

HUMAN PAPILLOMAVIRUS PREVENTION INTERVENTION FEASIBILITY STUDY IN TANZANIA

Abdunoor M. Kabanywany

Fatuma Manzi

Mwifadhi Mrisho

Hildegalda P. Mushi

Ritha Willilo

Salim Abdulla

This study was commissioned by the International Union against Cancer (UICC) with funding from the Swiss Agency for Development and Cooperation (SDC)

April, 2010

TABLE OF CONTENTS

LIST OF ANNEXES.....	4
LIST OF ABBREVIATIONS.....	5
EXECUTIVE SUMMARY.....	6
<i>Introduction.....</i>	<i>6</i>
<i>Methodology.....</i>	<i>6</i>
<i>Main findings:.....</i>	<i>7</i>
INTRODUCTION.....	10
<i>Overview.....</i>	<i>10</i>
<i>HPV-vaccine for cervical cancer prevention.....</i>	<i>11</i>
<i>Country background information.....</i>	<i>12</i>
<i>Cancer Services in the framework of Health Service Delivery.....</i>	<i>12</i>
METHODOLOGY.....	14
FINDINGS.....	16
A. <i>Historical perspective of cancer control activities in Tanzania and the burden of disease.....</i>	<i>16</i>
Cancer control efforts in Tanzania.....	16
Risk factor behaviour for HPV infection.....	17
Prevalence and burden of HPV.....	20
Professional education and training curriculum for health institutes in relation to cervical cancer..	20
B. <i>Cervical cancer and the broad policy context.....</i>	<i>23</i>
Health and development in Tanzania.....	23
Cancer and health policy in Tanzania.....	24
National strategy for Non-Communicable diseases.....	24
National Cancer Control Strategy	25
Remarks on MoHSW policy review.....	25
C. <i>Cancer services provision.....</i>	<i>27</i>
Ocean Road Cancer Institute.....	27
Kilimanjaro Christian Medical Centre (KCMC).....	31
Peramiho.....	32
Bugando Medical Centre.....	33
Cost of services.....	33
Equipments, supplies and drugs.....	34
HPV vaccination experience; time and motion assessment.....	35
C. <i>HPV policy implementation environment.....</i>	<i>38</i>
Existing channels of vaccination with potential interface for HPV vaccination.....	38
Stakeholders views regarding HPV vaccine implementation.....	40
Community perception of HPV vaccine.....	49
DISCUSSION.....	54

CONCLUSION.....	61
REFERENCES.....	63

LIST OF ANNEXES

Category	Description	Number
A	Facility Data	A1. Number of women screened with VIA/VILLI and positive result from 2004 -2008
		A2.Methods for diagnose
		A3.Number of women died due to cervical cancer at KCMC and ORCI
		A4. Personnel received in-service training on cervical cancer
		A5. Number of women screened with Pap smear from 2004-2008 at KCMC
		A6. Biopsy results KCMC 2004-2008
		A7. Facilities available for treatment and management of pre cancer and invasive cervical cancer
B	Facility Tools	B1.Health facility
		B2.Human resource
		B3.Time and Motion
		B4.Supervision
		B5.Infrustrcture
		B6. Team available
		B7. Curriculum interview guide
		B8. Mwanza - NIMR study
		B9.Data -Team available
		B10. Time and Motion data and summaries
		B11. Curricular respondents
		B12.List of participant (health facility)
		B13.List of participant (time and motion)
C	Policies and other documents reviewed	C1. Policies and other documents reviewed
D	Stakeholders	D1. Tentative list of institutions for Stakeholder interviews
		D2. Stakeholders interviewees (Participants)
		D3. Interview Guide for HPV stakeholders-1 – long version
		D4. Stakeholder guide – short version
E	Community	E1.FGD guide and In-depth interview tool
		E2.In-depth Interview - participants
		E3. List of participants in FGD in Dar es salaam, Mkuranga, Lindi and Moshi Kilimanjaro
F	Organograms	F1. ORCI
		F2. Mbeya

