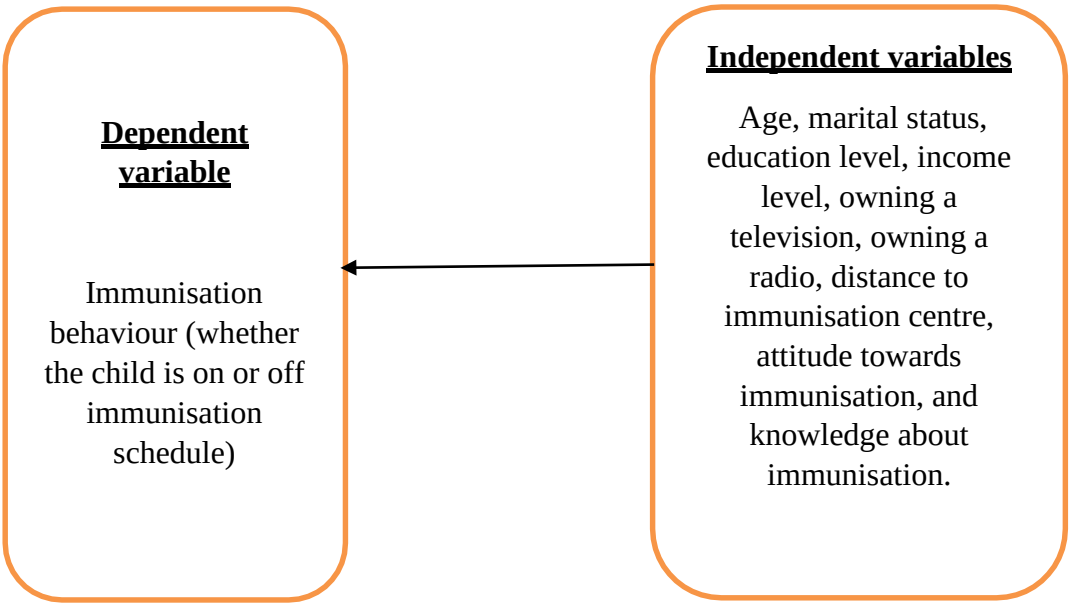
2.1 Introduction

This chapter presents the reviewed literature on immunisation behaviour and the different factors that affect it.

2.2 CONCEPTUAL FRAMEWORK

A conceptual framework is the researcher's understanding of how the particular variables in the study connect with each other. Thus, it identifies the variables required in the research investigation. It is the researcher's "map" in pursuing the investigation. The conceptual framework "sets the stage" for the presentation of the particular research question that drives the investigation being reported based on the problem statement (McGaghie, 2001)

Figure 1 CONCEPTUAL FRAMEWORK



Immunisation is a result of behaviour intention, this intention is as a result of two main factors i.e. knowledge about immunisation and attitude towards immunisation. However, there are other variables (background variables) that are responsible for determining the factors affecting the attitude towards immunisation and knowledge on immunisation practices e.g. Age, Education, Marital status, level of income, distance to immunisation unit, etc. which would be valuable in identifying individuals who fail to conform to immunisation schedules and their most pressing drawbacks.

2.3 IMMUNISABLE DISEASES

According to UNEPI guidelines (MOH, n.d.), Children below one year are immunised against eight vaccine preventable diseases which include; tuberculosis, diphtheria, whooping cough,

tetanus, hepatitis B, polio and measles. To have received all basic vaccination, a child must receive at least

- One dose of BCG vaccine which protects against tuberculosis
- Three doses of DPT-containing vaccine, which protects against diphtheria, pertussis (whooping cough), and tetanus
- Three doses of polio vaccine (not including the birth dose)
- One dose of measles vaccine

2.4 Immunisation Behaviour

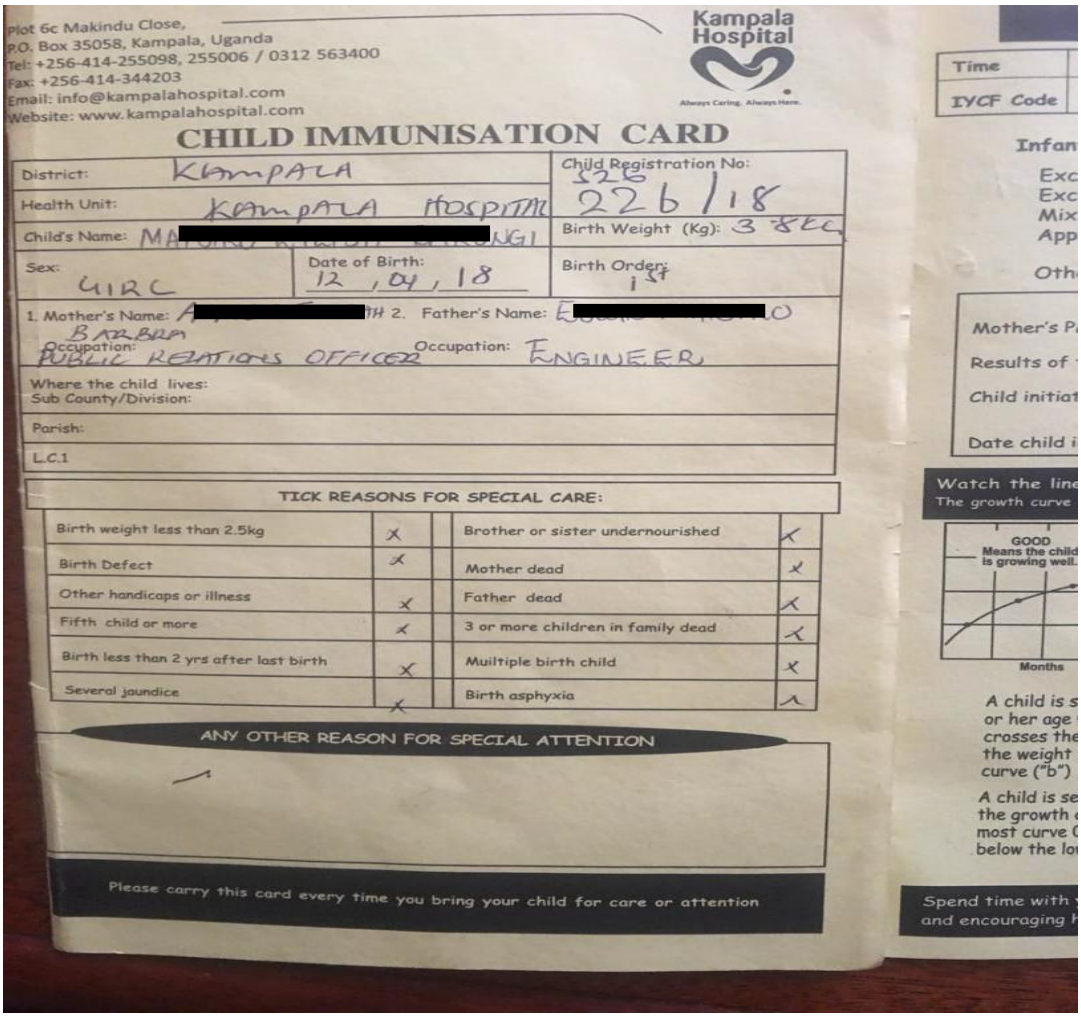
According to UNEPI guidelines (MOH, n.d.), Immunisation is the process whereby a person is made immune or resistant to an infectious disease, typically by administering of a vaccine. Immunisation can be done naturally or artificially. Studies about immunisation have often focused on parents, who are the key propagators, while the children are the key victims (Baale, 2013) therefore this research considers all children aged 0-36 months.

