PREVALENCE AND CONTRIBUTING FACTORS FOR MISSED OPPORTUNITY FOR VACCINATION AMONG CHILDREN UNDER TWO YEARS OF AGE ATTENDING HEALTH FACILITIES IN KINONDONI MUNICIPAL COUNCIL, DAR ES SALAAM, TANZANIA

Alex Mphuru, MD, MMed

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By

Alex Mphuru

A Dissertation Submitted in (partial) Fulfillment of the Requirement for the Degree of Master of Public Health of

Muhimbili University of Health and Allied Sciences
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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled: **‘‘P*revalence and contributing factors for Missed Opportunity for Vaccination among children under two years of age attending health facilities in Kinondoni Municipality, Dar es salaam, Tanzania’’*** in (partial) fulfillment of the requirements for the degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences.

_____

Prof. Ka goma S. Mnyika

(Supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Alex Athanasius Mphuru**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for similar or any other degree award.

Signature…… **Date**……..

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DEDICATION

To my parents; Eugenia Kajwahula and the late Prof. Athanasius Ndesanjo Mphuru, the foundation and support you have given me are grateful. God bless you.

ABSTRACT

Background: A missed opportunity for vaccination (MOV) is an incident whereby a child visits a health facility service and does not receive all recommended vaccines despite being eligible. Despite the efforts aiming at attaining universal vaccine coverage, anecdotal and reported findings indicate significant MOV in Tanzania. Moreover, several factors play part in contributing to MOV. Such findings, however, are not systematically documented in Tanzania. This study, therefore, aimed at exploring MOV and proposes appropriate measure in Tanzania context.

Aim of the Study: This study has a broad aim of determining the prevalence and contributing factors for MOV among children under two years of age attending health facilities in Kinondoni Municipal Council, Dar es Salaam, Tanzania.

Materials and Methods: This was a facility based cross-sectional study that used both quantitative and qualitative approach to data collection. A total of 330 parents/caregivers of children under two years of age participated in the quantitative survey and 6 health care workers participated in the qualitative approach of the study. Sample size was allocated in proportion to the target population of the facility. Analysis of quantitative data was conducted using IBM SPSS version 17 through descriptive and regression analyses methods. For the qualitative part, data was transcribed, coded and analysed using content thematic analysis method.

Results: A total of 195 out of 330 children recruited were eligible for vaccination during the day of interview, of which 142 (72.8%) received the vaccine during that day and the remaining 53 (27.2%) did not receive vaccine despite being eligible (MOV). The likelihood of experiencing MOV is high in children below 12 months compared to children above 12 months of age (OR 0.13, P<0.001). Moreover, the likelihood of experiencing MOV occurs in children whose main reason for attending health facility is medical consultation compared to those who attend health facility for vaccination (OR 77.43, p=0.001).

Health care workers described stock out of vaccines, knowledge /attitude of health care workers, breakdown of cold chain system and timing/days of immunization services as the main contributing factors for MOV.

Conclusion and Recommendations: The study highlighted prevalence of MOV and contributing factors in Kinondoni Municipal Council. Proper attention to children below 12 months of age during medical consultation, ensuring availability of vaccines, proper timing of immunization, ensuring functionality of cold chain and change of attitude of health care workers are of paramount importance to reduce MOV.

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LIST OF ABBREVIATIONS

BCG	Bacille Calmette-Guérin
DPT	Diphtheria-Pertussis-Tetanus vaccine
DPT-3	Third dose of Diphtheria-Pertussis-Tetanus vaccine
EPI	Expanded Programme on Immunization
HepB	Hepatitis B vaccine
GAVI	Global Alliance for Vaccine and Immunization
IVD	Immunization and Vaccine Development Programme
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MR	Measles-Rubella Vaccine
MOV	Missed Opportunity for Vaccination
OPV	Oral Polio Vaccine
PCV	Pneumococcal Conjugate Vaccine
Penta-3	Third dose of pentavalent vaccine
RED/REC	Reach Every District/Reach Every Child
RCH	Reproductive and Child Health
WHO	World Health Organization

OPERATIONAL DEFINITIONS OF KEY TERMS

Dropout rate	this is the rate difference between the first dose (usually Pentavalent 1) and the last dose (usually Pentavalent 3).
Fully immunized child	is the child who has received BCG, 3 Pentavalent, and 3 OPV, 3PCV, 2 Rotavirus and 2 Measles Rubella vaccines before reaching the age of 24 months.
Missed Opportunity	is the incidence whereby a child who came to the health facility for whatever service did not receive the vaccination for which he/she is eligible and with no valid contraindications.
Utilization	Is the process of continuation of immunization services once started (Determined by dropout rate).
Vaccination coverage	Percentage of the targeted population that has been vaccinated.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Global Overview of Immunization Programmes

The World Health Organization (WHO) established the Expanded Program on Immunization (EPI) in 1974 as a milestone in ensuring that all children benefit from lifesaving vaccines. The program started with six vaccines that protect against Tuberculosis (BCG Vaccine), Diphtheria, Tetanus and Pertussis (DTP vaccine), Measles (Measles Vaccine) and Poliomyelitis (Polio vaccine). Currently, several vaccines against diseases are being provided by different countries that are effective in combating major causes of childhood mortality and morbidity. Through the provision of vaccines, the world has made a considerable progress in saving lives of children and women reaching more than 80% of the children under one year of age with vaccines (1).

Reaching the target population, immunization programs uses vaccination coverage in addressing the goals. Considerable progress has been observed in the trend of vaccination coverage globally following Universal Child Immunization (UCI) in the 1980s and the Reach Every Child (REC) strategy in 2000s. The coverage for the dose of DTP3 increases from 20% in 1980 to 75% in 1990 and by 2016 the worldwide coverage has reached 81%. Despite this coverage, there is variation between countries and at subnational levels with some areas having coverages which are lower and contribute to a significant number of unimmunized and under-immunized children. According to WHO global immunization data of July 2015, it is reported that the total number of deaths averted is estimated to be two to three million deaths every year from Diphtheria, Tetanus, Pertussis and Measles and the estimated coverage in 2014 is 86% worldwide with the number of countries reaching coverage 80% or more increasing to 159 (2-3).

With respect to Africa, there is variation in coverage ranging from as high as 90% to below 50% in other countries that put a significant number of African children at risk of dying from vaccine preventable diseases. It is estimated around 24,000 children die of vaccine-

preventable diseases around the world every day. The biggest proportion of these deaths occurs in Sub-Saharan Africa with an estimated 4.4 million deaths in 2008 compared to other areas of the world. In light of this, strong immunization programs are necessary as one of cost-effective intervention to avert these deaths (4-5).

1.2 Immunization Program in Tanzania

In Tanzania, the Expanded Program on Immunization was established in 1975 with the provision of BCG and Polio vaccines which later the number of vaccines increased to include DPT and Measles in the 1980s. Currently, the program is providing eight (8) vaccines against fourteen (14) vaccine preventable diseases as shown in table 1.

The trend of coverage since the inception of the program gradually increased with the DPT 3 coverage increasing from 67% in 1985 to 85% in 1988 during Universal Child Immunization strategy. In 2001 several partners started to provide support to the program, the major one being Global Alliance Vaccines and Immunization (GAVI) that resulted in coverage increasing to 94% in 2004 (6).

Table 1: Routine Immunization schedule, Tanzania, 2017

ANTIGEN	AGE
BCG , OPV 0	At birth or first contact
OPV1, DTP-HepB-Hib1, PCV 1, Rota 1	6 Weeks of age
OPV2, DTP-HepB-Hib2, PCV 2, Rota 2	10 Weeks of age
OPV3, DTP-HepB-Hib3 , PCV3, IPV	14 Weeks of age
MR 1	9 Months of age
MR 2	18 Months of age
TT 1	First contact
TT 2	1 Month after the 1st dose
TT 3	6 Months after the 2nd dose
TT 4	1 Year after the 3rd dose
TT 5	1 Year after the 4th dose

Despite the high coverage, there is still a large number of children that are left under-immunized and others unimmunized. Global figures in 2012 have shown that around 22.4 million children were unvaccinated with Penta 3, of whom 70% are in Africa while Tanzania contributed 0.54% of the number. According to Tanzania Comprehensive Multi-Year plan 2016-2020, the total number of children that were unimmunized in 2014 was 47,013 with cumulative of 593,275 children since 2010. This huge number of children that are left unvaccinated put the country in a risk of an outbreak of already controlled vaccine-preventable diseases (7-8).

To address this large number of unvaccinated children, WHO developed and introduced the Reach Every District/Child (RED/REC) strategy in collaboration with other partners that focuses in five (5) areas:

- Re-establishment of regular outreach services
- Supportive supervision; on –site training
- Community linkage with services
- Monitoring and use of data for action
- Better planning and management of human and financial resources

The strategy involves utilization of coverage data to determine the access and utilization of immunization services and thereby determine which areas are performing low with respect to these parameters and subsequently, implementation. Tanzania started implementing RED in 2009 with the focus on 51 Districts based on the data of 2008. These districts were shown to have contributed to a large number of unvaccinated children (216,185 children) in the country during that period. Lesson learned from these districts were used to implement the strategy to other districts REC strategy was later extended to 14 regions, 61 districts and 610 health facilities in 2016 based on 2015 data. Tanzania comprehensive Multi-Year Plan (cMYP) addresses countrywide enrollment of REC in 2017 (6, 9).

1.3 Conceptual Framework

Immunization is one of the most important cost-effective public health interventions that aims at reducing childhood morbidity and mortality. Attainment of desirable coverage is important in addressing this since it ensures all children are reached for vaccination. According to World Health Organization, determinants of MOV can broadly be classified into two categories;

1. Factors that are attributable to users and demand which includes family/community characteristics as well as knowledge, attitudes, and practice of parents/caretakers
2. Factors that attributable to health facility which includes provision of health services as well as knowledge and attitudes of healthcare workers.