LIST OF ABBREVIATIONS

ACCP	Alliance for Cervical Cancer Prevention
BMC	Bugando Medical Centre
HPV	Human Papilloma Virus
HSSP III	Health Sector Strategic Plan III
DNA	Deoxyribonucleic Acid
EPI	Expanded Programme on Immunization
FGDs	Focus Group Discussions
GAVI	Global Alliance for Vaccines and Immunization
GDP	Gross Domestic Products
GSK	Glaxo Smith Kline
HMIS	Health Management Information system
KCMC	Kilimanjaro Christian Medical Centre
LEEP	Loop Electrosurgical Excision Procedure
MMAM	Mpango wa Maendeleo ya Afya ya Msingi
MSD	Medical Stores Department
MEWATA	Medical Women's Association of Tanzania
MoHSW	Ministry of Health and Social Welfare
NCCS	National Cancer Control Strategy
NHP	National Health Policy
MNH	Muhimbili National Hospital
NCDs	Non-Communicable Diseases
NGOs	Non Governmental Organizations
ORCI	Ocean Road Cancer Institute
PASADA	Pastoral Activities and Services for People with Aids, Dar es Salaam Archdiocese
PHSDP	Primary Health Service Development Programme
PMORALG	Prime Minister's Office Regional Administration and Local Government
STI	Sexually Transmitted Infection
TDHS	Tanzania Demographic and Health Survey
VIA	Visual Inspection with Acetic Acid
VILI	Visual Inspection with Lugol's Iodine

EXECUTIVE SUMMARY

Introduction

Worldwide, Human papillomavirus (HPV) is one of the most common sexually transmitted viruses infecting humans. HPV infections may lead to the development of pre-cancer and if left untreated can lead to cancer; hence it has been established as the primary underlying cause of cervical cancer. In developed countries, it has been demonstrated that effective cytology (Pap test) screening can prevent up to 80% of cervical cancer. Although similar coverage can be attained in low-resource settings there are challenges at community and policy making levels. These include, lack of awareness, follow-up, quality control and assurance as well as human and financial resources. Vaccination before exposure to cancer-causing HPV is a particularly important intervention that has demonstrated potential for high health impacts in pilot settings.

This report highlights the findings of a study that assessed the capacity, gaps and barriers for the implementation of HPV prevention interventions in Tanzania.

Methodology

Triangulation methods were employed using both quantitative and qualitative tools. Documents on policies and guidelines were reviewed to assess the current status of policies with regard to prevention. Assessment of the diagnosis and treatment options for cervical cancer to establish the gaps and opportunities for policy improvement were made. Information on incidence, prevalence and mortality from cervical cancer in the various regions in Tanzania were extrapolated from hospital records. These were supplemented by a literature review on HPV and cervical cancer at global level. Further literature review was done to gather information on sexual behaviour among youth in Tanzania and elsewhere in Africa. The training curriculum for nurse midwifery, assistant medical officer, medical officers and nursing officers was reviewed to identify gaps in knowledge, awareness and skills for cervical cancer prevention and management.

Teachers responsible for training in the health institutes were interviewed to gain more insight into the curriculum regarding cancer.

In-depth interviews were conducted with stakeholders to assess the opportunities, challenges and perceptions of intervention in the health system. Teachers were interviewed on their perceptions of the interventions and the possibility of using schools as vaccination delivery platforms. Focus group discussions (FGDs) were held with parents and guardians in rural and urban settings in Coast, Kilimanjaro and Lindi regions. This provided information on health needs, acceptability of interventions and strategies for advocacy.

A questionnaire was administered to the head of sections among four referral hospitals (Ocean Road Cancer Institute (ORCI), Bugando Medical Centre (BMC), Kilimanjaro Christian Medical Centre (KCMC) and Peramiho Hospital) to gather information on human resources, training, equipment, drugs, and supplies specifically for cervical cancer prevention and control. A checklist adapted from the Alliance for Cervical Cancer Prevention (ACCP) was used to check for essential equipment, supplies and drugs for cervical cancer prevention and control.

Main findings:

- I. Non-communicable diseases (NCDs), including cervical cancer, have been recognized as an important public health problem in recent years and the government is committed to implement appropriate control measures, as noted in the most recent Health Strategic Plan which is a document for resource mobilization. A specific cervical cancer framework has been developed by various stakeholders led by the WHO country office as a basis for its strategic plan development. Furthermore a special reproductive cancer unit (cervical cancer, breast and prostate) has been established at the Ministry of Health and Social Welfare under the Reproductive and Child Health department.
- II. Cancer of the cervix is a critical public health problem as it was in 2007-2008 the leading form of cancer and accounted for more than 37% of all cancers diagnosed at the ORCI, the only dedicated cancer institute in the country.
- III. There is shortage of human resources and basic equipment necessary for cervical cancer screening, diagnosis and management in main hospitals.
- IV. There was heterogeneity of screening approaches among the five referral facilities surveyed.
- V. Tailored training courses for screening and management of cervical cancer have contributed to increased access of services in peripheral areas. However the approach was impaired by lack of essential equipments and thus efforts need to be made to increase availability.
- VI. The curriculum used by health institutes across Tanzania covers cervical cancer but the approach is very theoretical explanations with little practical 'hands-on' training in the diagnosis and management of cervical cancer.
- VII. Awareness about cervical cancer burden is low among stakeholders (community, policy makers and Non Governmental Organizations). Specifically those not dealing