Information on vaccination can be collected in two ways; from vaccination cards shown to the interviewer and from mothers' verbal reports (Uganda Demographic and Health Survey, 2016) but for purposes of this research, vaccination cards were shown to interviewer where dates for timely immunisation are indicated. Some questions asked on immunisation in the UDHS, 2016included; do you have a card or book where (NAME)'s vaccinations are written down? Did you ever have a vaccination card or book for (NAME)? May I see the card or book where (NAME)'s vaccinations are written down? etc. Immunisation behaviour encompasses timely immunisation of children 0-36 months, timeliness of vaccinations dates were obtained from immunisation Health cards based on the following time ranges (lowest to highest target age):BCG(birth-8 weeks), Polio 0(birth-4 weeks), three polio and three pentavalent vaccines(4 weeks-2 months);8 weeks-4 months;12 weeks-6 months) and measles vaccine(38 weeks-12 months)- (Babirye, 2012) as guided by previous literature. If the child received respective vaccines within the time ranges above, 1 is recorded for on schedule and 0 for otherwise for the 12 vaccines considered in this research (BCG, Polio 0, Polio 1, DPT 1, PCV 1, Polio 2, DPT 2, PCV 2, Polio 3, DPT 3, PCV 3, Measles).

Immunisation behaviour was therefore measured as follows; Out of the 12 vaccines administered, a child is said to be on schedule if they have a total 12 vaccines administered on schedule within the time range and off schedule if otherwise.

2.4.1 Immunisation Health Card

Immunisation records act as proof of vaccination for vaccines received by the child, these cards are retained by parents often treasured as a symbol of hope for the child's future health and prosperity (Citizen, 2014). The important sections of an immunisation(health) of a child who has completed vaccination before their first birthday is shown below for purposes of this study are explained below



Plot 6c Makindu Close,
P.O. Box 35058, Kampala, Uganda
Tel: +256-414-255098, 255006 / 0312 563400
Fax: +256-414-344203
Email: info@kampalahospital.com
Website: www.kampalahospital.com

Kampala Hospital
Always Caring. Always Here.

CHILD IMMUNISATION CARD

District: KAMPALA	Child Registration No: 226/18
Health Unit: KAMPALA HOSPITAL	
Child's Name: [redacted]	Birth Weight (Kg): 3.8kg
Sex: GIRL / Date of Birth: 12, 04, 18	Birth Order: 1st
1. Mother's Name: [redacted] BARBRA / 2. Father's Name: [redacted]	
Occupation: PUBLIC RELATIONS OFFICER / Occupation: ENGINEER	
Where the child lives: Sub County/Division:	
Parish:	
L.C.1	

TICK REASONS FOR SPECIAL CARE:

Birth weight less than 2.5kg	X	Brother or sister undernourished	X
Birth Defect	X	Mother dead	X
Other handicaps or illness	X	Father dead	X
Fifth child or more	X	3 or more children in family dead	X
Birth less than 2 yrs after last birth	X	Muiltiple birth child	X
Several jaundice	X	Birth asphyxia	X

