

**ASSESSMENT OF FACTORS INFLUENCING HUMAN PAPILLOMA  
VIRUS VACCINE UPTAKE AMONG ELIGIBLE FEMALE  
ADOLESCENTS IN SECONDARY SCHOOLS IN MISSENYI DISTRICT  
COUNCIL, TANZANIA**

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**MSc. Applied Epidemiology Dissertation  
The Muhimbili University of Health and Allied Sciences.  
October, 2021**

**Muhimbili University of Health and Allied Sciences**  
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**Assessment of Factors Influencing Human Papilloma Virus Vaccine Uptake among  
Eligible Female Adolescents in Secondary Schools in Missenyi District Council, Tanzania**

**By**

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**A dissertation Submitted in Partial Fulfilment of the Requirements for the  
Degree of Master of Science in Applied Epidemiology of  
Muhimbili University of Health and Allied Sciences.**

**October, 2021**

**CERTIFICATION**

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled “*Assessment of factors influencing human papilloma virus vaccine uptake among eligible female adolescents in secondary schools in Missenyi district council, Tanzania*” in (partial) fulfilment of the requirements for the degree of Masters of applied epidemiology of Muhimbili University of Health and Allied Sciences.

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**Dr. Mucho Mizinduko**

(Supervisor)

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Date

.....

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.....

Date

**DECLARATION AND COPYRIGHT**

I, **Kidogo, Gerald Manasseh** 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 a similar or any other degree award.

Signature.....

Date .....

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## ACKNOWLEDGEMENT

This study has been a successful result of a combined efforts of a team of people under the support of our Almighty God. These people include in the first place my wife Celine P. Athumani, my children (Naomy N. Manasseh, Valentinus G. Manasseh, Gladness G. Manasseh and Valerius G. Manasseh) as well as the rest of my family and relatives. Collaboration from my employer Permanent Secretary from the President's Office, Regional Administration and Local Government (PORALG) who allowed me to join this training program and the Director of Health, Social Welfare and Nutrition department at PORALG Dr. Ntuli A. Kapologwe who dedicated a lot of support on my way to success and Muhimbili University of Health and Allied Sciences (MUHAS) through Dr. Candida Moshiro for her academic leadership role and moral support.

Dr. Mucho Mizinduko my research supervisor is gratefully acknowledged for his tirelessness follow up, supervision, directives, tolerance and patronage to shaping of this study starting from proposal concept note development all the way long to the dissertation submission. He was in the same regard assisted by Dr. Ally Hussein to make sure all technical aspects about the study were put in order. My sincere appreciations go to Mr. Kagari Edward the Ag. District Medical Officer of Missenyi DC for his exclusive material and moral support, Mr. Valence Lazaro Mhobezi the District Pharmacist for his devoted time during field data collection as well as Egidius Mutalemwa (Asst. DIVO) and other staff in Missenyi Council administrative Authority including the Council Secondary Education officer and all head masters from all visited 10 secondary schools who agreed and dedicated their time and allowed me to interfere their local examination schedule during the data collection exercise. I also send my sincere recognition to Latifa stationery of Dodoma at the IRDP and Kagera stationery located within the MUHAS compound for their indefatigable efforts on working out the secretarial and type setting work of this research report presented today.

A team of my contemporaries, the cohort 12 and FELTP staff wouldn't be left out and other many people for their financial, materials, moral encouragement and contributions towards completion of this post graduate studies program and the final report, especially my family who all time aligned hand in hand with me all the way through this undertaking and endeavors. Last but

not least my gratitude goes to the Dean Prof. Gasto Frumence, head of department her esteemed Dr. Candida Moshiro, course coordinator (s) and all lecturers at MUHAS who have been very not only fundamental and instrumental but also knowledge transferors for their keen tactical skills transference whose effort I couldn't do without.

**DEDICATION**

This work is dedicated to my beloved late parents Mzee Mhangila Kansulaheba Manasseh (Vyanssekuyaga) and Naomy Seme Mwakijambile Manasseh and as well as esteemed aunt Tukugulupi Seme Bugali.

## ABSTRACT

**Background:** High vaccination rates against Human Papilloma Virus (HPV) is a milestone in primary prevention of cervical cancer. With an increasing number of cases and deaths in the country among women however, like many other countries around the globe, Tanzania has had a high number of district councils (over 90%) who were underperforming in HPV vaccine uptake especially for 2<sup>nd</sup> dose. Despite the safe, effective, and opportunities for free vaccine delivery in health-care settings, the councils maintained low HPV vaccine update target (< 80%) in 2019.

**Objective:** To assess factors influencing HPV vaccine uptake among eligible female adolescents in secondary schools in Missenyi district council (DC), Tanzania in 2019.

**Methods:** A cross-sectional study was conducted among eligible female adolescents who were 14 years old in 2019 in Missenyi DC. A self-administered structured questionnaire was provided to 450 participants from 10 secondary schools after the assent. Key informant interview (KII) was done to health care officials. Independent variables were program, health care provider and beneficiaries related factors while dependent variable was HPV vaccine dose I and II uptake. Data was summarized by univariate and chi-square was used to assess association and *p*-value, <0.05 was considered statistically significant. The strength of association between dependent and independent variable was measured using Poisson regression analysis.

**Results:** The study shown that, majority (92%) of the 456 interviewed participants were aware of HPV vaccine and 70% reported school as common source of information. About 45% (203/450) of the respondents received HPV vaccine 1<sup>st</sup> dose and 53% of them were vaccinated at school. There was statistical significance association between guardian who reside with the girl and HPV vaccine uptake. Respondents who reside with mothers were 20% more likely to be vaccinated compared to those reside with both parents (*p*-value, 0.05). Of those received 1<sup>st</sup> dose, 54% (111/203) received HPV vaccine 2<sup>nd</sup> dose and 81% were vaccinated at the health facility. Distance, students class level, shortage of staff, parents' level of education, misconception, guardians' occupation and funding were the common barriers of HPV vaccine uptake reported.



**Conclusion:** HPV vaccine uptake was low below the national threshold due to barriers which were program based, beneficiaries and health care provider related. Addressing them such as outreach and mobile services revival, staffing and using schools as an access strategy shall influence uptake.

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**ABBREVIATIONS AND ACRONYMS**

CD	City Director
CDC	Center for Disease Control and Prevention
DC	District Council
DTP	Diphtheria, Tetanus and Pertussis
EPI	Expanded Program on Immunization
GAVI	Global Alliance for Vaccines and Immunization
HCPs	Health Care Providers
HF	Health Facility
HPV	Human Papilloma Virus
IPV	Injectable Polio Vaccine
IVD	Immunization and Vaccines Development
KII	Key Informant Interview
LAMICs	Low- and Medium-Income Countries
LGAs	Local Government Authorities
MC	Municipal Council
MCV	Measles Containing Vaccine
MD	Municipal Director
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MR2	Measles/Rubella Vaccine Second Dose
MUHAS	Muhimbili University of Health and Allied Sciences
NIMR	National Institute for Medical Research
ORCI	Ocean Road Cancer Institute
PORALG	President's Office, Regional Administration and Local Government
RAS	Regional Administrative Secretary
TC	Town Council
TD	Town Director
TFELTP	Tanzania Field Epidemiology and Laboratory training Program
URT	United Republic of Tanzania
WHO	World Health Organization

**DEFINITION OF TERMS**

<b>Acceptability</b>	refers to willingness to get vaccinated
<b>Eligible population</b>	for this particular context eligible population refers to all female adolescents who were 14 years old in the year 2019 as described in HPV vaccine introduction into routine immunization framework
<b>Data saturation</b>	means the collection of qualitative data to the point where a sense of closure is attained because new data yield redundant information.
<b>Retention</b>	is a key memory process that enhances the capability to hold information.
<b>Retrieval</b>	is the recollection of held information in the mind in response to external stimuli.
<b>Vaccination uptake</b>	refers to the action of vaccinating against Human Papillomavirus
<b>Unemployed</b>	refers to a person depending on unspecified temporally basis of income generating activities such as sugar cane farms labor, farming labor, porter services and other carries at different times in a day.
<b>Peasant</b>	refers to a person whose family income is based on purely agriculture

## **1.0 INTRODUCTION**

### **1.1 Background**

Human papillomavirus (HPV) vaccination usually offer enormous potential for cancer prevention, notably the prevention of cervical cancer (1). It is estimated that 75% of sexually active people are infected with HPV during their lifetime (2). It creates a significant disease burden worldwide since it is a fourth most common cause of cancer worldwide with more than 85% of the burden in developing countries. Among 630,000 new cancer cases occurring in the world every year, 530,000 (83%) are cervical cancer (2,3). Africa is the mostly affected following the fact that two-thirds of cervical cancers occur in less developed countries, due to lack of effective cervical cancer screening programs and high HPV infection prevalence (2).

Based on the Ocean Road Cancer Institute (ORCI) data approved by Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), statistically the disease ranked number one in Tanzania where according to HPV information center of the United Republic of Tanzania (URT), over 9,772 estimated new cases are diagnosed every year with mortalities of 6,695 every year (4). This was therefore found to be a public health agenda that needs appropriate intervention which is vaccination against the disease.

The emergence of vaccines against human papillomaviruses, the virus that cause cervical cancer, represented a significant advance in cervical cancer prevention but the prevention should go hand in hand with high coverage rates as suggested by WHO and CDC (5). Adolescent girls were the primary target population for vaccination however, this population has traditionally been difficult to be easily reached.

The results from diverse studies conducted, globally indicated that; coverage level was low in most of the countries for instance Hong Kong attained coverage between 2.4% and 9.1%. Studies in Sub-Saharan Africa countries of Malawi coverage stood at 52.7%, Rwanda less than 70%, and 50% to 60% for Cameroon (6).

Acceptability studies conducted in Kenya showed that the uptake at piloting was very high up to 95% but declined as time went on to recently 31%. Moreover, in other sub Saharan

countries studies indicated very high interest in the vaccines, but safety, cost and certain socio-cultural factors were noted as obstacles for the uptake (7).

Referring to twenty eight studies conducted in Low and Middle Income Countries (LMIC), from 2007 to 2012 and Brazil in 2020, despite the availability of safe and effective vaccines, and ample opportunities for vaccine delivery in the health-care setting, vaccination coverage rates among adolescent girls, failed to increase but remained between 25.1% in 2007, 53.8% in 2012 and 21.8% in 2020 (8,9) instead of the set target of  $\geq 80\%$ .

Tanzania has been on a steady track to achieving the decade of vaccines universal goals. Over the years, since 2016, the country through MoHCDGEC was on the high immunization coverages of 90% and above in almost all antigens for years but HPV vaccine, since its launching and inclusion in the routine immunization schedule in 2018, has remained below the predetermined coverage rate target of  $\geq 80\%$ . Tanzania's coverage in 2018 was 59% and 40% for first and second dose respectively but achieved 78% and 49% for first and second dose respectively in the year 2019 (10).

Based on current annual report by MoHCDGEC through IVD, about 52% of the total councils under-performed for first dose and over 90% of councils have had a coverage rate below 80% in 2019. A number of strategies such as increasing the number of health facilities offering vaccination services were implemented but results remained unpromising.

Missenyi DC was among the poor performing councils with a coverage rate of 48% for first dose and 24% for the second dose (10). This called for a study to identify factors influencing low uptake of the vaccine in the council. The findings of the study would help to propose possible uptake barriers and mitigation measures.

According to the World Health Organization (WHO) and the US Center for Disease Control and prevention (CDC) guidance, "the high-level vaccination coverage provides for a crucial opportunity for vulnerable community protection against Human Papilloma Virus (HPV) Infections".



Based on the 2019 population estimates, Tanzania had a population of 14.88 million women aged 15 years and older who are at risk of developing cervical cancer. About 3.3% of women in the general population are estimated to harbor cervical HPV-16/18 infection at a given time, and 68.0% of invasive cervical cancers are attributed to HPVs 16 (1).

## **1.2 Problem Statement**

Cervical cancer, as presented by WHO, represents a global women's health issue ranked number four worldwide in comparison to other types of cancer (27). The 2019 Ocean Road Cancer Institute (ORCI) report showed that, cervical cancer in Tanzania is the number one leading cause of deaths among women whereby over 68% of women diagnosed with cervical cancer die of the disease every year (2).

The emergence and initiation of vaccines against the most common types of HPV causing cervical cancer signified a noteworthy advance in cervical cancer community protection. Such protection is optimally achieved through high coverage rates of adolescent girls who are the primary target population for vaccination. In Tanzania, the high coverage level is not yet to be attained (5). Tanzania's HPV vaccination coverage level data since the launching of the vaccine into routine program in April 2018 for female adolescents aged 14 years, was still lower than the intended level i.e.,  $\geq 80\%$ . Coverage levels  $\geq 80\%$  are anticipated to have the protective impact against the disease. Recently, data showed Missenyi DC was among the low performing district councils with coverage rate of 44% (1,599/3,309) for first dose and 24% (795/3,309) for the second dose but also, Tanzania national coverage was 59% for first dose and 40% for the second dose (Apr-Dec in 2018) compared to 2019 (Jan - Dec) where the coverage was 78% and 49% for 1<sup>st</sup> and 2<sup>nd</sup> dose respectively (10–12). Community sensitization and advocacy meetings among schoolgirls were some of the efforts done by the Government in collaboration with partners and stakeholders aimed at improving HPV vaccination coverage (8). Despite of the efforts done to increase coverage (supply of vaccines, rise of awareness, provision of education and .....), in the year 2019, about 96 (52%) district had low vaccination coverage for first dose and coverage of more than 168 (90%) district councils for the second dose (10, 7, 11) but still there is lower coverage of first dose.

### 1.3 Conceptual Framework

Based on the outcome variable (HPV uptake) in conjunction with other studies, the hypothetical factors were reviewed under three categories, namely program-related, health care providers, and beneficiaries related factors (13) diagrammatical demonstrated (Figure 1).

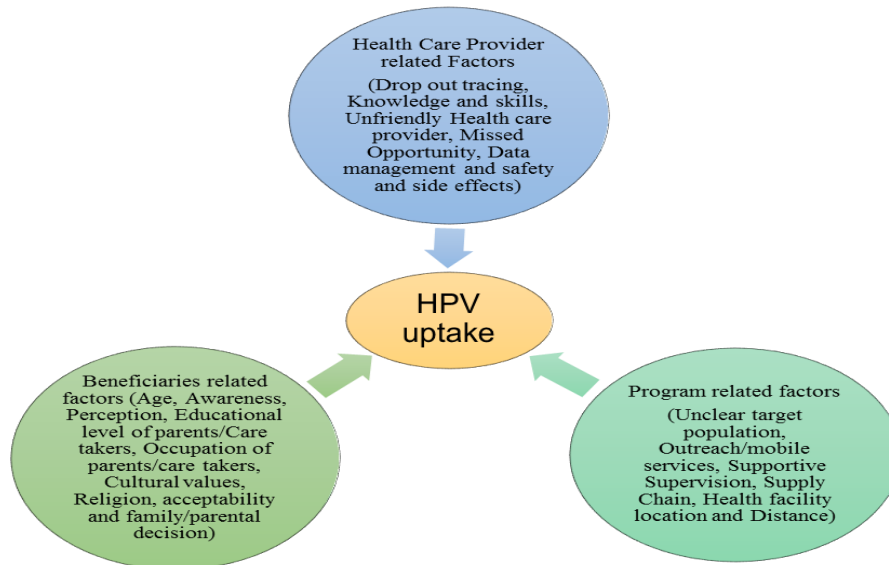


Figure 1: Conceptual frame work for variables of HPV vaccine uptake

**Source:** Gerald Manasseh (Adopted from Olu Olushayo and Muneene 2019)

From the above conceptual frame work, it shows that low uptake of the HPV vaccine may be associated with major three factors which are;

**Program related factors** for dependent variables in relation to independent variables mainly affected the uptake for both doses in Missenyi DC included the cancellation of outreach and mobile services, Distance between schools and the health facilities providing immunization, irregular supportive supervision from council and regional level. Others included health policy governing immunization services, health related laws enforcement, costs for immunization services, shortage of staff, inadequate program funding and access sources of HPV vaccines (17–22).