with cervical cancer directly. Most of them are not aware that there is an opportunity for prevention using vaccines.

- VIII. Promoting awareness is essential for appropriate cervical cancer management. The main channels of advocacy suggested include radio, community meetings and television.
- IX. There are key challenges regarding resources, particularly finance and human resources, and these have a bearing on sustaining such measures in the long run.
- X. There is an opportunity to integrate HPV vaccine within the Tanzanian health system infrastructure. The infrastructure for EPI is well established and well placed in the organogram of the ministry. However, the EPI cold chain facilities are currently fully utilized and there is a need to invest in storage infrastructure in case some facilities have to be used for HPV vaccine.
- XI. Primary schools were identified as the best channel for vaccination as there is high attendance in primary schools and the opportunity for special vaccination days.
- XII. The community members interviewed were positive regarding the introduction of HPV vaccine, as long as parents and the community were well informed.

INTRODUCTION

Overview

Human papillomavirus (HPV) is one of the most common viruses infecting humans worldwide. HPV is sexually transmitted and highly infectious. HPV has been established as the primary underlying cause of cervical cancer. It may lead to the development of pre-cancer or cancer if left untreated [1, 2]. HPV is estimated to affect 50 to 80% of sexually active women at least once in their lifetime [3, 4]. 69.6% of cervical cancer in Tanzania is associated with HPV types 16 and 18 [5].

Cancer of the cervix is the second most common cancer in women worldwide [6]. Each year approximately 500,000 women in the world develop cervical cancer and 274,000 die from the disease [7] of which about 83% occur in developing countries representing 15% of female cancers [8, 9]. In Tanzania cervical cancer ranks the most frequent cancer among women between 15 and 44 years of age [5].

WHO recommends a comprehensive approach to prevention and control of cervical cancer as the key to reducing the burden of cervical cancer worldwide. This includes education to raise awareness on high-risk sexual behaviours, the introduction of an effective and affordable HPV vaccine, and early detection through screening programmes followed by prompt treatment of pre-cancer and invasive cancer [10].

Experience from developed countries suggests that well-organized programmes for the detection and treatment of pre-cancerous lesions and the early stages of cancer can prevent up to 80% of cervical cancers [10]. Unfortunately, in low-resource settings, it has been somewhat difficult to implement screening programmes for the identification of pre-cancerous lesions at early stages, when they can easily be treated [10]. The main reasons include shortage of resources to ensure all process phases and low priority. Generally the disease is identified in its late stages when cancer-related symptoms have already developed, and when treatment is not so effective, resulting in higher

mortality [1, 10]. Hence, the focus on vaccination before exposure to cancer-causing types of HPV is particularly important, offering a new approach to an urgent public health problem.

HPV-vaccine for cervical cancer prevention

Currently there are two HPV vaccines available namely Gardasil® (MSD) and Cervarix® (GSK). They are designed to protect against HPV types 16 and 18 that cause most cervical cancers. Gardasil also protects against HPV types 6 and 11 associated with genital warts. Both vaccines are prepared as injections with required optimum storage temperature of 2-8^o C. Clinical trial results show that both vaccines are safe and very effective when given to females with no past infection of vaccine-related HPV types [11, 12]. Current HPV vaccines do not protect against all types of HPV and 30% of cervical cancers are due to HPV types other than 16 and 18. For this reason, vaccinated persons should be encouraged to be screened for cervical cancer later in life. Because HPV is sexually transmitted, HPV vaccination is most effective before onset of sexual activity. (The primary target group for HPV vaccination are girls before sexual activity starts, ages 9-13 years as defined in many countries). This age group is not the same everywhere. In the same definition, the secondary target group is a “catch-up” group as girls and women aged 14 to 26 years who have not been previously vaccinated against HPV [1, 6]. Computer modeling of the impact on cervical cancer when vaccinating boys along with girls suggests that the strategy is not cost-effective, except in scenarios of very low vaccine coverage among girls [13].