ANY OTHER REASON FOR SPECIAL ATTENTION

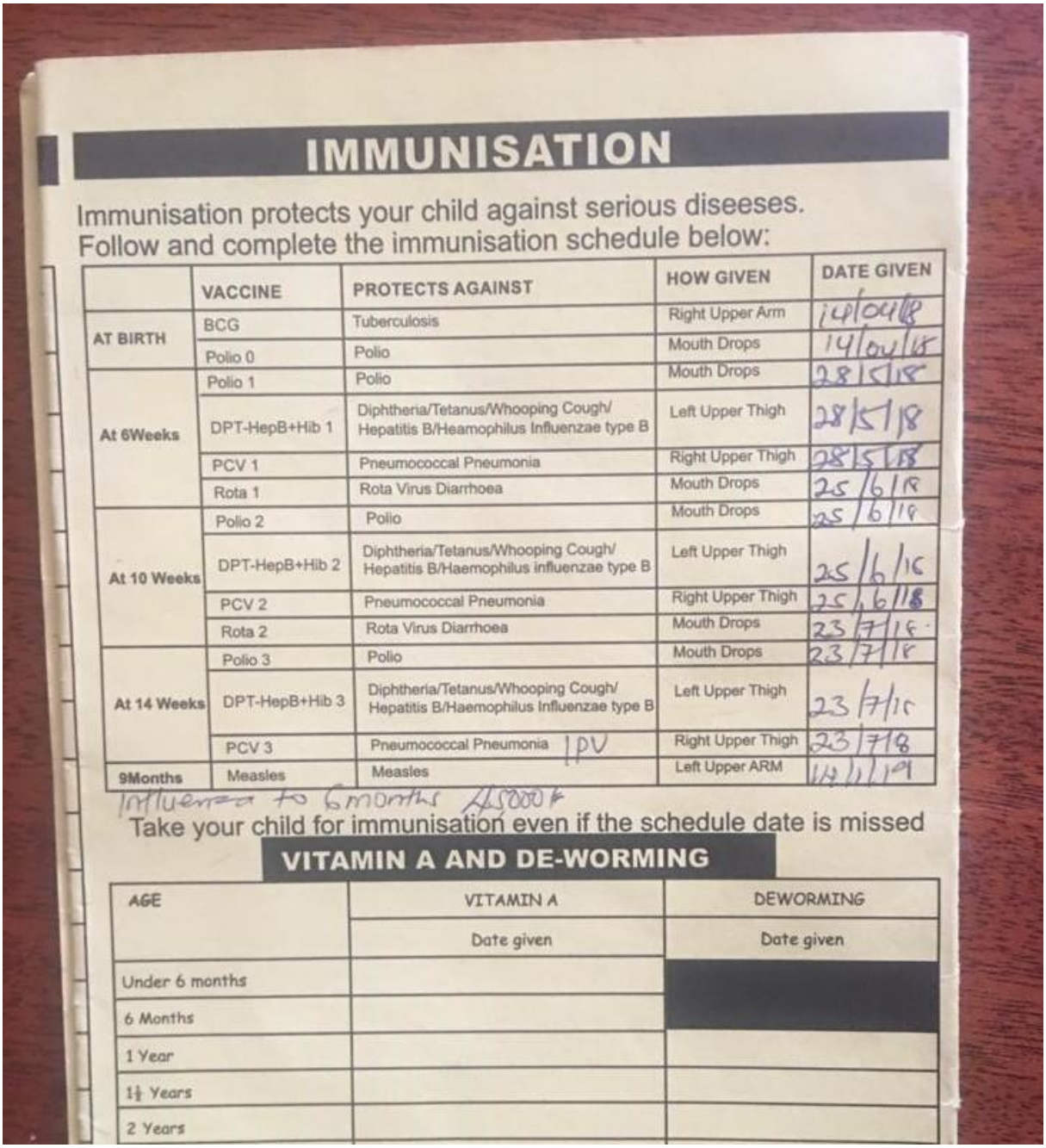
Please carry this card every time you bring your child for care or attention

Time
IYCF Code
Infan
Exc
Exc
Mix
App
Oth
Mother's P
Results of
Child initiat
Date child i
Watch the line
The growth curve
GOOD
Means the child is growing well.
Months
A child is s
or her age
crosses the
the weight
curve ("b")
A child is se
the growth
most curve
below the lo
Spend time with
and encouraging

Figure 2 First Section of Interest of an Immunization Card

shows socio demographic characteristics of the child and the parents e.g. name of child, names of parents, date of birth of child, weight of child at birth, birth order, occupation of parents, where the child lives, health unit, and district.

Figure 3: Second section of interest of an immunisation card



IMMUNISATION

Immunisation protects your child against serious diseeses.
Follow and complete the immunisation schedule below:

	VACCINE	PROTECTS AGAINST	HOW GIVEN	DATE GIVEN
AT BIRTH	BCG	Tuberculosis	Right Upper Arm	14/04/18
	Polio 0	Polio	Mouth Drops	14/04/18
At 6Weeks	Polio 1	Polio	Mouth Drops	28/5/18
	DPT-HepB+Hib 1	Diphtheria/Tetanus/Whooping Cough/ Hepatitis B/Heamophilus Influenzae type B	Left Upper Thigh	28/5/18
	PCV 1	Pneumococcal Pneumonia	Right Upper Thigh	28/5/18
	Rota 1	Rota Virus Diarrhoea	Mouth Drops	25/6/18
At 10 Weeks	Polio 2	Polio	Mouth Drops	25/6/18
	DPT-HepB+Hib 2	Diphtheria/Tetanus/Whooping Cough/ Hepatitis B/Haemophilus influenzae type B	Left Upper Thigh	25/6/18
	PCV 2	Pneumococcal Pneumonia	Right Upper Thigh	25/6/18
	Rota 2	Rota Virus Diarrhoea	Mouth Drops	23/7/18
At 14 Weeks	Polio 3	Polio	Mouth Drops	23/7/18
	DPT-HepB+Hib 3	Diphtheria/Tetanus/Whooping Cough/ Hepatitis B/Haemophilus Influenzae type B	Left Upper Thigh	23/7/18
	PCV 3	Pneumococcal Pneumonia IPV	Right Upper Thigh	23/7/18
9Months	Measles	Measles	Left Upper ARM	14/1/19

Influenza to 6months 45000

Take your child for immunisation even if the schedule date is missed

VITAMIN A AND DE-WORMING

AGE	VITAMIN A	DEWORMING
	Date given	Date given
Under 6 months		
6 Months		
1 Year		
1½ Years		
2 Years		

Figure 3 shows the immunisation schedule with clear dates when specific vaccines were administered. As indicated by the immunisation card, even if the schedule date is missed, it doesn't not mean that the child missed vaccination but rather the child is not on schedule.