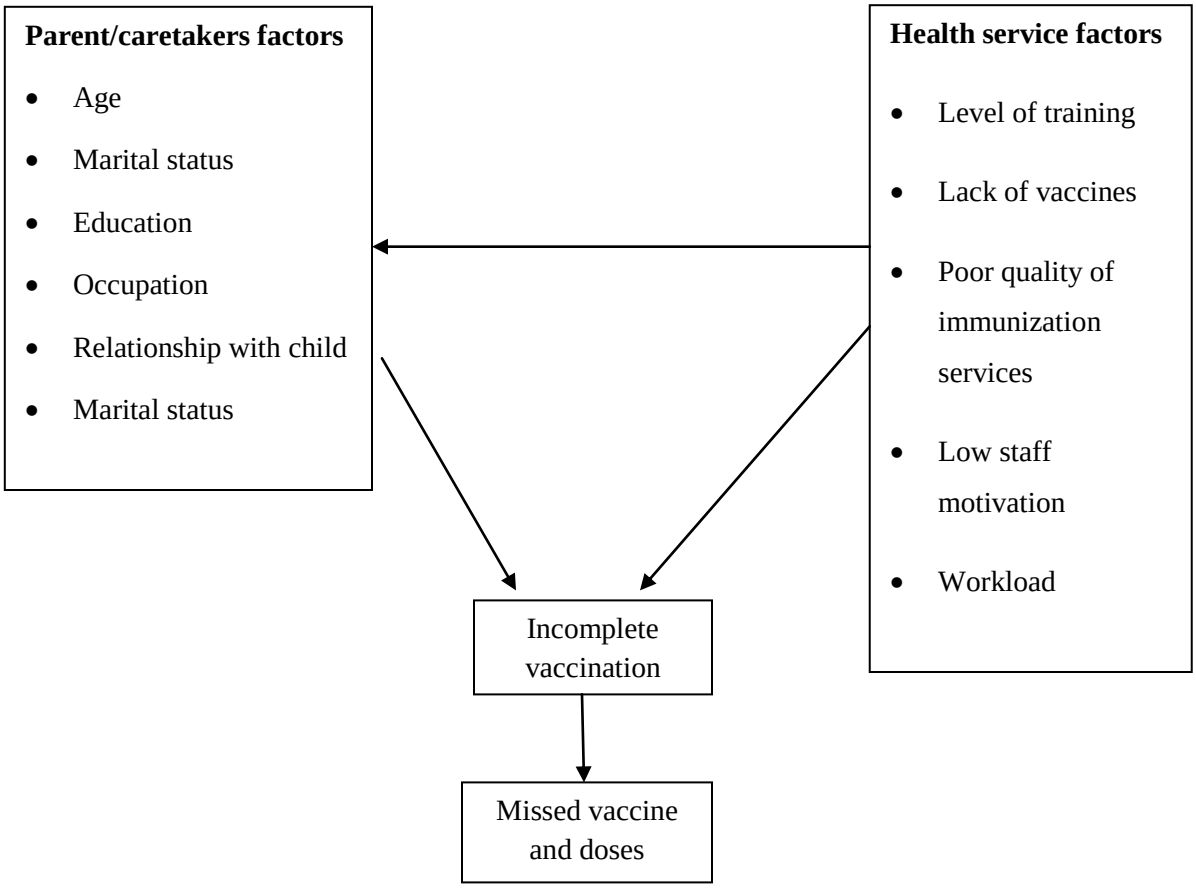


Figure 1: Conceptual Framework for Missed Opportunity for Vaccination

1.4 Statement of the Problem

Very few studies have been done to determine the magnitude of Missed Opportunity for Vaccination in children in Sub Saharan countries and ultimately understanding factors that must be addressed to reach every child with vaccination. In Mozambique, one of the Sub Saharan country, the prevalence of MOV was shown to be 25.7 %. (30)

Tanzania has been doing well in reducing child mortality and morbidity through provision of immunization services by the government through Immunization and Vaccine Development (IVD) program formerly known as EPI. Expansion of activities by IVD has resulted into coverage of above 80% of most of health facilities in the country. The region or councils can be happy because all their districts or health facilities reports the coverage of 80% and above. However, the remaining 20% of children who are not vaccinated need to be reached by immunization services so that they are protected against vaccine preventable diseases.

Many mothers/caretakers bring their children to the health facility for outpatient, inpatient and RCH services; unfortunately, they do not receive the recommended vaccines and ultimately contributes to large number of unvaccinated and under vaccinated children, a supposition of missed opportunity. These unvaccinated children are found both in urban and rural health facilities. According to Tanzania DVD-MT data closure of December 2016, Dar es Salaam has a total of 39,362 children that remained unvaccinated by Penta 3 by of which 27,651 (70%) are from Kinondoni Municipal Council. (WHO/UNICEF-Tanzania Joint Report Format 2016).

Prevalence of MOV is not known in Tanzania. Similarly, despite programmatic efforts to expand the coverage, evidence is not available of contributing factors of MOV in this setting. This study has the main interest of exploring the prevalence and contributing factors for MOV in our setting and ultimately improving immunization services in Kinondoni Municipal Council.

1.5 Rationale of the Study

Tanzania has been able to achieve high immunization coverage (above 90%) in the past 5 years. Moreover, the number districts with Penta 3 coverage less than 80% has been reduced from 56% in 2009 to 11.9% in 2014. In this case, Tanzania is on track and aiming to reach high coverage across all districts by 2020 through strengthening Reach Every Child (REC) approach, defaulter tracking, targeted strategies for hard to reach populations, improved micro planning and addressing MOV.

The Global Vaccine Action Plan (GVAP) 2012-2020 strategic objective 2 calls for benefit of immunization to be distributed equally to all people. This objective is evaluated by monitoring the percentage of districts with less than 80% coverage with three doses of diphtheria-tetanus-pertussis (Penta 3) containing vaccine and coverage gap between lowest and highest wealth quantile. Addressing MOV will have a significant impact of achieving this GVAP objectives.

Determining the prevalence of MOV will provide a potential gain in Penta 3 coverage in Kinondoni Municipal Council by understanding the contributing factors for MOV and appropriately address them. Moreover, it will add the knowledge in terms of addressing the impact of MOV on the overall coverage of the district. In this case, global and national target can be achieved.

In Tanzania, the coverage for the second dose of Measles Rubella (MR2) vaccine has been persistently low (57% in 2016) compared to other antigens. Factors contributing to this low coverage have not been explored Tanzania. Addressing MOV will contribute to gains in coverage of MR2 through enhanced integration of vaccination and treatment services at the national and health facility level.

Evaluation of MOV will have future impact on public health in strategic planning to reach every child for vaccination through appropriate designing and planning of REC strategy and improve immunization services which ultimately children will be prevented from vaccine preventable diseases.

1.6 Research Question (S)

1. What is the prevalence and contributing factors for MOV among children under two years of age attending health facilities in Kinondoni Municipal Council, Dar es Salaam, Tanzania?
2. How do health care workers describe factors that contribute to MOV in Kinondoni Municipal Council?

1.7 Objectives of the Study

1.7.1 Broad objective

To determine the prevalence and contributing factors for MOV among children under two years of age attending health facilities in Kinondoni Municipal Council, Dar es Salaam, Tanzania.

1.7.2 Specific objectives

1.7.2.1 To determine the prevalence of MOV among children under two years of age attending health facilities in Kinondoni Municipal Council, Dar es Salaam, Tanzania by July 2017.

1.7.2.2 To determine the proportion of vaccination opportunities that were missed by type of vaccine among children under two years of age attending health facilities in Kinondoni Municipal Council, Dar es Salaam, Tanzania by July 2017.

1.7.2.3 To determine parents/caretakers risk factors that contribute to MOV among children under two years of age attending health facilities in Kinondoni Municipal Council, Dar es Salaam, Tanzania by July 2017

1.7.2.4 To explore health care worker's perception on the factors that contribute to MOV in Kinondoni Municipal Council, Dar es Salaam, Tanzania by July 2017.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Prevalence of Missed Opportunity for Vaccination

In a study done in Mozambique to determine factors that which negatively influence vaccination completeness and contributing to MOV in children less than two years old, it was found that 28.2% of the children had not completed the vaccination program by two years of age and the prevalence of missed opportunity for vaccination was shown to be 25.7%/. In another study done in rural Nigeria, the prevalence was shown to be 33.4% among children under one year of age. On the other hand, in Swaziland study to determine existence of potential to increase vaccination coverage, assessment of magnitude of missed opportunity for vaccination was also conducted which showed the magnitude of 26% among children under two (2) years of age. With respect to different types of vaccines, Garib Z eta al in a study conducted in Dominican Republic showed that the rates of MOV ranged from11.4% in BCG to 52.7% for DTP-containing vaccines (13, 17, 24, 30).

2.2 Knowledge, attitude and practice of parents/caretakers on immunization

A good parental decision on immunization is important in ensuring all the children receive the immunization at an appropriate time. This decision will be made depending on whether the mothers/caretaker received appropriate information regarding immunization services as such, become knowledgeable about the importance of immunization. In a study done in Iraq on 528 parents, 66.1% were found to have adequate knowledge on immunization services using knowledge practice score whereas in a comparative study done in Uganda, women of under 5 children with cards showed similar knowledge as those other larger group of women (71.2% versus 63. 9%).The level of knowledge was shown to be positively correlated with the rate of immunization of children indicating the utilization of services after being knowledgeable (10-11).

Source of information is also important for the parents to make a decision for immunization services. Several studies have reported differently with regard to the source of information. In India family members and relatives were the main source (42.48%) followed by health care workers (34.19%) whereas in Nigeria, one of the African Country, the main source was healthcare workers (72.7%). In this studies, 16.67% and 37.2% of the respondents completed the immunization schedule in India and Nigeria respectively (12-13).

A study done in Burkina Faso with the aim of identifying specific factors associated with immunization status, one of the outcome was to assess knowledge of parents on immunization. In this study, 59.7% of parents knew the aim of vaccination as a preventive measure with about 66.4% of them identifying Poliomyelitis as one of the vaccine-preventable diseases. In rural Nigeria, more than 50% of parents are knowledgeable about symptoms of VPD with a cough being the most described symptom. With respect to attitude, this study also showed that most of the parents had positive attitudes towards immunization (14-15).

2.3 Reasons for incomplete vaccination reported by Parents

With regard to reasons for incomplete vaccination, a study done in Iran to determine rural-urban differences for incomplete vaccination, mothers in the rural area reported the unavailability of vaccine as the main reason for not completing vaccination schedules. This was reported in 59.8% among the respondents. Moreover, health care workers misconduct was also mentioned as the reason in rural area. On the other hand, urban mothers reported overcrowding in the health centers as the main reason. Factors such as mothers' illness, forgetting the next vaccination schedule and child illness was less likely to be the reasons for incomplete vaccination (16).

Sixty-six point eight percent (66.8%) of respondents from Burkina Faso study reported the communication problem as the reason for incomplete vaccination This specifically reported that they did not understand what the health worker wanted thinking that their children were fully immunized while they are not. Other mentioned that the reason for incomplete vaccination being organization problem of immunization activities (5%) (14).