**Beneficiaries related factors** involved misconceptions, parents' education level, parents/individual adolescents' decision, religious beliefs, painful shots, fear to adverse events

following immunization (AEFI), forgetting of vaccination schedule by the majority and occupation of parents. Others include type of school the girls were attending, distance to the facility providing immunization and awareness on the importance of the vaccine for both guardians and the adolescents were thought as having a great impact to influence the HPV vaccine uptake (3, 17).

**Health care provider related factors** contributed to low uptake of the HPV vaccine was lack of defaulters tracking mechanism, communication skills, provider/client relationship, missed opportunities and improper data management system (analysis) which could help them to identify under-immunized clients and gaps (7, 19,21).

#### **1.4 Rationale**

HPV vaccine was introduced in routine immunization program in Tanzania since April 2018 aiming at community protection against female adolescents. Since the launching of this preventive intervention, the uptake is still very low in most councils of Tanzania Missenyi DC inclusive. Missenyi is among the low performing councils with coverage level of 48% and 24% for first and second dose respectively in the year 2019 far below the national set threshold of  $\geq 80\%$ . This situation necessitated to conduct this study with which the factors influencing HPV vaccine uptake were determined. The study results obtained provided an understanding of the factors for the low uptake of HPV vaccine among female adolescents and as such recommendations for improvement of the coverage rates were laid down. The findings from this study will be useful for policy makers and serve as benchmark for developing strategies and enforcement of the implementation of immunization guidelines for improving coverage levels.

#### **1.5 Research Questions**

##### **1.5.1 Broad Research Question**

What are the factors influencing HPV Vaccine uptake among eligible Female adolescents (14 years old) in Secondary Schools of Missenyi District Council in Kagera for the year 2019?

### **1.5.2 Specific Research Questions**

1. What is the proportion of 14-year old female adolescents who received first dose who were eligible in 2019 in Missenyi DC?
2. What are factors associated with HPV vaccine first dose uptake among 14-year old female adolescents who were eligible in 2019 in Missenyi DC?
3. What is the proportion of 14-year old female adolescents who received first and second dose in 2019 in Missenyi DC?
4. What are factors associated with HPV vaccine first and second dose uptake among 14-year old female adolescents who were eligible in 2019 in Missenyi DC?
5. What could be perceived reasons of HPV Vaccine uptake emanating from Missenyi DC study based on respondents' information?

### **1.6 Objectives**

#### **1.6.1 Broad Objective**

To assess proportion of 14 years old female adolescents received first and second doses and identify factors associated with HPV vaccine uptake in Missenyi DC for the year 2019.

#### **1.6.2 Specific Objectives**

1. To determine proportion of 14-year old female adolescents who received first dose of HPV Vaccine who were eligible in 2019 in Missenyi DC
2. To determine factors associated with HPV vaccine first dose uptake among 14-year old female adolescents who were eligible in 2019 in Missenyi DC
3. To determine proportion of 14-year-old female adolescents who received first and second dose in 2019 in Missenyi DC
4. To identify factors associated with HPV vaccine first and second dose uptake among 14-year old female adolescents who were eligible in 2019 in Missenyi DC
5. To identify perceived barriers of HPV Vaccine uptake based on studied respondents' information.

## **1.7 Literature Review**

### **Proportion of eligible female adolescents who received first dose of HPV vaccine**

Low uptake of the first dose of HPV vaccine is significantly low in most places around the world Tanzania inclusive. For instance, based on the recent study conducted in 2018 on identification of determinants associated with hesitancy of uptake of HPV first dose of the HPV vaccine in Denmark, the first dose was verified standing at 52% in girls. Data indicated in some places to have delayed and a decreased in the uptake of the HPV1 vaccine whose coverage level was 41% of the 32,180 girls born in 2003. The highest coverage ever attained for first dose that was noted during the study for HPV dose one was 79% and 77% respectively for indigenous girls and boys aged 15 years in 2017 (16).

The study conducted in 2019 in Brunei Darussalam on HPV coverage among female students indicated that high HPV vaccination coverage rates were reported across countries that use school-based vaccination program, such as in Australia 70%, Bhutan 90%, England 83.8% and Scotland who attained >80%. Notably, there was a stark difference in HPV vaccination coverage rates between countries that use school-based vaccination program in comparison with countries that use community-based vaccination program. These included the United States whose coverage was 65.6% and France who attained 38.9%. The study suggested that, school-based approaches were a better and feasible strategy in increasing the HPV vaccination coverage rates including private schools (17).

Many other studies speculated the similar situation including the one conducted on factors influencing uptake of HPV vaccination among girls in Germany in 2016, the findings shown that during the first year of HPV vaccine availability in Germany, vaccination uptake was low as only 17.4 % of the girls aged nine to 17 years got vaccinated. On the other hand, while 61.5 % of those set on questionnaire felt positively about doing so ie getting vaccinated, 4.7 % said they would not be vaccinated and 16.3 % were not sure. The study further indicated that the probability of a girl being vaccinated increased with each additional year of age for instance among the 17 year-old girls, 38.5% had been vaccinated (18).

Additionally, a German survey conducted between the year 2009 and 2011 reported that 39.5 % of girls aged 14–17 had received the three-dose course of the HPV vaccine, while data for another German study conducted in 2010 reported that 49 % of women aged 18–20 years had been vaccinated. Similarly, to Germany, other countries included France which achieved a vaccination coverage of only 24% with three doses among 14-year-old girls in 2008, in the United States in 2007, data indicated 25.1% of girls aged 13 to 17 who had received at least one of the three necessary doses and only 4% of those had completed the full vaccine course. The 2007 California Health Interview Survey (CHIS) experienced more or less the same phenomenon as it found that 26 % of girls with age from 13 to 17 years had received at least one dose of the HPV vaccine and less than half of it (11 %) had completed the series of three doses (18).

#### **Factors associated with HPV vaccine first dose uptake among eligible female adolescents**

In accordance with the recent study conducted in 2018 on identification of factors associated with uptake of HPV vaccine in Denmark children with low uptake of HPV and other vaccines included girls living with one parent, household type and mother's marital status. Furthermore, the area of residence was associated with vaccine uptake also, vaccine hesitancy due to doubts over its safety (16). Another study which was conducted in 2019 in Brunei Darussalam observed that low uptake was due to the vaccine cost borne by non-Bruneian students while in both school types, HPV vaccination was provided at no cost to Bruneian students, but at a fee for non-Bruneian students. Other factors in private schools were lack of knowledge, misconceptions of parents and eligible children for HPV vaccination (17). The studies conducted in German in different years (from 2016 – 2019) and other High-Income Countries (HIC) on factors influencing uptake of HPV vaccination among girls revealed that parents Education level and Social Economic Status (SES) were significantly associated with having been vaccinated or not (18).

The study conducted in Ileje DC in Songwe region of Tanzania in 2016 over vaccination completion revealed underutilization of vaccines to be a challenge in many regions across the Country. Ileje DC was one of the District Councils in Tanzania with consistently low vaccine uptake i.e 69% with drop out of 15%. The main Contributory determinants were community

negative perceptions on vaccines, vaccine provider-client relationship, clients dissatisfaction with vaccination services and low frequency of static and outreach/mobile sessions (three sessions per week) and vaccines stock outs (19)<sup>i</sup>.

Another study conducted in Mtwara DC on factors associated with non-uptake of vaccine in 2017 shown that, coverage level were low (52% and 57%) than the WHO-recommended coverage of 90% and the national set coverage level of 95% due to Mothers education level, family size, low awareness and missed opportunities (20).

Several studies have come out with factors influencing HPV uptake categorized into three groups namely program related factors, beneficiary related factors, and health care provider related factors. Study conducted in 2016 on health care providers' perspectives on low HPV vaccine uptake and adherence in Appalachian Kentucky identified two reasons with beneficiary barriers to vaccination in their clinic as they believed that, young women were reticent to receive the vaccine because they just do not want to have a shot while second reason was the pain of the shot (13). Misconception was among the factors because they believed that young women from their area did not believe the HPV vaccine was important to their health (12) also that it was difficult for health care provider to change parents mind as per study in California in 2013 (13). Other factors reported included awareness, knowledge and education level of parents as per studies conducted on HPV vaccine uptake in Canada, United States of America and Norway in 2017 (15).

### **Proportion of eligible female adolescents received first and second dose**

In most cases for vaccination programs whether globally, Regional and local level, the first dose has been noted on high coverage compared to the second dose showing the high drop out. For example the study conducted in 2017 in Brazil aiming at estimating the coverage of the first and second dose of HPV vaccine by comparing cohorts of females aged 14, 15, and 16 years and investigation over the association between spatial heterogeneity in vaccination coverage and sociodemographic variables revealed that the percentage of adequate vaccination coverage was significantly higher in the first dose between 91.8% and 159.2%, regardless of the cohort. The coverage of the second dose was lower i.e between 7% and 79.9%. This

however concluded that even if the HPV vaccine stock pails were available through the Immunization Program, still there were factors contributed to a difficulty in achieving adequate vaccination coverage for second dose (21).

Based on the recently published information, WHO/UNICEF report released online on 31<sup>st</sup> December, 2020 for HPV vaccination coverage rates set for Cervical cancer elimination strategy in conjunction with analyzed data from 2010 to 2019 indicated that, there is backdrop of the 90% coverage target for HPV vaccination by 2030 set in the recently approved global strategy for cervical cancer elimination as a public health problem. By June 2020, 55% of the 194 WHO Member States introduced HPV vaccination. In low and middle-income countries (LMIC) where access had been limited, programs have had an average performance coverage of around 67% for the first dose and 53% for the second dose of HPV. LMICs performed on average better than high- income countries (HICs) for the first dose, but worse for the last dose due to higher dropout. Only 5 (6%) countries achieved coverages with the final dose of more than 90%, 22 countries (21%) achieved coverages of 75% or higher while 35 (40%) had a final dose coverage of 50% or less. When expressed as world population coverage (weighted by population size), global coverage of the final HPV dose for 2019 was estimated at 15%, (22).

Another study conducted in 2016 on HPV vaccine completion and dose adherence among females aged 9 through 26 years in the United States (US) observed that, HPV vaccination uptake in girls and young women since 2007 was still low as only 29.4% of the 378,484 females aged 9–26 years who initiated HPV completed the vaccination. The study further described that female who were receiving vaccines from primary care providers and OB/GYN providers were more likely to complete the vaccine series. Based on the number of females who completed HPV vaccination, 62.4% of them received all doses as recommended (23). Based on a retrospective cohort study conducted in United Kingdom (UK) in 2019 on adherence to the multi-dose vaccination schedules among adults data analysis reckoned that adherence to the hepatitis A/B recommended schedule was 56% for the second dose ( $n = 5822$ ) and 10% for series completion (receipt of the third dose;  $n = 1076$ ) by 6 months. Even in what the study called “adherence was greatest in the three middle age groups (50 to 69 years” the



completion of the second dose stood at 65% and 66%. Completion of the third dose was achieved by 3,276 adults (32%) increasing by 1% 3,417 (33%) (24).

Among the twenty-eight studies that were conducted in various countries shown low coverage rates at different levels, some at higher while others had very low rates. The HPV (at least 1 dose) vaccination uptake rate significantly varied among countries, ranging from 2.4% to 94.4%. Scotland achieved the highest uptake of all the studies included in this review, whereby Hong Kong had the lowest coverage rate standing at 2.4% to 9.1% (25). One of the study recommendation statement reads as "barriers to the uptake of the vaccine should be addressed, and that school-based health education of HPV infection and vaccine promotion should be reinforced" (25). The World Health Organization (WHO) highlights that only high coverage for this intervention provides for an opportunity for the protection of the vulnerable target population. Administrative HPV vaccination Coverage data by IVD Tanzania annual immunization report shows that since the introduction of the program in 2018 up to year 2019 there is an increasing trend; however, the proportion among vaccinated is low compared to unvaccinated in both years. 2018, the first and second dose (April to December) was 59% and 40% while in 2019 (Jan -Dec) was 78% and 49% respectively (26). This report indicates that Global HPV vaccination coverage levels among adolescent girls aged 13–17 years from the 2007–2012 although there is vaccine safety monitoring, the vaccination coverage with  $\geq 1$  dose of any HPV vaccine seem to have increased from 25.1% in 2007 to 53.0% in 2011 however, coverage in 2012 was 53.8% similar to 2011. Despite the availability of safe and effective vaccines, and ample opportunities for vaccine delivery in the health-care setting, vaccination coverage among adolescent girls, failed to increase from 2011 to 2012 as it remained low (8,27).

Completion of multiple-dose vaccine schedules (PHV vaccine second dose in this context) is crucial to ensure a protective immune response, and maximize vaccine cost-effectiveness. While barriers and factors to vaccine uptake have recently been addressed in some areas, there is less improvement in uptake of the vaccine especially the subsequent adherence or completion, which is key to achieving vaccination effectiveness (28).

A study conducted in the US on HPV vaccine completion and dose adherence among commercially insured females aged 9 through 26 years in the US recommended HPV vaccination the best intervention for HPV infection in girls and young women however, since the year 2007 the vaccine uptake level is still low in majority countries around the Globe (23).

Following coverage rates for neighboring countries taking Uganda's current study conducted on reasons for low HPV Vaccine uptake in 2020 shown the low coverage rate of HPV vaccine of 14% meaning that the bigger portion of eligible clients (86%) is left unvaccinated (3).

Coverage rate situation is different in Countries like Malawi, Rwanda, Democratic Republic of Congo, Cameroon. Malawi for instance had school class-based coverage for three consecutive years 2013 – 2015 achieved 86.5%, 91.1% and 83.3% respectively and Rwanda reported 93.2% in the same cluster. However, the same countries for general population coverage reported 52.7% in Malawi, less than 70% in the Republic of Rwanda and 50% - 60% for Cameroon (6,29,30).

Tanzania is in recognition as one among other good performing countries among sub-Saharan Countries on immunization services by Regional, continental and global organizations involved in Vaccination such as Global Alliance for Vaccines and Immunization (GAVI), WHO, CDC Immunization Strategic framework for reduction of Vaccine Preventable Diseases and so on to mention a few.

Adequate coverage is key to the success of human papillomavirus (HPV) vaccination programs. This study aims at determining HPV vaccine uptake level, as well as factors associated with low on none uptake in eligible girls in Tanzania during the second year of vaccine availability (7) and the uptake, should be intentionally increased through collaboration with partners and organs who have stake in the program (31).

Antigens like DTP1, DTP3 and MCV1 coverage has shown to improve for consecutive years since 2010 but with markable trend in 2019 i.e 109%, 105% and 102% respectively as shown in figure 2 however, MCV2 although not reached the target but remains up on trend.

According to annual Immunization report by IVD, the country has manifested a significant improvement on vaccination performances including IPV which was launched at the same time with HPV vaccine. In addition, MR2 coverage has steady increased over years from 71% in 2016 to 88% in 2019 which reflects an improved knowledge on provision of immunization services amongst health care providers around the country. Mentorship, coaching, data review workshops and supportive supervisions to the health workforce at all levels is an integral part of this achievement. HPV vaccine and Measles contained vaccine second dose are given to the new cohort and the coverage for both of them is far below the target (10).

The improved and Councils high performance trend of vaccination coverage rates from 2016 through 2019 for most antigens in Tanzania is very well known by numerous regional, zonal, continental and international entities strategies like WHO, CDC Global Health Immunization Framework, The Global Impact of Vaccines in Reducing Vaccine Preventable Diseases, Global Alliance for Vaccines and Immunization (GAVI) to mention a few.

It should be marked that, although HPV vaccine and Injectable Polio Vaccine (IPV) which is given once were launched together in Tanzania hence, the vaccination coverage rate has remained below the target level ( $\geq 80\%$ ) for HPV vaccine but higher on IPV for two consecutive years because of difference in target population and method of delivery schedule. IPV is integrated within the long-time existing vaccination schedule as opposed to HPV vaccine.

HPV Vaccination Coverage level performance trend by LGAs for the year 2019 for Tanzania mainland was aiming at 643,383 expected target population to receive the HPV vaccine but the performance was 59% (383,683) first dose and 40% (257,354) for second dose leaving a huge number of unimmunized amounting to 386,029 in 2018. Unimmunized in 2019 were 151,345 making big number (Pools) of under immunized eligible population in both years (11). Coverage for 2019 was 78% first dose and 48% second dose which is still far below the target.

