

**PERCEPTIONS OF HEALTHCARE WORKERS ON  
THE HUMAN PAPILLOMA VIRUS VACCINES AT  
SELECTED HEALTH FACILITIES IN NAIROBI,  
KENYA**

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**Perceptions of Healthcare Workers on the Human Papilloma Virus  
Vaccines at Selected Health Facilities in Nairobi, Kenya**

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**A thesis submitted in partial fulfilment for the Degree of Master of  
Science in Public Health in the Jomo Kenyatta University of  
Agriculture and Technology**

**2017**

**DECLARATION**

This thesis is my original work and has not been presented for a degree in any other University

Signature ..... Date.....

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This thesis has been submitted for examination with our approval as the University supervisors;

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## **DEDICATION**

This work is dedicated to my parents the Osamong`s and my siblings for their unending support.

To my husband and children for their encouragement and support all through the project. For the many moments they allowed me to take time out to concentrate on my work I am indeed grateful. I hope for years to come they will see the results of this work.

Thank you

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I thank my family for their encouragement and support all through the project. For the times they allowed me to take time out to concentrate on my work I am indeed grateful. I hope for years to come they will see the results of this work.

To all that supported me, I give my sincere gratitude. Thank you.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>CME</b>	Continuous Medical Education
<b>CO</b>	Clinical Officer
<b>ERC</b>	Ethical Review Committee
<b>GAVI</b>	Global Alliance for Vaccines and Immunisation
<b>HPV</b>	Human Papilloma Virus
<b>ICC</b>	Invasive cervical cancer
<b>KEMRI</b>	Kenya Medical Research Institute
<b>KEMSA</b>	Kenya Medical Supplies Agency
<b>SSA</b>	Sub Saharan Africa
<b>SSC</b>	Scientific steering committee
<b>WHO</b>	World Health Organisation

## ABSTRACT

Human papilloma virus is a common sexually transmitted viral infection that affects both men and women .A strong association has been found between presence of HPV and occurrence of cervical cancer. HPV infection is a public health concern and therefore the use of HPV vaccines that would reduce infection with HPV and consequently reduce cervical cancer incidence would be of utmost importance. The main objective of the study was to determine the healthcare worker's perception on the HPV vaccines at Nairobi Women's Hospital and Mbagathi District Hospital in Nairobi. The study was a descriptive cross sectional study with mixed methodology where self administered questionnaires amongst doctors and nurses while key informantinterviews were carried out with key informants in both hospitals. A total of 107 participants responded to questionnaires and data obtained. Health worker perception of HPV vaccines was assessed using qualitative data collected from open-ended questions administered to all 107 participating health workers and additional data from in-depth key informant interview among health workers (n = 10) in-charge of different service. The 10 key informants included medical officers (n = 2), a clinical officer and nurses (n = 7). Eighty six per cent of the health workers were aware that HPV is a sexually transmitted virus. While all 33 health workers at Nairobi Women's Hospital were aware that HPV is a sexually transmitted virus, 15 health workers from Mbagathi reported either not knowing what caused HPV (n = 5) or responded that HPV is caused by poor hygiene (n = 10). Most health workers in Mbagathi (87.7%) and Nairobi Women's (97%) recognised that HPV was associated with cervical cancer and there was no significant differences in knowledge of the association between HPV infection and cancer at the two hospitals (OR = 4.4, 95% CI 0.5-36.5). However, the health workers differed in the perception of the mechanism of HPV association with cancer of the cervix. While, health workers at Nairobi women's predominantly reported that HPV causes cancer of the cervix (OR = 25.8, 95% CI 8.6-76.8, p < 0.001), compared to their colleagues at Mbagathi were health workers at Nairobi women's were likely to report that HPV predisposes

infected individual to cancer of the cervix (OR = 0.1, 95% CI 0.02-0.2,  $p < 0.001$ ). There were differences in health workers responses on the target groups for HPV vaccination depending on the hospital they were based in. Seventy eight percent (78%) percent of health workers at Nairobi Women's Hospital thought the vaccine should target both boys and girls while most workers at Mbagathi reported that the vaccine targets girls (39.2%) and women (35.1%). The target age groups for vaccination according to health workers varied with those at Nairobi Women's Hospital giving 0-5 years (27.3%) and 25-30 years (30.3%). Those at Mbagathi gave 11 and 25 years (11-15 years at 17.6%; 16-20 years at 28.4%; and 21-25 years at 17.6%). There were no differences in attitude towards vaccination in terms of recommending HPV to clients (81.8% versus 81.1%) and recommending or receiving vaccine if funding were made available to subsidise HPV vaccine costs (93.9% versus 82.4%). With regard to practices health workers at Nairobi women's Hospital were more likely to report having received HPV vaccine (69.7% versus 2.7%), administered (87.9% versus 4.1%) and recommended (87.9% versus 17.6%) HPV vaccine to a client compared to health workers at Mbagathi. This study concludes that the knowledge, perceptions and the practices of health workers relating to HPV is largely dependent upon the sector at which they operate and not on their level of education and the professional training thereof.



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Human papilloma virus (HPV) is a common sexually transmitted virus. HPV affects both men and women and condoms are only partially effective in preventing infection as any exposed skin can transmit the virus (Winer & Hughes, 2006). HPV is responsible for other benign genital infections such as recurrent juvenile respiratory papillomatosis and genital warts; both mainly caused by HPV types 6 and 11 (Lacey, Lowndes & Shah, 2006).

HPV is a necessary cause of cervical cancer, but it is not a sufficient cause. Other cofactors are necessary for progression from cervical HPV infection to cancer. Tobacco smoking, high parity, long-term hormonal contraceptive use, and co-infection with HIV have been identified as established cofactors. Co-infection with *Chlamydia trachomatis* and herpes simplex virus type-2, immunosuppression, and certain dietary deficiencies are other probable cofactors. Genetic and immunological host factors and viral factors other than type, such as variants of type, viral load and viral integration, are likely to be important but have not been clearly identified (Muñoz, Castellsague, Gonzalez & Gissman, 2006).

Cervical cancer is the second leading cause of cancer death in women globally and the first in many developing countries. In sub Saharan Africa cervical cancer is the most common cancer (Parkin, Bray & Devesa, 2001). In Kenya according to the Nairobi cancer registry, cervical cancer accounted for 19.3% of all cancer cases recorded in the period 2003-2006. According to WHO cervical cancer is the most frequent cancer amongst women with mortality of 2111 lives every year (WHO, 2010).

HPV vaccines are part of the primary cervical cancer prevention tools. Vaccines targeting high risk HPV types and other types may be used to create immunity to Human papilloma virus thus enhancing prevention of cervical cancer. This may be an effective tool towards reducing the burden of cervical cancer disease. Commercial vaccines against HPV 16 and HPV 18 are now available, global variations in HPV type specific prevalence could affect effectiveness (Inglis, Shaw&Koenig, 2006).

In Kenya, there are two brands of the vaccine available to prevent HPV infection: Cervarix from GlaxoSmithKline that is bivalent and is adjuvated with ASO4 (a combination of aluminum hydroxide and monophosphoryl lipid A). This brand targets the HPV 16 and 18. Cervarix is nearly 100% effective in preventing cancerous lesions caused by strains 16 and 18, according to the study conducted by the company. In addition, the vaccine was 78% effective in preventing infection of HPV strain 45 and 60% effective in preventing infection of HPV strain 31. The four HPV strains cause about 80% of cervical cancer cases. Gardasil from Merck and Company is a quadrivalent used to target HPV type 16, 18, 6 and 11. Cervarix is given in three intra muscular injections at 0, 1 and 6 months while Gardasil is given as 3 doses at 0, 2 and 6 months.

It is important to know the perceptions of healthcare workers on these important vaccines, attitudes and practices of health care providers on the use of HPV vaccines because they are the ones who are in direct contact with parents and the children to be vaccinated.

## **1.2 Statement of the problem**

HPV infection is a public health concern. HPV has been shown to be the major risk factor in occurrence of cervical cancer. Cervical cancer is among the leading cancers in women and mortality and morbidity from it is high among women diagnosed with the disease. Coverage of cervical cancer prevention and screening programs is still low in developing countries. Human Papilloma Vaccine awareness and uptake is still

low. This could be attributed to several factors including the perceptions of healthcare workers. A positive perception, knowledge and practices on the HPV vaccines could enhance programs that aim to reduce burden of cervical cancer.

### **1.3 Study Justification**

With the introduction of HPV vaccines in the Kenya, it is important to know the knowledge, attitudes and practices of healthcare workers on these vaccines. Nurses and doctors are the first line in promotion of vaccines to parents of the target group. The study was done in Nairobi as the initial rollout of vaccine was done in Nairobi. Information obtained from the study will be used to evaluate healthcare worker related reasons that contribute to low coverage and uptake of the vaccines. Study findings will provide added understanding on perceptions of healthcare workers in Kenya with regard to HPV vaccination and should contribute to discussions about how to optimize the strategy for protecting women against HPV and hence preventing cervical cancer.

### **1.4 Research Questions**

- 1) What are the knowledge, perceptions and practices of healthcare workers on the HPV vaccines?
- 2) What are the factors influencing perceptions of healthcare workers on the HPV vaccines?
- 3) What are the differences in perceptions of healthcare workers in the two selected hospitals

### **1.5 Objectives**

#### **1.5.1 General Objective**

To determine the perceptions of healthcare workers on HPV vaccines in selected health facilities in Nairobi.

### **1.5.2 Specific Objectives**

1. To establish the knowledge, perceptions and practices of health care workers on HPV vaccines.
2. To determine factors influencing perceptions on HPV vaccines among healthcare workers in Nairobi women`s hospital and Mbagathi District hospital  
To compare perceptions of healthcare workers on HPV vaccines in Nairobi Women`s hospital and Mbagathi District Hospital.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Human papilloma virus

Human papilloma virus is a common sexually transmitted virus. HPV affects both men and women and condoms are only partially effective in preventing infection as any exposed skin can transmit the virus (Winer *et al.*, 2006). Human papilloma virus is commonly found in the anogenital tract with or without clinical lesions. The prevalence of HPV increases with severity of the lesion. Majority of the approximately 200 known types of HPV do not cause any symptoms in most people. More than 30 types of HPV are typically transmitted through sexual contact and infect the anogenital region. Some types can cause warts, while others can lead to cancers of the cervix, vulva, vagina and anus in women or cancers of the anus and penis in men. HPV is a member of the *papillomaviridae* family of viruses. Papillomaviruses are small, approximately 52-55nm in diameter. They are DNA viruses and there are more than 100 types of HPV.