This report presents the findings of an assessment of the capacity, gaps and barriers for the implementation of HPV prevention interventions in Tanzania.

Country background information

This study was conducted in the mainland Tanzania which is part of the United Republic of Tanzania. The United Republic of Tanzania is made up of Islands termed as administrative Zanzibar and Mainland Tanzania.

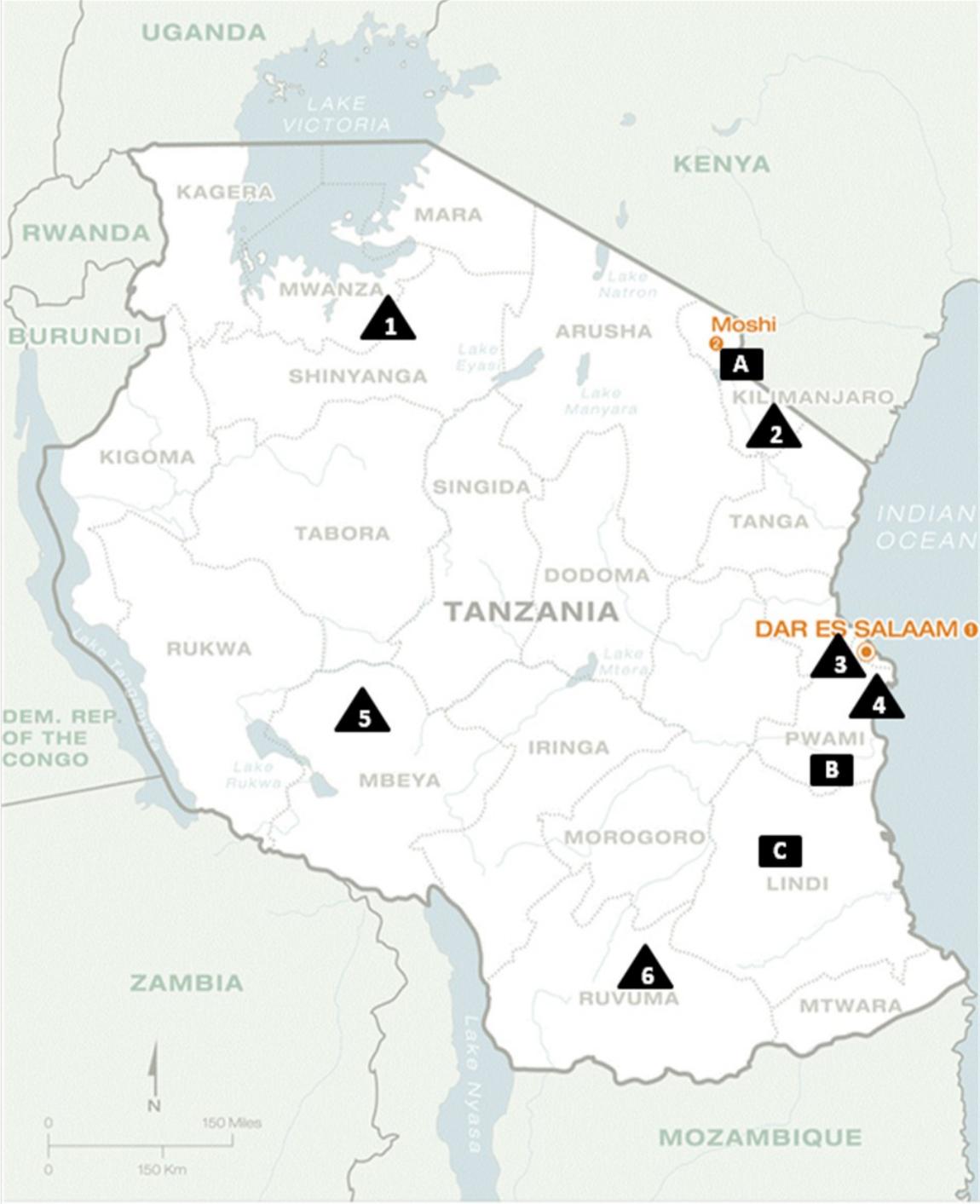
Mainland Tanzania covers an area of approximately 945,050 Km² including 59,050 Km² on inland waters. The Country is bordered by Kenya and Uganda on the Northern part, the Democratic Republic of Congo, Rwanda and Burundi on the Western part, Zambia, Malawi and Mozambique on the Southern part, and the Indian Ocean on the Eastern part. It lies between the 1°S and 12°S latitudes and 30°E and 40°E longitudes [14].