During the first two months of the vaccine introduction, there was a good clients turn up in the first two to three months (April and May, 2018) of vaccine inauguration due to the delivery method used by most of the councils where the use of campaign approach was employed (26). Since the approach was not maintained then the coverage went lower.

Notwithstanding an increase of number of councils that achieved the coverage of HPV 2 above 80% from 7 to 20 out of 195 Councils in 2018 and 2019 respectively still the target coverage has not been attained yet as about 108 (55%) achieved below 50% of routine HPV vaccination coverage in 2019. For the purpose of enhancing immunization services equity, Tanzania is providing immunization services for free regardless of gender, social economic status and geographical boundaries (26). However, some differences between urban and rural residence are marked.

After the introduction, the performance of HPV 1 vaccination and HPV 2 vaccination for the second year of implementation had gradually increased from 59 % and 40% in 2018 and 2019 to 78% and 49 % respectively.

### **Factors associated with HPV vaccine first and second dose uptake among eligible female adolescents**

Factors that were associated with differences in coverage rates between the first and second doses were societal heterogeneity, the degree of urbanization such as households with private bathrooms in the municipality were better off, places with or without the outreach of vaccination coverage pointed a great differences in coverage (21).

Based on the studies conducted in High Income Countries (USA, The UK, Canada, France, Australia and some of the Low and Middle Income Countries (LMIC) in the year 2016 on factors influencing completion of multidose vaccine schedules in adolescents by which a systematic review for human papillomavirus vaccine was done included racial or ethnic groups, inadequate health insurance coverage, parental healthcare seeking behavior and vaccine delivery in schools. Others were community misconceptions, health facilities vaccine delivery system as well as Gender, prior healthcare use and socio-economic status (28).

On the other hand the study conducted in the US in 2016 on HPV vaccine completion and dose adherence among commercially insured females aged 9 through 26 years summarized factors influencing first and second dose uptake to be, age at HPV vaccine initiation, health insurance plan, seasonal pattern, and integration of flu vaccination with HPV vaccination. However, younger age up to 22 years and receipt of flu vaccine were negatively related to HPV vaccine dose adherence (23).

A retrospective cohort study on adherence to the multi-dose vaccination schedules among adults in the UK including hepatitis A and hepatitis B conducted in 2019 also indicated that, adherence and series completion rates for multi-dose vaccination schedule is challenging and uptake of vaccines in the UK are low. Identified contributing factors include low understanding and knowledge (24).

Additionally, the intervention study conducted in Indonesia from July to August 2017 in Kulon Progo district, Yogyakarta Province, Indonesia summarized the results with factors like low Parent's awareness, insufficient knowledge and negative perception, low acceptability among the community in the country. The study brought about an informative explanation that only 49.2% of parents had heard HPV infection and almost 48.8% had heard about the vaccine (32). Studies conducted from January 2006 to March 2015 in various Countries around the globe examined the reasons for low uptake of HPV vaccine to be awareness, knowledge, acceptability, and intention of adolescents concerning HPV vaccination (25).

Another study conducted in German on HPV Vaccine uptake among nine to 17 years old girls to assess factors affecting HPV vaccine uptake found that mothers' level of education, age and socio economic status influenced the vaccine uptake as high and medium education level and socio economic status were significantly accessed the inoculations (33).

Factors leading to low HPV vaccine uptake have been discussed by a considerable number of authors and researchers globally, Africa and different individual countries, for instance, German, the USA, Scotland, Hongkong, Uganda, Malawi including those found during a study in Low and Middle-Income Countries (LAMICs). In the Republic of Uganda and Malawi for instance after the study conducted recently in Uganda identified factors hampering HPV

uptake to be inadequacy in vaccines supply, inadequate or lack of training of health care providers, awareness and insufficiency of human resources. Other factors include unclear target population, Distance to the health facility, age, outreach and mobile cancellation, side effects of the vaccine, unfriendly health care workers and so on (3).

Effort by MoHCDGEC through IVD towards raising up HPV vaccine coverage rate Tanzania through MoHCDGEC under the IVD after it experienced low vaccination coverage, took some tremendous efforts and decision to implement for example a ration of sensitization and advocacy meetings, supportive supervision, data review and evaluation meetings and mentorship so as to enhance improvement of the vaccination of eligible girls. Community sensitization and advocacy meetings (Communication & advocacy strategy) for three consecutive months started in February through May aimed at increasing the uptake however, the situation even if it contributed to an increase of some kind, the coverage achieved remained below the predetermined starting coverage level. Other efforts included increasing number of health facilities providing immunization services at the sub-national levels, particularly the Councils. Starting from the year 2016 through 2019, the number of facilities providing immunization have had significantly increased from 5,983, 6,205, 6,387 and 6,497, respectively (26) along ensuring that there was, a continuous supply of vaccines at all levels. The results yielded after the implementation of these strategic efforts motivate me to conduct a study that is going to identify contributing factors to the HPV vaccine low vaccination coverage rates. The purpose of this study is to explore and summarize direct factors, associated and the facilitators of and barriers to HPV vaccination among school female adolescents the are affecting completion of multi-dose HPV vaccine schedule in Missenyi DC.

By reflection of other different studies, all provided for recommendations for mitigation strategies to improve the situation. Likewise, the information gathered in this study will have significant implications for the drawing up of necessary health strategies for vaccination program to promote the uptake of HPV vaccination in future. The human papillomavirus (HPV) vaccine is a safe and effective cancer prevention abstract method that is underutilized in the URT (34). Despite the strategies for improving vaccination rate employed in the land

from February through May and on later times in 2019, the rates have remained low below the target (2,4). However, the need to effectively identify feasible and relevant inhibitors for raising immunization coverage level is of paramount importance and very necessary (34) due to the fact that those implemented for three months' time and later didn't bringing up the desired outcome as were thought.

### **Barriers of HPV Vaccine uptake based on key informants' responses and information**

Factors for HPV uptake in Missenyi emanated from the key informants' responses included shortage of staff, outreach and mobile services cancellation, inadequate funding and improper vaccination data management (lack of defaulters tracing and non-tracking of dropout rates). This is similar with the study conducted on factors that were associated with coverage rates between the first and second doses revealed barriers to be geographical location and degree of urbanization, places with or without the outreach of vaccination services as well as that of 2020 February in Uganda Mbale, Lira districts and the which summarized the barriers to be shortage of staff, untrained workforce, no outreach services, inadequate primary health care funding, unfriendly health care workers, misconceptions about the vaccine, erratic vaccine supplies, fear of side effects and the like (3,15,16,28).

Other studies conducted in different countries through a systematic review on the uptake of HPV vaccination and its associated factors among adolescents; summarized them into misconceptions, distance, perceptions and safety of the vaccine. The same indicated vaccine completion barricades to be ages of vaccine recipients, caregivers' perception and transportation issues that could be the reason preventing the clients from returning for vaccine completion dose but also intention to complete the 2<sup>nd</sup> dose series (15). In two studies conducted in the year 2011 by Sharon et al on factors associated with HPV vaccine uptake in teenage girls evaluated that shorter distance between home and the vaccination center as well as parents' education were significantly associated with higher vaccine uptake and generally geographic region was also found to an influence on the vaccine uptake. Others were (15,36). Based on young age starting at 12 years female adolescents, the misconception also was noted as the parents thought that their children were too young to start vaccination therefore had to

wait till they get older hence summarized the two studies report that, older adolescents were more likely to complete the vaccine series program (37).



## **2.0 METHODOLOGY**

### **2.1 Study Design**

A Cross-Sectional survey was conducted among female adolescents in secondary schools who were 14 years old in 2019 in Kagera region who are currently 16 years old.

### **2.2 Study Area**

The Study area was Missenyi DC in Kagera region which is one among the low vaccination coverage performing councils with coverage level (44% & 24%) below the set target ( $\geq 80\%$  for both 1<sup>st</sup> and 2<sup>nd</sup> Dose). According to PORALG web site on profiles Kagera region is one among the 26 regions of Tanzania mainland located in the Lake Zone and it shares borders with Uganda to the north, Rwanda and Burundi to the west, the region of Kigoma to the south, and the region of Geita to the east. The region is known for its agriculture, its beautiful lush landscapes, and its wildlife. The Kagera River forms the region's border with Rwanda. Kagera is composed of eight councils among which Missenyi is inclusive. Others are Bukoba DC, Bukoba MC, Biharamulo DC, Muleba DC, Karagwe DC, Kyerwa DC, and Ngara DC. Missenyi DC to which the study was directed is one of the eight Councils of Kagera Region of Tanzania mainland. It is bordered to the north by Uganda, to the east by Bukoba Rural District, to the south by Karagwe District and to the west by Kyerwa District. According to the 2012 Tanzania National Census, the population of Missenyi District for 2019 was estimated to be 258 319 habitats housed in about 53,816 households at the household population average rate of 4.8. The Council has a total number of two divisions namely Missenyi and Kiziba, 20 wards, 77 registered villages and 356 hamlets. Other institutions available in the Council include 37 health facilities, 27 secondary schools and 104 primary schools (38). Building on the annual immunization data for the year 2019 report, the district has had an estimated number of 3 397 eligible female adolescents for HPV vaccination by the year 2019 from which the sample was obtained.

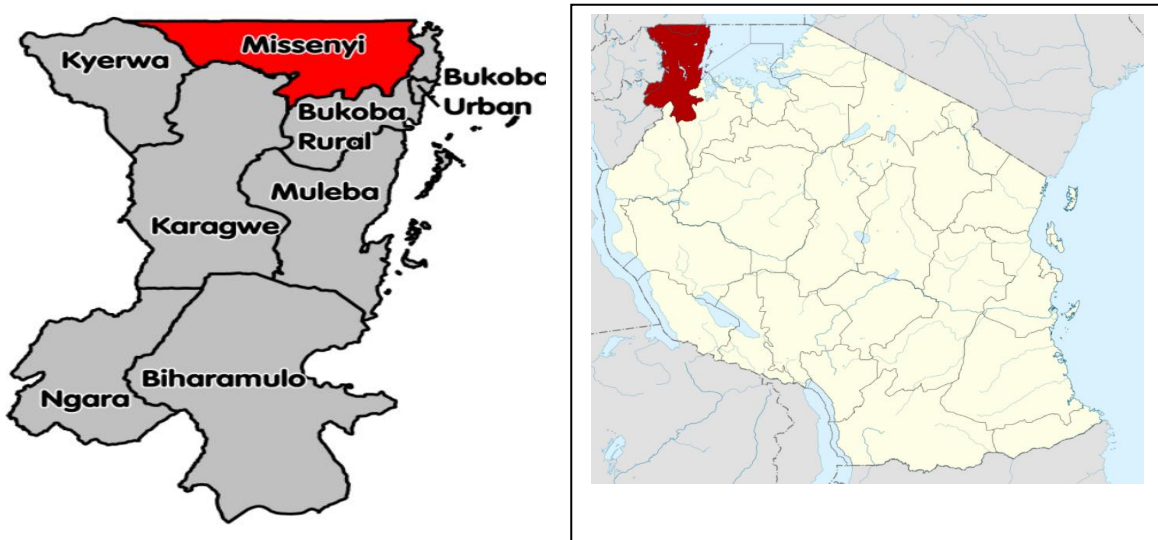


Figure 2: Kagera map showing Missenyi DC & Tanzania map showing Kagera region

### 2.3 Sampling Procedure

Probability sampling was done using multi-stage sampling i.e Cluster simple random sampling (The Probability Proportional to Size) where secondary schools were considered to be clusters. Sampling was started by randomly selection of Missenyi district from a large number of least performing councils by lottery method. From which ten schools among the existing 27 were selected for study enrollment. Sample size of 450 was targeted considering that, only 45 eligible participants from each of the 10 schools were to be recruited to participate. Nevertheless, a weighted sampling was used to obtain study individuals through a non-replacement lottery method where each study unit from the sampling frame was assigned a unique number and picked randomly. Pieces of paper with numbers were mixed up and picked in each school till the sample size from each of the schools was reached. Recruitment of eligible participants per school depended on the weighted calculation among schools. Selection of 14 schools was randomly conducted to have alternative site to enroll more participants in case 10 sampled schools would not provide the required number of participants (30, 31).

## **2.4 Study Duration**

The study was executed for the estimated duration of five months from data collection to the dissertation production. The study involved one month of data collection, three months of data processing, data accuracy checks (Data cleaning), analysis and a month for dissertation report writing.

## **2.5 Study Population and Study Site**

Study population was the secondary school eligible female adolescents who were 14 years old by the year 2019 in Missenyi DC whereby the secondary school girls were picked. The number of adequate study participants (Population) from the sampling frame of 3,397 eligible female adolescents in the council for the year 2019 (Girls aged 14 years) was determined. Based on the ten sampled secondary schools' clusters from which the study population was drawn, a total of 450 weighted participants of the required age were obtained as follows; Kyaka secondary school (35), Kilimilile (35), Kagera (62), Nsunga (52), Bunazi (29), Bugandika (64) and Bwabuki (5). Others included Minziro (22), Kikukwe (80) and Gera (66). Six key informants three health care providers from health facilities and three immunization officials at Regional and Council levels were engaged in the study to acquire more information about the study.

Based on studies conducted over memory retention and retrieval, the explicit or declarative type of memory particularly the episodic (the long-term memories) of specific events, such as what you did in the past that describes the functions of short (Working) and longtime memory and retrieval mechanism in human (20,21), the selected participants were those whose vaccination inoculation was to take place at the age of 14 years old by 2019 whom today are 16 years old, hence the interval of only two years to avoid recall bias.

## 2.6 Sample Size

### 2.6.1 Sample size estimation for quantitative data

A minimum sample size was computed by using the following formula with a incidence of 44% of eligible female adolescents who were vaccinated against HPV as was observed in the Tanzania immunization annual report ((10,12)). We employed the sample size calculation using Leslie Kish formula (1965) to obtain the study population.

The estimated number of study participants for quantitative interview study was 450 after a non-response rate was set at 15%.

Formula for sample size is hereby shown to indicate how the sample size was obtained.

$$n = \frac{z^2 * p * q}{d^2}$$

n = Sample size

Z = Alpha risk expressed in z-score (1.96)

p = Expected prevalence (44%)

q = 1-p

d = Margin of error (Absolute precision set at 5)

$$\frac{1.96^2 * 44 (100-44)}{5^2}$$

**n= 379.**

Taking into account non response or drop-out rate of 15% then, minimum sample size will be **n= 379/0.85**. Therefore, the minimum sample size **n = 450**

### 2.7 Sample size estimation for qualitative data

Six key informants purposeful selected from three health care facilities and three from regional and council involved with immunization services were selected.

## **2.7 Inclusion Criteria**

Eligible female adolescents aged 14 years in the year 2019.

## **2.8 Exclusion Criteria**

Eligible female adolescents who were not in Missenyi DC by the year 2019

Eligible female adolescents who received the shot (s) before and after the year 2019

## **2.9 Variables**

### **2.9.1 Independent Variables**

Independent variables summarized (broadly indicated in the conceptual framework)

- Health Care Provider related factors which were training of health staff, knowledge and skills outreach/mobile services implementation, immunization schedule, missed opportunities, unfriendly health care providers, safety and side effects of vaccines data management issues and defaulters tracking.
- Beneficiaries related factors which were attitude towards HPV vaccine, misconception, awareness, safety/side effects and perceptions. Others included cultural values, religious matters, acceptability and family/parental decision, individual adolescents' factors, education level of parents/guardians, parents' occupation, education level of parents and students' class level and type of school attended (Day or boarding) and Distance to the unit providing immunization.
- Program related factors were Supply chain, distance to the health facility providing immunization and supportive supervision. Other hypothetical facilitators of low vaccination coverage were unclear target population, outreach and mobile services as well as location of the health facility (Distance between students' residence and the immunizing facility).

### **2.9.2 Dependent Variable**

- HPV vaccine uptake

The dependent variable was the uptake of the HPV vaccine with two outcomes either uptake yes or no in both first and second dose.

## **2.10 Data Collection Methods**

### **2.10.1 Data collection for quantitative method**

I as principal researcher collected data with support from assistant researchers who were trained on the data collection tools and method of sampling of respondents for two days sessions. A structured questionnaire was used to collect data, whereby those 450 study participants weighted for equal contribution of participants among schools who also assented to participate were face to face interviewed by which the responses were obtained. A total of 10 secondary schools were physically visited for questionnaire administration to the participants who were eligible but also whose assent was provided. All school from which we obtained respondents were day time scholars.