2.4.2 A brief history of immunisation in Uganda;

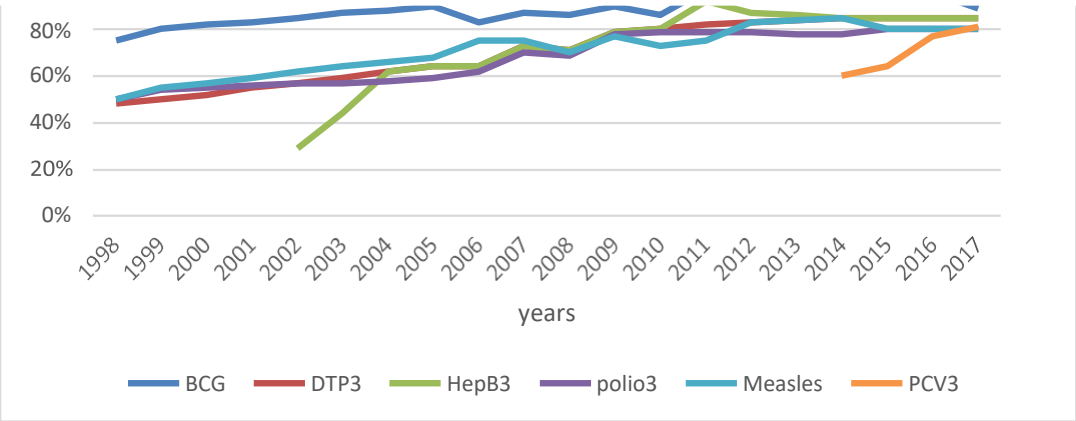
Uganda's immunisation coverage performance has varied over the past years fluctuating from high to low coverage - an indication of a vulnerable system. The table below shows data on national routine immunisation coverage for Uganda for respective basic vaccines, following a respective graph showing percentage of surviving infants who received each of the vaccines below as of 2017 for the last 20 years.

Table 1**:** National Immunisation Coverage by percentages in Uganda for the last 20 years (1998-2017)

vaccine	BCG	DTP3	HepB3	polio3	Measles	PCV3
2017	89	85	85	80	80	81
2016	96	85	85	80	80	77
2015	96	85	85	80	80	64
2014	95	85	85	78	85	60
2013	96	84	86	78	84	
2012	96	83	87	79	83	
2011	97	82	92	79	75	
2010	86	80	80	79	73	
2009	90	79	79	78	77	
2008	86	71	71	69	70	
2007	87	73	73	70	75	
2006	83	64	64	62	75	
2005	90	64	64	59	68	
2004	88	62	62	58	66	
2003	87	59	44	57	64	
2002	85	57	29	57	62	
2001	83	55		56	59	
2000	82	52		55	57	
1999	80	50		54	55	
1998	75	48		50	50	

source: WHO/UNICEF estimates of national immunisation coverage,2017 revision (UNICEF, n.d.)

Figure 4: Immunization coverage of Uganda for the last 20 years according to different basic vaccines received



source: WHO/UNICEF estimates of national immunisation coverage,2017 revision

Interpretation: The immunisation program registered progressive improvement between 1998 to 2005, however there was a deterioration and unstable trends in immunisation performance in the period 2006 to 2011 and constant immunisation patterns between 2011 to 2017.

2.5 Factors that affect immunisation Behaviour

To undertake this study, it is important to investigate the factors that affect immunisation behaviour. The factors affecting immunisation behaviour considered in this study include the following; age, marital status, education level, income level, owning a television or owning a radio, distance to immunisation centre, attitude towards immunisation, and knowledge about immunisation.

2.5.1 AGE

Age refers to the number of years an individual has lived from the time of birth. Different age cohorts tend to have different ways on how they interact with immunisation behaviour, age influences health service utilization because old age is usually associated with greater confidence and experience and when combined with greater responsibilities, it is not surprising that older people will seek health services more than younger ones (Addai, 2000). In this study, the null hypothesis is that older individuals are more likely to take their children for immunisation as compared to younger ones. Respondents will be asked to state their age in competed years.

2.5.2 MARITAL STATUS

Marital status is the civil status of each individual in relation to the marriage law or customs of the country. Intensive parenting is an important rationale for achieving desired levels of health of

children and that unmarried individuals are more likely to abscond from vaccinating their children. In this study, the null hypothesis is that, "Married couples are more likely to take children for immunisation as compared to unmarried individuals", and the question to be asked to respondents is, "What is your marital status?" which was coded with 0 for never married, 1 for married, 2 for widowed, and 3 for divorced.

2.5.3 EDUCATION LEVEL

Education level is the highest grade completed within the most advanced level attended in the education system of a country where the education was received. According to previous studies, basic literacy enables individuals to read and understand messages concerning general health (Tim Ensor, 2004) therefore less educated parents may visit immunisation centres less often for reasons like ignorance, lack of awareness and understanding of information regarding the health decisions that ought to be taken. The null hypothesis in this study is that "The higher the education level, the more likely it is to take children for immunisation as compared to individuals with lower education level" and the respondents will be asked their highest level of education. It will be categorized into four outcomes, 0=no education, 1=primary education, 2-secondary education, 3=tertiary and university.

2.5.4 INCOME LEVEL

Income is the amount of money received by a person, during a certain period of time. The level of income among individuals dictates how they will prioritize health related needs and necessities like immunisation for their children and also the ability to afford health-promoting goods depend on the income level of individuals. The hypothesis in this study is that, "Higher income earners are more likely to take children for immunisation as compared to lower income earners" and respondents will be asked their monthly income in Uganda shillings.

2.5.5 OWNING A RADIO

In areas where access to technology is expensive, radio continues to play an important role in information sharing i.e. in acquiring basic information through advertisements, news bulleting, message delivery, etc. It is the most convenient way to reach out to remote areas (WHO, Gender and Immunisation, November 2010). Owning a radio affects immunisation behaviour as a good source of information for parents to learn about child immunisation. The hypothesis in this study is that, "Individuals who own a radio are more likely to take children for immunisation as compared to those who do not own a radio"

2.5.6 OWNING A TELEVISION

Use of appropriate information and communication strategies through television can improve vaccination behaviour i.e. concerned parties can acquire basic information about immunisation activities through advertisements, news bulleting, message delivery, etc. The hypothesis in this

study is that, “Individuals who own a television are more likely to take children for immunisation as compared to those who do not own a television”

2.5.7 DISTANCE TO IMMUNISATION CENTRE

Distance to immunisation centre is how long in kilometres it takes an individual to move from their residence to an immunisation centre irrespective of what means they use to reach their destination According to WHO, knowledge of health care facilities catchment area is important for assessing health service utilization and for that reason, distance to the immunisation centre affects the level to which immunisation will be undertaken. The hypothesis in this study is that “Individuals who are in close proximity to an immunisation centre are more likely to take children for immunisation as compared to individuals who are not in close proximity to an immunisation centre” and the question to be asked to the respondent is, “how far is the nearest immunisation centre from your residence in kilometres?”