2.4 Health facility factors associated with MOV

Among the factors associated with MOV in the health facility is the duration of provision of immunization services. In Most areas to avoid MOV, vaccination services are provided 5 days a week (Monday to Friday) for a full day. Daly and colleagues assessed the MOV in health facilities in Swaziland for children aged less than 2 years. In this study, 45% of the surveyed health facilities had fully integrated their services by providing vaccination every day. Moreover, 14% provide vaccination 3 days per week, 24% provide 1 day per week and 10% did not provide vaccination at all (17).

2.5 Knowledge and attitude of health workers associated with MOV

Good access to health facilities and services has been shown not to determine the uptake of immunization services but rather complex interrelated factors one of which is knowledge and perception of health care workers. In a study done in Dili, Timor-Letse, in-depth interview was done using semi-structured questionnaire with health staff regarding their knowledge and perception and why most of the children do not complete immunization schedule. In this study, 89% of the clients were advised on when to return, but only 16% were invited to ask questions which showed that health care workers took a time to advice the caregivers but do not offer an opportunity for caregivers to express their concern. The information provided by health care workers was also shown to be incomplete that causes the caregivers to misunderstood the schedule for immunization for them to comply in the future. Moreover, it has been shown that most of the healthcare workers had multiple tasks and out of 18 health care workers interviewed, 9 were aware of immunization coverage, and 3 were aware of dropout rates for their health facilities (18).

Attitude and behaviour of health care workers have been shown to contribute to missed opportunities for vaccination. They play important role in educating caretakers on the importance of immunization; this is significant especially in hospital deliveries. During analysis of global grey literature by Favin M et al results showed that when health care worker does not show hospitality when providing services, mothers tends not to visit such facility regularly. Such misconduct of health care workers ranges from screaming to mothers when

she forgets the vaccination card or schedule. This clearly, shows that health workers' treatment of mothers – including the manner and effectiveness of their communication with mothers is an important determinant of how positively or negatively mothers assess health services. Moreover, health care workers communicate poorly to mothers that leave them with little knowledge on vaccination and when to return. Other health care workers do not attempt to check the vaccination card once they see a child at the health facility that significantly contributed to missed opportunities as shown by Daly et al (17, 19-20).

Stock out of vaccines and unreliable services also imposes a challenge in immunization programs that causes some of the children being unvaccinated or under-vaccinated. In a study done by Sumina S et al in Nepal to assess predictors of incomplete immunization, among other factors, they showed that convenient opening hour, the length of waiting time, and stock out of vaccines are related to under-vaccination (21-22).

2.6Staff motivation and workload

Among other factors analyzed by Amin R et al, multiple work function of health care workers also contributes to limitation of immunization activities. They reported that most health care workers have multiple tasks and about half of them reported that they do not only provide immunization services but also other health service. They reported that there is shortage of health workers and have limited ability to deliver immunization services (18).

2.7 Demographic factors associated with incomplete immunization

A cross-sectional study done in Brazil showed that, 10.9% (CI 95%: 7.3-15.3%) of children were found to have incomplete vaccination and presence of one or more siblings under five years of age, per capita income below half minimum wage, maternal education less than four years, employment, exclusive breastfeeding less 120 days were shown not to be statistically significant contributors to incomplete vaccination. Garib Z eta al in Dominican Republic undertook a cross-sectional study to determine the Missed Opportunities for Vaccination and found the prevalence to be 43.7% with the most identified risk factors being geographic area

(OR = 1.80; p = 0.02), age 1–4 years (OR = 3.63; $p \leq 0.0001$), and the purpose of the health visit being a sick visit (OR = 1.65; p = 0.02) (23-24).

Age has been shown to be a risk factor for incomplete vaccination as illustrated by Garib Z et al in Dominican Republic whereby children who are older experience a greater risk of being unvaccinated or under-vaccinated compared to younger children (OR = 3.63; $p \leq 0.0001$).

In another study done to estimate risk factors for delay in age-appropriate vaccination the contrary has been found whereby age was shown not to be associated with incomplete vaccination (24-25).

Mothers' literacy rate was also associated with incomplete immunization. Children of uneducated women were found to be 19.5 times more likely to be incompletely immunized compared to educated women. A study done in Tanzania by Edward et al to determine barriers to childhood vaccination found that, literacy and education level were found to be significant risk factor for incomplete vaccination with an odds ratio of 0.480 (CI: 0.360-0.641). In this study it was reported that education increases parents/caretakers understanding of health and consequently argument their use of maternal and child health services. Kabudi A et al in a study conducted in Goma, Democratic Republic of Congo showed that immunization rates increased with parental education. They reported that mothers, with higher levels of education had higher rates of complete immunization (Pearson Chi-Square= 34.517; p< 0.01) (26-28).

Marital status also has been shown to have influence on the rates of immunization. Kabudi A et al again reported that children who are living with both parents have more chance to be immunized than who are living only with their mother. (Chi –square 0.039, p<0.05) (28).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study area

This study was conducted at Kinondoni Municipal Council in Dar es Salaam Region. As of December 2016, immunization coverage for Penta 3 vaccine in Dar es Salaam region was 78%. Kinondoni Municipal Council was chosen because it has the highest number of un-vaccinated and under- vaccinated children for the past 6 months and easily accessible by a researcher. Generally, immunization services are provided in fixed and outreach services. In the fixed session, it is provided 5 times a week from Monday to Friday, however some vaccines (BCG and MR) are provided once a week.

Kinondoni Municipal Council is located in the northern part of Dar es Salaam City with an area of 531 sq. km and a total estimated population of 2,497,940. Kinondoni Municipal Council is divided into two (2) divisions which are Kinondoni and Kawe. These divisions are further divided into twenty (20) wards, which in turn are sub divided into hamlets. Kinondoni Municipal Council has 63 hamlets and about 90% % of the area is urban.

The Council has 29 public health facilities and 33 private health facilities that provide immunization services. This study was conducted at public health facilities because all parents/caretakers of different socio economic status have an access contrary to private health facilities. The distribution of these facilities is shown in the table below.

Table 2: Type and distribution of health facilities providing immunization services in Kinondoni Municipal Council

Type of health facility	Public	Private	Total
Hospital	3	10	13
Health centres	1	3	4
Dispensaries	25	20	45
Total	**29**	**33**	**62**

3.2 Study Design

This facility based, cross-sectional study, which involved a mixed approach i.e. quantitative and qualitative approaches.

3.3 Study population

Parents/Caretakers with children under two (2) year of age were the study population. The choice of age was made owing to the current vaccination schedule in Tanzania. Children with this age has to be fully immunized according to Tanzania schedule. Moreover, RCH in charge in the health facility and vaccinators at the clinic were also interviewed.

Inclusion criteria

Eligibility for this study fulfilled the following criteria

Quantitative approach

- Parents/caretaker with children under two (2) years of age attending health facility

Qualitative approach

- RCH clinic in charge and a vaccinator who have worked for at least 2 weeks at Reproductive and Child Health Clinic

Exclusion criteria

The following were excluded in this study

Quantitative approach

- Parents/Caretakers with children under two (2) years of age who do not have RCH card number 1.
- A parent/caretaker with under 2 years old child who have been referred to a higher level facility

3.4 Sample size

3.4.1 For Quantitative approach

The sample size was determined by using one of the sample size methods for estimating proportion. Since the outcome variable is categorical and follows a normal distribution with 5% degree of precision, and then the sample size formula was:

$$n = \frac{Z^2Pq}{d^2}$$ (Leslie K et al, 1965)

Whereby:

Z= 1.96

P = 0.257, Proportion of MOV in Mozambique (Jani J et al, 2008), assuming the same in Tanzania.

q = 1-P = 0.743

d = 0.05

Then, n = 293

Adjusting this sample size for missing data and non-responders then the sample size was increased by 10%.

Then the sample size required was 322 which was approximated to 330

3.4.2 For qualitative approach

For the qualitative part of the study, purposely selection of one (1) Dispensaries, one (1) Health center and one (1) Hospital was done. Two (2) interviews per facility was conducted involving RCH in-charge. These were selected purposely.

3.5 Sampling method

Purposive sampling was used to select 10 health facilities that have low coverage and hence, contributed the largest number of under and unvaccinated children based on the data from Tanzania DVD-MT.

The allocation of 330 sample size of parents/caretakers per health facility was done by proportionate sampling based on the target population for vaccination of each health facility.

The estimated target population for vaccination was taken from DMO office and the proportional sample size was calculated for each level of care using the following formula:

$$\left\{ n_i = \frac{n \; N_i}{N} \right\}$$

Whereby:

n_i = Sample size for a specific level of care

N_i = Target population for vaccination for specific level of care

n = Sample size

N = Total target population for vaccination in sampled health facilities

Based on the above formula, the following table shows the sample results of parents/caretakers of eligible children:

Table 3: Sample size for each Health facility

S/N	FACILITY TYPE	NAME OF FACILITY	Target population (Ni)	330*Target Population (N)	Sample size per facility (ni)
1	DISPENSARY	TEGETA	2,013	664,290	49
2	HEALTH CENTRE	MAGOMENI	2,003	660,990	48
3	HOSPITAL	LUGALO	1,798	593,340	43
4	DISPENSARY	KAMBANGWA	1,785	589,050	43
5	DISPENSARY	KIGOGO	1,379	455,070	33
6	DISPENSARY	TANDALE	1,147	378,510	28
7	DISPENSARY	KUNDUCHI	1,008	332,640	24
8	DISPENSARY	MADALE	879	290,070	21
9	DISPENSARY	OYSTERBAY	868	286,440	21
10	DISPENSARY	BUNJU	805	265,650	19
TOTAL			**13,685**		**330**

Purposeful quota sampling technique was used because the study aimed at identifying MOV and hence was focused in health facilities with low coverage. Parents/caretakers were selected consecutively following consultation with health care workers until the sample size in a particular facility was reached.

3.6 Study duration

The study was conducted for a period of 6 months from February to July 2017. The process of proposal development took place in February 2017 after which ethical clearance was sought from MUHAS in March 2017. April 2017 was the period of data collection after which the process of data entry, coding, analysis, report writing and dissemination of result findings was done.

3.7 Recruitment of study subjects

Children with their parents/caretaker were recruited after they have completed utilizing health service (outpatient, inpatient, RCH etc.). This was the convenient time to explore whether the child has an opportunity for vaccination and whether that opportunity was taken or not.

3.8 Research instruments

Two types of research instruments were used in this study.

In the first part**,** adopted WHO structured questions for assessment of the prevalence of MOV and parents/caretaker`s factors that contribute to MOV was used for this study. The questionnaire is in English and was translated into Kiswahili.

The translated version was later retranslated back in English by an independent reviewer to make sure that the meanings of the content of questions were not distorted.

The first part of questionnaire obtained information about socio-demographic characteristics and reasons for attending health facility.