### **2.10.2 Data collection for qualitative method**

About six key informants who are involved in immunization services were consulted. Three among them were health care providers from three health facilities providing immunization services, two from district council level and one from the regional level so as to explore more information about the influencers of HPV vaccine uptake. The interviewed Regional and Council officials were those responsible for vaccination program. A guiding principle for key informants in this research was such that saturation of information gathered was reached (42). Qualitative data were collected using key informants' interview (KII) guide.

A social scientist who is good in conducting qualitative study with good techniques to probe for more information and clarifications to obtain rich data explored the participants adequately for details about their understanding on the possible factors hindered HPV vaccination coverage and behaviours that might have influenced the situation in school-based vaccination program till when saturation was reached.

Resources required for data collection included human (researcher, research assistants, interviewers and supervisors for technical support and right direction), time (period allocated for data collection), finances (funds for allowances and travelling costs), materials and tools (computer laptop, stationery, secretarial services) and transport facilities to and from the research sites and various places as the need arose.

### **2.11 Investigation tools, validity and reliability Issues**

Structured questionnaire was used when asking investigative questions to help obtaining the needed information. Jack-knife validity was conducted to various identified factors contributing to low uptake of HPV vaccine as per conceptual framework so as to control variances and bias as well as increasing reliability of interventions (43). For key informants the KII was used

### **2.12 Validation of Tools**

The data collection designed tool were pretested for their validity and consistence.

### **2.13 Data Analysis**

All responses obtained were checked for completeness of the questionnaire after each interview. Data entry, cleaning and graph plotting was done through the use of Excel (Microsoft office 2016) and imported into STATA version 15.1 for data analysis. Simple descriptive analysis was presented using tables and figure. Association between independent and dependent variable was assessed using chi-square (fisher's exact test in cells with less than 5 observation) and variables with  $p$ -value,  $<0.05$  was considered statistically significant. Variables within  $p$ -value,  $<0.2$  in chi-square, were subjected to Poisson regression analysis to measure the strength of association. Since the outcomes was (HPV dose one and two uptake) found to be common by having a value of more than 15% (44). This is often preferred over logistics regression since odds ratio tend to overestimate the prevalence ration when the outcome is common (45). Regression analysis was clustered by school.

Data analysis involved descriptive as well as analytical statistics on diverse variables like distance from the facility, participants class level, guardians' level of education, residence and awareness to mention a few, were summarized. Association between dependent and independent variables were considered statistically significant at  $p$ -value, of  $<0.05$ .

Significant statistical variables were analyzed using modified Poisson regression adjusted for 10 school cluster was conducted to control for confounders.

Univariate analysis for uptake of HPV vaccine variable was conducted so as to determine proportion of individuals vaccinated against HPV infection while multivariate analysis was conducted between two independents (associated factors) for checking collinearity,

independent and dependent variables for measuring association and strength of association by using modified Poisson regression and stratification of the factors instituted to control for confounders.

The Jack-knife validity test will be conducted for various contributing factors to control variances and bias (43).

#### **2.14 Ethical Clearance**

This study was executed after all necessary ethical issues were observed. This include an ethical clearance which was sought from Muhimbili University of Health and Allied Sciences (MUHAS) Directorate of Research and Publications and The National Institute for Medical Research (NIMR). Permission to undertake the study was obtained from the Permanent Secretary of the President's Office, Regional Administration and Local Government (PORALG), followed by the Director of Missenyi DC and finally two responsible departments of Secondary Education as well as Health Department.

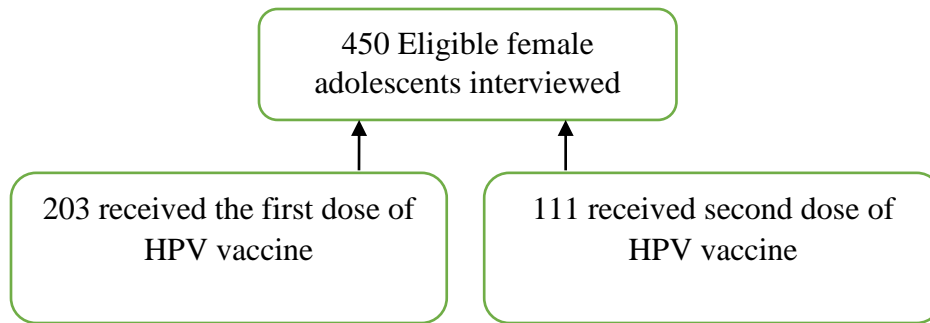
Potential participants and their parent/guardian(s) were informed about the study and the written consent was obtained from all visited schools' administrations on behalf of the parents/guardians because all interviewed students were less than 8 years of age. Verbal assent was also obtained from both the interviewees and school administration for each school before questionnaires were administered.

I as well provided an assurance that all information collected would be confidentially treated and used for the study purpose and not otherwise.



### 3.0 RESULTS

A total of 450 participants were invited and interviewed, the results on HPV Vaccine first and second dose uptake in Missenyi DC are summarized here diagrammatically.



**Figure 3:** Participants interview and uptake flow chart

Study population was the secondary school eligible female adolescents who were 14 years old by the year 2019 in Missenyi DC. The number of adequate study participants (Population) from the sampling frame of 3,397 eligible female adolescents in the council for the year 2019 (Girls aged 14 years) was determined. Based on the ten sampled secondary school clusters from which the study population was drawn, a total of 450 weighted participants of the required age were obtained as follows; Kyaka secondary school (35), Kilimilile (35), Kagera (62), Nsunga (52), Bunazi (29), Bugandika (64) and Bwabuki (5). Others included Minziro (22), Kikukwe (80) and Gera (66).

#### **Socio-demographic characteristics of participants recruited in the study**

A total of 450 secondary school eligible female adolescents out of 1,223 were randomly recruited in this study. About forty-three (43) percent were in form three and fifty-five (55) percent reported to reside with both parents. About two third (68.2%) and around half (52%) of the parents had primary school level of education and were peasants. About sixty-nine (69) percent reported to reside in rural and 84.4% were residing in the same area since 2019 as table 1 summarizes these findings.

**Table 1:** Socio-demographic characteristics of the studied population (N=450)

<b>CHARACTER</b>	<b>FREQUENCY (n)</b>	<b>PERCENTAGE (%)</b>
<b>Students' Educational Class level</b>		
Form I	62	13.8
Form II	160	35.6
Form III	196	43.6
Form IV	32	7.0
<b>Student's residence with parent/guardian</b>		
Both Parents	250	55.6
Father	15	3.3
Mother	117	26.0
Other relatives	68	15.1
<b>Guardians'/parents' Education level</b>		
None	11	2.5
Primary school	307	68.2
Secondary school	86	19.1
University/College	46	10.2
<b>The Guardians'/parents' Occupation</b>		
Unemployed	36	8.0
Self employed	122	27.1
Employed	58	12.9
Peasant	234	52.0
<b>Student's area category of residing in 2019</b>		
Urban	140	31.1
Rural	310	68.9
<b>Same area residence since 2019</b>		
Yes	70	15.6
No	380	84.4

On an approximate, 92% of the student respondents reported to be aware of the HPV vaccine. Schools were identified as the most common source of information (70.2%) followed by media (13.3%) while the least was other sources (1.3%). Figure 5 demonstrates the findings.

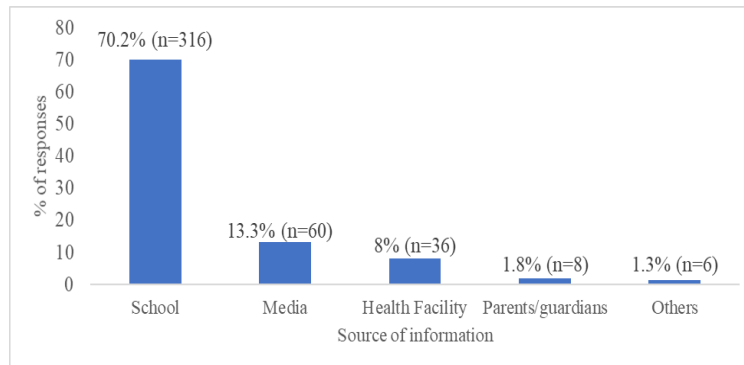


Figure 4: Respondents' source of information on awareness for the first dose in Missenyi

#### HPV vaccine first dose uptake

About 45% of the participants were reported to have received the first dose of HPV vaccine in Missenyi DC in the year 2019 as shown in figure 6. Majority (53%) of the participants received vaccine at school and the rest received vaccine at the health facilities.

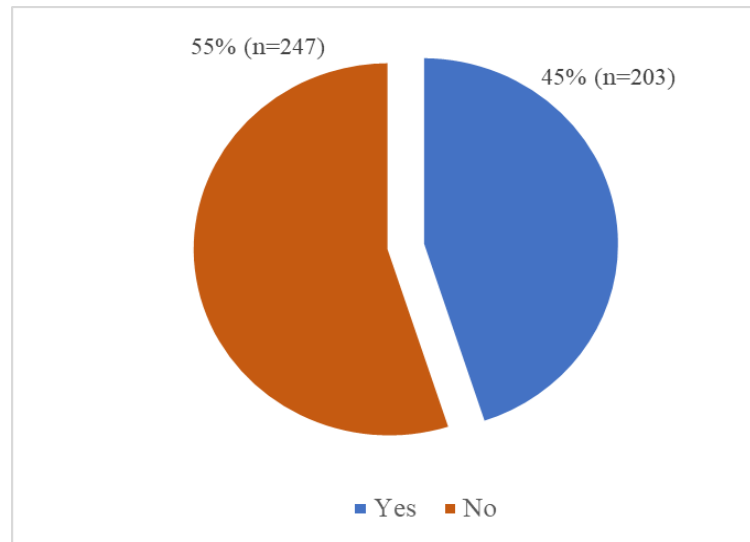


Figure 5: HPV vaccine first dose uptake in Missenyi DC among eligible females in the year 2019

**Factors associated with HPV vaccine first dose uptake**

Seventy-two percent of the form IV respondents reported to have received the first dose of HPV vaccine compared to 42% of the form I respondents ( $p$ -value,  $< 0.01$ ). Forty five percent of participants who reported to reside with both parents received HPV first dose while only 35% of those living with other relatives were vaccinated ( $p$ -value, 0.018).

More than half (52.2%) of the participants whose parents/guardians had university/college education level got vaccinated compared to 45% of those whose parents/guardians had informal education level ( $p$ -value, 0.780). Sixty one percent of the participants whose guardians were unemployed were vaccinated compared to 50% of participants whose parents were employed ( $p$ -value, 0.018) as of table 2.

**Table 2:** Association between socio-demographic characteristics and first dose uptake of HPV Vaccine among 14-year-old female adolescents in Missenyi DC

Character	HPV Vaccine		Total	P value
	Received, n (%)	Not received, n (%)		
	203 (45)	247 (55)		
<b>Students' Educational Class level</b>				
Form I	26 (41.9)	36 (58.1)	62	<b>&lt;0.001</b>
Form II	48 (30)	112 (70)	160	
Form III	106 (54.1)	90 (45.9)	196	
Form IV	23 (71.9)	9 (28.1)	32	
<b>Students' residence with guardians</b>				
Both Parents	113 (45.2)	137 (54.8)	250	<b>0.018</b>
Father	3 (20)	12 (80)	15	
Mother	63 (53.9)	54 (46.1)	117	
Other relatives	24 (35.3)	44 (64.7)	68	
<b>Guardians'/parents' Education level</b>				
None	5 (45.5)	6 (54.5)	11	<b>0.780</b>
Primary school	135 (44.0)	172 (56.0)	307	
Secondary school	39 (45.3)	47 (54.7)	86	
University/College	24 (52.2)	22 (47.8)	46	
<b>The Guardians'/parents' Occupation</b>				
Unemployed	22 (61.1)	14 (38.9)	36	<b>0.018</b>
Self employed	62 (50.8)	60 (49.2)	122	
Employed	29 (50.0)	29 (50.0)	58	
Peasant	90 (38.5)	144 (61.5)	234	
<b>Student's area of residence in 2019</b>				
Urban	70 (50.0)	70 (50.0)	140	<b>0.161</b>
Rural	133 (42.9)	177 (57.1)	310	
<b>Same area residence since 2019</b>				
Yes	30 (42.9)	40 (57.1)	70	<b>0.680</b>
No	173 (45.1)	207 (54.9)	380	

Participants who were form four students were significantly more likely to receive HPV vaccine first dose compared to form one students in both bivariate [1.71 (1.18 – 2.49)] and multivariate [1.63 (1.13 – 2.82)] analysis. Respondents resided with their fathers were less likely to receive HPV vaccine first dose compared to those who resided with both parents in both bivariate [0.44 (0.24 – 0.83)] and in multivariate [0.40 (0.20 – 0.82)] analysis. Respondents resided with other relatives were less likely to receive HPV vaccine first dose compared to those who resided with both parents in both bivariate [0.78 (0.65 – 0.94)] and in multivariate [0.78 (0.65 – 0.94)] analysis. Respondents whose guardians'/parents were unemployed were more likely to receive HPV vaccine first dose compared to those whose guardians/parents were peasants in both bivariate [1.60 (1.23 – 2.08)] and in multivariate [1.25 (1.02 – 1.73)] analysis table 3 illustrates the findings.

Table 3: Modified Poisson regression analysis on factors associated with uptake of first dose of HPV vaccine

<b>Variable</b>	<b>PR (95% CI)</b>	<b>p-value</b>	<b>APR (95% CI)</b>	<b>p-value</b>
<b>Students' Educational Class level</b>				
Form I	1			
Form II	0.72 (0.44 – 1.16)	<b>0.173</b>	0.72 (0.32 – 2.15)	<b>0.147</b>
Form III	1.28 (0.89 – 1.85)	<b>0.177</b>	1.24 (0.83 – 1.85)	<b>0.285</b>
Form IV	1.71 (1.18 – 2.49)	<b>0.005</b>	1.63 (1.13 – 2.82)	<b>0.011</b>
<b>Student's residence with Parents</b>				
Both Parents	1			
Father	0.44 (0.24 – 0.83)	<b>0.010</b>	0.40 (0.20 – 0.82)	<b>0.012</b>
Mother	1.20 (0.99 – 1.44)	<b>0.055</b>	1.61 (0.89 – 1.39)	<b>0.427</b>
Other relatives	0.78 (0.65 – 0.94)	<b>0.010</b>	0.78 (0.65 – 0.94)	<b>0.008</b>
<b>The Guardians'/parents' Occupation</b>				
Peasant	1			
Unemployed	1.60 (1.23 – 2.08)	<b>&lt;0.001</b>	1.25 (1.02 – 1.73)	<b>0.014</b>
Self employed	1.33 (0.98 – 1.80)	<b>0.067</b>	1.23 (0.91 – 1.68)	<b>0.189</b>
Employed	1.31 (1.05 – 1.62)	<b>0.014</b>	1.25 (0.93 – 1.71)	<b>0.148</b>
<b>Student's area of residence in 2019</b>				
Rural	1			
Urban	1.15 (0.90 – 1.49)	<b>0.254</b>	1.18 (1.01 – 1.57)	<b>0.277</b>

\*Adjusted for 10 school cluster

**Table 3:** Modified Poisson regression analysis on factors associated with uptake of first dose of HPV vaccine

*\*Adjusted for 10 school cluster*

### HPV vaccine second dose uptake

About fifty five percent of the participants received the second dose of HPV vaccine in Missenyi DC in the year 2019 as shown in figure 7. Majority (81%) of the participants received vaccine at health facilities and the rest (19%) received vaccine at their schools.