Worldwide HPV- 16 and 18 contribute to over 70% of all cancer cases. The most prevalent type of HPV worldwide is type 16 with less variation in geographical distribution than other types (Clifford, Franceschi, Diaz, Munoz&Villa, 2006). Cross sectional studies done have shown that the overall prevalence of any HPV types in the general population of Sub Saharan Africa for women with normal cytology is 21.8%. The prevalence of HPV types 16 and 18 among ICC cases in SSA range from 43.7 to 90.2%. The overall combined estimated HPV 16 and 18 prevalence among ICC cases in Mozambique was found to be 69% (Naucler *et al.*, 2004), which is consistent with worldwide estimates of 70% (ICO information center on HPV and cancer, 2009).

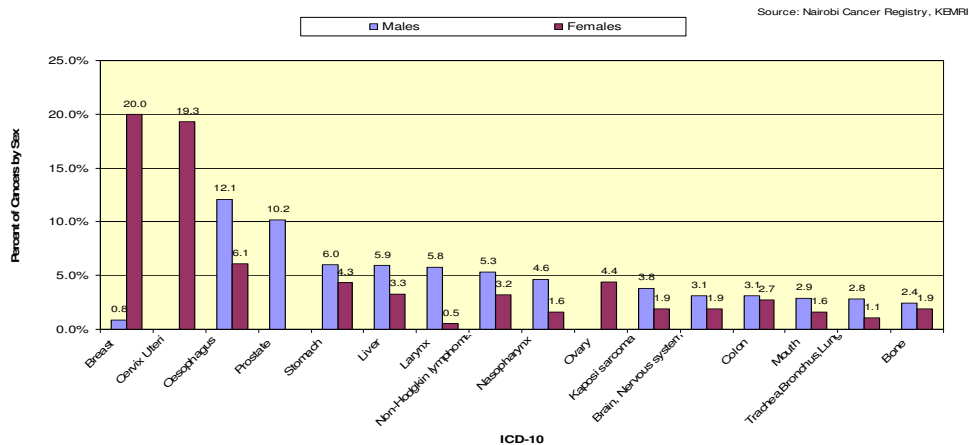
In Kenya about 38.8% of women in the general population are estimated to harbour cervical HPV infection, with HPV 16/18 prevalence being found to be 60.9% in a

group of women with ICC (WHO, 2010). In addition, HPV prevalence in HIV positive women was found to be higher 49% than in the general population (Yamada *et al.*, 2008).

In a study done in Kenya to evaluate the most frequent type of HPV in histology of invasive cervical cancer cases it was found that type 16 was most common (43.8%) followed by type 18 (17.6%) and type 45 (17%) (Guan *et al.*, 2012) while in women with normal cytology in Kenya HPV types 58 and 16 were most common (11%). Although the prevalence of HPV in women with normal cytological findings is high and variable across world regions, worldwide, HPV types 16, 18, 31, 52, and 58 are consistently found among the 10 most common types in all of them (Bruni *et al.*, 2010).

## **2.2 Cervical Cancer**

Cervical cancer is the second leading cause of cancer death in women globally and the first in many developing countries. In sub-Saharan Africa cervical cancer is the most common cancer (Parkin *et al.*, 2001). In Kenya according to the Nairobi cancer registry, cervical cancer accounted for 19.3% of all cancer cases recorded in the period 2003-2006 (figure 2.1). According to WHO cervical cancer is the most frequent cancer amongst women with mortality of 2111 lives every year (WHO, 2010).



**Figure 2.1: Frequency of Cancers as Registered by Nairobi Cancer Registry – KEMRI (2003 -2006)**

Routine pap smear tests can be done to detect early lesions of the disease. It is estimated that 70,722 new cases of invasive cervical cancer (ICC) occur annually in sub-Saharan Africa and it is responsible for one quarter of all female cancers (Parkin *et al.*, 2008). In East Africa the age-standardized incidence rate of cervical cancer is 42.7 per 100,000 women (Ferlay, Bray, Pisani & Parkin, 2004). The age standardized incidence rates is 12.1 in North America and 11.9 in Europe (WHO, 2010). Each year, approximately 450,000 new cases of invasive cervical cancer are diagnosed worldwide, with the rate being highest in regions where there is little cytological cervical cancer screening (Sankaranarayanan, Gaffikin, Jacob, Sellors & Roblese, 2005).

Cervical cancer cytology screening programmes have been successful in curbing the incidence of cervical cancer in developed countries (Sankaranarayanan, Budukh & Rajkumar, 2001). According to WHO screening programmes coverage is still very low (0.4%-20.2%) in Sub-Saharan Africa. Many women in developing countries still do not get screened (WHO, 2002) with women seeking medical attention when cancer is at an advanced stage, leading to higher mortality as treatment options may not be successful with advanced disease (Stewart & Kleihues, 2003).

### **2.3 Human Papilloma Virus and Cervical Cancer**

A strong association has been found between presence of HPV and the occurrence of cervical cancer (Bosch, Lorincz, Munoz, Meijer & Shah, 2002; Castellsague *et al.*, 2006). Among the 15 high-risk oncogenic HPV genotypes that have been identified, HPV 16 and 18 have been associated with most of the HPV-associated cervical cancer cases. HPV types 16, 18, 31 and 45 are called "high-risk" types because they can lead to cervical, anal, vulvar, penile, and lung cancers (Khan, Castle, Lorincz, 2005; Schiffman *et al.*, 2005).

### **2.4 Human Papilloma Virus Vaccines**

Human PapillomaVirus vaccines are part of the primary cervical cancer prevention tools. Vaccines targeting high-risk HPV types and other types may be used to create immunity to HPV thus enhancing prevention of cervical cancer. This may be an effective tool towards reducing the burden of cervical cancer disease. Commercial vaccines against HPV 16 and HPV 18 are now available, global variations in HPV type specific prevalence could affect effectiveness (Inglis *et al.*, 2006). The vaccines do not treat existing infections or lesions and so are recommended for young women without known exposure to targeted types of HPV (Constance *et al.*, 2006). Most countries that have issued official recommendations for immunization recommend immunization of pre-adolescent girls of age 9-13years (WHO, 2008). In the USA girls aged 11-12years are being targeted for vaccination (Schiffman, Jeronimo, Rodriguez & Wacholder, 2007). In Kenya the guidelines for HPV vaccines are currently in preparation and the vaccines are available in limited hospital set-ups. The vaccines are costly and generally in Kenya the vaccine coverage is still low.

In Kenya there are two brands of the vaccine available to prevent HPV infection: Cervarix<sup>®</sup> from GlaxoSmithKline that is bivalent and is adjuvated with ASO4. This brand targets the HPV 16 and 18. Cervarix<sup>®</sup> is nearly 100% effective in preventing cancerous lesions caused by strains 16 and 18, according to the study conducted by



the company. In addition, the vaccine was 78% effective in preventing infection of HPV strain 45% and 60% effective in preventing infection of HPV strain 31. The four HPV strains cause about 80% of cervical cancer cases. Gardasil® from Merck & Co is a quadrivalent used to target HPV type 16, 18, 6 and 11. Cervarix® is given in three intra muscular injections at 0, 1 and 6 months while Gardasil® is given as 3 doses at 0, 2 and 6 months.

It is important to know the knowledge, attitudes and practices of health care providers on the use of HPV vaccines because they are the ones who are in direct contact with parents and the children to be vaccinated. The vaccines are costly with an average cost of approximately 360\$ for the full three-dose regimen (Parkinet *al.*, 2006). An economic survey evaluating the impact of vaccination in the Global Alliance for Vaccines and Immunisation (GAVI) eligible countries showed that with 70% coverage of pre-adolescents, HPV vaccines have the potential to reduce the lifetime risk of cervical cancer by 31-60% in the region (Goldie *et al.*, 2008).

## **2.5 Human Papilloma Virus vaccine and the healthcare provider**

HPV vaccines are now available in Kenya for clinical use. The uptake and acceptance of the vaccine depends largely upon and whether providers recommend the vaccines to the target population. The introduction of the vaccines has positioned healthcare workers to play an active role in ensuring its successful implementation. Healthcare workers are the first line in promotion of HPV vaccines to parents of target group for vaccines (Editorial, 2008). The positive role of physicians has been acknowledged as important to the acceptability of vaccinations among parents (Fernandez, Allen, Mistry&Kahn, 2010). With the introduction of HPV vaccines it is important to find out the perceptions of the healthcare workers on the vaccines. In a study done in France to assess the perceptions and practice among practitioners, majority of the respondents gave a favourable opinion on public health benefits of the vaccine the main reason for non favourable responses was the recent introduction of the vaccines

cited by 43% of respondents, there were also difficulties in terms of patient concerns about potential side effects (Lutringer -Magnin *et al.*, 2011).

In a study done in Italy where 807 Italian mothers of adolescent girls were interviewed about HPV vaccination, paediatricians were found to be the providers of most of information on HPV vaccine (31%) and were perceived as preferred immunization providers (77%)(Tozzi *et al.*, 2009). In Canada it was found that 95% of respondents in a survey on health care providers Knowledge, attitudes and beliefs about HPV vaccination indicated that the vaccine should be given to girls before onset of sexual activity. Eighty percent of the respondents felt that the best age for vaccination is < 14years (Winer & Hughes, 2006). The cost of vaccines may affect the clinical staff's attitudes towards recommending the vaccines as shown in a survey where majority of respondents intended to recommend HPV vaccine if they are publicly funded (Duval *et al.*, 2007, 2009).