The second part involved inspecting child`s health card (RCH 1) to determine whether the child is up to date with immunization schedule. This helped in determining unvaccinated and

under-vaccinated children and hence, the number of children that have completed immunization schedule for their age. Inspection of the RCH card took into account Tanzania schedule of vaccination for children below 2 years of age, which is: at birth (BCG and OPV) at 6 weeks (OPV 1, Penta 1, PCV1 and Rota 1) at 10 weeks (OPV 2, Penta 2, PCV2 and Rota 2), at 14 weeks (OPV 3, Penta 3, PCV3) at 9 months is MR1 and at 18 months is MR2. This section also determined MOV, reasons for not been vaccinated and quality of immunization services.

The second research instrument was a semi-structured interview guide that was used for key informant interviews with health facility in charge of RCH section and vaccinator. The interview covered areas of reasons that some children are missed for vaccination and suggestions on how to improve immunization services.

3.9 Reliability and Validity of the MOV questionnaire

The World Health Organization (WHO) Regional Office for Americas developed the MOV methodology including the questionnaire. The questionnaire went into extensive review during its creation. It has been validated in states of Morelos, Mexico in September 2012 and subsequently implemented on national scale in Dominican Republic in October 2012. Based on the findings, the questionnaire has been shown to be standard and adaptable. (24, 29).

3.10 Adaptation and Pre-testing of the questionnaire

The structured questions for assessing MOV was adapted to be able to capture immunization series according to Tanzania immunization schedule. Moreover, it was also pre-tested before being implemented. A group of parents/caretakers that consist of 10% of the estimated sample size (in this case 33) was used to pretest the questionnaire which involved examining whether the questions were appropriate and meaningful. The process of pre-testing was done in Temeke Hospital.

3.11 Study Variables

The Dependent variable is Missed Opportunity for Vaccination.

Independent variables will be:

- Child`s age
- Childs Sex
- Age of the parent/Caretaker
- Education status of parent/caretaker
- Occupation of parent/caretaker
- Marital Status of parent/caretaker
- Relationship with Child

Confounders:

- Knowledge about vaccine
- Quality of immunization services
- Information on immunization services

3.12 Data entry, Cleaning and analysis

Quantitative data from the questionnaire was double entered in SPSS for windows version 17 and then validated using EPI-INFO version 7 software.

Analysis of quantitative data was conducted using IBM SPSS version 17 software through descriptive and regression analyses methods. In descriptive analyses, frequency measures were used to provide description characteristics of the study population which include age of the child, Sex of the child, age of the parent/caretaker, education, occupation and marital status, reason for attending health facility and relationship with the child. Moreover, frequency measures were also used to express vaccination status of children, proportion of children that were eligible for vaccination and MOV.

Regression models were used to functional relationship between MOV and age of the child, Sex of the child, age of the parent/Caretaker, education status of parent/caretaker, occupation of parent/caretaker, marital status of parent/caretaker, reason for attending health facility and

relationship with child. Binary logistic regression analysis was first conducted and factors with p-value less than 0.2 were introduced into multiple logistic regression model to examine independent factors functional relationship with MOV. The level of significance was taken at p-value less than or equal to 0.05 in two tail.

Qualitative data was analysed using content thematic analysis. Interviews were transcribed in English, in order to be used for identifying individual bits of data. The transcripts were read and re-read in full so as to interpret any thoughts in the margin. This involved **e**xamining the text closely, line by line, to facilitate a micro analysis of the data. Coding was then carried out. Items relating to similar topics were organized into categories to enable identify emerging themes. The proto-themes were examined to start definitions.

3.13 Ascertainment of MOV

All under vaccinated and unvaccinated children with no valid contraindication were recorded. Children that have missed more than one vaccines were categorized by vaccine type. This was followed by an assessment of the vaccines that the child should have already received and those that the child missed upon visiting the health facility. This took into consideration child`s age and vaccine he/she should have received according to Tanzania National Immunization schedule. Children whom were eligible and did not received vaccine were categorized as MOV. Missing vaccines and doses that were not administered during the visit were recorded.

3.14 Recruitment and training of research assistants

A total of three medical doctors were recruited as research assistants. They were oriented for two (2) days prior to the actual field work and the orientation process involved briefing about the main purpose of the study, questionnaire for assessing MOV and relevant logistics for the data collection. Research ethics and administrative issues and logistics were also discussed.

3.15 Quality control of data collection

Data collection was conducted by 2 research assistants per facility from Monday to Friday. Parents/caretakers were approached after they have finished utilizing health services at exit point of health facility. Informed consent was sought and parents/caretakers signed the consent form. The team visited selected health facility for one day. At the end of each day of data collection, questionnaires were collected from the research assistants assessed by the principal investigator. Feedback of the problems encountered were revised and further improvement was done accordingly. In depth- interview among health care workers were conducted by principal investigator.

3.16 Ethical consideration

Ethical consideration to carry out this study was sought from Muhimbili University of Health and Allied Sciences (MUHAS) higher degree research and publication committee. Permission to conduct the study was obtained from District Medical officer (DMO) of Kinondoni, Municipal Council. Informed consent was also sought from parents/caretakers prior to interview.

CHAPTER FOUR

4.0 RESULTS

4.1 Results for quantitative survey

4.1.1 Socio – Demographic characteristics of respondents

In this study, information was obtained from interviewing 330 parents/caretakers with children under two (2) years of age, in ten (10) health facilities. In general, one (1) hospital one (1) health center and eight (8) dispensaries took part in this study. Majority (72.4%) of the respondents were recruited form dispensaries.

The study revealed that most parents/caretaker recruited had children below 12 months of age (80%). More than half of parents/caretakers, 184 (55.8%) were above 25 years and 284 (86.1%) were biological parents. Sixty-seven point six percent of the parents/caretakers are married with 48.2% being housewives. With regard to education, 161 (48.8%) of the respondents had primary level education whereas 7 (2.1%) haven't been to school at all **(Table 4).**

Children seen at the health facility were brought by parents/caretakers for vaccination (41.2%), medical consultations (35.2%) with the remainder being brought for child health visit, hospitalization or was accompanying the parent/child (23.6%)

Table 4: Socio-Demographic characteristics of respondents (n=330)

Characteristic	Number (N)	Percentage (%)
Child in the study		
Age		
≤12 months	264	80.0%
>12 months	66	20.0%
Sex		
Male	143	43.3%
Female	187	56.7%
Parents/Caretakers		
Parents Age		
≤25	146	44.2%
>25	184	55.8%
Education		
None	7	2.1%
Primary	161	48.8%
Secondary	134	40.6%
Higher education	28	8.5%
Relationship		
Biological Parent	284	86.1%
Grandparent	15	4.5%
Uncle/Aunt	17	5.2%
Brother/Sister	14	4.2%
Occupation		
Housewife	159	48.2%
Employee	59	17.9%
Self-Employed	109	33.0%
Employer	3	0.9%
Marital Status		
Single	78	23.6%
Married	223	67.6%
Cohabiting	22	6.7%
Widowed	7	2.1%

4.1.2 Prevalence of Missed opportunity for vaccination

A total of 195 out of 330 children who were recruited, were eligible for vaccination during the day of interview, of which 142 (72.8%) received the vaccine during that day and the remaining 53 (27.2%) did not receive vaccine despite being eligible (MOV) **(Table 5)**.

Table 5: Missed opportunities for vaccination (N=195).

	Eligibility for vaccination	
Vaccination	**Eligible (%)**	**Not eligible (%)**
Vaccinated	142 (72.8)	0 (0.0)
Not vaccinated	53 (27.2)	135 (100.0)
TOTAL	195(100.0)	135(100.0)

With respect to different type of vaccines, **Table 6** shows different types of vaccine and opportunities missed with respect to each type of vaccine. Most of the opportunities missed were for BCG vaccine (41.6%), Measles Rubella vaccine (34.8%) and least observed for OP vaccine (19.5%).

Table 6: Missed opportunities for vaccination by specific vaccine (N=503).

Opportunity for Vaccination			
Vaccine type	**No MOV n (%)**	**MOV n (%)**	**Total N (%**
BCG	7 (58.4)	5 (41.6)	12(100.0)
OPV	91(77.8)	26(22.2)	117(100.0)
Pentavalent	78(78.0)	22(22.0)	100(100.0)
PCV	78(78.0)	22(22.0)	100(100.0)
Rotarix	68(76.4)	21(23.6)	89(100.0)
Measles Rubella	58(65.2)	31(34.8)	89(100.0)
TOTAL	380(75.0)	127(25.0)	507(100.0)

A child can miss more than one vaccine/dose

4.1.3 Risk factors for Missed Opportunity for vaccination.

To determine the relative importance of socio demographic characteristics in relation to opportunity for vaccination, logistic regression model was used and results are shown in Table 7. Children of 12 months and below are 87% more likely to experience MOV compared to children aged above 12 months. (OR 0.13, P<0.001). Moreover, the likelihood of experiencing MOV occurs in children whose main reason for attending health facility is medical consultation compared to those who attend health facility for vaccination (OR 77.43, p=0.001).

Table 7: Child`s and Parents/caretakers risk factors for missed opportunity for vaccination.

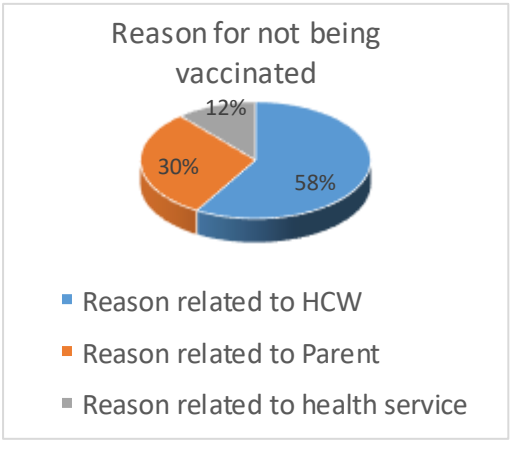
Risk factor	Binary logistic regression OR(95%CI)	p-value	Multiple Logistic regression OR(95%CI)	p-value
Age				
≤12 months	1	**<0.001**	1	**0.004**
>12 months	0.19(0.09-0.39)		0.13(0.03-0.56)	
Sex				
Male	1	**0.028**	1	0.092
Female	2.07(1.08-3.95)		2.73(0.85-8.82)	
Parents Age				
≤25	1	0.925		
>25	0.97(0.51-1.83)			
Education				
Primary or less	1	0.532		
Above secondary	0.81(0.42-1.55)			
Marital status				
Married	1	-		
Single	1.94(0.17-22.26)	0.594		
Cohabiting	0.71(0.06-8.26)	0.780		
Widowed	1.00(0.07-14.64)	1.000		
Occupation				
Housewife	1	0.227		
Works	1.48(0.784-2.791)			

Table 7: Continues

Risk factor	Binary logistic regression OR(95%CI)	p-value	Multiple Logistic regression OR(95%CI)	p-value
Reason for Attending				
Vaccination	1	-	1	-
Med Consult	46.8(6.05-363.22)	**<0.001**	77.43(6.08-986.06)	**0.001**
Health visit	0.35(0.05-2.45)	0.294	0.35(0.03-3.90)	0.393
Accompanying	1.12(0.14-8.99)	0.912	1.18(0.09-14.61)	0.898
Relationship to child				
Biological parent	1	-	1	
Grand parent	4.20(1.21-14.56)	**0.024**	0.36(0.05-2.66)	0.319
Uncle/Aunt	4.20(0.59-30.00)	0.153	2.98(0.18-46.99)	0.439
Brother/Sister	0.53(0.10-2.84)	0.912	0.12(0.00-4.20)	0.245

4.1.4 Reasons for not being vaccinated.

Among children who experienced MOV, 31 (58%) had reasons related to health care workers of which, majority of them (77%) reported that health care workers did not tell them that they are eligible for vaccination on that day.