The Tanzania Mainland has an estimated population of 40 million for the year 2008 as projected from the 2002 population Census [15]. It has an annual population growth rate of 2.9%. 23% of the population resides in urban areas whereas the majority (77%) of population is rural dwellers. 35.7% of the population is below the poverty line with Gross Domestic Product (GDP) per capita of US\$280 (in 2000) [15].

Cancer Services in the framework of Health Service Delivery

The Country has four geographical zones with four major consultancy and referral hospitals. The North zone has the Kilimanjaro Christian Medical Centre in Kilimanjaro region. The Western zone has the Bugando Medical Centre in Mwanza region as the main zone referral hospital. In the Central part where the Dodoma regional hospital is located has the capacity to serve as zone referral facility. The Southern highland's zone there is the Mbeya referral hospital; although Peramiho and Ndanda mission hospitals are both acting as referral hospitals for the extreme south parts of this region (Figure 1).

Figure 1: Tanzania: Referral Hospitals and Community study areas



Mainland showing

Key:

 **Health Facilities**

1. Bugando Hospital
2. Kilimanjaro Christian Medical Centre
3. Muhimbili National Hospital

4. Ocean Road Cancer Institute
5. Mbeya Referral Hospital
6. Peramiho Mission Hospital

 **Community Interview Regions**

- A. Kilimanjaro
- B. Mkuranga
- C. Lindi
- D. Dar es salaam

METHODOLOGY

Triangulation methods were employed, using both quantitative and qualitative tools. The tools were administered in Swahili then the report was translated to English. The tools were developed according to the need of the study. In this regards, search was done to find out the basics of cervical cancer control from WHO website and from studies done in South Africa and Uganda [10, 16]. Available policies and guidelines (Annex C1) were reviewed to assess current policies in place for the prevention, diagnosis and treatment of cervical cancer, and to identify gaps and potential opportunities in this respect. Hospital records were reviewed to extrapolate information on incidence, prevalence and mortality of cervical cancer in Tanzania. International sources [5] were used where hospital records were insufficient on HPV and cervical cancer.

A literature review was conducted to gather information on sexual behaviour among youth in Tanzania and elsewhere in Africa. In-depth interviews were held with stakeholders at national level, international communities, NGOs and youths organizations. These were done to gain insight into cervical cancer prevention policies and their implementation. The national stakeholders included the Ministry of health and

social welfare in the departments and units namely reproductive and child health (RCH), Expanded Programme in Immunization (EPI), Medical Stores Department, Tanzania Food and Drugs Authority (TFDA). NGOs visited include Women's Dignity and Engender Health. International organizations included WHO country office and Development Partners for Health. Youths groups interviewed were Femina-HIP (HIP standing for Health Information Project).

To explore community perceptions about HPV vaccine, four communities were chosen (Temeke - Dar es Salaam region; Mkuranga - Coast; Moshi - Kilimanjaro and Lindi rural and Lindi urban - Lindi) to represent urban and rural. A total of twelve Focus Group Discussions (FGD) consisting 6-7 people were conducted with parents (Parents: Male and Female) – (Annex E1). The discussions were arranged according to gender and age to preserve social norms. Furthermore, 16 in-depth interviews were conducted with primary and secondary school teachers. Both in-depth interviews and FGD were intended to gather information about awareness and knowledge of cervical cancer; acceptability of a vaccine; delivery options; advocacy and suggestions on how to improve cancer services. Before the FGD, the moderator introduced all participants; he explained the general topics of discussion and encouraged all participants to contribute their ideas. An experienced moderator led the discussions with the support from a professional notes taker. After the FGD and In-depth interviews, the note-taker and the moderator reviewed their handwritten notes. After revision of notes, the transcripts were typed and manually analysed. Data analysis compared responses from both the in-depth interviews and FGDs. Our major key themes on community perceptions about the HPV vaccines emerged as a result of the interview guide that included awareness on cervical cancer problem, advocacy and issues of acceptability and delivery strategy of HPV vaccine.