Healthcare workers interact with patients a lot during patient's clinical care. They are the ones who administer vaccines and so are very important in terms of uptake of HPV vaccines. Eighty five percent(85%) of respondents on a survey done on nurses Knowledge, attitudes and practices on HPV vaccines acknowledged they would recommend HPV vaccines to their patients (Tozzi *et al.*, 2009). Another study done found that a personal belief in the positive impact of the HPV vaccine and providers feeling comfortable talking with parents about sexual nature of vaccine as the most common factors influencing perceptions (Mc Cave,2010).

## **CHAPTER THREE:**

### **MATERIALS AND METHODS**

#### **3.1 Study Design**

The study was a descriptive cross sectional study, which utilized both quantitative and qualitative data techniques.

#### **3.2 Study Site**

The study was conducted in two health facilities, Mbagathi District Hospital and Nairobi Women's Hospital, public and private facilities, purposively, all in Nairobi County. Both hospitals offer outpatient and inpatient services to women and girls who are the target population for HPV vaccines.

##### **3.2.1 The Nairobi women's Hospital**

The Nairobi Women's hospital is a private hospital set up in March 2001 with the aim of providing holistic care to the women and children of the society. The hospital is located in Hurlingham area, about 4 kilometres north of Nairobi Central Business district. It has branches at Adams arcade and Ongata Rongai.

##### **3.2.2 Mbagathi District hospital**

Mbagathi District Hospital is a government-owned public hospital located in Ngummo estate of Nairobi, about 4 kilometres northeast of Nairobi City centre. It serves as the district hospital for Nairobi County. The hospital has outpatient and inpatient services.

### 3.3 Study Population

These were healthcare workers recruited into the study and it included doctors, clinical officers and nurses who fulfilled the following inclusion and exclusion criteria.

#### 3.3.1 Inclusion criteria

- All resident doctors, clinical officers and nurses working at the Nairobi Women's Hospital at the time of the study, who consented, were eligible for recruitment into the study.
- All resident doctors, clinical officers and nurses working at the Mbagathi District Hospital, who consented to participate in the study

#### 3.3.2 Exclusion criteria

- Non-clinical staff of the selected hospitals.
- Doctors, clinical officers and nurses who did not consent to participate in the study

### 3.4 Sample size determination

Sample size was determined using standard statistical formula (Cochran, 1963):

$$n = \frac{Z_{\alpha/2}^2 p(1-p)}{d^2}$$

p=assumed proportion of people with good knowledge is 50%

$$n = \frac{3.842 \times 0.5 \times 0.5}{0.05 \times 0.05}$$

$$n = 385$$

Apply the finite population correction factor (FPC). This was used to slightly reduce the sample size as the population was small.

$$n_c = \frac{nN}{N+n-1}$$

$$N+n-1$$

Where

n is calculated sample size=385

N is actual population of possible respondents = 149

Sample size = 107

The **107** respondents were randomly selected within the two selected institutions.

### **3.5 Data Collection**

Self-administered questionnaires (Appendix 1) were developed and issued to respondents for them to fill-in. The main issues in the questionnaires included perceptions, knowledge, practices and factors associated with the perceptions of health workers on HPV vaccines. The filled-in questionnaire was later picked from participants at an agreed time convenient to each individual.

Key informant interviews were also conducted amongst the section heads like medical doctor, maternity nurse and senior staff nurse. An interview guide (Appendix 2) was used to obtain qualitative information from the purposively selected informants. The issues captured by the guide ranged from perceptions, knowledge, practices to factors associated with the perceptions of health workers on HPV vaccines. The interviews were conducted by the investigator who moderated the interviews while one field assistant was tape-recording the proceedings and writing notes as back-ups.

### **3.6 Data storage and Management**

Filled questionnaires and notes from key informants were stored in a lockable cabinet only accessible to the researchers. Back up of soft data was stored in flash disks and protected under passwords.

### **3.7 Data Analysis and Presentation**

Data from questionnaires was entered in access and was analysed using SPSS. Continuous data was summarised using means, standard deviation or median. Data is presented in the form of percentages, tables and graphs. Comparisons between the two hospitals were done using chi-square (Fishers exact test) for categorical variables while analysis of variance (ANOVA) for continuous variables. In determining factors influencing perception on HPV vaccine among health care workers, logistic regression analysis was performed. In all analyses, the level of statistical significance was 5%.

Notes from key informant interviews were typed in Microsoft word and manually analysed based on themes which were developed from the study objectives and the guide. Results are presented in verbatim.

### **3.8 Ethical Considerations**

#### **3.8.1 Approvals**

Approval to conduct this study was sought from the Scientific steering committee (SSC) of KEMRI (**SSC NO.2330**) and National Ethical Review Committee (ERC) for scientific and ethical approvals, respectively.

#### **3.8.2 Consent**

Written consent to participate in the study was sought from participants prior to commencement of the study (Appendix 3).

### **3.8.3 Confidentiality**

No personal identifiers such as names were used in the study. Participants were assured that all information obtained from them was going to be treated with maximum confidentiality and that none of their names was going to be used in any form such as publication or report arising from the study. All data was stored in a lockable cabinet, soft copies protected using passwords and access granted to only authorised personnel.

### **3.8.4 Purpose and Benefits**

Participants were informed of the purpose of the study which sought to determine the perceptions of healthcare workers on the HPV vaccines. Respondents were provided with additional information on cervical cancer and HPV. Participants were further notified that there were no direct benefits to them for their participation in this study other than the fact that their contributions will go a long way in improving existing health programs in as far as HPV vaccines are concerned. There were no payments for participating in the study but information obtained would contribute to overall improvement of uptake of HPV vaccines and eventual reduction in cervical cancer.

### **3.8.5 Potential risk/harm**

Participants were informed that there was no direct anticipated harm from the study as no invasive procedures were going to be performed. Care was taken to ensure maximum confidentiality by not using any personal identifiers.

## CHAPTER FOUR:

### RESULTS

#### 4.1 Socio-demographic characteristics of healthcare workers

Table 4.1 shows the overall summary of the socio-demographic characteristics of respondents in the two hospitals (Nairobi Women's and Mbagathi). The table shows that 30.7% health workers were recruited from Nairobi Women's hospital and 69.2% from Mbagathi Hospital. The average age of participants was 28.5 years (SD 7.6), with a range from 20 to 49 years. Overall, majority (37.4%) of health workers were aged between 23 and 24 years with this age group being the modal age group both within Mbagathi DH (33.8%) and Nairobi Women's hospital (45.5%). Female health workers accounted for 67.3% and the percentage of participants at the two hospitals were not significantly different (63.5% in Mbagathi DH compared to 75.8% in Nairobi Women's hospital).

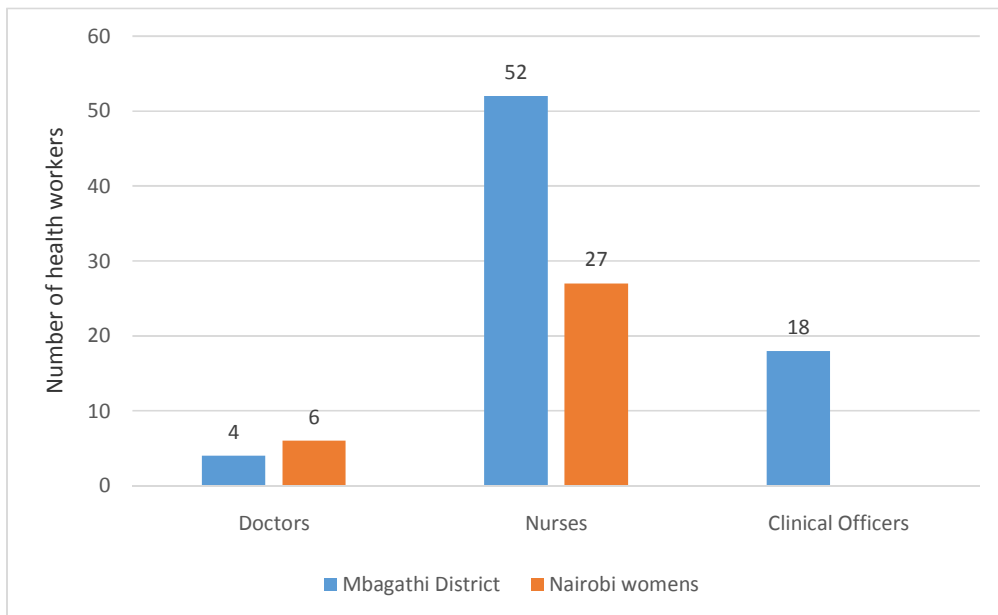
Most (71%) health workers held diploma qualifications (Mbagathi DH, 67.6% versus 78.8% in Nairobi Women's hospital). However there were more health workers who had first degrees in Mbagathi (21.6%) than in Nairobi Women's (15.2%). There were significant differences in the duration of service (in years) reported at the two hospitals (chi square = 9.8, d.f = 2; P value = 0.008). Most health workers at both sites had been in service for less than 5 years (59.5% versus 66.7%), but a higher percentage of staff in Mbagathi compared to Nairobi Women's had served for at least 11 years (29.7% versus 6.1%).



**Table 4.1: Demographic characteristics of study participants**

<b>Age in years</b>	<b>Hospital</b>		<b>Total</b>
	<b>Mbagathi DH</b>	<b>Nairobi Women's</b>	
	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>
23-24	25(33.8)	15(45.5)	40(37.4)
25-29	20(27.0)	11(33.3)	31(29.0)
30-34	7(9.5)	6(18.2)	13(12.2)
35-39	10(13.5)	1(3.0)	11(10.3)
40-44	7(9.5)	0	7(6.5)
45-49	5(6.8)	0	5(4.7)
<b>Sex</b>			
Male	27(36.5)	8(24.2)	35(32.7)
Female	47(63.5)	25(75.8)	72(67.3)
<b>Education qualification</b>			
Diploma	50(67.6)	26(78.8)	76(71.0)
Higher diploma	8(10.8)	1(3.0)	9(8.4)
Bachelors degree	16(21.6)	5(15.2)	21(19.6)
Masters degree	0	1(3.0)	1(1.0)
<b>Duration of service in years</b>			
0-5	44(59.5)	22(66.7)	66(61.7)
6-10	8(10.8)	9(27.3)	17(15.9)
11 and above	22(29.7)	2(6.1)	24(22.4)

Further, figure 4.1 shows that Nairobi Women’s hospital had a higher percentage (18.2%, 6/ 33) of doctors compared to Mbagathi District Hospital (5.4%, 4/ 74). It is important to note that whereas Mbagathi hospital had 24.3% (18/ 74) clinical officers, Nairobi Women’s hospital that had no clinical officers (0/ 33). Overall, nurses comprised the majority (73.8%, 79/ 107) of health workers, and were also the majority in Mbagathi (70.3%, 52/ 74) and Nairobi Women’s’ (81.2%, 27/ 33).