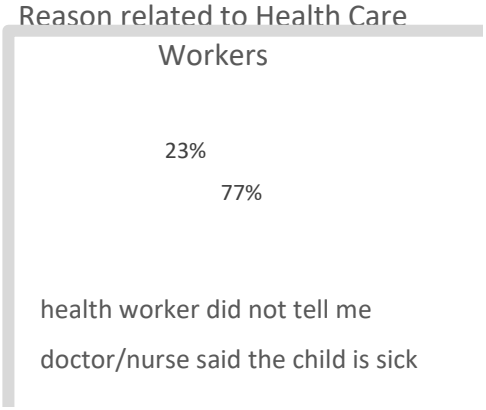


Figure 2: Reason for not being vaccinated (n=53).

4.2 Results for Qualitative Survey

This section presents the findings from the study as analyzed according to the last objective of health care worker's perception on factors contributing to MOV.

4.2.1 Characteristics of the participants

A total of six (6) health care workers, five (5) females and one (1) male were recruited for this survey. They were between 21 and 49 years. Four (4) participants are diploma holders and the remaining two (2) have bachelors in nursing education. Three (3) participants were in charge of RCH services and the remaining three (3) were vaccinators. Their work experience in the field of RCH ranged from 6 months to 22 years.

4.2.2 Missed Opportunity for Vaccination

Generally, almost all the participants reported the existence of Missed Opportunity for vaccination in their health facility. They reported existence of MOV as exemplified by the following quote from a vaccinator:

"Those scenarios do happen because sometimes mothers come late during the day… so in that case a baby will miss the vaccine that day". (Vaccinator)

One of the RCH in charge reported;

"There is such a problem of children not being vaccinated (MOV) when they reach health facility, but not to a great extent at this facility. This is because we share with the community the schedule for BCG and Measles vaccines which are provided once in a week". (RCH in charge)

Another participant felt the problem of MOV does not occur in their health facility. She reported;

"We don't experience MOV much here in our centre. We insist mothers to bring their children with RCH cards at our health facility; it is difficult to see a child does not being vaccinated". (Vaccinator)

4.2.2 Factors that contribute to MOV

There were several themes emerged from this survey regarding health care worker's perception on the factors that contribute to MOV; they include stock out of vaccines, knowledge and attitude of health care workers, breakdown of cold chain system and timing and days of immunization services.

4.2.2.1 Stock out of vaccines

Three participants felt that availability of vaccines at the health facility is important for ensuring every child receive vaccines upon arrival at the health facility. This is demonstrated by the following statements;

"Yes, vaccine stock out causes problems... It brings about distress to the mothers because most mothers would like their children to be vaccinated and protected against diseases. So the mother come the first week and the following week, and there is stock out of vaccine, she will be tired and no longer bring the child again for vaccination" (RCH In-charge)

Another participant said;

*"If there is a stock out of vaccine, children will be affected because they will not be vaccinated on time. And vaccine is provided according to age since birth. So if they don't get them on time, that kind of vaccine will not be of beneficial to the child***".** *(RCH In-charge)*

Another participant reported;

".... stock out will influence immunization services because children will not receive vaccine on time and be protected." (Vaccinator)

The findings revealed that availability of vaccine at the health facility is important to ensure that whenever a child visits a health facility, vaccines are available and avoiding missed opportunity for vaccination.

4.2.2.2 Knowledge and Attitude of Health care workers

This theme involved the knowledge and attitude of health care workers which include timing of immunization and appropriate counselling to the parents/caretakers on issues concerning

child health services. Low knowledge, due to lack of on job training with inappropriate attitude was reported by most interviewees.

"It can happen such that, mother does not know the dates for vaccination and health care worker who is providing service does not know thoroughly about immunization and when they should be provided. Because he/she does not know, a child might be lost without being immunized." (RCH in charge)

"..... a doctor can see a child without looking at RCH card; or he/she may say that they are not responsible for vaccination. Doctors do rarely went for training on vaccination."(Vaccinator)

"A doctor may see the child and misses to see the card…you know drs often they don't look at the card. But in our side we do advice the mothers when they go to see the Drs, they should carry the card…" (RCH in charge)

These areas signify the importance of advocating for change of attitude of health especially doctors to provide appropriate information and proper history taking in order to avoid missed opportunity for vaccination.

4.2.2.3 Breakdown of cold chain system

Two participants out of six reported that that breakdown of cold chain system can result in missing children for vaccination services. They reported that since vaccines have to be stored at an appropriate temperature, particularly in a refrigerator, then once there is a breakdown of refrigerator, vaccines have to be transferred to other facility to ensure that they remain safe and potent. One of the participants reported;

"The challenge we are facing is the refrigerator. Sometimes it has a problem and we have to transfer the vaccine to another health facility. So if a mother comes for vaccination, we tell her to go to another facility. It became difficult to know whether that mother will go to that facility or we lost her for vaccination." (Vaccinator)

The second participant reported that:

"The biggest challenge that we are facing is cold chain system breakage because of frequent power cut. When it happens, we take the vaccine at another health facility. So if mother come for vaccination, she will not get it in our health facility" (Vaccinator)

Hence, these participants felt that failure of cold chain system due to malfunctioning of refrigerator or power cut can contribute to missing children for immunization service because vaccines will not be available in that particular time.

4.2.2.4 Timings and days for Immunization services in a facility.

Duration of provision of immunization services is one of the important theme that was mentioned by all participants. It involved reporting the number of days that immunization services are provided and time from the start to finish of immunization sessions. Most participants reported specific days of the week that provide BCG and Measles vaccine. This one reported;

"Our immunization services are provided from morning from 8 am up to 3.30 pm which in the time for completion of work for the day. For Measles and BCG, we are providing them on Fridays only". (RCH in charge)

Another participant reported;

There are vaccines which are provided daily and others weekly. Weekly vaccines are Measles and BCG. These are a weekly because the availability of children. For example, if you open a vial of BCG for 2 children it will be as if you lose the vaccine. So we offer once so that when children are many, we give them" (RCH in charge)

These participants reported specific days of the week that provide Measles and BCG vaccines whereas during the other days they do not provide them due to fear of wastage**.**

With respect to time period of providing immunization services, this participant reported;

"…and we offer from morning up to 2pm. But there is one 9-month vaccine (Measles) in its terms is that once issued, after 6 hours no longer required to be issued."(Vaccinator)

These findings revealed that specific vaccines are provided during specific time and days of the week. Availability of children during the days that these vaccines are not provided does not infer taking opportunity of that child coming to health facility.

CHAPTER FIVE

5.0 DISCUSSION

In this study, 330 parents/caretakers and 6 healthcare workers were assessed regarding Missed Opportunity for Vaccination among children below 2 years of age attending health facilities in Kinondoni Municipal Council. The findings showed that 277 (83.9%) were up to date with immunization for their age following contact with the health facility while the remaining were either under or unvaccinated (16.1%). These unvaccinated/under vaccinated children impose the risk of outbreak of vaccine preventable diseases despite the high vaccination coverage in Tanzania. The findings concur with global figures and Tanzania comprehensive multiyear plan which showed significant number of children that remained unvaccinated or under vaccinated (7,8). In Brazil, 10.9% (95% CI 95%: 7.3-15.3) were found to have incomplete vaccination (23).

The findings showed that 53 (27.2%) children among 195 whom were eligible for vaccination during the day of interview did not receive vaccine despite being eligible (MOV). This is comparable to what was observed by Jani J et al in Mozambique, one of the sub Saharan country which showed the prevalence to be 25.7% and Garib Z eta al in Dominican Republic found the prevalence to be 43.7% (24,30). The lower prevalence experienced in our setting may be explained by the strong immunization program in Tanzania that is shown by high immunization coverage and the Reach every child strategy that has been implemented in Tanzania since 2009. This strategy reinforces, among other things, supportive supervision to health care workers including on-site training for better provision of immunization services.

Results shows that children aged below 12 months did have the likelihood of MOV (OR 0.13, $P<0.001$) compared to children aged above 13 months However, relationship of the child with parents/caretaker did not result in the increase likelihood of MOV. These findings are contrary to what was observed by Garib Z et al in Dominican Republic which reported that children who are older experience greater risk of being unvaccinated or under vaccinated compared to younger children. On the other hand, contrary finding has been shown by Dombkowski K et al

whom reported age being not a risk factor for incomplete vaccination (24,25). The great risk observed of MOV observed in our study might be explained by significant number of vaccines doses being provided in children below 12 months compare only a single dose of MR2 which is provided in children above 13 months.

Finding from this study revealed children whose parents have primary education or did not attend school did not have a greater risk of MOV compared to children whose parents have at secondary or higher level education with an odds ratio of 0.81 (95% CI 0.427-1.551). This is contrary to study done by Edward et al to determine barriers to childhood immunization in Tanzania showed that children of uneducated women were 19.5 times more likely to experience incomplete immunization compared to those whose parents are educated. The most explainable reason in this study was education increasing parents understanding of health. Moreover, Kabudi et al also showed that low level of education among parents had higher rates of incomplete immunization (27,28). Differences between these studies may be explained by higher high community awareness of immunization program in Tanzania that is reflected by immunization coverage. Hence difference in education status does not results in likelihood of MOV.