For the facility survey a questionnaire was administered to the head of sections in 5 facilities that serve as referral hospitals in the country (Bugando Medical Centre in Mwanza region, Kilimanjaro Christian Medical Centre at Kilimanjaro, the Ocean Road Cancer Institute in Dar-es Salaam and Peramiho Mission Hospital in Ruvuma). Data

were collected on human resources, training, equipment, drugs, and supplies specifically for cervical cancer prevention and management. A checklist adapted from the Alliance for Cervical Cancer Prevention (ACCP) was used to check for essential equipment, supplies and drugs for cervical cancer prevention and control (see annexes B1, 2, 4, and 5).

The referral hospitals were selected to represent study sites given their role to serve a number of regional and district hospitals in the country. The communities were selected to represent the country diversity of influence based on their socio-economic status. In the north (Kilimanjaro region) people are more educated than in rural southern region (Lindi). This has implication in their perception of a new HPV vaccine for their children.

FINDINGS

A. Historical perspective of cancer control activities in Tanzania and the burden of disease

Cancer control efforts in Tanzania

Before independence cancer services were limited to colonialists i.e. Germans, then British [5] perhaps because cancer was thought to be a rare disease among Africans [17]. Following independence in 1961, the government through the Ministry of Health began to address cancer in the larger population. Cancer management came to be concentrated in three hospitals, then Muhimbili Medical Centre, (now Muhimbili National Hospital (MNH)), Bugando Hill Centre (now Bugando Medical Centre), and Kilimanjaro Christian Medical Center [17]. In each of these three hospitals a cancer registry was established for recording histologically confirmed cancers. In the 1980s, cancer control efforts progressed to the creation of a radiology department at Muhimbili Medical Centre. This department was later moved to Ocean Road hospital [18].

The Ocean Road Cancer Institute (ORCI), the only dedicated cancer institute in Tanzania was established in 1996 through an Act of Parliament. The ORCI offers radiation, chemotherapy and hormone therapy as well as palliative care.

Cervical cancer is the main cause for admissions to ORCI.

It could be argued that the health sector in the past has prioritized funding for treatment and palliative care at the expense of prevention. However from 2007 the Ministry of Health and Social Welfare through the Ocean Road Cancer Institute (ORCI) and other stakeholders has increased the capacity for the prevention of cervical cancer including early detection/screening using visual tests with VIA /VILI, Pap smear test for pre-cancerous lesions and treatment. Similar capacity is also available at Bugando Consultant Hospital, Kilimanjaro Christian Medical centre (KCMC), Morogoro Regional Hospital, Lindi Regional Hospital, Muheza Designated Hospital and Peramiho Hospital.

There are a number of organizations in Tanzania that support cancer control activities. These include Nongovernmental organizations (NGOs) such as the Medical Women's Association of Tanzania (MEWATA) and PASADA [19]. MEWATA have contributed on the advocacy of cancer problem and screening for breast cancer. Palliative care in Tanzania is given by four organisations: Selian Hospital, Muheza, Hospice Care, PASADA, and Ocean Road Cancer Institute. Specifically, PASADA provides palliative care to patients with cancer and AIDS through home based care. The activities of these groups are sustainable, recognized by the MoHSW and their impact is measured by increased number of clients and members as well as availability of various modes of care that include hospital units, support teams, clinics or drop in services, home care and day care. Their work has contributed to raising awareness on cancer problem in the country and more people receiving palliative care.

Risk factor behaviour for HPV infection

Early and unprotected sex is the most important factor for HPV infection as HPV is passed from one person to another during skin-to-skin contact with an area of the body infected with HPV [20-22]. Available literature on sexual and reproductive behaviour among adolescents in Sub-Saharan Africa show that there has been minimal change in risky sexual behaviours (having multiple partners; not using condom and alcohol use) and their undesirable outcomes such as unwanted pregnancies, STIs and HIV [23-25]. A high prevalence of STIs including HIV is recorded among young people and the prevalence is highest amongst females [26-29]. The use of condom is one of the vital preventive measures against HIV in Tanzania and there has been an increase in condom use during the past decade [30, 31]. Nevertheless, risky sexual practices, such as reported high number of sexual partners have been levelled over time in some parts of Tanzania [32, 33]. According to the 2004/05 Tanzania Demographic and Health Survey [34], 12% of young women and 9% of young men had had sex by age 15. Young women with no schooling were significantly more likely than those with at least some secondary education to have had sex by age 15. Likewise, boys and girls in rural areas were reported to be more likely than those in urban areas to have had sex by age 15. Early sexual debut is several times more likely in mainland Tanzania than in Zanzibar

[34]. Other possible factors for HPV infection include high parity, the presence of other chronic genital infections, oral contraceptive use and cigarette smoking [35].