2.5.8 KNOWLEDGE ABOUT IMMUNISATION

Knowledge on immunisation behaviour is the familiarity gained by experience which in this case is through learning, discovering and practising activities related to immunisation behaviour e.g. being familiar with the immunisation schedule, knowing the repercussions of abhorring from immunisation, etc. Knowledge on immunisation is likely to produce more positive outcomes on immunisation behaviour. The hypothesis is that, “Individuals who are more knowledgeable about immunisation are more likely to take children for immunisation as compared to individuals who are less knowledgeable about immunisation” and the question to be asked to the respondent is, “Are you aware of the basic vaccines your infant should receive?”

2.5.9 ATTITUDE TOWARDS IMMUNISATION

Attitude towards immunisation is a settled way of thinking or feeling about what has been or is being done in regards to immunisation. The mother’s perception of vaccination plays a key role in their attitude towards immunisation (Phouphengack, 2007), attitude is shaped not by just healthcare professionals but also other information sources. The hypothesis is that, “Individuals with are positive attitude towards immunisation are more likely to take children for immunisation as compared to individuals with a negative attitude towards immunisation” and the question to be asked to the respondent is, “From your past experience, do you think immunisation is greatly helpful towards your child’s health?”

Child Health is the state of physical, mental, intellectual, social and emotional wellbeing and not merely the absence of disease or infirmity. Healthy children live in families, environments, and communities that provide them with the opportunity to reach their fullest developmental potential (Workgroup, October 2007). Children cannot achieve optimal health alone, they are dependent upon adults in their family and community to provide them with an environment in which they can learn and grow successfully.

3 CHAPTER THREE

3.1 OBJECTIVE OF THE STUDY

To study immunisation behaviour and the factors that influence it in kasokoso village.

3.2 POPULATION FRAME

The target population are mothers or guardians with infants aged 0-36 months old from different sampled households. If a sampled household has more than two infants aged 0-36 months, then only one will be considered and if a given household doesn't have an infant aged 0-36 months old, then that household is excluded from the sample.

3.3 RESEARCH DESIGN

The research design of the study shall be cross sectional survey. The design consists of administering questionnaires to representative samples of the population at a single point in time. The design is useful for descriptive purposes as well as for determination of relationship between and among variables

3.4 DATA TO BE COLLECTED

The data to be used in this research is primary data. This data will be collected using a questionnaire developed in Open Data Kit (OKD COLLECT v1.22.2) The advantages of using ODK include;

- Ease of use
- Collecting and digitalizing data right at the source makes data entry more efficient and cleaner and leads to improved quality
- Pre coded skip patterns make it easy for enumerators and prevent the need for removing irrelevant fields later
- It is time and cost effective

Data collection was done by personal interview method where questions were read out directly to the respondent and this is important in helping the respondent understand the questions and thus ensure proper responses.

3.5 DEGREE OF PRECISION REQUIRED

The degree of precision is 0.1(10%). The degree of precision is the margin of permissible error between the estimated value and the population. It measures how close an estimate is to the actual characteristic in the population and is usually estimated using the standard error.

3.6 SAMPLE SIZE ANS SELECTION

The sample size will be determined by Cochran's formula for proportions (1977) to calculate sample size as follows;

$$\boldsymbol{n = \frac{z^2pq}{e^2}}$$

Where;

n= required sample size

z= the standard normal value corresponding to the required level of confidence (95%)

p= the percentage of immunized children across regions in Kampala, 51% (UDHS 2016) used as p because the percentage of immunized children in kasokoso is unknown. The question asked that led to this statistic in the (Uganda Demographic and Health Survey, 2016) was, Did (NAME) ever receive any vaccinations to prevent (NAME) from getting diseases, including vaccinations received in campaigns or immunization days or child health days?

q= (1-p), percentage of children who are not immunized in kasokoso

e= margin of error (0.1)

Hence;

$$\boldsymbol{n = \frac{1.96^2(0.51)(0.49)}{0.1^2}}$$

=96.001584

≈96 respondents

3.7 STATISTICAL ANALYSIS

Data was analyzed using statistical packages of STATA and Microsoft Excel, at three different levels i.e. univariate, bivariate and multivariate level.

For univariate analysis, it will be used to summarize data from respondents. Frequency tables (one-way tables) will be generated for categorical variables alongside summary and descriptive statistics generated for the quantitative independent variables;

Mean: It is the average number of the variable in question.

Sample mean formula; sample mean, $\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$ Where xi x_i Is the value of the variable and n is the number of respondents.

Standard deviation: It is measure of variation or dispersion of the variable in question from the mean.

Standard deviation formulas; sample standard deviation, $s = \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2}$

Where n is the number of respondents, $x_i$is the value of the variable and $\bar{x}$ is the value of the sample mean.

Median: Is the measure of central tendency (the value separating the higher half from the lower

half of the data), it gives a better sense of how the variable is distributed.

For Bivariate analysis, correlation coefficients are obtained to measure how strong a relationship is between two variables (between immunization behavior and the independent variables i.e. age, marital status, education level, income level, owning a television or owning a radio, distance to immunization center, attitude towards immunization, and knowledge about immunization)

Pearson's correlation coefficient, $\rho = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$

Where n is the number of respondents, x is the value of independent variable and y is the value of the dependent variable.

At 5% level of significance, , ρ returns a value between -1 and 1 as an indication of the direction and strength of the relationship between the two variables.

For multivariate analysis, a logistic regression model will be used to describe data and to explain the relationship between the dependent variable (immunization behavior) and one or more independent variables (age, marital status, education level, income level, owning a television or a radio, distance to immunization center, attitude towards immunization, and knowledge about immunization)

Model estimation

The dependent variable is dichotomous (binary) i.e. a child is either on vaccination schedule or off vaccination schedule, and independent variables are either binary, non-binary or continuous. Therefore, logistic regression or probit regression may be used for analysis.