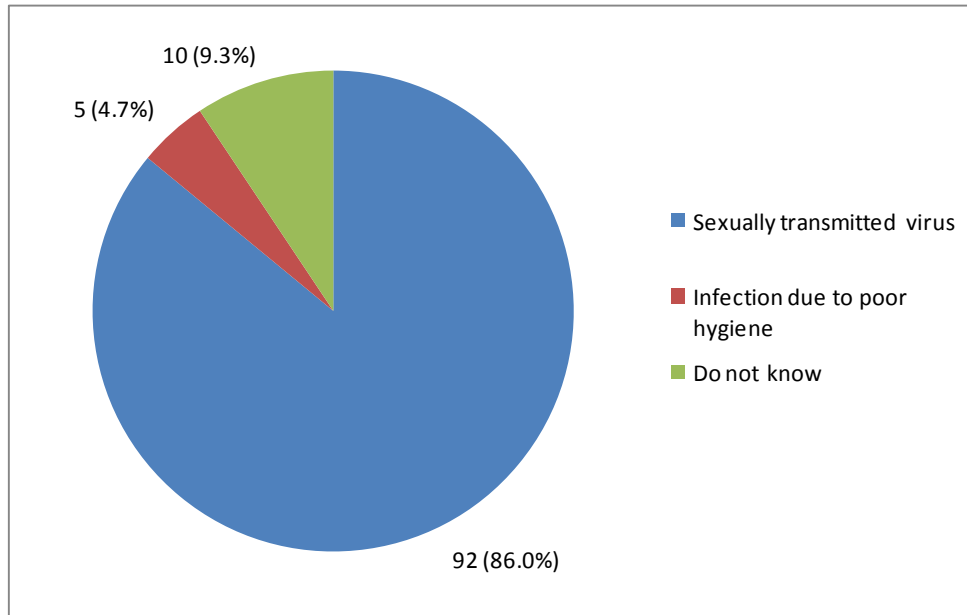
**Figure 4.1: Distribution of healthcare workers by cadre**

## **4.2 Knowledge, perceptions and practices on HPV vaccines**

### **4.2.1 Health worker knowledge on HPV and HPV vaccines**

Figure 4.2 below shows that, overall 86% of the health workers were aware that HPV is a sexually transmitted virus. While all 33 health workers at Nairobi Women’s Hospital were aware that HPV is a sexually transmitted virus, 15 health

workers from Mbagathi District Hospital reported either not knowing what caused HPV (n = 5) or responded that HPV is caused by poor hygiene (n = 10), p = 0.005.



**Figure 4.2: Knowledge of Health worker on HPV infection**

There was no significant difference in level of knowledge concerning HPV among health workers in the different cadres (p = 0.384). All the doctors were aware that HPV is a sexually transmitted virus, compared to 67 (84.8%) nurses and 15 (83.3%) COs who also knew that HPV was a sexually transmitted virus (Table 4.2).

**Table 4.2: Knowledge on HPV infection according to health worker cadre**

	Health worker cadre		
	Doctor	Nurse	CO
<b>HPV is:</b>			
A sexually transmitted virus	<b>10(100.0)</b>	<b>67(84.8)</b>	<b>15(83.3)</b>
Infection due to poor hygiene	<b>0(0.0)</b>	<b>3(3.8)</b>	<b>2(11.1)</b>
I don't know	<b>0(0.0)</b>	<b>5(6.3)</b>	<b>0(0.0)</b>

Health workers at Nairobi Women’s Hospitals were more likely to report ever having heard about HPV vaccine compared to workers at Mbagathi DH (100% versus 71.6%,  $p = 0.0001$ ) as shown in table 4.3 below. Overall, 69.3% of health workers had heard about HPV vaccine in College/University, 22% in CMEs and 8.6% in Journals or magazines.

Out of the 57 (53.3%) health workers who had attended a CME on HPV 40 (80.7%) reported that they had been on the CME within the last 6 months. Attendance of HPV CMEs was significantly different among health workers at the two hospitals with the workers at Nairobi women being 11.9 times more likely to report having attended a CME (OR = 11.9, 95% CI 3.8-37.5) compared to health workers at Mbagathi District Hospital.

**Table 4.3: Knowledge on HPV vaccine**

Knowledge	Hospital		Total n (%)	OR (95% CI)	P value
	Mbagathi DH n (%)	Nairobi Women’s n (%)			
<b>Ever heard about HPV vaccine</b>	53(71.6)	33 (100)	86(80.4)	-	0.0001
<b>Heard about vaccine in:</b>					
College/ university	33(44.6)	24(75)	57(69.5)	3.3 (1.4-8.1)	0.007
Workshop/ CME	11(22)	7(21.9)	18(22)	1.5 (0.5-4.4)	0.418
Journal/ Magazine	6(12)	1(3.1)	7(8.6)	0.4 (0.04-3.1)	0.327
<b>Attended CME on HPV</b>	28(37.8)	29(88.9)	57(53.3)	11.9 (3.8 – 37.5)	<0.001
<b>Cervical cancer and HPV</b>					
HPV associated with cervical cancer	32(97)	65(87.8)	97(90.7)	4.4 (0.5-36.5)	0.134
HPV causes cervical cancer	27(83.4)	11(17)	38(39.2)	25.8 (8.6-76.8)	<0.001
HPV predisposes to cervical cancer	5(15.6)	54(83)	59(60.8)	0.1(0.02-0.2)	<0.001

#### 4.2.2 HPV infection and its association with cancer of the cervix

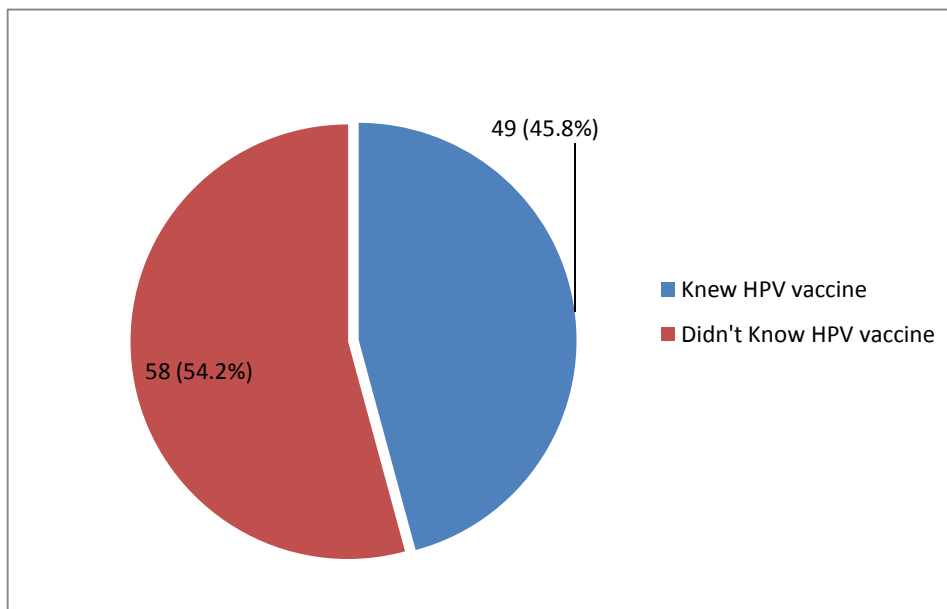
As shown in Table 4.3, most health workers in Mbagathi (87.7%) and Nairobi Women's (97%) recognised that HPV was associated with cervical cancer and there was no significant differences in knowledge of the association between HPV infection and cancer at the two hospitals (OR = 4.4, 95% CI 0.5-36.5). However, the health workers differed in the perception of the mechanism of HPV association with cancer of the cervix. While, health workers at Nairobi women's predominantly reported that HPV causes cancer of the cervix (OR = 25.8, 95% CI 8.6-76.8,  $p < 0.001$ ), compared to their colleagues at Mbagathi DH, the health workers at Nairobi women's were likely to report that HPV predisposes infected individual to cancer of the cervix (OR = 0.1, 95% CI 0.02-0.2,  $p < 0.001$ ).

**Table 4.4: Knowledge on HPV vaccine according to health worker cadre**

	Health worker cadre		
	Doctor	Nurse	CO
<b>Ever heard about HPV vaccine</b>	10(100.0)	61(77.2)	15(83.3)
<b>Heard about vaccine in:</b>			
College/university training	8(80.0)	38(48.1)	11(61.1)
Workshop/CME	1(10.0)	13(16.5)	4(22.2)
journal/magazine	1(10.0)	6(7.6)	0(0.0)
<b>Attended CME on HPV</b>			
0-6 months	3(30.0)	38(48.1)	5(27.8)
6mths-1yr	0(0.0)	4(5.1)	0(0.0)
1-2yrs	1(10.0)	1(1.3)	1(5.6)
more than 2 years	1(10.0)	0(0.0)	3(16.7)
<b>Cervical cancer and HPV</b>			
HPV causes cervical cancer	3(30.0)	33(41.8)	2(11.1)
HPV predisposes someone to			
cervical cancer	5(50.0)	40(50.6)	14(77.8)

All the participating doctors (n = 10) had reported that they had ever heard of HPV vaccine compared to 77.2% and 83.3% of nurses and Clinical officers, respectively (Table 4.4). Doctors were also more likely to have heard about the vaccine during undergraduate training (80%) compared to nurses (48.1%) and COs (61.1%). Nurses (48.1%) reported attending CMEs on HPV more recently than other cadres (27.8%-30%). At least one-half of health workers in each cadre reported that HPV predisposes individuals to cervical cancer.