With regard to parents marital status, findings from this study shows that children whose parents are not married have the likelihood of experiencing MOV compared to children whose parents are married with the results being statistically significant. (OR 0.38, $p<0.05$). Similar findings were also observed by Kabudi et al reporting that children who are living with both parents have more chances of being immunized compared to those living with single parent who experience MOV. (Chi-square 0.039, $p<0.05$) (28). These results can be explained that having both parents at home could likely results in advising each other about the care and wellbeing of the child compared to a single parent. This increases the likelihood of advising each other for taking the child to hospital and ultimately receiving the vaccine.

In this study parents/caretakers were asked for the reason for attending health facility. Parents/caretakers whose main reason was for medical consultation had increased likelihood of experiencing MOV compared to those who attend health facility for vaccination (OR 77.43,

p=0.001). This finding was also observed by Garib Z eta al in Dominican Republic which also showed that the likelihood of MOV increasing with the main reason of attending health facility being medical consultation compared to vaccination (24). This is explained by most of the medical consultation does not address the need for vaccination. Health care worker's personnel during medical consultation do not assess properly under five children (including looking at RCH card) and identify the need for vaccination of that particular child.

In this study parents/caretakers whose children experience MOV were asked the reason for not being vaccinated. Most of the reason mention, 31 (58%) were related to health care workers and among them, majority (77%) reported that health care workers did not tell them that they are eligible for vaccination that day. Such finding was also observed in a study done by Tabatabaei S et al in Iran which reported that unavailability of vaccine and health workers misconduct as the main reasons for children having incomplete vaccination. In this study, reasons related to parents/caretakers were mention to be less likely to contribute to incomplete vaccination. Moreover, Sanou A et al in Burkina Faso reported that 66.8% of their respondents mentioned communication problem of the health care workers as the main reason for incomplete vaccination (14,16). Lack of proper communication of health care workers in these studies may be attributed by work overload at health facility that causes health care workers not to have time to talk properly about immunization servces to parents/caretakers. Moreover, this may also be attributed by personal attitude of health care workers.

In depth interview of health care workers in this study presented that stock out of vaccine is one of the factor that contribute to MOV. Stock out of vaccine will cause children not being vaccinated on time but also children might be lost when frequently visiting health facility and there is no vaccines. These findings are similar to what Sumina S et al and Shen A et al in two different studies reported; that stock out of vaccines is related to undervaccination. Morreover, they reported that frequent stock out and unrealiable services leads to MOV once a child vissit a health facility (21, 22).

This study also reveled that knowledge and attitude of health care workers contribute to MOV. Some health care workers do not have thourough knowledge about immunization. Moreover, attitude especially among doctors can contribute to MOV particularly when attending children under five years of age. When they do not assess properly under five children especially looking at the RCH card can lead to missing important information about immunization and ultimately advice properly. Similar finding were reported in Dili, Timor-Letse during indepth interview with health staff which showed that information provided by healthcare workers to clients was incomplete. Favani M et al also reported that the manner and effectiveness of health care workers while attending clients is important determinant of accessibility of the service. Also Daly et al also reported that health care workers do not attempt to check the vaccination card once they see a child at health facility and significantly contribute to MOV (17,19,20).

This study also highligheted the duration of providing immunization services. It reported the number of days that immunization services are provided and time from the start to finish of immunization sessions. Most participants reported specific days of the week that provide BCG and Measles vaccine. This infers that if there is an opportunity that a child visits a health facility and not specific day for Measles and BCG vaccine, that opportunity might be lost. Daly A et al in a survey done at health facilities in Swaziland reported that 14% provide vaccination for 3 days per week, 24% provide 1 day per week and 10% do not provide at all.[17] In order to avoid MOV, vaccination services should be provided 5 days in a week (Monday to Friday) for a full day. BCG and Measles vaccines impose a special challenge to health care workers of balancing between taking opportunity and vaccinate the child and wastage of vaccine.

CHAPTER SIX

6.1 Study Limitation

1. This study was a cross sectional and only evaluated the presence of association between the variables and not the casual association. Moreover, being purposely selection of parents/caretakers who seek health services it was prone to selection bias because there is potential number of children who also seek health services.
2. Since the number of eligible children for vaccination was found to be 195, then the sample size of 330 was not reached. This has limitation in confidence intervals obtained from this study.

6.2 Study Strength

1. Being a mixed type of study design, utilizing both qualitative and quantitave method, this study was able to understand in depth the concept of MOV and contributing factors from parents/caretaker to health care worker's perspective.

2. This study was able to identify children in Kinondoni Municipal Council who are not receiving all needed vaccine despite being eligible and contact with health facility.

6.3 Conclusion

This study highlighted MOV and contributing factors in Kinondoni Municipal Council. Despite most of the children being up to date with immunization for their age following contact with the health facility, there is still significant number of children that are either under or unvaccinated. These children attended health facility but due to several contributing factors they were not vaccinated. Age and reason for attending health facility were shown to significantly contribute to MOV. Moreover, health care workers described vaccine stock out, knowledge/attitude of health care workers, breakdown of cold chain system timing and days of immunization services as the main contributing factors for MOV. Addressing these factors is of paramount importance in ensuring every child is reached for vaccination and protected from vaccine preventable diseases.

6.4 Recommendations

6.4.1 To Parents/caretakers

1. Children below 12 months have high chances of experiencing MOV. Parents/caretakers with children below 12 months should be attentive with vaccination schedule and ensure that their children receive vaccine.
2. When a parent/caretaker attends health facility for medical consultation, he/she should enquire education to health care workers about vaccination status of her/his child.

6.4.2 To healthcare workers

1. Attitude when attending under five children should be improved by health care workers. This through ensuring proper history taking and examination as well as communication to ensure whenever a child who is eligible for vaccination is directed to RCH section and receive the service.

6.4.3 To policy makers and researchers

1. This was a cross-sectional study that established the prevalence and parent's/healthcare workers factors that contribute to MOV at a point in time. Moreover, Kinondoni setting is mostly urban. It was therefore difficult to determine whether MOV was seasonal or not and the setting of rural. A longitudinal study to cover for both urban and rural settings and addressing community factors is recommended for future research.
2. Vaccine stock out at the health facility and failure of cold chain system will cause some of the children who attended the health facility to miss vaccination. Policy makers need to ensure constant availability of vaccines and functionality of cold chain system at health facilities and avoid MOV.

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APPENDICES

Appendix I: Questionnaire for Parents/Caretakers

Missed opportunity for vaccination among children under two years of age attending health facilities in Kinondoni Municipality, Dar es salaam, Tanzania

I would like you to help in answering some of the few questions about immunization. The information you will provide will help in improving immunization services in Tanzania. Your participation is voluntarily and the information you will provide will be kept confidential.

Thank you very much.

Interviewer name……

1. ID no…….	**Date of Interview……..**
2. What is type of Health facility	1. Hospital □ 2. Health center □ 3. Dispensary □
3. Name of Health facility	……

4. Does parent/caretaker accept interview	**1. Yes □ 2. No □**
5. What is the reason for refuses interview	Reason 1. In hurry or not available □ 2. Doesn't like interview □ 3. Others……. □

Data on the Child	
6. Child's date of Birth	Day…. /Month….. /Year……
7. Child`s Age	……..(Months)
8. Child Sex	1. Boy □ 2. Girl □

Demography of Child`s Parent/Caretaker	
9. Age (years)	…….
10. Sex	1. Male□ 2. Female □
11. What is your relationship with the child?	1. Mother/Father □ 2. Grandparent □ 3. Uncle/Aunt 4. Brother/Sister □ 5. Other (specify)……. □
12. Marital status	1. Single □ 2. Married □3. Informal marriage □ 4. Separated/divorced □ 5. Widowed □
13. Occupation	2. Housewife (work is housekeeping) □ 2. Employee □ 3. Self-employed □ 4. Employer □
14. Education level	3. None □ 2. Primary □ 3. Secondary □ 4. Higher education □
15. Why did you bring the child to this health facility? (Reason for attending HF)	1. For medical consultation 2. Vaccination 3. Health child visit 4. Company 5. Hospitalization 6. Others (specify)……

Use of Vaccination card (RCH card No 1)	
16. Does your child have vaccination card?	1. Yes □ 2. No □

17. Request and examine Child`s RCH Card no 1 and Fill the table below

ANTIGEN	**SCHEDULE (SERIES)**	**DATE GIVEN (dd/mm/yy)**
BCG	At birth or first contact	
Oral Polio vaccine (OPV)		
OPV 0	At birth or first contact	
OPV1	6 Weeks of age	
OPV2	10 Weeks of age	
OPV 3	14 Weeks of age	
Pentavalent vaccine (Penta)		
Penta 1	6 Weeks of age	
Penta 2	10 Weeks of age	
Penta 3	14 Weeks of age	
Pneumococcal Conjugate Vaccine (PCV 13)		
PCV 1	6Weeks of age	
PCV 2	10 Weeks of age	
PCV 3	14 Weeks of age	
Rotavirus Vaccine (Rota)		
Rota 1	6 Weeks of age	
Rota 2	14 Weeks of age	

MR 1	9 months of age	
MR 2	18 months of age	

18. What is the vaccination status of the child?	**Vaccinated (fully vaccinated for age)**	**Under-Vaccinated (incomplete vaccination for age)**	**Un-Vaccinated (Not vaccinated at all)**

19. Was the child eligible for Vaccination that day	**YES**	**NO**

20. Was the child vaccinated that day	**YES**	**NO (MOV)**

21. What type of vaccine missed and number of doses	**Vaccine Missed**	**Doses**

22. Reason for Not Vaccination	
Why didn't they vaccinate your child?	**A: Reason related to Health care worker** 1. The doctor/nurse said the child is already vaccinated or has completed series or is not due for vaccination at this time □ 2. Health worker did not ask me □ 3. The doctor/nurse said the child is sick □ 4. Others (Specify…) **B: Reason related to the parent/caretaker** 1. last time the child got sick □ 2. My religion doesn't permit it □ 3. Negative experience of family/friend □ 4. In don't trust vaccines □ 5. I don't trust health care workers □ 6. I forgot □ 7. Vaccine can cause diseases/discomfort □ 8. In don't have time □ 9. Was not purpose of visit □ 10. Others (Specify…) □ **C: Reasons related to heath service logistics** 1. There were no vaccine/syringes/supplies □ 2. It is not vaccination day □ 3. No person □ 4. There was long waiting time □

Quality of Vaccination service	
23. Did they tell you today what vaccine they gave the child?	1. Yes □ 2. No □
24. Did they tell you the today the date of the next vaccination appointment and write in the vaccination card?	1. Yes □ 2. No □
25. Did you receive information today on the reactions that can occur following vaccination?	1. Yes □ 2. No □
26. Are you satisfy with the service provided?	1. Yes □ 2. No □

Reasons to Vaccinate	
27. Could you tell me the purpose of vaccines?	1. To prevent diseases □ 2. So children will grow up healthy □ 3. To cure diseases□ 4. They don't do any good □ 5. Not sure what they`re for
28. What diseases does vaccine prevent?	1. Tuberculosis □ 2. Hepatitis □ 3.Poliomyelitis □ 4.Diptheria □ 5.Whooping Cough □ 6. Tetanus □ 7 Pneumonia □ 8. Meningitis □ 9. Diarrhea □ 10. Measles □ 11.Rubela□

29. Any other comment:

……

……

Appendix II: Dodoso la Mzazi/Mlezi

Kiwango cha watoto walio na umri chini ya miaka 2 ambao wanahudhuria katika vituo vya kutolea huduma za afya na wanakosa nafasi ya kupata huduma za chanjo katika manispaa ya Kinondoni, Dar es Salaam, Tanzania.