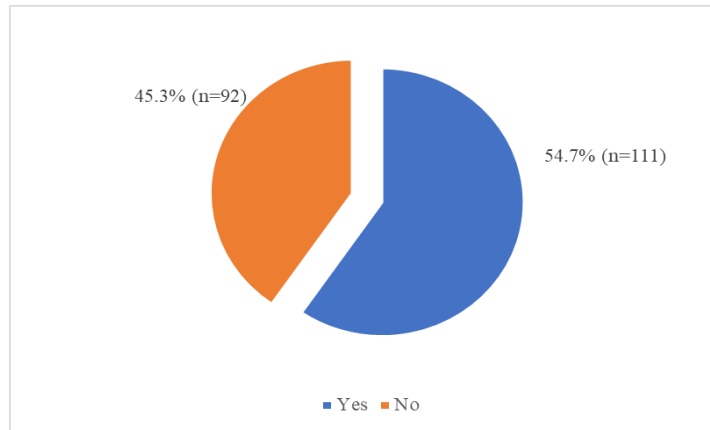


Figure 6: HPV vaccine second dose uptake in Missenyi DC among eligible females in the year 2019

### Factors associated with HPV vaccine second dose uptake

About 54.7% (111/203) of the participants who received the first dose were reported to be vaccinated for the second dose of HPV Vaccine. Over 63% of the form III respondents reported to have received the second dose of HPV vaccine compared to 26.9% of form I respondents ( $p$ -value, 0.009). The 59.3% of participants who reported to reside with both parents received HPV second dose while those who resided with father parent were 33.3% ( $p$ -value, 0.476).

More than half (54.2%) of the participants whose parents/guardians had higher level of education (university/college) got vaccinated compared to 52.6% of those whose parents/guardians had primary education level ( $p$ -value, 0.558). About Sixty-seven percent of

the participants whose guardians were self-employed were vaccinated compared to 45.6% of the participants whose parents were peasants ( $p$ -value, 0.063). Table 4 summarizes the findings of the respondents who were vaccinated for second dose.

Table 4: Association between socio-demographic characteristics and second dose uptake of HPV Vaccine among 14-year-old female adolescents in 2019 in Missenyi DC

Characters	HPV Vaccine		Total	P Value
	Received (n, %)	Not received (n, %)		
	<b>111 (54.7)</b>	<b>92 (45.3)</b>		
<b>Students' Educational Class level</b>				
Form I	7 (26.9)	19 (73.1)	26 (100)	
Form II	24 (50.0)	24 (50.0)	48 (100)	
Form III	67 (63.2)	39 (36.8)	106 (100)	
Form IV	13 (56.5)	10 (43.5)	23 (100)	<b>0.009</b>
<b>Student's residence with guardians</b>				
Both Parents	67 (59.3)	46 (40.7)	113 (100)	
Father	1 (33.3)	2 (66.7)	3 (100)	
Mother	31 (49.2)	32 (50.8)	63 (100)	
Other relatives	12 (50.0)	12 (50.0)	24 (100)	<b>0.476</b>
<b>Guardians'/parents' Education level</b>				
None	2 (40.0)	3 (60.0)	5 (100)	
Primary school	71 (52.6)	64 (47.4)	135 (100)	
Secondary school	25 (64.1)	14 (35.9)	39 (100)	
University/College	13 (54.2)	11 (45.8)	24 (100)	<b>0.558</b>
<b>The Guardians'/parents' Occupation</b>				
Unemployed	12 (54.5)	10 (45.5)	22 (100)	
Self employed	42 (67.7)	20 (32.3)	62 (100)	
Employed	16 (55.2)	13 (44.8)	29 (100)	
Peasant	41 (45.6)	49 (54.4)	90 (100)	<b>0.063</b>
<b>Student's area category of residing in 2019</b>				
Urban	43 (61.4)	27 (38.6)	70 (100)	
Rural	68 (51.1)	65 (48.9)	133 (100)	<b>0.161</b>
<b>Same area residence since 2019</b>				
Yes	18 (60.0)	12 (40.0)	30 (100)	
No	93 (53.7)	80 (46.3)	173 (100)	<b>0.526</b>



Participants who were form four students were significantly more likely to receive HPV vaccine second dose compared to form one students in both bivariate [1.23 (1.05 – 1.44)] and multivariate [1.27 (1.07 – 1.50)] analysis. Respondents whose parents are self-employed were significantly more likely to receive the second dose of HPV vaccine compared to those whose parents were peasants in both bivariate [1.15 (1.02 – 1.29)] and in multivariate [1.11 (1.00 – 1.23)] analysis. Interviewees who resided in urban settings were more likely to receive HPV vaccine second dose compared to those who resided in rural areas [1.07 (0.97 – 1.18)] and in multivariate [1.04 (0.94 – 1.14)] as demonstrated in table 4B by the modified Poisson regression. Table 5 demonstrates the findings

Table 5: Modified Poisson regression analysis on factors associated with uptake of second dose of HPV vaccine

<b>Variable</b>	<b>PR (95% CI)</b>	<b>p-value</b>	<b>APR (95% CI)</b>	<b>p-value</b>
<b>Students' Educational Class level</b>				
Form I	1			
Form II	1.18 (1.02 – 1.36)	<b>0.018</b>	1.17 (1.03 – 1.33)	<b>0.016</b>
Form III	1.29 (1.05 – 1.57)	<b>0.014</b>	1.27 (1.06 – 1.52)	<b>0.010</b>
Form IV	1.23 (1.05 – 1.44)	<b>0.009</b>	1.27 (1.07 – 1.50)	<b>0.005</b>
<b>The Guardians'/parents' Occupation</b>				
Peasant	1			
Unemployed	1.06 (0.90 – 1.25)	<b>0.462</b>	1.01 (0.82 – 1.26)	<b>0.906</b>
Self employed	1.15 (1.02 – 1.29)	<b>0.020</b>	1.11 (1.00 – 1.23)	<b>0.040</b>
Employed	1.07 (0.96 – 1.18)	<b>0.223</b>	1.03 (0.95 – 1.13)	<b>0.454</b>
<b>Student's area of residing in 2019</b>				
Rural	1			
Urban	1.07 (0.97 – 1.18)	<b>0.194</b>	1.04 (0.94 – 1.14)	<b>0.458</b>

### Barriers for HPV vaccine uptake

About 13% of the respondents had misconception about HPV that hindered the uptake of the vaccine. Distance from between residence of the respondents and vaccination point (7.3% and prohibition by parents (2.2%) were the second and third common barriers for HPV vaccine uptake respectively. Figure 7 shows the findings.

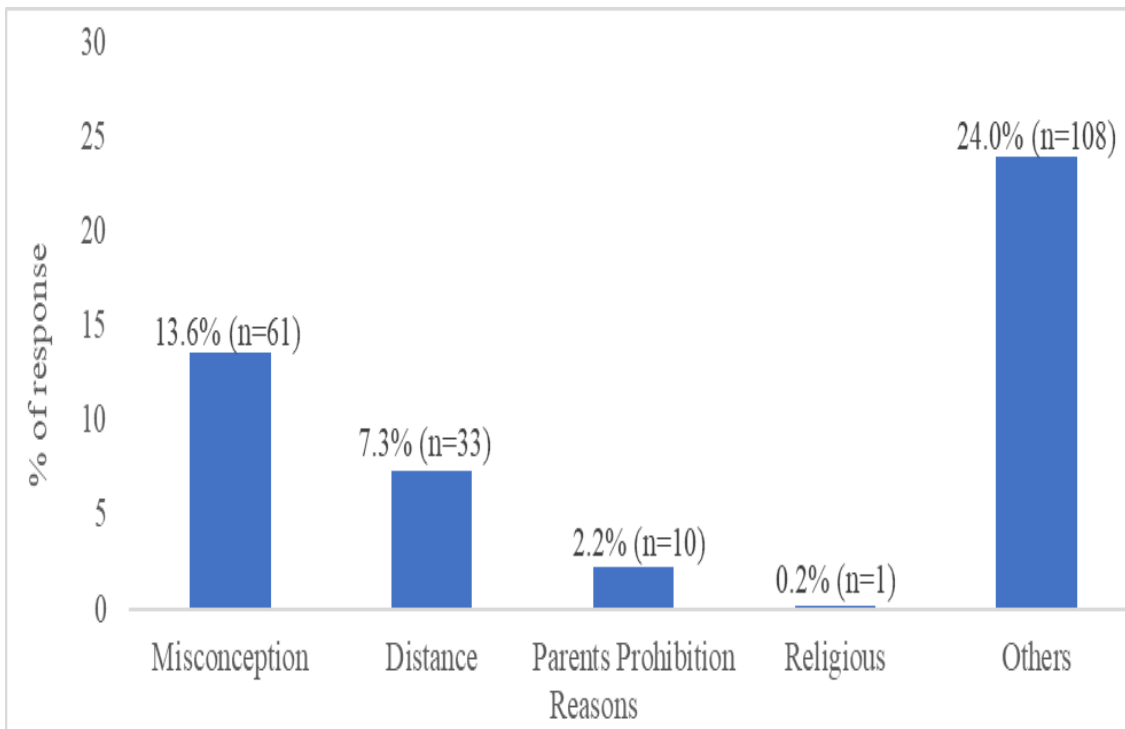


Figure 7: Barriers for HPV vaccine uptake in Missenyi DC, 2019

This study was additionally explored in a qualitative approach, for exploration of more possible reasons to why low PHV vaccine uptake. Six key informants who are involved in immunization services purposefully selected were engaged. Three were from health facility level (health care providers) two from council level and one from regional level helped to provide more information about HPV vaccination status where the discussion was stopped when saturation was reached i.e no new or different information was obtained from the interviewees.

It was revealed that inadequate health workforce, insufficient funding and lack of transport contributed much to low coverage rates in the area. While highlighting on reasons the interviewed key informants on responding to the researcher's interrogations said;

*Here at Bunazi health center we were not able to conduct the planned outreach after the first dose because of being very few. We prioritized providing vaccination services at static sessions because it wouldn't be fair leaving clients who visited the health facility unserved at the health facility and go for outreach. Initially the approach was to go out reaching students at their schools and vaccinate them especially during the first dose but later on we were not able to go any more (KII May, 2021). There was cancellation of mobile services during the first dose but it went massive for the second dose she added.*

Alike narrations were also given by other key informant respondent in her notes she said:

*We did not manage to go out since we couldn't obtain fuel and vehicle to take us there for vaccination at schools because some schools are very far away from here (the vaccinating facility) up to 15 kilometers. Some times during rainy season some schools became difficult to reach due to floods (KII May, 2021).*

Another key informant from council level said;

*Inadequate funding for the program was one of the obstacles as it contributed much to outreach cancellation. Only 55% of the budgeted activities were funded with a shortfall of up to 45% of the required funding which made fueling of vehicles and repairs difficult hence cancellation of most mobile services (KII June, 2021).*

*If you look into data you shall see for the dose one most clients were vaccinated at their schools but later, we didn't send vaccinators to the*

*schools, we were not able to pay for the trips so those few who got vaccinated were at health facilities. There has not been any stock out for both the vaccines nor injection materials but shortage of personnel. We are sure that we did a lot about sensitization and mobilization for the antigen and most clients were eager to get vaccinated but we didn't fulfill all that we were supposed to undertake because even the first dose was not as higher to the required coverage rate (KII June, 2021).*

#### **4.0 DISCUSSION**

This study revealed that generally the level of awareness about HPV vaccine was high although, the uptake in the district for both doses was far below the national set target of  $\geq 80\%$ . Factor that contributed to the low uptake included guardians' occupation and level of education, with whom the students' lived, students' class level, distance between the vaccinating facilities, misconception and outreach and mobile immunization services cancellation, shortage of human health workforce and the parents' prohibition. It is therefore thought that it is indeed possible to improve the uptake by just reviving the outreach and mobile services and increase the number of health staff.

#### **Proportion of eligible female adolescents who received first dose in Missenyi DC in 2019**

The study results indicated HPV vaccine low uptake of the first dose below the national set coverage level Findings from other studies on uptake of HPV vaccination among girls in Germany in 2016, shown that during the first year of HPV vaccine availability the uptake was even lower that of Missenyi DC(33). The California study through Health Interview Survey (CHIS) in 2007 revealed that 26 % of girls with age from 13 to 17 years received at least one dose (46). For Hong Kong and pan- Canada studies recorded the lowest uptake from 2.4% to 9.1% and 1.1% respectively (25). The differences between different studies are due to different geographical factors, customs and degree of awareness on HPV vaccine. Based on the five studies on awareness about HPV vaccine, only 40.3% of Hong Kong respondents said to be aware of the HPV vaccine while adolescents in Latvia had less awareness over HPV vaccine of 9.9% (25).

### **Factors associated with HPV vaccine first dose uptake among eligible female adolescents in Missenyi DC as of the year 2019**

In this study, it was found that, with whom the students resided, the guardians' occupation and students' class level highly contributed to low uptake of HPV vaccine first dose. Others included parents' level of education, place of residence as those lived in rural settings were more exposed to vaccines low uptake. About half of the parents who had university level of education their children were vaccinated compared to parents who had non-formal where only 5 of 11 of their children were vaccinated ( $p$ -value, 0.780). Similar results were found in studies conducted between 2006 and 2015 in Hong Kong reported that a higher level of parents education had their children positively associated with the uptake of the HPV vaccine. The study indicated that, girls whose mothers had a tertiary education were over twice more likely to be vaccinated against HPV than those who were less educated (15). Similar findings were obtained in the study conducted in Mtwara DC in 2017 where education level was significantly associated with uptake of vaccine (20). Similar results were obtained in the studies conducted in German from 2016 – 2019 on factors influencing uptake of HPV vaccination among girls which revealed that Education level of the parents was proportionally significant predictor for girls having been vaccinated (18).

### **Proportion of eligible female adolescents who received second dose in Missenyi DC in 2019**

The study shown that, HPV vaccine uptake for second dose was low than the set target as about only a quarter of the national targeted coverage level was attained. This shows a high drop-out rate of up to 45.3% of the first dose beyond the recommended drop-out rate which stands at 10% for multidose antigens. The same findings were reported by a study conducted in Ileje DC in Songwe region of Tanzania in 2016 over two dose vaccination completion which revealed underutilization of vaccines to be a challenge in the district consistently low vaccine uptake i.e., 69% with drop out of 15%.

A higher dropout rate (15%) was also found in the interview conducted in Health Interview Survey done in California (CHIS) in 2007 where one in every four of girls with age from 13 to 17 years completed HPV vaccination (14). Similarly in the study done in the United States in

2007, that involved girls aged 13 to 17, a dropout of 19% was observed (25% in first dose and 6% in second dose) in the completion of the full vaccine course (46). A low completion of HPV vaccine was found in the study conducted in German between the year 2009 and 2011, Similarly, in study done in France showed that only 24% of girls aged 14-year-old completed HPV vaccination. the study in the United States in 2007, data indicated 25.1% of girls aged 13 to 17 had received at least one, and only 4% completed the full vaccine course (33). Based on these findings Missenyi seems to have higher coverage for second dose due to high level of awareness as the rest of the studied countries had very week awareness level.

### **Factors associated with HPV vaccine second dose uptake among eligible female adolescents in Missenyi DC as of the year 2019**

One of the key informants explained factors contributed to low coverage of HPV vaccine included reduced number of sessions at schools due to outreach and mobile services cancellation which made students not to go for second dose vaccination due to long distance. Other factors based on the key informants were lack of transport for health staff, inadequate health care providers to sustain visits to the schools to provide vaccines to female students who were eligible as well as insufficient funds. Similarly, the findings of the study conducted in Mbale District of Uganda in 2020 reported inadequate health workforce, insufficiency of primary health care funding and cancellation of outreach and mobile services that made dose completion difficult (35). The study on factors influencing intention to obtain the HPV vaccine and acceptability of 2v, 4v and 9v HPV vaccines among undergraduate female health sciences students in Fujian, China in 2019 recommended outreach strategy to Students in the university by a health team so as to boost HPV vaccine uptake and address the safety evidence of the vaccine (47).