Figure 4.3 shows that 49 (45.8%) of health workers knew at least one of the vaccines with demonstrated efficacy against HPV infection. These health workers who knew any HPV vaccine included 29 (87.9%) out of the 33 health workers at Nairobi Women's Hospital and 27 (20%) of the 74 health workers at Mbagathi DH. The workers from Nairobi Women's were more likely to know at least one vaccine with proven efficacy against HPV compared to health workers at Mbagathi DH (OR = 19.6, 95% CI 6.1-62.7, p < 0.001).



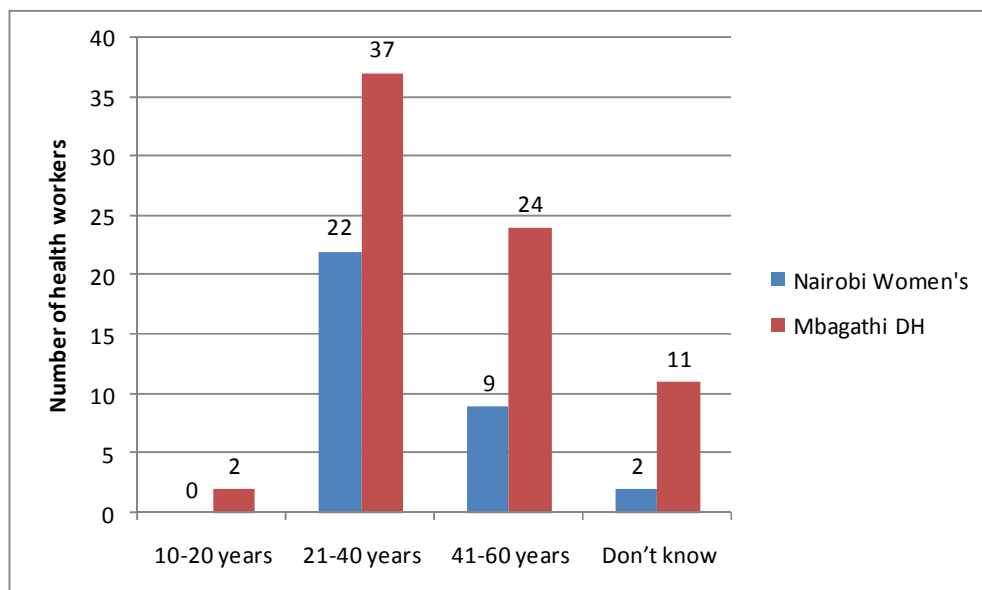
**Figure 4.3: Health worker responses on knowledge of any type of HPV vaccine**

Table 4.5 shows that 50% of doctors, 48.1% nurses and 33.3% Clinical Officers reported that they knew any of the licenced HPV vaccines.

**Table 4.5: Health worker responses on knowledge of any HPV vaccine according to cadres**

	Health worker cadre		
	Doctors	Nurses	CO
<b>Health workers reported that they knew any HPV vaccine:</b>			
Yes	5(50.0)	38(48.1)	6(33.3)
No	3(30.0)	38(48.1)	12(66.7)

Figure 4.4 shows most health workers at both Mbagathi DH and Nairobi Women's Hospital indicated that cervical cancer was most commonly found in the age groups between 21 and 40 years. Based on these responses health workers reported that the second most commonly affected age group was 41 to 60 years.



**Figure 4.4: Comparison on age group affected by cervical cancer**

Table 4.6 shows that when health workers were asked what age group most affected by HPV infection, most doctors (50%) and nurses (60.8%) indicated 21-40 years while most COs (61.1%) responded 41-60 years.

**Table 4.6: Healthcare workers knowledge on age distribution of cervical cancer**

	Health worker cadre		
	Doctors	Nurses	CO
Reported age group affected by cervical cancer			
10-20 years	1(10.0)	1(1.3)	0(0.0)
21-40 years	5(50.0)	48(60.8)	6(33.3)
41-60 years	2(20.0)	20(25.3)	11(61.1)
I don't know	1(10.0)	6(7.6)	1(5.6)

Table 4.7 below shows that there were differences in health workers responses on the target groups for HPV vaccination depending on the hospital they were based in. Seventy-eight percent (78%) of health workers at Nairobi Women's Hospital thought the vaccine is targeted at both boys and girls while most workers at Mbagathi DH reported that the vaccine targets girls (39.2%) and women (35.1%).

Concerning age groups that should be targeted for vaccination the two important age groups according to health workers at Nairobi Women's Hospital were: 0-5 years (27.3%) and 25-30 years (30.3%).



**Table 4.7: Health workers opinion on target populations for HPV vaccination**

Responses on target populations	Hospital		Total, n (%)
	Nairobi Women's, n(%)	Mbagathi, n(%)	
<b>Vaccine target group</b>			
Girls	1(3)	29(39.2)	30(28)
Boys	0(0)	1(1.4)	1(0.9)
Girls and boys	26(78.8)	10(13.5)	36(33.6)
Women	3(9.1)	26(35.1)	29(27.1)
Don't know	3(9.1)	8(10.8)	11(10.3)
<b>Vaccine target age group</b>			
0-5 years	9(27.3)	1(1.4)	10(9.3)
6-10 years	4(12.1)	3(4.1)	7(6.5)
11-15 years	3(9.1)	13(17.6)	16(15)
16-20 years	1(3)	21(28.4)	22(20.6)
21-25 years	2(6.1)	13(17.6)	15(14)
25-30 years	10(30.3)	6(8.1)	16(15)
30 – 40 years	1(3)	4(5.4)	5(4.7)
Over 40 years	0(0)	2(2.7)	2(1.9)
Don't know	3(9.1)	11(14.9)	14(13.1)

The responses on vaccine target group did not show any associations with health worker cadre, with nurses, doctors and COs being equally likely to report that the vaccine targeted girls and boys or women (Table 4.8). Approximately 40% of both doctors and COs reported that the target age group for HPV vaccination was 11-15 years, while 22.6% of nurses indicated that the vaccine target age group was 16-20 years (Table 4.8).

**Table 4.8: Reported vaccine target groups according to health workers' cadre**

	Health worker cadre		
	Doctors	Nurses	CO
<b>Vaccine target group</b>			
Girls	3(30.0)	19(24.1)	8(44.4)
Boys	0(0.0)	1(1.3)	0(0.0)
girls and boys	3(30.0)	29(36.7)	3(16.7)
Women	2(20.0)	21(26.6)	6(33.3)
I don't know	0(0.0)	5(6.3)	1(5.6)
<b>Vaccine target age group</b>			
0-5 years	2(20.0)	7(8.9)	1(5.6)
6-10 years	0(0.0)	7(8.9)	0(0.0)
11-15 years	4(40.0)	5(6.3)	7(38.9)
16-20 years	1(10.0)	18(22.8)	3(16.7)
21-25 years	1(10.0)	12(15.2)	2(11.1)
25-30 years	0(0.0)	15(19.0)	1(5.6)
30-40 years	0(0.0)	3(3.8)	2(11.1)
Over 40 years	1(10.0)	1(1.3)	0(0.0)
I do not know	0(0.0)	6(7.6)	2(11.1)

#### 4.2.3 Health worker perceptions and practices towards HPV vaccines

Table 4.9 shows practices and attitudes related to HPV vaccines among health workers at Mbagathi and Nairobi Women's Hospitals. Attitudes measured by question on whether health workers were willing to get vaccinated, recommend the vaccine or receive the vaccine if HPV was funded. The responses showed that with the exception of willingness to get vaccinated under current conditions where health workers in Nairobi women had a more positive attitude (93.9% versus 43.2%), there were no differences in attitude towards vaccination in terms of recommending HPV

to clients (81.8% versus 81.1%) and recommending or receiving vaccine if funding were made available to subsidise HPV vaccine costs (93.9% versus 82.4%).

With regard to practices health workers at Nairobi women's Hospital were more likely to report having received HPV vaccine (69.7% versus 2.7%), administered (87.9% versus 4.1%) and recommended (87.9% versus 17.6%) HPV vaccine to a client compared to health workers at Mbagathi DH.

**Table 4.9: Health worker perceptions and practices towards HPV vaccine**

Question/issue	Hospital	Yes	No	Not sure
<b>worker perceptions towards HPV vaccine</b>				
Would you get vaccinated with HPV vaccine?	Nairobi Women's	31(93.9)	0	2(6.1)
	Mbagathi DH	32(43.2)	17(23)	25(33.8)
Would you recommend the vaccine to a client?	Nairobi Women's	27(81.8)	0	6(18.2)
	Mbagathi DH	60(81.1)	3(4.1)	11(14.8)
Would you recommend/receive the vaccine if it is funded hence cheaper?	Nairobi Women's	31(93.9)	0	2(6.1)
	Mbagathi DH	61(82.4)	6(8.1)	7(9.5)
<b>Health worker practices towards HPV vaccine</b>				
Have you received the HPV Vaccine at the hospital?	Nairobi Women's	23(69.7)	10(30.3)	NA
	Mbagathi DH	2(2.7)	72(97.3)	NA
Have you administered the vaccine to a patient?	Nairobi Women's	29(87.9)	4(12.1)	NA
	Mbagathi DH	3(4.1)	71(95.9)	NA
Have you already recommended the vaccine to a client?	Nairobi Women's	29(87.9)	4(12.1)	NA
	Mbagathi DH	13(17.6)	61(82.4)	NA

Sixty percent of nurse and doctors compared to 50% of COs were willing to get vaccinated with HPV vaccine (Table 4.10). Most health workers across the different cadres would recommend the vaccine to clients both at the market price and if the vaccine price was subsidized. Less than one-third of doctors (20%), nurses (29.1%)

and COs (0%) had received the vaccine in the hospital. Forty percent, of doctors had administered the vaccine to a client compared to 34.2 of nurses and 5.6% of COs.