Ningependa kukuliza maswali machache kuhusu huduma za chanjo. Taarifa utakazotoa zitasaidia kuinua kiwango cha huduma za chanjo nchini Tanzania. Kushiriki kwako ni kwa hiari na taarifa utakazotoa zitawekwa kuwa siri.

Asante.

Jina la Mdodosaji……...

1. Namba ya Dodoso. …….	**Tarehe ……..**
2. Je ni aina ya kituo cha huduma?	1. Hospitali □ 2. Kituo cha Afya □ 3. Zahanati □
3. Jina la Kituo cha huduma	……..

4. Je mzazi/mlezi amekubali kushiriki 1. Ndio □ 2. Hapana □	
5. Je nini sababu ya kukataa kushiriki?	Sababu ya kukataa kushiriki 1. Nina Haraka sina Muda □ 2. Sopendi kushiriki □ 3. Sababu Nyingine (Taja…….) □

Taarifa za Mtoto	
6. Mwanao amezaliwa lini?	Siku…….Mwezi……./Mwaka……
7. Mwanao ana umri gani?	Miaka……Miezi……Siku……..
8. Jinsia ya mtoto	1. Mme □ 2. Mke □

Taarifa za Mzazi/Mlezi	
9. Je wewe una umri gani? (Miaka)	..…….
10. Jinsia	1. Mme □ 2. Mke □
11. Nini uhusiano wako na mtoto?	1. Mama/Baba □ 2. Bibi/Babu □ 3. Anko/Shangazi □ 4. Kaka/Dada □ 5. Mengineyo (Eleza)…….. □
12. Je hali ya Ndoa ni ipi?	1. Hajaolewa/Hajaoa □ 2. Ameolewa/Ameoa □ 3. Anaishi bila ndoa □ 4. Ameachika □ 5. Mjane □
13. Unafanya Kazi gani?	1. Mama/Baba wa Nyumbani □ 2. Mwajiriwa □ 3. Amejiajiri □ 4. Mwajiri □
14. Je Kiwango cha Elimu ni kipi?	1. Hajasoma □ 2. Shule ya Msingi □ 3. Sekondari □ 4. Elimu ya Juu (Chuo)□
15. Umehudhuria kituo cha huduma kwa sababu gani?	1. Mtoto Anaumwa □ 2. Kwa ajili ya Chanjo □ 3. Kuhudhuria Kliniki □ 4. Kumsindikiza mwenzake/mama □ 5. Kulazwa □ Mengineyo (Eleza)…… □

Tumia kadi ya kliniki ya mtoto (RCH namba 1)	
16. Je una kadi ya kliniki ya mtoto?	1. Ndio □ 2. Hapana □

17. Omba na chunguza kadi ya kliniki ya mtoto kisha jaza jedwali lifuatalo:

CHANJO	**RATIBA**	**TAREHE ALIYOPATA (DD/MM/YYYY)**
BCG	Anapozaliwa	
Oral Polio vaccine (OPV)		
OPV 0	Anapozaliwa	
OPV1	Wiki ya 6	
OPV2	Wiki ya 10	
OPV 3	Wiki ya 14	
Pentavalent vaccine (Penta)		
Penta 1	Wiki ya 6	
Penta 2	Wiki ya 10	
Penta 3	Wiki ya 14	
Pneumococcal Conjugate Vaccine (PCV 13)		
PCV 1	Wiki ya 6	
PCV 2	Wiki ya 10	
PCV 3	Wiki ya 14	
Rotavirus Vaccine (Rota)		
Rota 1	Wiki ya 6	
Rota 2	Wiki ya 14	
MR 1	Miezi 9	
MR 2	Miezi 18	

1. Je hali ya Chanjo kwa mtoto ni ipi? (weka alama ya √)	Amekamilisha ratiba ya chanjo kwa umri wake	Hajakamilisha ratiba ya chanjo kwa umri wake	Hajapata chanjo

2. Je Mtoto alikuwa anafaa kupata chanjo siku hiyo (weka alama ya √)	NDIO	HAPANA

3. Je alipata chanjo siku hiyo? (weka alama ya √)	NDIO (Nenda Swali la 23)	HAPANA (MOV)

4. Je ni aina gani ya chanjo na dozi ngapi za amekosa?	Chanjo aliyokosa	Dozi

5. Sababu ya kutopata chanjo leo	
Kwa nini mtoto hakupata Chanjo leo?	**A: Sababu zinazohusiana na watumishi wa afya** 1. Mhuduma amesema ameshachanja/amekamilisha chanjo/Tarehe yake ya chanjo bado □ 2. Mhuduma wa afya hajaniambia □ 3. Mhuduma amesema mtoto ni mgonjwa □ 4. Mengineyo (Eleza…..……..) □ **B: Sababu zainazohusiana na mzazi/mlezi** 1. Mara ya mwisho alivyochanja aliumwa □ 2. Dini yangu hairuhusu chanjo □ 3. Jirani yangu aliniambia sio nzuri □ 4. Siamini katika chanjo □ 5. Siwaamini watoa huduma ya afya □ 6. Nimesahau □ 7. Chanjo zinasababisha ugonjwa/kuumwa □ 8. Sikuwa na muda □ 9. Sikuja kwa ajili ya chanjo □ 10. Mengineyo (Eleza……..) □ **C: Sababu zinazohusiana na kituo** 1. Hakukuwa na chanjo □ 2. Sio siku ya kuchanja □ 3. Hakukuwa na mhuduma □ 4. Muda wa kusubiri ulikuwa mrefu □

Ubora wa huduma za chanjo	
6. Je umeelezwa chanjo gani amepewa mtoto?	1. Ndio □ 2. Hapana □
7. Je umeelezwa tarehe ya kurudi na imeandikwa kwenye kadi ya kliniki?	1. Ndio □ 2. Hapana □
8. Je umeelezwa maudhi yoyote yanayoweza kutokea baada ya chanjo?	1. Ndio □ 2. hapana □
9. Je umeridhika na huduma uliyopata?	1. Ndio □ 2. Hapana □

Sababu ya kumchanja mtoto	
10. Je unaweza kunieleza madhumuni ya chanjo?	1. Kukinga magonjwa □ 2. Watoto wakue na afya □ 3. Kutibu magonjwa □ 4. Hazina faida □ 5. Sifahamu □
11. Je ni chanjo za magonjwa gani zinatolewa?	1. Kifua kikuu/TB □ 2. Homa ya Ini □ 3.Kupooza/Polio □ 4.Dondakoo □ 5.Kifaduro □ 6. Pepopunda □ 7 Nimonia/Kichomi □ 8. Homa ya uti wa mgongo □ 9. Kuhara □ 10. Surua □ 11.Rubela □

12. Maoni mengineyo:

……

……

Appendix III: Key Informant Interview Guide for Health Care Workers

I am …… a master of public health trainee from MUHAS. We are conducting a health facility based study to establish the prevalence and contributing factors for Missed Opportunities for Vaccination (MOV) in children aged below 2 years of age attending facilities in Kinondoni Municipality so as to inform policy and development partners and ultimately improving immunization services. You have been chosen to participate in the study due to your experience and position. We really appreciate your participation.

Please feel free to discuss/participate and ask for clarification where necessary. All the information you provide will be kept confidential. You do not have to reveal information that makes you uncomfortable if you do not want to, but if you are willing to share your experiences; it will be very helpful to us in understanding issues relating to missed opportunities for immunization service in the health facilities**.**

I also have a tape recorder that will help me to capture the discussion/interview to ensure that I do not miss anything.

Are you willing to participate? (Document consent of the respondent).

Thank you very much

Questions:

1) How should immunization services be provided at health facilities and by whom?
2) How should such health providers be trained and by whom, and how often?
3) How availability of vaccines at health facility affects immunization services?
4) What are the barriers to immunization service provision? Why do you think some children are not vaccinated when they visit health facility despite being eligible and no valid contraindication?

5) What should be done to ensure quality immunization service provision so as to avoid missed opportunities?

6) How should these health workers be motivated to enable them provide quality immunization services?

7) Do you think work load will have an influence on missed opportunities? How?

8) What challenges are the health providers likely to face in provision of immunization services? How can they be overcome?

9) Do you have anything else you would like to add?

Thank you very much for your time

Appendix IV: Mwongozo wa Mahojiano kwa Mtoa Huduma ya Afya

Habari, Ninaitwa…….. Nafanya kazi ya kutafiti wa Kiwango cha watoto walio na umri chini ya miaka 2 ambao wanahudhuria huduma za Afya katika Vituo vya kutolea huduma na wanakosa nafasi ya kupata huduma za Chanjo katika Manispaa ya Kinondoni, Dar es Salaam, Tanzania. Lengo ni kutoa mwongozo kwa watunga sera na wadau wa maendelea ili kuinua huduma za chanjo nchini. Umechaguliwa kuwa mmojawapo wa washiriki katika utafiti huu kutokana na ufahamu wako na ujuzi uliokuwa nao katika huduma za chanjo.Tutashukuru ushiriki wako.

Tafadhali kuwa huru kushiriki katika utafiti huu na uliza pale unapokuwa na shaka au kuhitaji ufafanuzi. Maelezo yote utakayotoa yatabaki kuwa siri. Kama utajisikia kutotoa maelezo kwa jambo ambalo utaona litakutatiza, kuwa huru, lakini ufahamu na ujuzi utakuwa na manufaa sana katika kufahamu changamoto zinazofanya watoto wanakosa huduma za chanjo pale wanapopata nafasi ya kuhudhuria vituo vya kutolea huduma za afya.

Sambamba, nitakuwa na rekodi maongezi yetu ili kuhakikisha napata ufahamu wa kina na kuhakikisha sitakosa kila jambo tutakalozungumzia.