Logistic regression measures the relationship between a binary categorical dependent variable and one or more dependent variables by estimating probabilities using a logistic function which is the cumulative logistic distribution, thus it treats the same set of problems as probit regression with the latter using a cumulative normal distribution curve and therefore the logistic model was used for purposes of this study. The linear regression model can be specified as:

$$log\,[\frac{p_i}{1-p_i}] = \beta_0 + \beta_1 Age_i + \beta_2 Mar_i + \beta_3 NMar_i + \beta_4 Wid_i + \beta_5 Div_i + \beta_6 PEduc_i + \beta_7 SEduc_i + \beta_8 PSEduc_i + \beta_9 Income_i + \beta_{10} OTel_i + \beta_{11} 0Radio_i + \beta_{12}\, Dist_i + \beta_{13}\, KIB_i + \beta_{14} AIB_i + \varepsilon$$

Where;

p_i is the probability of ith respondent having a child on schedule for immunisation

1-p_i is the probability of the ith respondent having a child off the immunization schedule

Age_i is the age of respondent i

Mar_i is respondent i who is married

$NMar_i$ is respondent i who has never married

Wid_i is respondent i who is widowed

Div_i is respondent i who is divorced

$PEduc_i$ is respondent i with primary education

$\beta_7 SEduc_i$ is respondent i with secondary education

$PSEduc_i$ is respondent i with post-secondary education

$Income_i$ is the income of the ith respondent

$OTel_i$ is respondent i who owns a television

$ORadio_i$ is respondent i who owns a radio

$Dist_i$ is respondent i's distance to the nearest immunization center

KIB_i is respondent i with knowledge on immunization behavior

AIB_i is respondent i's attitude on immunization behavior

This model includes non-numeric data i.e. categorical variables which can be represented as dummy variables- variables containing values such as 1 or 0 representing the presence or absence of a categorical value, caution should therefore be taken of the dummy variable trap which is a scenario in which the independent variables are multi collinear- where two or variables are highly correlated. In the event that so, the solution to a dummy variable trap is to drop one of the categorical variables.

4 CHAPTER FOUR: ANALYSIS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

This chapter presents the results of the research. In the discussion of the study findings, descriptive analysis at univariate level, correlations at bivariate level and logistic regression analysis at the multivariate level. Analysis is done in line with the research objectives and as a way to get the research objectives answered.

4.2 Results from univariate analysis

Table 2: Univariate analysis of the variables and their units of measurement

Variable	N	Mean	Std. Dev	Min	Max
Age (Complete years)	96	27.594	5.562	20	43
Monthly Income (Shillings)	96	105,104.2	89,818.47	20,000	800,00
Television (1 = Yes 0 = No)	96	0.677	0.470	0	1
Radio (1 = Yes 0 = No)	96	0.688	0.466	0	1
Nearest Immunization Centre (Kilometers)	96	3.000	1.392	1	5
Basic Vaccination Awareness (1 = Yes 0 = No)	96	0.583	0.496	0	1
Immunization schedule awareness (1 = Yes 0 = No)	96	0.167	0.375	0	1
Marriage					
Ever been married (1 = Yes 0 = No)	96	0.198	0.401	0	1
Married (1 = Yes 0 = No)	96	0.573	0.497	0	1
Widowed (1 = Yes 0 = No)	96	0.052	0.223	0	1
Divorced (1 = Yes 0 = No)	96	0.177	0.384	0	1
Education					
No education (1 = Yes 0 = No)	96	0.042	0.201	0	1
Primary (1 = Yes 0 = No)	96	0.302	0.462	0	1
Secondary (1 = Yes 0 = No)	96	0.500	0.503	0	1
Post-secondary (1 = Yes 0 = No)	96	0.146	0.355	0	1

Source: Primary data

Interpretation

A total of 96 respondents answered the questionnaire and thus 100% response rate. The average age of the respondents was 28 complete years with a standard deviation of 5.562 years, the highest age being 43 years and the lowest being 20 years.

The average monthly income of the women was 105,104.2 Uganda Shillings ranging from 20,000 to 800,000 Uganda Shillings with a standard deviation of 89,818.47 Uganda Shillings.

The percentage of women who use television stands at 67.7% with a standard deviation of 0.470 and while the percentage of women who use radio is 68.8% with a standard deviation of 0.466.

According to the women participants, on average the nearest health center is 3km Away the nearest being 1km and the furthest being 5km away with a standard deviation of 1.392km. This implies that the shortest distance moved on average to the nearest Immunization center by any woman is 3Km.

58.3% of the women have knowledge of basic vaccination with a standard deviation of 0.496 in comparison to 41.7% of the women who had no knowledge of basic vaccination while only 16.7% have knowledge of their immunization schedules in comparison to the majority at 83.3% of the women who had no knowledge about their immunization schedules.

Majority of the respondents were married at 57.3%, followed by 19.8% who ever been married 17.7% of the women were divorced while only 5.2% of the women are widowed.

Descriptive analysis about education reveals that majority of the participants had secondary as their highest level of education at 50%, followed by the uneducated at 42%, those with primary qualification were at 30.2% and women who qualified past the post-secondary were at 14.6%.