**Table 4.10: Perceptions and practices towards HPV vaccine according to health worker cadre**

Issues	Health worker cadres (%)			Total
	Doctors	Nurses	CO	
Would get vaccinated with HPV vaccine	6(60.0)	48(60.8)	9(50.0)	63(58.9)
Would recommend the vaccine to a client	7(70.0)	63(79.7)	17(94.4)	87(81.3)
Would recommend/receive the vaccine if it is funded hence cheaper	7(70.0)	71(89.9)	14(77.8)	92(86)
Had received the HPV Vaccine at the hospital	2(20.0)	23(29.1)	0(0.0)	25(23.4)
Had administered the vaccine to a patient	4(40.0)	27(34.2)	1(5.6)	32(29.9)
Had already recommended the vaccine to a client	5(50.0)	31(39.2)	6(33.3)	42(39.3)

### 4.3 Perceptions of HPV vaccines

Health worker perception of HPV vaccines was assessed using qualitative data collected from open-ended questions administered to all 107 participating health workers and additional data from in-depth key informant interview among health workers (n = 10) in-charge of different service. The 10 key informants included medical officers (n = 2), a clinical officer and nurses (n = 7). All the 10 participating health workers had heard of HPV, but only three (2 medical officers and a senior nurse) had ever recommended or administered the vaccine.

**Table 4.11: Perceptions of health workers on HPV vaccines**

<b>Perception/issue</b>	<b>Nairobi Women's n = 33</b>	<b>MDH n = 74</b>	<b>Total n = 107</b>
<b>Reasons for not getting HPV vaccination</b>			
Not aware of vaccine	1(3%)	6(8.1%)	7(6.5%)
Not well informed on	0(0%)	11(14.9%)	11(10.3%)
Fear of side effects	0(0%)	1(1.4%)	1(0.9%)
cost of vaccine	1(3%)	5(6.8%)	6(5.6%)
Availability of vaccine	2(6.1%)	4(5.4%)	6(5.6%)
Don't know	0(0%)	2(2.7%)	2(1.9%)
<b>Reasons for not recommending HPV to client</b>			
Cost of vaccine	27(81.8%)	12(16.2%)	39(36.4%)
Fear of side effects	0(0%)	3(4.1%)	3(2.8%)
Not well informed	2(6.1%)	21(28.4%)	23(21.5%)
Vaccine schedule	0(0%)	1(1.4%)	1(0.9%)
Availability of vaccine	1(3%)	18(24.3%)	19(17.8%)
Other	0(0%)	1(1.4%)	1(0.9%)
<b>Reasons why health workers have never received HPV at Hospital</b>			
Not aware of vaccine	2(6.1%)	12(16.2%)	14(13.1%)
Not well informed on HPV	2(6.1%)	17(23%)	19(17.8%)
Fear of side effects	0(0%)	1(1.4%)	1(0.9%)
Cost of vaccine	1(3%)	8(10.8%)	9(8.4%)
Availability of vaccine	1(3%)	14(18.9%)	15(14%)
Don't know	0(0%)	1(1.4%)	1(0.9%)
<b>Reason why health workers have never administered vaccine</b>			
Not aware of vaccine	2(6.1%)	16(21.6%)	18(16.8%)
Not well informed on HPV	0(0%)	6(8.1%)	6(5.6%)
Fear of side effects	0(0%)	2(2.7%)	2(1.9%)
Cost of vaccine	0(0%)	1(1.4%)	1(0.9%)
Availability of vaccine	1(3%)	36(48.6%)	37(34.6%)
Don't know	0(0%)	2(2.7%)	2(1.9%)

**Table 4.12: Main responses from the key informant interviews**

<b>Main theme</b>	<b>Main responses</b>
<b>Knowledge about HPV vaccines</b>	<i>"We have sufficient information on HPV vaccine...thanks to the hospital management which made it possible to get the vaccine"</i>

	<p><i>“Where there an availability of vaccine information on the same is missing because we are the ones supposed to be handling and get them out to patients”</i></p> <p><i>“So many people do not know about it”</i></p> <p><i>“The vaccine lowers incidence of cancer lowers morbidity, less money spent on sickness”</i></p> <p><i>“People are not informed on the benefits of HPV, sensitization [on availability, and use of HPV] not done”</i></p> <p><i>“Reduce occurrence of cervical cancer. Anxiety levels among women will also reduce as they will feel safer after vaccine”</i></p>
<p><b>Availability of vaccine</b></p>	<p><i>“It is not available because of the low awareness, marketing is poor usage not initiated It is expensive, popularization not done” “available though am not sure on affordability”</i></p> <p><i>“The vaccine is not available in government or ministry facilities. In fact I have not seen it myself”</i></p> <p><i>“HPV is very available, it is expensive, and popularization has not done...it is available, though I am not sure on affordability”</i></p>

Main theme	Main responses
<p><b>Practices towards HPV vaccines</b></p> <p><b>Attitudes towards vaccines</b></p>	<p><i>“I have recommended but not given”</i></p> <p><i>“ Yes, i recommend especially for sexually active people</i></p> <p><i>“It is relatively new and outcome has not been told yet but i would for it”</i></p> <p><i>“It has side effects and people have a notion on new things”</i></p>
<p><b>Factors affecting uptake of HPV</b></p>	<p><i>“If I say that many people are not aware when most of us professionals are also unaware of the same I will be cheating”</i></p> <p><i>“The cost of the vaccine is unbearable to many people, it’s expensive that only a few people can afford”</i></p> <p><i>“To get these drugs which are expensive is not that easy because of unnecessary procurement procedures accompanied by insensitive managers whose priorities are different. The scenario is worse when stock-outs are realized...you will really have to wait for very long to get the vaccines”</i></p>
<p><b>Way forward/ recommendations</b></p>	<p><i>“Make HPV vaccine available, bring pamphlets to institutions subsidise cost of drugs”</i></p> <p><i>“It should be stocked and awareness especially to staff improved so to recommend to patients”</i></p> <p><i>“If the government agrees it should be added for all women”</i></p> <p><i>“We would like HPV training as part of induction and [to] improve knowledge and skills needed...regular sensitization is needed. Training is encouraged because many health-workers have not heard of vaccine”</i></p>

## CHAPTER FIVE:

### DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Discussion

East Africa has been highlighted as having the highest incidence of invasive cervical cancer in the world (Parkin *et al.*, 2005). In this regard, highly effective prophylactic vaccines against HPV-16 and -18 have been made available for use in many countries. HPV vaccines have been recognized and recommended by WHO as an integral way of preventing cervical cancer (WHO 2010; Tay, 2012; Kohout & Stewart, 2010). Many countries including Kenya have put up strategies towards the implementation and realization of prophylactic HPV vaccination. This saw Kenya becoming the first nation among the developing countries to protect girls with free vaccines in 2013 under the GAVI initiative. HPV vaccines have been shown to prevent infections by certain types of human papillomavirus associated with the development of cervical cancer, genital warts, and other cancers (Markowitz *et al.*, 2007; CDC, 2010). There are two vaccines (Gardasil<sup>®</sup> and Cervarix<sup>®</sup>) in the market, which have been approved for use in many countries as of 2014 (Reuters (2007). Both vaccines protect against the two HPV types (HPV-16 and HPV-18) which has been shown to cause 70% of cervical cancers, 80% of anal cancers, 60% of vaginal cancers and 40% of vulvar cancers (De Vuyst, Clifford, Nascimento, Madeleine & Franceschi, 2009).

However the uptake of health services in any facility is largely dependent upon, among other factors, the efficient manner in which health workers relate clients' assessments to the type of treatment to be prescribed and administered. This ability is informed by the overall knowledge (acquired through experience or education by perceiving, discovering, or learning) of the healthcare workers on recognizing and handling patients up-to administering the right drugs. Many a times a gap in knowledge may be witnessed amongst health workers in as far as acceptance, priority



setting and other issues related to new interventions is concerned. Further, the success of any integrated service has been shown in a study to be related to several factors, including knowledge, understanding and preferences of health workers and the community members (Markowitz *et al.*, 2007).

This study has shown that all participants (100%) at Nairobi Women's hospital were aware that HPV is a sexually transmitted virus and knew of existence of vaccines for HPV as compared to those at Mbagathi hospital where 84.7% of respondents knew that HPV vaccine is a sexually transmitted virus and 71.4% had heard of the vaccine. This finding (which is similar to another finding by Mutyaba (Mutyaba, Mmiro & Weirderpass, 2006; Güdücü, Gönenç, İşçi, Yiğiter, & Dunder, İ., 2012) shows that health workers in private health facilities seem to be more aware of the HPV vaccine as well as knowing that HPV is a sexually transmitted virus. This is attributed to many issues that support the same in the private sector. The private health sector such as the Nairobi Women's hospital, is attempting to provide all health services using the latest interventions as their procurement plans are not subjected to numerous and tedious bureaucracies witnessed in public health facilities such as at Mbagathi district hospital. However, health workers at the Mbagathi District hospital had a longer duration in service than the Nairobi Women's hospital counterparts. It is important to note that Nairobi women's hospital has specialised women's programs on sexual, reproductive health and a Gender Based violence recovery centre.

In addition, only 46% of all respondents knew of a specific vaccine and 25% mentioned cervarix<sup>®</sup> when asked to specify the HPV vaccine known to them. This shows that there is no sufficient knowledge on HPV and HPV vaccines among the respondents. A study in Mulago hospital whose objectives was to describe knowledge on cervical cancer, attitudes and practices towards cervical cancer screening among the medical workers of Mulago hospital found that 93% considered cancer of the cervix a public health problem and knowledge about Pap smear was 83% among respondents (Mutyaba *et al.*, 2006). Worth noting also is the finding of this study that 69% of healthcare workers had heard of HPV and the vaccine during

training either at university or college with only 21% and 9% having heard of the same through workshops and journals respectively.