The difference Based on the five studies on awareness about HPV vaccine, conducted in Hong Kong, only 40.3% of said to be aware of the HPV vaccine while adolescents in Latvia had less awareness over HPV vaccine of 9.9% (25)

Other barriers for HPV uptake in Missenyi emanating from the interviewees information included, outreach and mobile services cancellation while health staff explained about inadequate funding and shortage of staff but my assessment noticed improper vaccination data

management (lack of defaulters tracing and non-tracking of dropout rates). This is similar with the study conducted on factors that were associated with coverage rates between the first and second doses revealed barriers to be geographical location and degree of urbanization, places with or without the outreach of vaccination services as well as that of 2020 in Uganda Mbale district which summarized the barriers to be shortage of staff, untrained workforce, no outreach services, inadequate primary health care funding, unfriendly health care workers, misconceptions about the vaccine, erratic vaccine supplies, fear of side effects and the like (21,35). Another study with similar results for barriers of vaccination series completion in Malawi Zomba district, conducted in the year 2017 indicated that, barriers HPV vaccine uptake to be self-refusal by adolescent, health facilities location, fear for side effects, misconceptions by both the parents and adolescents, students transfer out and absenteeism (29)

#### **Perceived barriers of HPV Vaccine uptake based on studied respondents' local information.**

While building on responses from interviewees, the perceived barriers that were stated to be associated with low HPV vaccine uptake for first dose among eligible group in 2019 in Missenyi DC were misconceptions (13.6%), distance between school premises and vaccination center (7.3%), parental prohibition (2.2), a little of religious affiliated reasons were noted while unspecified reasons stood at 24%. Other included inadequate supportive supervision from both Council and regional teams, inadequate data management practices and lack of feedback. *“A shorter distance between residence and the vaccinating facility was significantly associated with higher vaccine uptake, and geographic region was found to influence vaccine uptake”* as stated in studies done in 2012 (37). Barriers of HPV vaccine second dose uptake as this study is concerned were forgetting vaccination date (51%), long distance (8.8%), painful shot (4.3%), fear of Adverse Events Following Immunization (3.3%) and guardians prohibition (2.2%). Other (unspecified) reasons contributed up to 30.4%. Looking into other studies for related outcome it was noted that parental concerns about the safety of the HPV vaccine and its potential side effects were reported to hinder the uptake of vaccination from studies conducted in the United States, the United Kingdom, Germany, and



Canada, given that the vaccine was relatively new in the area for them to offer total trust (15,48)

#### **4.1 Study Limitations and Mitigation**

Impassable roads during data collection mostly when it rains, making it difficult to access some sampled schools. Two school were added from the pool 14 schools that were selected at the first time to replace those schools we could not reach due to floods. To minimize sampling error observed due to non-use of design effect during sample size calculation, we conducted modified Poisson regression analysis adjusting for cluster.

## **5.0 CONCLUSION AND RECOMMENDATIONS**

### **5.1 Conclusion**

The study found that proportional coverage of the first dose were far lower than the set national threshold and the factors associated with this coverage were educational level of research participants (form four), those residing with father and other relatives as protective and occupation of the parents or guardian who were unemployed was among the factors. About the proportion of those who received the second dose was yet found to be below the set vaccination coverage target for HPV. The factors associated with this coverage in the study were education level, the guardian or parent occupation. About half of the adolescent girls reported to forget date for second dose and distance from the facility as barriers for second dose. Human workforce challenge and financial resources as well as hard to reach areas were reported by healthcare providers as factors of cancellation of outreach and mobile services thus led to low uptake of second dose of HPV vaccine uptake. The key factors for low uptake by key informants were outreach and mobile services cancellation, shortage of staff, less funding for the program, improper data management and irregular supportive supervision.

### **5.2 Recommendations**

Based on the findings of this study the following are recommended: -

1. Council public health authority should ensure that health facilities include outreach and mobile services in their annual plan and budget and implement the planned outreach to raise the HPV vaccine coverage.
2. Teachers should be integrated into vaccination intervention program to provide health education. They can be a reminder to both students and health care providers about subsequent doses.
3. PORALG should ensure health care providers are employed and allocated including staff reallocation within the council to ensure adequate number of health workforce.

## 6.0 REFERENCES

1. Bosch FX, Robles C, Díaz M, Arbyn M, Baussano I, Clavel C, et al. HPV-Faster: Broadening the scope for prevention of HPV-related cancer. *Nat Rev Clin Oncol*. 2016;13(2):119–32.
2. Baussano I, Lazzarato F, Ronco G, Franceschi S. Impacts of human papillomavirus vaccination for different populations: A modeling study. *Int J Cancer*. 2018;143(5):1086–92.
3. Nabirye J, Okwi LA, Nuwematsiko R, Kiwanuka G, Muneza F, Kanya C, et al. Erratum: Correction to: Health system factors influencing uptake of human papilloma virus (HPV) vaccine among adolescent girls 9-15 years in Mbale District, Uganda (*BMC public health* (2020) 20 1 (171)). *BMC Public Health*. 2020;20(1):491.
4. Human Papillomavirus and Related Diseases Report United Republic. 2019;(June).
5. Carlos RC, Dempsey AF, Patel DA, Dalton VK. Cervical cancer prevention through human papillomavirus vaccination: Using the “teachable moment” for educational interventions. *Obstet Gynecol*. 2010;115(4):834–8.
6. Tsega A, Hausi H, Chriwa G, Steinglass R, Smith D, Valle M. Vaccination coverage and timely vaccination with valid doses in Malawi. *Vaccine Reports* [Internet]. 2016;6:8–12. Available from: <http://dx.doi.org/10.1016/j.vacrep.2016.06.001>
7. Vermandere H, Naanyu V, Mabeya H, Broeck D Vanden, Michielsens K, Degomme O. Determinants of acceptance and subsequent uptake of the HPV vaccine in a cohort in Eldoret, Kenya. *PLoS One*. 2014;9(10).
8. CDC HPV vaccine rates, Morbidity and Mortality Weekly Report (MMWR), Human Papillomavirus Vaccination Coverage Among Adolescent Girls, 2007–2012, and Postlicensure Vaccine Safety Monitoring, 2006–2013 — United States.
9. Faisal-cury A, Levy RB, Tourinho MF, Grangeiro A, Eluf-neto J. Vaccination coverage rates and predictors of HPV vaccination among eligible and non-eligible female adolescents at the Brazilian HPV vaccination public program. 2020;1–12.
10. URT, EPI\_Data Analysis 2019, Ministry of Health, Community Development, Gender, Elderly and Children, Dar es Salaam, Tanzania.

11. URT, 2018, Vaccination Coverage, Ministry of Health, Community development, Gender, Elderly and Children, Dar es Salaam.
12. URT, Vaccination Coverage, 2019, Ministry of Health, Community Development, Gender, Elderly and Children.
13. Head KJ, Vanderpool RC, Mills LA. Health care providers' perspectives on low hpv vaccine uptake and adherence in appalachian kentucky. *Public Health Nurs.* 2013;30(4):351–60.
14. McRee A-L, Gilkey MB, Dempsey AF. HPV Vaccine Hesitancy: Findings From a Statewide Survey of Health Care Providers. *J Adolesc Heal* [Internet]. 2014;54(2):S30. Available from: <http://dx.doi.org/10.1016/j.jadohealth.2013.10.073>
15. Loke AY, Kwan ML, Wong YT, Wong AKY. The uptake of human papillomavirus vaccination and its associated factors among adolescents: A systematic review. *J Prim Care Community Heal.* 2017;8(4):349–62.
16. Amdisen L, Kristensen ML, Rytter D, Mølbak K, Valentiner-Branth P. Identification of determinants associated with uptake of the first dose of the human papillomavirus vaccine in Denmark. *Vaccine* [Internet]. 2018;36(38):5747–53. Available from: <https://doi.org/10.1016/j.vaccine.2018.08.006>
17. Chaw LL, Lim STW, Md Yussof SR. Human Papillomavirus vaccine coverage among female students in Brunei Darussalam: results from the first 4 years of the national school-based vaccination programme. *Heliyon* [Internet]. 2019;5(10):e02588. Available from: <https://doi.org/10.1016/j.heliyon.2019.e02588>
18. Schülein S, Taylor KJ, König J, Claus M, Blettner M, Klug SJ. Factors influencing uptake of HPV vaccination among girls in Germany. *BMC Public Health* [Internet]. 2016;16(1):1–8. Available from: <http://dx.doi.org/10.1186/s12889-016-3663-z>
19. Chambongo PE, Nguku P, Wasswa P, Semali I. Community vaccine perceptions and its role on vaccination uptake among children aged 12-23 months in the Ileje District, Tanzania: A cross section study. *Pan Afr Med J.* 2016;23:1–8.
20. Magodi R, Mmbaga EJ, Massaga J, Lyimo D, Mphuru A, Abade A. Factors associated with non-uptake of measles-rubella vaccine second dose among children under five

- years in Mtwara district council, Tanzania, 2017. *Pan Afr Med J.* 2019;33:1–7.
21. Moura LL, Codeço CT, Luz PM. Human papillomavirus (HPV) vaccination coverage in Brazil: spatial and age cohort heterogeneity. *Rev Bras Epidemiol.* 2020 Dec 18;24:e210001. Portuguese E. Two doses coverage study in Brazil. 2020.
  22. Laia Bruni, Anna Saura, Alexandra Montoliu, Maria Brotons, Laia Alemany, Mamadou Saliou Diallo, Oya Zeren Afsar, D. Scott LaMontagne, Liudmila Mosina, Marcela Contreras, Martha Velandia-González, Roberta Pastore, Marta Gacic-Dobo PB. WHO, UNICEF REPORT. 2020.
  23. Liu G, Kong L, Du P. HPV vaccine completion and dose adherence among commercially insured females aged 9 through 26 years in the US. *Papillomavirus Res* [Internet]. 2016;2:1–8. Available from: <http://dx.doi.org/10.1016/j.pvr.2015.10.001>
  24. Johnson KD, Lu X, Zhang D. Adherence to hepatitis A and hepatitis B multi-dose vaccination schedules among adults in the United Kingdom: A retrospective cohort study. *BMC Public Health.* 2019;19(1):1–9.
  25. Loke AY, Kwan ML, Wong YT, Wong AKY. The uptake of human papillomavirus vaccination and its associated factors among adolescents: A systematic review. *J Prim Care Community Heal.* 2017;8(4):349–62.
  26. URT, Immunization Performance and Data Desk Review 2018, MoHCDGEC, Dar es Salaam, Tanzania.
  27. Mitchell K, Saraiya M, Bhatt A. Increasing HPV Vaccination Rates Through National Provider Partnerships. *J Women’s Heal.* 2019;28(6):747–51.
  28. Gallagher KE, Kadokura E, Eckert LO, Miyake S, Mounier-Jack S, Aldea M, et al. Factors influencing completion of multi-dose vaccine schedules in adolescents: A systematic review. *BMC Public Health* [Internet]. 2016;16(1). Available from: <http://dx.doi.org/10.1186/s12889-016-2845-z>
  29. Msyamboza KP, Mwangomba BM, Valle M, Chiumia H, Phiri T. Implementation of a human papillomavirus vaccination demonstration project in Malawi: Successes and challenges. *BMC Public Health.* 2017;17(1):1–7.
  30. Munthali AC. Determinants Of Vaccination Coverage In Malawi : Evidence From The

- Demographic And Health Surveys. 2000;
31. Nicholas Dias, Yung Peng RK. HHS Public Access. *Physiol Behav.* 2017;176(3):139–48.
  32. Sitaresmi MN, Rozanti NM, Simangunsong LB, Wahab A. Improvement of Parent’s awareness, knowledge, perception, and acceptability of human papillomavirus vaccination after a structured-educational intervention. *BMC Public Health.* 2020;20(1):1–9.
  33. Schülein S, Taylor KJ, König J, Claus M, Blettner M, Klug SJ. Factors influencing uptake of HPV vaccination among girls in Germany. *BMC Public Health.* 2016 Sep 20;16(1).
  34. Walling EB, Benzoni N, Dornfeld J, Bhandari R, Sisk BA, Garbutt J, et al. Interventions to improve HPV vaccine uptake: A systematic review. *Pediatrics.* 2016;138(1):1–13.
  35. Nabirye J, Okwi LA, Nuwematsiko R, Kiwanuka G, Muneza F, Kanya C, et al. Health system factors influencing uptake of Human Papilloma Virus (HPV) vaccine among adolescent girls 9-15 years in Mbale District, Uganda. *BMC Public Health.* 2020 Feb 4;20(1).
  36. Peterson CE, Silva A, Holt HK, Balanean A, Goben AH, Dykens JA. Barriers and facilitators to HPV vaccine uptake among US rural populations: a scoping review. *Cancer Causes Control* [Internet]. 2020;31(9):801–14. Available from: <https://doi.org/10.1007/s10552-020-01323-y>
  37. Kessels SJM, Marshall HS, Watson M, Braunack-Mayer AJ, Reuzel R, Tooher RL. Factors associated with HPV vaccine uptake in teenage girls: A systematic review. *Vaccine.* 2012;30(24):3546–56.
  38. PORALG. PORALG website (3), Country Profile Kagera Regional Profile as retrieved on 31 April 2021 at 2030hours. 2020.
  39. <https://Dessertation.leard.com/sampling-the-basics.php> SRS Step# 1 to 6 as retrieved on 31st Dec. 2020 at 1130 hrs. *Payment\_methods\_online.* 2020.
  40. Amin H, Malik AS. Human memory retention and recall processes: A review of EEG

- and fMRI studies. *Neurosciences*. 2013;18(4):330–4.
41. Hayne H, Gross J. Memory by association: Integrating memories prolongs retention by two-year-olds. *Infant Behav Dev*. 2017;46:7–13.
  42. Moser A, Korstjens I. Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *Eur J Gen Pract [Internet]*. 2018;24(1):9–18. Available from: <https://doi.org/10.1080/13814788.2017.1375091>
  43. Cornish-Bowden A, Wong JT. Validity of the jack-knife technique for analysing enzyme kinetic data. *Biochem J*. 1980;185(2):535–6.
  44. Barros AJD, Hiraakata VN. Alternatives for logistic regression in cross-sectional studies: An empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol*. 2003;3:1–13.
  45. Barros AJD, Hiraakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol*. 2003 Oct;3:21.
  46. Work R. Recent Work. *Philos Books*. 2002;43(1):5–22.
  47. Lin Y, Lin Z, He F, Hu Z, Zimet GD, Alias H, et al. Factors influencing intention to obtain the HPV vaccine and acceptability of 2-, 4- and 9-valent HPV vaccines : A study of undergraduate female health sciences students in Fujian , China. *Vaccine [Internet]*. 2019;37(44):6714–23. Available from: <https://doi.org/10.1016/j.vaccine.2019.09.026>
  48. Apata IW, Averhoff F. WHO Global rotavirus surveillance network - a strategic review of the first 5 years (2008-2012). *Wkly Epidemiol Rec*. 2014;89(30):340–4.

**7. APPENDICES**

**Appendix 1A: Informed Consent Form English Version**

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES**



**Consent declaration form assessment of HPV vaccine uptake - 2019**

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**Consent to Participate in a Research. Name of School.....**

**Region..... District.....Ward.....**

Greetings! My name is.....from the Muhimbili University of Health and Allied Sciences (MUHAS) executing a research on assessing the factors influencing low HPV vaccine uptake among eligible female adolescent for the year 2019 in Kagera region – Missenyi DC

**Purpose of the Study**

This study has the purpose of collecting information on factors influencing uptake of HPV vaccination programs in Missenyi DC, Karega Tanzania. You are requested to participate in this study because you have relevant information and experiences that possibly will be pertinent to the study.

**Confidentiality**

I reassure you all information we collect on the tablets or forms will be entered into computer with only the unique identification number and that the information will be strictly confidential. Only people who are involved in this study will have access to the information of this study. I shall compile a report which will contain responses from all research subject involved in this research. Your name will not in any circumstances appear in the report or any other information that will identify you or the records you provided



**What Participation Involved**

If you voluntarily consent to participate in this study, you will be required to answer a series of questions that have been prepared for the study through questionnaire or an interview guide in order to obtain the intended information regarding the purpose foresaid above in this area.

**Rights to withdraw and alternatives**

Taking part in this study is completely your own choice. If you choose not to respond to any question to be asked you won't be regarded as unfair person. You can stop participating in this study any time even if you have already given your consent. Refusal to participate or withdraw from the study will not involve any penalty what so ever

**Intended Benefits of the information**

We hope that the information will provide essential data to assess the potential influencers of low uptake of the vaccine which is very important for an individual and community protection against Human Papilloma Virus Infections.

**Who to be contacted?**

If you ever have questions about this study, you should contact the study coordinator Kidogo Gerald Manasseh of MUHAS, P.O. Box 65001, Dar es Salaam. If you ever have questions about your rights as a participant, you may call

Chairperson of the Senate Research and Publications Committee,  
Telephone No. 2150302- 6 or 2152489.