4.3 Bivariate Analysis

Table 3: Correlation of factors associated with immunization behaviors

	Immunization Schedule	Age (complete years)	Monthly income (Ug Shs)	Television (1 = Yes, 0 = No)	Radio (1 = Yes, 0 = No)	Distance to IC (Kilometers)	Vaccination awareness (1 = Yes, 0 = No)		Immunization awareness (1 = Yes, 0 = No)	Ever been married (1 = Yes, 0 = No)	Married (1 = Yes, 0 = No)	Widowed (1 = Yes, 0 = No)	Divorced (1 = Yes, 0 = No)	No education (1 = Yes, 0 = No)	Primary (1 = Yes, 0 = No)	Secondary (1 = Yes, 0 = No)	Post-secondary (1 = Yes, 0 = No)
Immunization Schedule	1.00																
Age (complete years)	0.13	1.00															
Monthly Income (Ug Shs)	0.21*	0.35	1.00														
Television (1 = Yes, 0 = No)	0.06	-0.04	0.00	1.00													
Radio (1 = Yes, 0 = No)	0.17	0.02	0.07	0.54	1.00												
Distance to IC (kilometers)	-0.12	0.05	-0.06	-0.13	-0.05	1.00											
Vaccination awareness (1 = Yes, 0 = No)	-0.21*	0.19	0.15	0.00	-0.03	0.12	1.00										
Immunization awareness (1 = Yes, 0 = No)	0.04	0.16	0.03	0.13	-0.12	0.10	0.38		1.00								
Ever been married (1 = Yes, 0 = No)	-0.14	0.14	0.02	-0.10	0.11	0.00	0.05		0.06	1.00							
Married (1 = Yes, 0 = No)	0.02*	-0.18	0.00	0.07	-0.13	-0.03	-0.10		-0.12	-0.57	1.00						
Widowed (1 = Yes, 0 = No)	0.16*	0.27	0.08	-0.03	-0.04	0.03	0.11		0.27	-0.12	-0.27	1.00					
Divorced (1 = Yes, 0 = No)	0.02	-0.07	-0.07	0.03	0.08	0.02	0.00		-0.06	-0.23	-0.54	-0.11	1.00				
No education (1 = Yes, 0 = No)	-0.09	0.13	-0.03	-0.30	-0.31	-0.04	-0.13		-0.09	0.16	-0.13	-0.05	0.04	1.00			
Primary (1 = Yes, 0 = No)	-0.04	-0.04	-0.21	-0.03	0.06	0.00	-0.08		-0.18	-0.16	0.07	-0.05	0.11	-0.14	1.00		
Secondary (1 = Yes, 0 = No)	0.08	-0.08	0.16	0.07	-0.04	0.03	0.09		0.05	0.07	0.03	0.04	-0.14	-0.21	-0.67	1.00	
Post-secondary (1 = Yes, 0 = No)	0.09	0.09	0.08	0.08	0.14	0.00	0.09		0.23	0.03	-0.09	0.04	0.05	-0.08	-0.26	-0.40	1.00

At 0.05% significance level, it was observed that the factors which significantly affect immunization schedule are monthly income, vaccination awareness, married and widowed.

It was also observed that there is a weak positive significant relationship between immunization schedule and monthly income at 5% level of significance (0.21).

There was a weak negative significant relationship between immunization schedule and awareness of basic vaccination at 5% level of significance (-0.21).

It was also observed that there is a very weak positive significant relationship between immunization schedules and married at 5% level of significance (0.02).

It was also observed that there is a weak positive significant relationship between immunization schedules and widowed at 5% level of significance (0.16).

4.4 Multivariate analysis

Table 4: Logistic regression analysis

Variable	Coefficient	Standard Error	P value
Television (1 = Yes, 0 = No)	-0.147	0.103	0.155
Radio (1 = Yes, 0 = No)	0.235	0.107	**0.023**
Distance to nearest immunization center			
2 kilometers	0.009	0.119	0.942
3 kilometers	-0.011	0.120	0.927
4 kilometers	-0.151	0.133	0.261
5 kilometers	-0.082	0.120	0.500
Vaccination awareness (1 = Yes, 0 = No)	-0.204	0.083	**0.016**
Immunization awareness (1 = Yes, 0 = No)	0.195	0.121	**0.011**
Marriage			
Married (1 = Yes, 0 = No)	0.173	0.103	**0.046**
Widowed (1 = Yes, 0 = No)	0.352	0.188	0.096
Divorced (1 = Yes, 0 = No)	0.153	0.125	0.224
Education			
Primary	0.002	0.214	0.993
Secondary	0.082	0.210	0.697
Post-secondary	-0.028	0.231	**0.049**
Constant term	0.043	0.202	0.833

Source: Primary Data collected

Number of obs = 96 F (17, 69) = 1.33

R-squared = 0.189 Adj R-squared = 0.047

Prob > F = 0.207

Interpretation

The regression results revealed that 96 observations were considered and the overall model probability value was found to be 0.207 at 5% level of significance. This implies that the model does not support well variation in immunization behavior in Kasokoso Village at 5% level of significance. The adjusted R-squared was found to be 0.047. This implies that the variations in explanatory variables in the model explain only 4.7% of the variations in immunization behavior.

The results also showed that radio, awareness of basic vaccination, immunization awareness, married and post-secondary significantly influence immunization behavior in Kasokoso village at 5% level of significance since their respective probability values are less than 0.05.

The estimated coefficient of radio was 0.235. This implies that a unit increase in radio usage increases immunization behavior by 0.235 holding other factors constant. This result was consistent with the hypothesis. Therefore, radio is associated with immunization behavior.

The estimated coefficient of awareness of basic vaccination was -0.204. This implies that a unit increase in awareness of basic vaccination reduces immunization behavior by 0.204 holding other factors constant. This result was consistent with the hypothesis. Therefore, awareness to basic vaccination is associated with immunization behavior.

The estimated coefficient of immunization awareness was 0.195. This implies that a unit increase in immunization awareness increases immunization behavior by 0.195 holding other factors constant. This result was consistent with the hypothesis. Therefore, immunization is associated with immunization behavior.

More to that, the estimated coefficient of married was 0.173. This implies that a unit increase in the number of marrieds increases immunization behavior by 0.173 holding other factors constant. This result was consistent with the hypothesis. Therefore, married women are associated with immunization behavior.

Finally, the estimated coefficient of post-secondary was -0.028. This implies that a unit increase in the number of women with post-secondary qualifications decreases immunization behavior by 0.028 holding other factors constant. This result was consistent with the hypothesis. Therefore, post-secondary is associated with immunization behavior.

Table 5: Test for multicollinearity

Variable	VIF	1/VIF
Marital status		
Widowed	1.84	0.542756
Divorced	1.47	0.681657
Education		
Primary	3.34	0.298990
Secondary	3.81	0.262253
Post-secondary	3.23	0.309796
Vaccination awareness	1.90	0.527219
Immunization awareness	1.87	0.534424
Distance to nearest Immunization center		
2 kilometers	2.30	0.435438
3 kilometers	2.10	0.476020
4 kilometers	2.26	0.442998
5 kilometers	2.44	0.409801
Television	3.14	0.318560
Radio	2.60	0.385070
Mean VIF	2.48	

5 CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents conclusions on the findings and recommendations basing on the results of this research.