Findings of this study demonstrated that health workers can, with that knowledgeable background, be able to detect HPV and subsequently treat it soonest before it can lead to cervical cancer. The primary goal in HPV vaccination is to prevent cervical cancer. Although the importance of the Pap smear in reducing cancer incidence and mortality is known, many developing countries especially in Africa have not mounted national cervical cancer screening programs. (WHO, 2002) The practices of the healthcare workers towards HPV vaccines varied between the two hospitals. Most respondents in Nairobi Women's hospital reported having received 79.3% and administered the HPV vaccine (93.6%) and recommended (93.6%) to patients. In Mbagathi hospital on the other hand only 2.8% reported having received the vaccine with only 4% having administered the vaccine while 18.9% had recommended the vaccine. One respondent observed;

*“You see, we only administer what we have in our stores”*

This could be attributed to the fact that the vaccine is not available in government hospitals and lack of marketing of the vaccines to the government facilities, as noted above. This is further shown in this study where the greatest barrier to HPV uptake as perceived by healthcare workers was availability and accessibility of the vaccine in Mbagathi in contrast to what was found out at the Nairobi Women's Hospital where the vaccine was noted to be readily available. This study notes that where healthcare workers reported availability of the vaccine at the hospital there were concerns on the affordability and this hampered accessibility to the vaccines. Though that is the situation, the Hong Kong study amongst the private primary care physicians to explore various issues including the knowledge, attitude and practices shows that 68.3% of the respondents agreed that HPV vaccination be fully paid by the government as an important public health strategy (Wong, Lee, Ngai, Chor & Chan, 2013).

Despite studies that have shown a clear link between HPV and cervical cancer, HPV vaccines have not been widely accessible and affordable both to the health workers and the beneficiaries. Issues such as lack of awareness and stigma associated with cancer pose a real threat to accessing HPV vaccines despite WHO's recommendation in 2009 that routine HPV vaccination be included in national immunization programs. Cancer is however preventable through vaccination and effective screening. The emergence of HIV has been shown in a study to exacerbate HPV infection, which can develop into cervical cancer more quickly in women living with HIV than in women who are HIV negative (Yamada *et al.*, 2008). However, this study found that the greatest barrier to uptake as perceived by healthcare workers was availability and accessibility of the vaccine, as noted by one health worker;

*“Truly, getting this vaccine especially in public facilities is a tall order and if available they are expensive”*

This study also found out that lack of prioritization and clarity on government policy concerning HPV use and ordering problems at hospital level and overall procurement of HPV vaccines was attributed to the unavailability of the vaccine in public facilities, as noted by one respondent;

*““You know how commodities and other supplies are procured..This is a tedious process where commodities may get late in reaching facilities, thus missing the need of getting them to needy populations”*

The finding is in line with the various government of Kenya guidelines on procurement of drugs to public health facilities. The Kenya Medical Supplies Agency (KEMSA), established as a state corporation under Cap 446, is a specialized Government medical logistics provider for Ministries of Medical Services/Public Health-supported health facilities and programmes in Kenya. One of its main tasks is to play a key role in procuring, storing and distributing health commodities for the public sector.

Though that is the situation, Vaccine Procurement is a specialized field that is different from the procurement of other pharmaceuticals and health products in several ways. Despite some similarities to other pharmaceuticals, vaccines possess a number of peculiarities, which require specific consideration during the procurement process. Vaccines are highly sensitive and complex biological products.

This study showed that most (58.1%) of respondents indicated that cervical cancer mostly affects individuals between age 21-40year in Mbagathi 12.2% of respondents did not know the age distribution of cervical cancer in the population. All workers in Nairobi Women's hospital (100%) perceived there was an association between HPV infection and cervical cancer while 91.9% of those in Mbagathi had the same understanding. Further this study found that on the healthcare workers perception on vaccine target groups and vaccine types and availability in the market, 75.5% of the health care workers at Mbagathi did not know of the types of HPV vaccines available in Kenya while 87.1% at Nairobi Women's reported knowing one commercially available vaccine. This can be attributed to the availability and accessibility of the vaccines at the respective hospitals. The vaccines are not available at Mbagathi while they are stocked at Nairobi Women's hospital. 30% and 33.3% of healthcare workers at Nairobi Women's hospital perceived 0-5 and 26-30years respectively as being appropriate age for target group vaccination while 31% of Mbagathi respondents perceived 16-20years as being appropriate age for vaccination. This findings are similar to that of another study done in western Kenya where focussed group discussions were done with caregivers and opinion leaders (Allison *et al.*, 2014)

Many respondents (83.3%) of Nairobi Women's hospital perceived both boys and girls as being target group for vaccination while 40% of those cited girls as being the target group. Variability in perceptions on target group and population could be attributed to awareness of HPV vaccine guidelines. Ninety percent (90 %.)% of healthcare workers in Nairobi Women's hospital were aware of some HPV vaccine guidelines while only 11% of the Mbagathi healthcare workers were aware of the guidelines. A study in Hong Kong to explore the knowledge, attitudes and practices

and barriers to prescribe HPV vaccines among private primary care physicians shows that vaccination against HPV was perceived as more important than those for genital herpes (52.2%) and chlamydia (50.1%) for adolescent health and the majority selected adolescents aged 12-14 years as the ideal group for vaccination (wong *et al.*, 2013).

Healthcare workers interviewed were cognizant of the critical role of health care workers perceptions in influencing uptake of the vaccine with all the respondents indicating a need for training on HPV and HPV vaccines within their institutions. One respondent noted;

*“The healthcare worker is a strong pillar regarding the utilization of this essential service is concerned and their perceptions are always very critical and important”*

Lack of information on the HPV vaccine was found out to be a major issue among health workers at Mbagathi DH and not Nairobi Women’s Hospital. This lack of information influenced perception of the vaccine in Mbagathi and was cited as an important reason, which hampered health workers recommendation of HPV vaccine to clients, and vaccine administration. However, at Nairobi Women’s hospital health workers reported that they had adequate information on HPV vaccine. A respondent at Nairobi women’s noted;

*“We have sufficient information on HPV vaccine... thanks to the hospital management which made it possible to get them”*

This lack of information influenced perception of the vaccine in Mbagathi and was cited as an important reason, which hampered the recommendation of HPV vaccine by healthcare workers to clients, and vaccine administration. However, at Nairobi Women’s hospital this study found out that healthcare workers had adequate information on HPV vaccine. This result is similar to findings of a study done in Nyanza where it was noted that success of HPV vaccination would depend critically

on information, communication and social mobilisation of healthcare workers (Friedman *et al.*, 2013).

The level of education was found not to be a significant factor in influencing the perceptions of the health workers on the HPV vaccines. There was no significant difference in the levels of education at the two health facilities where Nurses accounted for between 52% and 59% of the respondents at the two facilities. Most respondents 78.8% at Nairobi Women's hospital and 68% at Mbagathi hospital had diploma qualifications.

There was a significant difference ( $p=0.001$ ) in ages of respondents at the two facilities. The average age of respondents at Nairobi Women's was 25.9% while at Mbagathi hospital average age was 30.3% with none of the participants at Nairobi Women's being above 40 years of age. This study has therefore shown that age is a key influencing factor on perceptions of healthcare workers on the HPV vaccines.

The perception among health workers that the vaccine was expensive and unavailable, coupled with lack of information on the HPV vaccine were commonly mentioned as reasons why health workers at both Mbagathi DH and Nairobi Women's Hospital were not recommending the vaccine to client.

This study has identified some factors/themes which influence perceptions of HPV vaccines in any health facility; availability of HPV in routine hospital setup, clients' knowledge and beliefs about HPV and Health workers' awareness and attitudes.

However, this study found out that the greatest barrier to HPV uptake as perceived by health workers was availability and accessibility of the vaccine. Health workers responses were variable depending on private and public hospital ownership. Responses obtained at Nairobi Women's Hospital indicated that the vaccine was readily available while health workers at MDH either reported that the vaccine was unavailable or expressed uncertainty as to whether the vaccine was stocked within the hospital and available at the points of use.

Interestingly, even where health workers reported vaccine availability at a hospital, there were concerns about the accessibility and health workers often felt that accessibility was hampered by affordability of the vaccine. The health workers also identified additional factors that were perceived to impede vaccine availability and commonly identified factors included: procurement procedures, lack of prioritization and clarity on government policy concerning HPV use, vaccine supply and ordering problems at hospital level.

Several health workers felt that awareness among clients attending clinics for care was low reflecting generally poor public awareness about HPV and misconceptions about the vaccine. This view was manifested by the fact that many respondents suggested that public awareness was the main approach that could be effectively employed in improving coverage among girls who are targeted for vaccination but are currently not getting vaccinated. Indeed, when asked what general factors affected uptake of HPV in Kenya, respondents identified ignorance or illiteracy as issues that increased the encouraged the entrenchment of misconceptions among the public.

Suggestions for improving client and public awareness included health education activities conducted both at the hospitals (individualized health education sessions and distribution of patient brochures) and in the community (public campaigns, posters and billboards).

Health worker attitude and their level of awareness were both identified as potential enablers and barriers to HPV uptake depending on whether workers displayed positive or negative attitude or whether they had adequate or inadequate knowledge about the vaccine. Respondents were cognizant of the critical role of health worker awareness in influencing uptake of the vaccine with all the respondents indicating a need for training regarding HPV within their institutions.

This is shown to be a key influencing factor on perceptions of healthcare workers on the HPV vaccines. A significant difference in healthcare workers practices on the HPV vaccines was observed with 79.3% and 93.6% of respondents at Nairobi Women's hospital having received the vaccine and administered the vaccine respectively as compared to 2.8% and 4% in Mbagathi hospital. Overall the greatest barrier to the vaccine uptake as perceived by the healthcare workers was availability and accessibility of the vaccine. Responses at Nairobi Women's hospital indicated that the vaccine was readily available while workers at Mbagathi Hospital indicated that the vaccine was not available.

Healthcare workers attitude and their level of awareness were both identified as potential influencers on perceptions on HPV vaccines. These were also noted to be potential enablers or barriers of HPV vaccine uptake depending on whether workers displayed positive or negative attitude or whether they had adequate or inadequate knowledge about the vaccine.