P.O. Box 65001

**DAR ES SALAAM**

**Signature:**

Do you agree?

Participant agrees.....Participants doesn't agree.....

I .....have read the contents in this form. My questions have been well clarified. I agree to participate in this study.

Signature of participant.....Signature of research assistant.....

The Date consent Signed.....

***“Thank you very much for your consent of participation”***

**Appendix 1B: Informed consent form – Swahili version.****CHUO KIUU CHA AFYA NA SAYANSI SHRIKISHI MUHIMBILI**

Na. ya Fomu

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**Fomu uthibitisho wa kushiriki utafiti wa matumizi ya chanjo ya HPV - 2020****Ridhaa kushiriki kwenye utafiti**

Habari za saa hizi/leo! ----- Salaam

Majina yangu ninaitwa \_\_\_\_\_ Ninafanya utafiti juu ya sababu zinazosababisha washichana wanaostahili kupata chanjo ya HPV wasichanjwe katika Halmashauri ya Wilaya ya Missenyi.

**Madhumuni ya utafiti**

Lengo la utafiti huu ni kuchunguza sababu za kwanini wasichana wengi wa umri wa miaka 14 kwaka jana 2019 hawakupata chanjo ya HPV katika Halmashauri ya Wilaya ya Missenyi ili mikakati itakayowekwa isaidie wasichana wengi kuchanjwa kwa ajili ya kinga ya saratani ya shingo ya uzazi katika Jamii. Kutokana na umuhimu wa zoezi hili unaombwa kushiriki katika utafiti huu kwa sababu taarifa utakazotoa zitakua na umuhimu mkubwa katika utafiti hu una kutatua changamoto husika

**UKuthibitisha usiri wa Taarifa**

Napenda kukuhakikishia kwamba taarifa zote nitakazopata kutoka kwako kwa njia ya simu au ana kwa ana kupitia fomu hii zitaingizwa kwenye kompyuta yenye nywila na kwamba taarifa hizi zitatunzwa kwa usiri mkubwa.

Baada ya ukusanyaji wa takwimu zote husika na kufanya uchambuzi, itaandaliwa taarifa ya utafiti huu, ambapo jina la mtu yeyote aliyeshiriki kutoa taarifa halitatajwa wala utambulisho wowote mwingine hautaoneshwa kwa mtu awaye yeyote. Namba iliyowekwa kwenye fomu ya dodoso ndio itatumika kama utambulisho wa taarifa utakayotoa.

### **Ridhio la kushiriki**

Ukiridhia kushiriki katika utafiti huu, utatakiwa kujibu maswahi kadhaa yaliyopo kwenye dodoso ili kutoa taarifa muhimu kuhusu sababu zinazomfanya mtu kukubali au kukataa kuchanjwa chanjo ya HPV kingatiba.

### **Faida ya taarifa**

Taarifa unazotoa kwenye utafiti huu zitasaidia sana katika kujua sababu zinazochangia mtu kukubali au kukataa kuchanjwa ili kuifanya Jamii ikingwe dhidi ya saratani ya shingo ya kizazi. Taarifa hizo zitatumwa na idara ya Afya Mkoani, Wilaya na Wizara ya Afya na wadau wa maendeleo kupitia Mpango wa Taifa wa chanjo ili kuongeza kiwango cha uchanjaji katika Halmashauri, Mkoa na Jamii kwa ujumla.

### **Haki ya kushiriki au kujitoa**

Uamzi wa kushiriki katika utafiti huu ni kwa hiari na sio lazima. hivyo unaweza kuamua kuendelea au kutoendelea na utafiti huu wakati wowote na hakutakua na adhabu wala hutapoteza haki yako yoyote na wala hautanyimwa stahiki yako yoyote ikiwa ni pamoja na kuchanjwa kama utakuwa unastahili.

### **Nani wa kuwasiliana naye**

Kama una swali lolote kuhusiana na utafiti huu tafadhali wasiliana na Mtafiti Mkuu anayeratibu utafiti huu ambaye ni Kidogo, Gerald Manasseh (Simu; 0763148869).

Kwa maswali zaidi unaweza kuwasiliana na Mwenyekiti wa Kamati ya Utafiti na Machapisho wa Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili kilichopo Dar es Salaam kwa anwani na simu kama ifuatavyo:-

Simu Na. 2150302- 6 au 2152489.

S.L.P 65001

DAR ES SALAAM

Je, Umekubali?

Mshiriki amekubali (  ), Mshiriki hajakubali (  )

Mimi \_\_\_\_\_ nimesoma/nimepata ufafanuzi na kueleza na kuridhia maelezo yote yaliyotolewa katika fomu hii, hivyo kwa ridhaa yangu mwenyewe nikiwa na akili timamu na bila shuruti nakubali kushiriki katika utafiti huu.

Saini ya Mshiriki Saini ya mtafiti msaidizi \_\_\_\_\_

Tarehe ya makubaliano \_\_\_\_\_

**Appendix 2A: Informed ASSENT Form English version****MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES**

ID- NO

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**ASSENT to** Participate in a Research for adolescents below 18 years of age on HPV uptake

**Name of school**.....**Region**.....

**District**..... **Ward**.....

Greetings! My name is.....from Muhimbili University of Health and Allied Sciences (MUHAS) executing a research on assessing the factors influencing low HPV vaccine uptake among eligible female adolescent for the year 2019 in Missenyi DC of Kagera region

**Purpose of the Study**

This study has the purpose of collecting information on factors influencing low uptake of HPV vaccination programs in Missenyi DC, Karega Tanzania. You are requested to participate in this study because you have relevant information and experiences that possibly will be pertinent to the study and a way forward to solution.

**Confidentiality**

I hereby assuring you (Participant(s) that, all information we collect on either way telephone calls or face to face questionnaire administration will be treated as confidential at all the time, that during data analysis will be entered into computer with the unique identification number and password to enhance confidentiality. Only people who are involved in this study will have access to the information of this study. I shall compile a report which will contain responses from all research subject involved in this research. Be sure that your name will not in any

circumstances appear in the report or any other information that will identify you or the records you provided.

### **Participation and involvement**

If you voluntarily consent to participate in this study, you will be required to answer a series of questions that have been prepared for the study through questionnaire or an interview guide in order to obtain the intended information regarding the purpose foresaid above in this area.

### **Rights to withdraw and alternatives**

Taking part in this study upon request, is completely your own decision. If you choose not to respond to any of the question or all questions to be asked you won't be regarded as unfair person. You can stop participating in this study at any time even if you have already given your consent. Refusal to participate/withdraw from the study won't involve any penalty what so ever.

### **Intended Benefits of the Information**

We hope that the information obtained will provide essential data to identify the potential influencers of low uptake of the vaccine which is very important for an individual and community protection against Human Papilloma Virus Infections.

### **Who to be contacted?**

If you ever have questions about this study, you should contact the study coordinator namely Kidogo, Gerald Manasseh of MUHAS, P.O. Box 65001, Dar es Salaam. Cell.0763148869

In case of more clarities about your rights as a participant, you may call

Chairperson for the Senate Research and Publications Committee,

Telephone No. 2150302- 6 or 2152489,

P.O. Box 65001,

**DAR ES SALAAM.**

Do you agree? (Delete as appropriate)

I.....On behalf of the parent/Parents/  
guardian/guardians of the student/students and on behalf of the school administration I  
(Matron/Patron) do agree/don't agree for the student to Participant in this research which need  
information about vaccination status about herself for the/even if its meaningful interpretation  
that would result into public health protection benefits.

Participants doesn't agree..... Signature  
participant/Representative.....

Signature of research assistant..... The Date assent  
Signed.....



**Appendix 2B: informed assent form – swahili version**

**CHUO KIUU CHA AFYA NA SAYANSI SHRIKISHI MUHIMBILI**

Fomu ya Ridhaa ya Mzazi/Mlezi wa mshiriki wa utafiti juu ya matumizi ya chanjo ya HPV

Na. ya Fomu

**Fomu ya uthibitisho wa**

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**kushiriki utafiti kwa washiriki wenye umri chini ya miaka 18 katika shule ya.....**

**Ridhaa ya kushiriki utafiti**

Habari za saa hizi/leo! ----- Salaam

Majina yangu ninaitwa\_\_\_\_\_ Ninafanya utafiti juu ya sababu zinazosababisha washichana wanaostahili kupata chanjo ya kuzuia Saratani ya Shingo ya Kizazi wasichanjwe katika Halmashauri ya Wilaya ya Missenyi hasa wale waliopo shuleni.

**Madhumuni ya utafiti**

Lengo la utafiti huu ni kuchunguza sababu za kwanini wasichana wengi wa umri wa miaka 14 (kwaka jana 2019) hawakupata chanjo ya kuzuia Saratani ya Shingo ya Kizazi (HPV) katika Halmashauri ya Wilaya ya Missenyi ili mikakati itakayowekwa isaidie wasichana wengi kuchanjwa kwa ajili ya kinga ya ugonjwa huo katika Jamii. Kutokana na umuhimu wa zoezi hili unaombwa kushiriki katika utafiti huu kwa sababu taarifa utakazotoa zitakua na umuhimu mkubwa katika utafiti huu ili kutatua changamoto husika

**Kuthibitisha usiri wa Taarifa**

Napenda kukuhakikishia kwamba taarifa zote nitakazopata kutoka kwako kwa njia ya simu au kwa mahojiano ya ana kwa ana kupitia fomu hii zitaingizwa kwenye mfumo wa kuchakata takwimu (Statistical softwares) yenye nywila na kwamba taarifa hizi zitatunzwa kwa usiri mkubwa.

Baada ya ukusanyaji wa takwimu zote husika na kufanya uchambuzi, itaandaliwa taarifa ya utafiti huu, ambapo jina la mtu yeyote aliyeshiriki kutoa taarifa halitatajwa wala utambulisho wowote mwingine hautaoneshwa kwa mtu awaye yote. Namba iliyowekwa kwenye fomu ya dodoso ndio itatumika kama utambulisho wa taarifa utakayotoa na siyo jina lako.

### **Ridhaa ya ushiriki**

Ukiridhia kushiriki katika utafiti huu, utatakiwa kujibu maswahi kadhaa yaliyopo kwenye dodoso ili kutoa taarifa muhimu kuhusu sababu zinazomfanya mtu kukubali au kukataa kuchanjwa chanjo tunazozifanyia utafiti sasa.

### **Faida ya taarifa**

Taarifa unazotoa kwenye utafiti huu zitasaidia sana katika kujua sababu zinazochangia mtu kukubali au kukataa kuchanjwa ili zitatuliwe na kuifanya Jamii ikingwe dhidi ya aina hii ya Saratani . Taarifa hizo zitatumwa na idara ya Afya Mkoani, Wilaya na Wizara ya Afya na wadau wa maendeleo kupitia Mpango wa Taifa wa chanjo ili kuongeza kiwango cha uchanjaji katika Halmashauri, Mkoa na Jamii kwa ujumla.

### **Haki ya kushiriki au kujitoa**

Uamzi wa kushiriki katika utafiti huu ni kwa hiari na sio lazima. hivyo unaweza kuamua kuendelea au kutoendelea na utafiti huu wakati wowote na hakutakua na adhabu wala hutapoteza haki yako yoyote na wala hautanyimwa stahiki yako yoyote ikiwa ni pamoja na kuchanjwa kama utakuwa unastahili.

### **Nani wa kuwasiliana naye**

Kama una swali lolote kuhusiana na utafiti huu tafadhali wasiliana na Mtafiti Mkuu anayeratibu utafiti huu ambaye ni Kidogo, Gerald Manasseh (Simu; 0763148869).

Kwa uelewa Zaidi, unaweza kuwasiliana na Mwenyekiti wa Kamati ya Utafiti na Machapisho wa Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili kilichopo Dar es Salaam kwa anwani na simu kama ifuatavyo:-

Simu Na. 2150302- 6 au 2152489.

S.L.P 65001

DAR ES SALAAM



Je, Umekubali?

Mimi \_\_\_\_\_ kwa niaba ya mzazi/Mlezi wa

mwanafunzi/wanafunzi wa shule ya sekondari ya \_\_\_\_\_

ambaye ni Mlezi wa wanafunzi (Patron/Matron), kwa niaba ya uongozi wa shule hii na kwa

mamlaka yaliyoridhiwa na mzazi/wazazi/mlezi/walezi wa mwanafunzi/wanafunzi

nimesoma/nimepata maelezo, ufafanuzi na kuelewa hivyo naridhia maelezo yote yaliyotolewa

katika fomu hii. Kwa ridhaa yangu mwenyewe nikiwa na akili timamu na bila shuruti nakubali

kwa niaba ya mzani/wazazi/mlezi/walezi wa mshiriki/washiriki kushiriki katika utafiti huu.

Saini ya mwidhinishaji kwa niaba ya Mshiriki/washiriki \_\_\_\_\_

Saini ya mtafiti msaidizi \_\_\_\_\_

Tarehe ya kusaini makubaliano

**Appendix 3A: Questionnaire (English version)****Muhimbili University of Health and Allied Sciences (MUHAS)****A questionnaire for assessing school age HPV vaccination uptake -2019 SN. No .....**

Name of Region..... Name of District.....

Name of Division.....Name of Ward.....

Name of the School ..... Total students..... Male.... Female .....

Number of eligible students..... Name of nearby HF.....

**Instructions:** Circle the number of the appropriate single response**Part “A” Social demographic characteristics of the participant**

1. Date of Birth.....

2. Education level

1) Form I

3) Form III

2) Form II

4) Form IV

3. With whom do you live?

1) Both Parents

3) Mother

2) Father

4) Other relatives, mention.....

4. What are your Guardians’/parents’ Education level?

1) None

3) Secondary school

2) Primary school

4) University/College

5. What are your Guardians’/parents’ Occupation?

1) Unemployed

3) Employed

2) Self employed

4) Others, mention.....

6. Where did you reside in 2019?

1) Urban

2) Rural

7. Are you residing at the same area since 2019?

1) Yes

2) No

**Part “B” HPV fist dose information**

8. Have you ever heard about HPV Vaccine?

1) Yes

2) No

***If No go Qn 16***

9. If yes, from where did you hear about HPV vaccine?

1) Media

2) At school

- 3) At the HF  
4) Parents/guardians
- 5) Others, mention.....

10. Did you receive HPV vaccine first dose in 2019?

- 1) Yes  
2) No

***If yes go to question no 12***

11. Why didn't you receive the first dose of HPV vaccine? (*Then go Qn 15*)

- 1) Worry about the side effects  
2) Distance from HF  
3) Religious matter
- 4) Parent's prohibition  
5) Others, mention.....

12. When did you receive the second dose? Date ..... Month ..... Year.....

13. Who told you to go for HPV Vaccination?

- 1) Health Care Provider  
2) Teacher
- 3) Parents/Guardians  
4) Others Specify.....

14. Where did you receive the first dose?

- 1) Health Facility
- 2) At school  
3) Others, mention.....

15. What is the distance (Km) from your residence to the place where you received the first dose of HPV vaccine? .....

16. What distance (Km) is your residence from Health facility? .....

17. What is the distance (Km) from your school to the health facility.....?

18. Were you informed about the vaccination schedule? (Time between doses)

- 1) Yes  
2) No

**Part "C" HPV second dose information**

19. Did you receive HPV vaccine second dose?

- 1) Yes  
2) No

***If yes go to Qn 21***

***If No go to next Qn 20***

20. Why didn't you receive the second dose of HPV vaccine?

- 1) Got Side effects (AEFI)  
2) Distance from Health Facility  
3) The first shot was painful
- 4) Parent's prohibition  
5) Forgot the schedule  
6) Others, mention.....

21. When did you receive the second dose? Date ..... Month ..... Year....

22. Who reminded you to go for second dose HPV Vaccination?

- 1) Myself  
2) Health Care Provider  
3) Teacher
- 4) Parents/Guardians  
5) Others Specify.....

23. Where did you receive the second dose?

- 1) Health Facility  
2) At school

3) Others, mention.....

24. What is the distance (Km) from your residence to the place where you received the second dose of HPV vaccine? .....

25. Were you aware of the vaccination schedule? (Time between doses)

1) Yes

2) No

***Thank you for your participation***

**Appendix 3B: Questionnaire – (swahili version).****CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI CHA MUHIMBILI – DAR  
ES SALAAM - TANZANIA**

Dodoso la utafiti juu ya matumizi ya chanjo ya HPV kwa wanafunzi wa kike wa shule za sekondari. Nambari ya Dodoso.....