5.2 Conclusions

The main purpose of this research was to investigate factors affecting immunization behaviors in Kasokoso village. 96 respondents were selected and included in the sample and research face to face interviews were conducted with women with a guide of a well-designed Open Data Kit containing all the predetermined questions. The collected data was analyzed using STATA and inference was made from this analysis. Univariate, bivariate and multivariate levels of analysis were done.

A descriptive summary was made for each of the variables at the univariate level and a pairwise correlation was made between immunization behavior and the rest the variables at 5% level of significance at the bivariate level of analysis while at the multivariate level, a multiple linear regression model was made with immunization behavior as the dependent variable and the rest of the variables as independent variables at 5% level of significance. This analysis revealed immunization behavior is significantly and positively influenced by radio usage, immunization awareness and married women while the awareness of basic vaccination and post-secondary significantly influenced immunization behavior to the negative direction.

5.3 Recommendations

The following recommendations were made basing on the results of this study as discussed in the previous chapter: -

From the analysis, monthly income was found to have a positive and significant effect on immunization behavior; women should therefore engage more in income generating activities so as to increase immunization behavior in Kasokoso Village.

Since it was observed that awareness of basic vaccination negatively affects immunization behavior, women are encouraged to change their attitude towards vaccination as this may be a contributing factor to the negative relationship between immunization behavior and basic vaccination awareness.

More to that, women should also be advised to stay in marriage with their husbands for situations where it is applicable i.e. reduce divorce cases and also the widowed to remarry if possible as this contributes towards proper and appropriate immunization behavior since it was found out that the two are positively significantly correlated.

Considering a sample of only 98 women who were used in this research, it may not be representative of all women in Kasokoso village since the number of women in the reproductive ages is very large and so the results of this research should not be generalized for this village. However, this sample is sufficiently representative for the study case area and so the results can reliably be generalized for Kasokoso Village.

5.4 Further Research

Only a few of the factors influencing immunization behavior were considered in this research and so researchers should be advised to expand this scope in the proceeding studies so as to explore more of the factors that may have a significant influence on immunization behavior.

The research period was strictly on immunization behavior in only one month. Since different issues concerned with immunization behavior may change in a period greater than a month, researchers should be encouraged to always make their research about immunization behavior basing on a relatively larger period to ensure reliability on the research studies.

APPENDICES

APPENDIX 1: QUESTIONNAIRE

MAKERERE UNIVERSITY

COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES

(Co BAMS)

SCHOOL OF STATISTICS AND PLANNING

CONFIDENTIAL

Questionnaire No.: _____

I greet you, my name is OWOMUGISHA ELIZABETH, a third-year student at Makerere University pursuing a degree in Bachelor of Statistics. I am carrying out an academic research on "factors affecting immunization behavior in kasokoso village." All information you provide in this questionnaire will be for research purposes only and it will be treated with utmost confidence. Would you like to proceed? If yes;

Instructions: For the coded questions, please fill in the code which best corresponds to your response and for the questions that are not coded, kindly write the correct answer in the response column. The codes are written in brackets alongside each question

FACTORS AFFECTING IMMUNISATION BEHAVIORS IN LESS PRIVILEGED COMMUNITIES; A CASE STUDY OF KASOKOSOKO VILLAGE

Questions	Response
SECTION A: DEMOGRAPHIC CHRARACTERISTICS OF REPONDENT	
1. What is your age?	
2. What is your marital status?	
Never married (0=No, 1=Yes)	
Married (0=No, 1=Yes)	
Widowed (0=No, 1=Yes)	
Divorced (0=No, 1=Yes)	
3. What is the highest level of education you have attained?	
no education (0=No, 1=Yes)	

primary education (0=No, 1=Yes)	
secondary education (0=No, 1=Yes)	
Post-secondary education (0=No, 1=Yes)	
4. What is your monthly income?	
SECTION B: KNOWLEDGE, ATTITUDE AND PRACTICES	
5. Do you own a television or a radio?	
Television (0=No, 1=Yes)	
Radio (0=No, 1=Yes)	
6. How far is the nearest immunisation centre from your residence in kilometres?	
7. Are you aware of the basic vaccines your infant should receive? (0=No, 1=Yes)	
8. Are you aware of what the immunisation schedule requires for you to maintain the right immunisation behaviour for your infant? (0=No, 1=Yes)	

Thank you very much for your time.

6 REFERENCES

Addai, I. (2000). Determinats of Use of Maternal-Child Health Services in rural Ghana. *Journal of Biosocial Science*.

Baale, E. (2013). Factors affecting Childhood immunisation in Uganda. *Journal of Health, population and nutrition*.

Babirye, J. (2012). Timeliness of of childhood vaccintion in Kampala,Uganda.

Citizen, G. (2014). What is an immunisation Card? *Health*.

JM, S. (2000). Immunization pockets of need: science and practice. *PubMed*.

McGaghie. (2001). Problem Statement, conceptual frmework, nd reserch question. *Academic Medicine*, 923-924.

MOH. (n.d.). *IMMUNISATION GUIDLINES BY UNEPI*. Retrieved from MINISTRY OF HEALTH: health.go.ug

Mutua, M. K. (2016). Fully immuniseed Child: coverage,timing and sequencing of routine immunisation in an urban poor settlement in Nairobi,Kenya. *Tropical Medicine and Health*.

Phouphengack, k. (2007). Knowledge and peception of mothers about immunisation of children under 3 years of age.

Tim Ensor, S. c. (2004). Overcoming barriers to health service access. *Health Policya nd Planning*, 69-79.

(2016). *Uganda Demographic and Health Survey.* Kampala, Ugnda: Uganda Bureau of Statistics.

UNICEF. (n.d.). *Immunisation coverage estimates data visualization*. Retrieved from UNICEF Website: http://data.unicef.org

WHO. (2000, september). *Millenium Development Goals(MDGs)*. Retrieved from WHO Web site: http://www.who.int

WHO. (2010). *Uganda National Expnded Programme on Immunisation*. Retrieved from WHO Web site: http://www.who.int

WHO. (November 2010). *Gender and Immunisation.* Swiss centre for internationsl Health.

Workgroup, H. (October 2007). First things First. *Child Health*.