Je umekubali kushiriki? (Andika fomu ya kukubali kushiriki).

Asante sana

Maswali:

1. Je ni vipi huduma za chanjo zinatakiwa kutolewa katika kituo, na nani?
2. Je ni vipi watoa huduma wanatakiwa kupata mafunzo,nani anatakiwa kutoa mafunzo na mara ngapi?
3. Je ukosekanaji wa chanjo katika kituo cha huduma kunaathiri vipi huduma za chanjo?
4. Je utoaji wa huduma za chanjo una vikwazo vipi? Kwa nini unafikiri baadhi ya watoto wanafika katika kituo na wanakosa huduma za chanjo ingawa wanastahili?

5. Nini kifanyike ili kuhakikisha huduma za chanjo ni bora na watoto wanaostahili kupata chanjo wanapata mara wafikapo katika kituo cha huduma?
6. Je wahudumu wa afya wanahitaji motisha zipi ili waweze kutoa huduma bora za chanjo?
7. Je unafikiri kazi nyingi wanazokuwa nazo watoa huduma inaweza kuchangia watoto kukosa huduma za chanjo mara wanapofika katika kituo? Ni kwa jinsi gani?
8. Watoa huduma wanapata changamoto gani katika kutoa huduma za chanjo? Nini kifanyike kukabiliana na changamoto hizo?
9. Je una mengine ungependa kuongezea?

Asante nashukuru kwa muda wako

Appendix V: Informed Consent Form for Parents/Caretakers/Health care workers

ID No……

To the Parents/ Guardians/Healthcare worker ……..

Greetings, my name is ….....from Muhimbili University of Health and Allied Sciences, Dar es Salaam. I am doing a research study titled Missed Opportunity for Vaccination among children under two years of age attending Health facilities in Kinondoni Municipal Council, Dar es salaam, Tanzania.

Purpose of the study

The study has a broad objective of assessing prevalence for Missed Opportunity for Vaccination in children less than two years of age attending health facilities in Kinondoni Municipal in Dar es Salaam, Tanzania. Moreover, it aims at determining parents/caretakers factors and reasons that contribute to Missed opportunity for vaccination.

What participation involved

If you agree to participate in this study, you will be required to answer series of questions that have been prepared for the study through interviewing in order to obtain the intended information regarding the prevalence and contributing factors for missed opportunity for vaccination in Kinondoni Municipal Council in Dar es salaam, Tanzania. *(For Health care workers: The information is recorded and is considered confidential and no one else except the researcher will have access to them)*

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research will have access to the information. We will be compiling a report which will contain responses from several parents/caretakers and health care workers without any reference to any individual. We will not put your name or other identifying information on the records of the information you provide.

Risks

You will be asked questions about factors that are associated with uptake of vaccination services. Some questions could potentially make you feel uncomfortable. You may refuse to answer any particular question and stop the interview at any time. We do not expect any harm to happen to you because of participation in this study.

Right to withdraw

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

The information you provide will help to increase our understanding on the prevalence and contributing factors for MOV in Kinondoni Municipal Council and communicate the findings to policy makers in the council and ministry for improvement of immunization services in the Council as well as in the country.

Responsibility of Investigator

In the case where the child will be found to have not completed the immunization schedule, the parent/caretaker will be counseled on the advantages of immunization and be advised to visit the health facility for immunization services.

In case of injury

We do not anticipate that any harm will occur to you or your child as a result of participation in this study.

Who to contact

If you have questions about this study, please don't hesitate to contact:

Dr Alex Mphuru, Principal Investigator, MUHAS (Tel. no. 0713 765 222).

Prof. Meinem Moshi, Chairman of Senate Research and Publications, MUHAS (Tel: 2151489.

Prof K. S. Mnyika, Supervisor of this study (Tel. no. 0789 333 145).

Signature

Do you agree?

Participant agrees…… Participant does not agree……..

I ……. have read the content in this form, my questions have been answered, I agree to participate in this study

Signature of Participant…….……

Signature of Research assistant……Date…….

Appendix VI: Fomu ya Idhini cha mahojiano kwa Mzazi/Mlezi/Mtoa Huduma

Fomu Namba……..

Kwa Mzazi/ Mlezi /Mtoa huduma……..

Habari, Ninaitwa…….. kutoka Chuo Cha Kikuu cha Afya na Tiba Muhimbili. Ninafanya kazi ya kutafiti wa kiwango cha watoto walio na umri chini ya miaka 2 ambao wanahudhuria huduma za Afya katika Vituo vya kutolea huduma na wanakosa nafasi ya kupata huduma za chanjo katika Manispaa ya Kinondoni, Dar es Salaam, Tanzania.

Madhumuni ya utafiti

Utafiti huu unakusudia kuchunguza ukubwa wa kiwango cha watoto walio na umri chini ya miaka 2 ambao wanahudhuria huduma za Afya katika Vituo vya kutolea huduma na wanakosa nafasi ya kupata huduma za Chanjo katika Manispaa ya Kinondoni, Dar es Salaam, Tanzania. Aidha utafiti huu una lengo la kufahamau sababu zinazoathiri utumiaji wa huduma za chanjo.

Nini kinahitajika ili kushiriki

Ili kushiriki katika utafiti huu inabidi kukubali na kujiunga kwa kujibu maswali toka kwenye dodoso wa kwa ajili ya utafiti huu ili kupata taarifa ya ukubwa wa ukubwa wa kiwango cha watoto walio na umri chini ya miaka 2 ambao wanahudhuria huduma za Afya katika Vituo vya kutolea huduma na wanakosa nafasi ya kupata huduma za Chanjo katika Manispaa ya Kinondoni, Dar es Salaam, Tanzania.*(Kwa watoa huduma: Maelezo utakayotoa yatarekodiwa na yatawekwa kuwa siri na hakuna mtu mwingine yeyote atayepata isipokuwa mtafiti mkuu)*

Usiri

Ninakuhakikishia kuwa taarifa zitakazokusanywa kutoka kwako kupitia dodoso hili zitakua siri na hakuna mtu yeyote ambaye hafanyikazi kwenye utafiti huu atakayeambiwa ulichosema. Itaadaliwa taarifa ya utafiti huu ambao hautamtaja mshiriki yeyote. Jina lako wala utambulisho mwingine wowote hautawekwa kwenye taarifa unazozitoa. Taarifa zako zitaingizwa kwenye ngamizi kwa kutumia namba za utambulisho.

Hatari

Hakuna hatari yeyote itakayotokea kwako kutokana na ushiriki wako kwenye utafiti huu. Baadhi ya maswali yanaweza kukufanya usijisikie vizuri. Unaruhusiwa kukataa kujibu maswali na kukatisha utafiti huu.

Haki ya kujitoa au vinginevyo

Ushiriki katika utafiti huu ni hiari. Kutokushiriki au kujitoa kutoka kwenye utafiti hakutakua na adhabu yeyote na hutapoteza stahili zako endapo utaona ni vema kufanya hivyo.

Faida

Kama utakubali kushiriki kwenye utafiti huu itakua ni fanasa kwa vile utafiti huu una lengo la kuboresha huduma za chanjo kwa kubaini kiwango cha watoto walio na umri chini ya miaka 2 ambao wanahudhuria huduma za Afya katika Vituo vya kutolea huduma na wanakosa nafasi ya kupata huduma za Chanjo. Iwapo mtoto wako atabainikia kuhitaji kupatiwa chanjo, utashauriwa ipasavyo ili mtoto akapate chanjo na kumkinga dhidi ya magonjwa yanayozuilika kwa chanjo.

Endapo utapata madhara au la

Hatutegemei kupata madhara yoyote kutokana na ushiriki wako katika utafiti huu. Hakuna dawa wala damu itakayotolewa kwa mtoto.

Nani wa kuwasiliana naye

Kama kuna swali kuhusiana na utafiti huu itakubidi kuwasiliana na:

Dkt Alex Mphuru wa Chuo Kikuu cha Afya na Sayansi ya Tiba Muhimbili, (Simu: 0713765 222) ambaye ni Mtafiti mkuu.

Prof. Meinem Moshi, Mkurugenzi wa Kamati ya Utafiti na Uchapishaji, Chuo Kikuu cha Muhimbili (Simu: 2151489)

Prof K. S. Mnyika ambaye ni msimamizi wa utafiti huu. (Simu: 0789333 145)

Je, Umekubali?

Mshiriki amekubali…… Mshiriki hajakubali……

Mimi……...nimesoma maelezo ya fomu hii, maswali yangu yamejibiwa na nimeridhika. Nakubali kushiriki katika utafiti huu.

Sahihi ya Mshiriki……

Sahihi ya mtafiti msaidizi……

Tarehe ya kutia sahihi ya kushiriki……

Appendix VI: Ethical Approval letter

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES

P.O. Box 65001
DAR ES SALAAM
TANZANIA
Web: www.muhas.ac.tz

Tel G/Line: +255-22-2150302/6 Ext. 1015
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. MU/ PGS/SAEC/Vol. XVIII/

3rd March, 2017

Dr. Alex Mphuru
MPH-Executive Track
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: *MISSED OPPORTUNITY FOR VACCINATION AMONG CHILDREN UNDER TOWN YEARS OF AGE ATTENDING HEALTH FACILITIES IN KINONDONI* MUNICIPALITY, DAR ES SALAAM, TANZANIA

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 2nd February, 2017 to 1st February, 2018. In case you do not complete data analysis and dissertation report writing by 1st February, 2018, you will have to apply for renewal of ethical clearance prior to the expiry date.

Prof. Andrea B. Pembe
DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences

Appendix VI: Permission letter for data collection

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
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Tel G/Line: +255-22-2150302/6 Ext. 1015
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. HD/MUH/T.395/2015

7th March, 2017

Waganga Wafawidhi
Mpeni uSuri'laiano
24/03/17

District Executive Director
Kinondoni Municipal Council
P.O. Box 31902
DAR ES SALAAM.

Re: INTRODUCTION LETTER

The bearer of this letter Dr. Alex Athanasiu Mphuru is a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MPH- Executive Track.

As part of his studies he intends to do a study titled:"***Missed opportunity for vaccination among children under two years of age attending health facilities in Kinondoni Municipality, Dar es Salaam, Tanzania".***

The research has been approved by the Chairman of University Senate.

Kindly provide him the necessary assistance to facilitate the conduct of his research.

We thank you for your cooperation.

Ms. A. Ndyeikiza
For: DIRECTOR, POSTGRADUATE STUDIES

cc: Dean, School of Public Health and Social Sciences
cc: Dr. Alex Mphuru