**Maelekezo:** Zungushia jibu moja kati ya orodha iliyopo kwenye kila swali.

**Taarifa za utangulizi**

Jina la Mkoa..... Jina la  
Halmashauri.....

Jina la Tarafa.....Jina la  
Kata.....

Jina la Shule ya Sekondari ..... Idadi ya Wanafunzi .....  
Kike.....Kiume.....

Idadi ya Wanafunzi wenye sifa za kuchanjwa..... Jina la kituo cha chanjo cha karibu.....

**Sehemu “A” Taarifa muhimu za mhojiwa**

1. Tarehe ya kuzaliwa.....
2. Kiwango cha elimu
  - 1) Kidato I
  - 2) Kidato II
  - 3) Kidato III
  - 4) Kidato IV
3. Unaishi na nani?
  - 1) Wazazi (Baba na Mama)
  - 2) Baba
  - 3) Mama
  - 4) Wengineo,  
Taja.....
4. Kiwango cha Elimu cha Wazazi/Walezi?
  - 1) Hakusoma
  - 2) Elimu ya Msingi
  - 3) Elimu ya Sekondari
  - 4) Elimu ya chuo
5. Kazi ya Wazazi/Walezi?
  - 1) Hajaajiliwa
  - 2) Kujiajili
  - 3) Amejiliwa
  - 4) Nyingine,  
Taja.....
6. Ulikuwa unaishi wapi mwaka 2019?
  - 1) Maeneo ya Mjini
  - 2) Maeneo ya Kijijini
7. Bado unaishi eneo lilelile toka mwaka 2019?

1) Ndiyo

2) Hapana

**Sehemu "B" Taarifa zinazohusu uchanjaji wa dozi ya kwanza ya HPV**

8. Umewahi kusikia juu ya chanjo ya kuzuia Saratani ya Shingo ya Kizazi?

1) Ndiyo

2) Hapana

***Kama jibu ni hapana nenda swali 16***

9. Kama jibu ni ndiyo, ulisikia wapi?

1) Vyombo vya Habari, Taja...

4) Wazazi/Walezi

2) Shuleni

5) Nyingine,

3) Kituo cha chanjo

Taja.....

10. Umewahi kuchanjwa dozi ya kwanza ya HPV katika mwaka 2019?

1) Ndiyo

2) Hapana

***Kama jibu ni ndiyo nenda swali 12***11. Kwanini hukuchanjwa? (*Kisha nenda swali 16*)1) Niliogopa madhara ya  
chanjo

4) Wazazi walikataa

2) Umbali mrefu

5) Sababu nyingine,

3) Dini yangu inakataza

Taja.....

12. Ulichanjwa lini? Tarehe .....Mwezi

.....mwaka.....

13. Nani alikwambia ukachanjwe?

1) Mtumishi wa Afya

4) Mwingine,

2) Mwalimu

Taja.....

3) Wazazi/Walezi

14. Ulichanjiwa wapi dozi ya kwanza?

1) Kituo cha chanjo

3) Kwingineko,

2) Shuleni

Taja.....

15. Kuna umbali gani (km) kutoka mahali unapoishi hadi kituo cha Huduma za Afya?.....

16. Kuna umbali gani (Km) kutoka mahali unapoishi mpaka kituo cha chanjo?.....

17. Kuna umbali gani (Km) kutoka shuleni mpaka kituo cha chanjo?.....

18. Je, baada ya kuchanjwa dozi ya kwanza ulijulishwa ratiba ya chanjo inayofuata?

1) Ndiyo

2) Hapana

**Sehemu "C" Taarifa zinazohusu uchanjaji wa dozi ya pili ya HPV**

19. Je, ulichanjwa dozi ya pili ya chanjo ya kuzuia Saratani ya Shingo ya Kizazi (HPV)?

1) Ndiyo

2) Hapana

***Kama jibu ni ndiyo nenda swali la 21***

***Kama jibu ni hapana endelea swali la 20***

20. Sababu gani zilifanya usichanjwe dozi ya pili?

- |                              |                               |
|------------------------------|-------------------------------|
| 1) Nilipata madhara (AEFI)   | 4) Zuo la Wazazi/Walezi       |
| 2) Umbali mrefu uliopo       | 5) Nilisahau ratiba           |
| 3) Maumivu ya dozi ya kwanza | 6) Sababu nyingine, Taja..... |

21. Ulichanjwa lini? Tarehe.....Mwezi

.....Mwaka.....

22. Ni nani alikukumbusha kwenda kuchanjwa dozi ya pili?

- |                        |                  |
|------------------------|------------------|
| 1) Mimi mwenyewe       | 4) Wazazi/Walezi |
| 2) Mtoa huduma za Afya | 5) Mwingine,     |
| 3) Mwalimu.....        | Taja.....        |

...

23. Ulichanjiwa wapi dozi ya pili?

- |                             |                |
|-----------------------------|----------------|
| 1) Kituo cha huduma za Afya | 3) Kwingineko, |
| 2) Shuleni                  | Taja.....      |

24. Kuna umbali gani (Km) kutoka unapoishi hadi pale ulipochanjiwa dozi ya pili?.....

25. Je, ulikuwa unafahamu utaratibu wa dozi ya pili?

- |          |           |
|----------|-----------|
| 1) Ndiyo | 2) Hapana |
|----------|-----------|

***“Asante sana kwa ushiriki wako”***



**Appendix 4A: Key Informant Interview guide – English version**

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES**

**Key Informants Interview Guide**

No.....

**Section A: Health Care Provider Related Factors**

1. Why do you think there is low uptake of HPV vaccine? .....
2. Can you relate the low coverage with the followings?      1. Yes      2. No
  - a. Drop out tracing?      1. Yes      2. No
  - b. Knowledge and skills?      1. Yes      2. No
  - c. Unfriendly HCPs?      1. Yes      2. No
  - d. Missed opportunities?      1. Yes      2. No
  - e. Data entries/records?      1. Yes      2. No
  - f. Vaccines side effects?      1. Yes      2. No
3. Give any other information based on your understanding.....

**Section B: Program Related Factors**

4. Why do you think there is low uptake of HPV vaccine?.....
5. Which factors among the following might have contributed to the low coverage?
  - a. Unclear Target Population?      1. Yes      2. No
  - b. Supply chain?      1. Yes      2. No
  - c. Supportive supervision?      1. Yes      2. No
  - d. Distance to the HF?      1. Yes      2. No
  - e. HF geographical location?      1. Yes      2. No
  - f. Out-reach and mobile services?      1. Yes      2. No
  - g. Shortage of staff      1. Yes      2. No
6. Give any other information based on your understanding.....

**“Thank you for your participation”**



**Appendix 4B: Key Informants' Interview guide – Swahili version**

Na.....

**CHUO KIKUU CHA SAYANSI NA SAYANSI SHIRIKISHI MUHIMBILI****Mwongozo wa upatikanaji wa taarifa Muhimu za chanjo ya HPV katika Halmashauri****Sehemu A: Maswali kwa mtoa huduma**

1. Unadhani ni kwanini kiwango cha uchanjaji wa chanjo ya HPV ni kidogo ?.....
2. Je, unaweza kuhusanisha kiwango hicho kidogo na mambo yafuatayo?
3. Kutokuwa na mkakati wa kufuatilia wasiochanjwa?                    1. Ndiyo            2. Hapana
4. Uelewa na ujuzi mdogo wa watumishi?                                    1. Ndiyo            2. Hapana
5. Lugha ya watoa huduma isiyo rafiki?                                        1. Ndiyo            2. Hapana
6. Kutotumia nafasi vizuri?     1. Ndiyo            2. Hapana
7. Mapungufu katika takwimu za uchanjaji wa HPV?                        1. Ndiyo            2. Hapana
8. Madhara ya chanjo yaliyojitokeza baada ya kuchanjwa?                1. Ndiyo            2. Hapana
9. Kutochanja kwa njia ya mkoba na huduma tembezi?                    1. Ndiyo            2. Hapana
10. Toa maelezo mengine kwa kadri unavyofahamu .....

**Sehemu B: Kuhusiana na Mpango wa Chanjo**

11. Unadhani ni kwanini baadhi ya walengwa hawakuchanjwa?.....
12. Ni sababu zipi kati ya hizi zifuatazo zinaweza kuwa zilichangia wengi kutochanjwa?
13. Idadi kubwa ya walengwa kwenye Halmashauri                    1. Ndiyo            2. Hapana
14. Idadi ndogo ya walengwa kwenye Halmashauri?                        1. Ndiyo            2. Hapana
15. Upungufu wa chanjo na vifaa vingine?                                    1. Ndiyo            2. Hapana
16. Kutofanyika kwa Ziara za usimamizi shirikishi?                        1. Ndiyo            2. Hapana
17. Umbali kwa wananchi na vituo vilipo?                                    1. Ndiyo            2. Hapana
18. Hali ya kutofifika kwa vituo vya chanjo?                                 1. Ndiyo            2. Hapana
19. Kufutwa kwa huduma mkoba na huduma tembezi                    1. Ndiyo                                    2. Hapana
20. Toa maelezo mengine kwa kadri unavyofahamu .....

**“Asante sana kwa kushiriki kwako utafiti huu”**

**Appendix 3A: Ethical clearance for the study**

**UNITED REPUBLIC OF TANZANIA**  
 MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY  
 MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES  
**OFFICE OF THE DIRECTOR - RESEARCH AND PUBLICATIONS**



Ref. No.DA.282/298/01.C/

Date: 11/02/2021

MUHAS-REC-02-2021-489

Gerald Manasseh Kidogo  
 MSc Applied Epidemiology,  
 School of Public Health and Social Sciences  
 MUHAS

**RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED:  
 ASSESSMENT OF FACTORS INFLUENCING LOW HPV VACCINE UPTAKE  
 AMONG ELIGIBLE FEMALE ADOLESCENTS IN SCHOOLS OF MISSENYI  
 DISTRICT COUNCIL IN KAGERA REGION**

Reference is made to the above heading.

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 11/02/2021

EXPIRATION DATE OF APPROVAL: 11/02/2022

**STUDY DESCRIPTION:**

**Purpose:**



The purpose of this cross section study is to assess factors influencing low uptake of HPV vaccine among eligible female adolescents (14 years old girls) in Misenyi District Council for the year 2019 and provide recommendations for improvement.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided;

<https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%20361.pdf> and in the MUHAS archives.

### Appendix 3B: Permission application letter for the study from MUHAS

**UNITED REPUBLIC OF TANZANIA**  
 MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY  
 MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES  
 OFFICE OF THE DIRECTOR – POSTGRADUATE  
 STUDIES

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In reply quote;  
 Ref. No. HD/MUH/T.810/2019

04<sup>th</sup> March, 2021

The Permanent Secretary,  
 The Regional Administration and Local Government,  
 President Office,  
 Mji wa Serikali, Mtumba Road,  
 P.O. Box 1923,  
**DODOMA.**

**Re: INTRODUCTION LETTER**

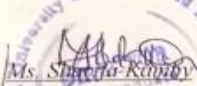
The bearer of this letter is Gerald Manasseh Kidogo , a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MSc. Applied Epidemiology.

As part of his studies he intends to do a study titled: *“Assessment of Factors Influencing Low HPV Vaccine Uptake Among Eligible Female Adolescents in Schools of Misenyi District Council in Kagera Region.”*

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. Shirecia Kumbi  
**For: DIRECTOR, POSTGRADUATE STUDIES**

cc: Dean, School of Public Health and Social Sciences, **MUHAS**  
 cc: Gerald Manasseh Kidogo

Appendix 3C: Introductory letter from the PS – PORALG to the study area

OFISI YA RAIS  
TAWALA ZA MIKOA NA SERIKALI ZA MITAA

Anuani ya Simu "TAMISEMI" DODOMA  
Simu Na: +255 26 2321607  
Nukushi: +255 26 2322116  
Barua pepe: [ps@tamisemi.go.tz](mailto:ps@tamisemi.go.tz)



Mji wa Serikali – Mtumba,  
Mtaa wa TAMISEMI,  
S.L.P. 1923,  
41185 DODOMA.

Unapojibu tafadhali taja:-

Kumb. Na. RALG/PF.6482/30

31 Machi, 2021

Mkurugenzi Mtendaji (W),  
Halmashauri ya Wilaya ya Missenyi,  
S. L. P. 38,  
**MISSENYI.**

Yah: **MWANAFUNZI WA SHAHADA YA UZAMILI KATIKA CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI**

Tafadhali husika na somo tajwa hapo juu.

2. Mtajwa hapo juu ni mtumishi wa Ofisi ya Rais – TAMISEMI anayesoma Shahada ya Uzamili ya "*MSc. Applied Epidemiology*" katika Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili.
3. Katika kukamilisha masomo yake, anakusudia kufanya utafiti wenye jina "*Assessment of Factors Influencing Low HPV Vaccine Uptake Among Eligible Female Adolescents In School of Missenyi District Council In Kagera Region*"
4. Kwa barua hii, tunaomba Ofisi yake imruhusu na kumpa ushirikiano ili aweze kukamilisha utafiti wake.
5. Ninakushukuru kwa ushirikiano wako.

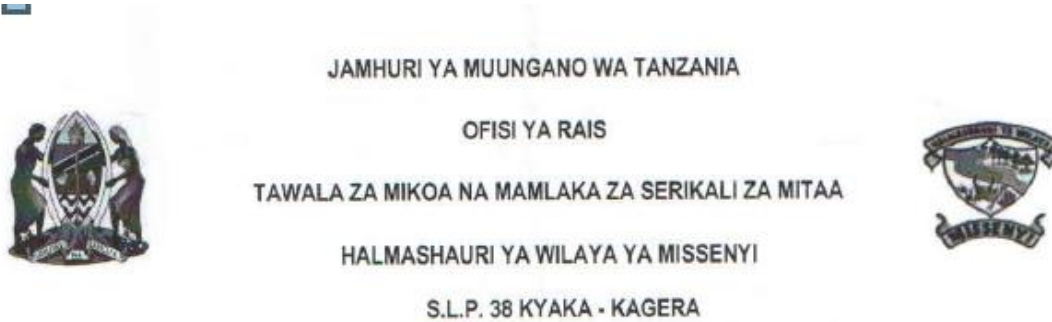
  
V. F. Kategere  
Kny. **KATIBU MKUU**

Nakala: Katibu Tawala wa Mkoa,  
Ofisi ya Mkuu wa Mkoa,  
S. L. P. 299,  
**KAGERA.**

" Makamu Mkuu wa Chuo,  
Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili,  
S.L.P.65001'  
**DAR ES SALAAM.**

" Gerald Manase,  
**OR- TAMISEMI.**

### Appendix 3D: Permission letter by Missenyi DC Authority for the study



Unapojibutafadhalitaja:

Kumb. Na.KGR/MSY/E.1/14/VOL.V/38

10/05/2021

**GERALD MANASE**

**OR – TAMISEMI**

**YAH:**

#### **OMBI LA KUFANYA UTAFITI**

Tafadhali rejea mada tajwa hapo juu na pia rejea barua ya Katibu Mkuu Tamisemi yenye Kumb na. RALG/PF.6482/30 ya tarehe 31/03/2021 ya kuombewa kibali cha kufanya utafiti katika shule 27 za Sekondari za Halmashauri ya Wilaya ya Missenyi wenye jina " *Assesment of Factor Influencing Low HPV Vaccine Update Among Eligible Female Adolescence in School of Missenyi District Council in Kagera Region* "

2. Kwa barua hii umeruhusiwa na ofisi ya Mkurugenzi Mtendaji Wiliaya ya Missenyi kufanya utafiti kwenye taasisi hizo na pia utapewa ushirikiano wa kutosha kutoka kwa wakuu wa shule.

4. Nakutakia utekelezaji mwema.

Saverina J. Misinde  
**KNY: Mkurugenzi Mtendandaji (W)**  
**HALMASHAURI YA WILAYA YA MISSENYI**

Nakala:

Mkurugenzi Mtendaji Halmashauri ya Wilaya  
 MISSENYI

..... Aione kwenye jalada.

Wakuu wa shule za Sekondari Missenyi

..... Tao ushirikiano wa kutosha.