## **5.2 Conclusions**

- The knowledge, perceptions and the practices of health workers relating to HPV is largely dependent upon the management and overall leadership policies in the sectors at which they operate. The policies and the management practices in the private sector has been noted to greatly influenced aspects including how the health workers relate to work and particularly in as far as the acquisition of HPV is concerned. This study has noted that though Kenya provided universal HPV immunization in 2013, the vaccines can be accessed easily in a private health facility (Nairobi Women's Hospital) than in the public facility like Mbagathi district hospital.
- Though the availability of the vaccine has been identified as a key influencing factor to the uptake of HPV most health workers felt that lack of awareness among clients is the main issue that affect the utilization of any health service including HPV. In this regard, the attendance of clients to clinics for care



were found to be low reflecting generally poor public awareness about HPV and misconceptions thereof. In addition, health worker attitude and their level of awareness were both identified as potential enablers and barriers to HPV uptake depending on whether workers displayed positive or negative attitude or whether they had adequate or inadequate knowledge about the vaccine.

- Moreover, there is a discrepancy in the level of knowledge, perception and practices towards HPV among health workers in public and private health facilities with those in the private sector having more levels on all the issues. However, despite the knowledge on HPV, the attitude and practices of health workers is different, often not informed by knowledge.

### **5.3 Recommendations**

Arising from the above conclusions, this study therefore makes the following recommendations;

- To be able to reach out to many needy populations, there is need to prioritize the availability and the acquisition of the vaccines especially to the public health facilities at the community level for optimal utilization in order to realize the desired target of alleviating un-necessary suffering and the pain associated with their health concerns are addressed. With the importance of the vaccine and the association of HPV with several cancers the government should step in with other partners such as GAVI to make the vaccine available probably through inclusion in the KEPI program. The management policies that govern public health sector should therefore be targeted for revision to fasten acquisition of the vaccines, among other health services.
- Practical strategies to involve the community in advancing continuous feasible approaches of sensitizing and mobilizing the community members to enhance their uptake of HPV at the health facilities should be employed. This aspect will endear the community members, whose ignorance and literacy levels are low, towards supporting the initiative for greater health benefits of

the greater populations. This will effectively go a long way in improving coverage among the populations, especially girls who are bogged down by socio-cultural issues. This will eventually change on the misconceptions among the public.

- To improve on the perceptions and the overall practices of the health workers both in the private and public sectors on HPV, there should be intentional efforts to continue providing refresher courses, educative seminars or set resources towards training them on the health expectations associated with HPV. The training will inform them on the current issues in order to be able to effectively communicate to the community and patients, by extension.

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## APPENDICES

### Appendix 1: Questionnaires

Study number.....

#### A: Socio-demographic information

1. Title Doctor ( ) Nurse ( ) clinical officer ( )

2. Age

3. SEX

F ( ) M ( )

4. Highest level of education attained

Diploma ( ) Higher national Diploma ( ) Degree ( ) Masters ( ) Phd ( )

5. Years of service completed

0-5 ( ) 6-10 ( ) 11- 15 ( ) 16-20 ( ) more than 20

6) Human papilloma virus (HPV) is

(1) a sexually transmitted virus (2) infection due to poor hygiene (3) I don't know (4) other specify.....

7) Have you heard about HPV vaccines (1) yes (2) no?

8) If yes where did you hear about HPV vaccines? (1) college/university training (2) workshop/CME (3) journal/magazine (4) other specify.....

9) If you have attended a workshop on Human Papilloma Virus (HPV), how long ago was the workshop/CME?

(1) 0-6 months (2) 6mths-1yr (3)1-2yrs (4) more than 2 years

10). in your view is there an association between cervical cancer and HPV?

(1)Yes (2) no

11). If yes what is the association?

(1) HPV causes cervical cancer (2) HPV predisposes someone to cervical cancer

(3) I don't know (4) other specify.....

12). Do you know of any vaccine that prevents HPV infection

(1)Yes (2) no

13) If yes, specify the HPV vaccine(s) you know

(1)..... (2) .....

14). what age group is cervical cancer commonly found

(1) 10-20 (2) 21-40 (3) 41-60

(4) 61-80 (5) over 80 (6) I don't know

15). who should receive HPV vaccine

(1) Girls (2) boys (3) girls and boys (4) women (5) I don't know

16). what age group should receive the HPV vaccine?

- (1) 0-5 (2) 6-10 (3) 11- 15 (4) 16-20
- (5) 21-25 (6) 25-30 (7) 30 – 40 (8) over 40
- (9) I do not know

17). How many types of the vaccine are available in the Kenya market

- (1) One (2) two (3)three (4) I don't know

18) Would you get vaccinated with the HPV vaccine?

- (1) Yes (2) no (3) not sure

19) If no why wouldn't you get vaccinated?

- (1) Not aware of vaccine (2) Not well informed on any benefits of the vaccine
- (3) Fear of side effects (4) cost of vaccine
- (5) Availability of vaccine (6) don't know

20. Would you recommend the vaccine to a client?

- (1) Yes (2) No (3) not sure

21. In your view what would prevent you from recommending the HPV vaccine

- (1) Cost of vaccine
- (2) Fear of side effects (3) not well informed on the benefits of the Vaccine
- (4) Vaccineschedule (5) availability of the vaccine
- (6) Other specify.....

22). would you recommend/receive the vaccine if it is funded hence cheaper?

(1) Yes (2) No

23). Have you received the HPV Vaccine at the hospital?

(1) Yes (2) No

24) If no why?

(1) Not aware of vaccine (2) Not well informed on any benefits of the vaccine

(3) Fear of side effects (4) cost of vaccine

(5) Availability of vaccine (6) don't know

(7) Other specify.....

25. Have you administered the vaccine to a patient?

(1) Yes (2) No

26) If no why?

(1) Not aware of vaccine (2) Not well informed on any benefits of the vaccine

(3) Fear of side effects (4) cost of vaccine

(5) Availability of vaccine (7) don't know

(8) Other specify.....

27. Have you recommended the vaccine to a patient?

(1)Yes (2) no

28) If no why?

(1) Not aware of vaccine (2) Not well informed on any benefits of the vaccine

(3) Fear of side effects (4) cost of vaccine

(5) Availability of vaccine (6) don't know

(7) Other specify.....

29. Would you like to attend a workshop on HPV VACCINES?

(1) Yes (2) no

30) If no why?

(1) Not aware of vaccine (2) Not well informed on any benefits of the vaccine

(3) Fear of side effects (4) cost of vaccine

(5) Availability of vaccine (6) don't know

(7) Other specify.....

31) Are you aware of any guidelines in place on HPV vaccination?

(1) Yes (2) no

32) If answer to above question is yes specify source of the information on the guidelines .....

## **Appendix 2: Key informant interview guide**

1. What do you know about HPV vaccines?
2. What is your attitude towards the vaccines?
3. What are your practices on HPV vaccines?
4. Is the vaccine available at your institution?
5. If it is not available in your view why is this case?
6. In your view what are the main factors affecting uptake of the HPV vaccine?

**Appendix 3: Consent form**

**2: INFORMED CONSENT FORM**

**PERCEPTIONS OF HEALTHCARE WORKERS ON THE HUMAN PAPILLOMA  
VIRUS VACCINES AT SELECTED HEALTH FACILITIES IN NAIROBI, 2012**

Study no..... Date \_\_/\_\_/\_\_

<b>Investigator</b>	<b>Role</b>	<b>Telephone contact</b>
Lilian ApadetOsamong	Investigator	0721513477
Dr Juliette Ongus	Supervisor	0722339682
Dr Joseph Mutai	Supervisor	0725082352

**RESEARCHERS' STATEMENT**

We are asking you to participate in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether you should be in this study or not. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear to you. When we have answered all your questions, you can decide if you want to be in the study or not. This process is called 'informed consent.' We will give you a copy of this form for your records.



## **INTRODUCTION**

Human papilloma virus vaccines have recently been introduced in the market and are being administered to women of various ages. Campaigns for the same have been launched so as to sensitize the public on these vaccines. This study aims at establishing the perception of healthcare workers on the HPV vaccines and establishing factors that may influence these perceptions.

## **PURPOSE AND BENEFITS**

We would like to determine the perceptions of healthcare workers on the HPV vaccines.

You will benefit from additional information material on HPV that will be provided to you.

There will be no additional benefits to you participating in this study. There will be no payments for participating in the study but information obtained would contribute to overall improvement of uptake of HPV vaccines and eventual reduction in cervical cancer.

## **STUDY PROCEDURES**

You will be required to read through this form and after understanding it you will be required to sign it. After signing you will be given a study questionnaire that you will be required to fill. Selected participants will undergo a key informant interview

## **RISKS, STRESS, OR DISCOMFORT**

-We have tried to minimize time that will be spent filling the questionnaire by it in a simple manner to enable easy response to the questions.

-Some of the questions asked may be private.

**OTHER INFORMATION AND CONFIDENTIALITY**

This is voluntary consent you are allowed to withdraw if you wish to with no penalty.

Otherwise all the information collected is for research purposes and will be treated with maximal confidentiality.

No self identifiers such as name will be used, and all records will be kept in a lockable room.

A copy of your signed consent form will be given to you if you want.

**Printed name of researcher Lillian ApadetOsamong**

**Signature of researcher**

**date.....**

**Subject's statement**

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, I can ask one of the researchers listed above. I will receive a copy of this consent form.

**Name of participant**

**Signature of participant**

**Date**\_\_\_\_\_

**Contact information**

For any questions or concerns about the study contact Lillian ApadetOsamong on 0721513477. P.o.box 60309-00200 Nairobi, Kenya.

For any questions pertaining to rights of as a research participant ,contact the secretary ,KEMRI Ethical review committee P. O. Box 54840-00200 Nairobi; tel 020-2722541.0722205901.email [erc@kemri.org](mailto:erc@kemri.org)

## **Appendix 4: Ethical Approval**