Based on current trends, it is predicted that tobacco will be the leading cause of disease burden by 2020s, resulting in about 1 in 8 deaths, a proportion greater than from any other single cause [36]. Of these deaths, 70 per cent will occur in developing countries, where cigarette smoking was rare. However, the high income countries have witnessed decreases, most clearly in men. However, Africa region is reported to have the lowest smoking prevalence in the world – ranging from about 36% for men and 9% for women based on estimates by Corrao [37] and 29% for men and 4% for women estimated by Jha and others [36]. In Tanzania smoking is more common among the men than women. The prevalence of tobacco smoking is 27% in males and 5% in females [38]. In another study the prevalence of current cigarette smoking among in-school adolescents was reported to be 3.0% and 1.4% among males and females, respectively [39]. Such data implies the presence of risk factors for cancer.

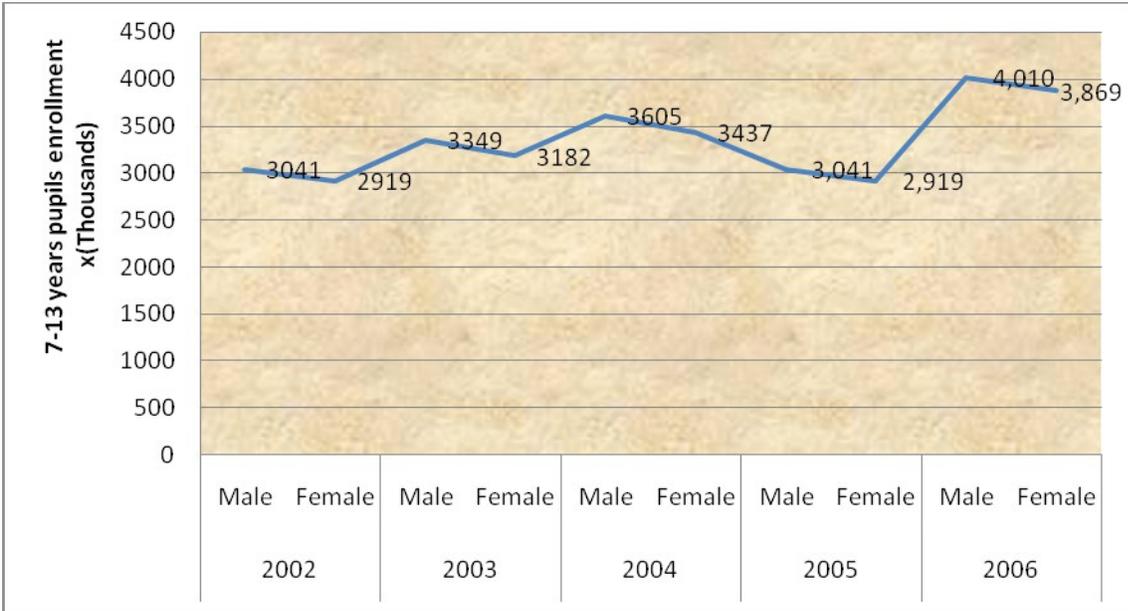
The Tanzania school system starts at age 5 years for early childhood and then primary school, at ages 7-13 years. The overall enrolment at this level has reached 82% [40]. By 2008, net enrolment rates had risen to 97.2% and 83.4 % in the Mainland and Zanzibar [41]. There is a slight gender disparity with regard to enrolment of girls and boys at the primary school level, with the majority of male enrolled each year [42]. Government schools enrol majority of pupils as compared to non-government. The current data does not discriminate between rural and urban although verbal communication indicates that there is a near parity in both setting. Primary School retention rates (proportion of children enrolled in Standard I who complete Standard VII) have improved from 71 % in 1997 to 78% in 2004 in the Mainland [41]. However, the retention of girls is slightly better than that of boys. Health education is mainly concerned with identifying prevailing health problems and disseminating methods of preventing and controlling them. This is an integral part of community involvement in Primary Health Care. Public health education is provided by a variety of methods including mass media, continuous development and dissemination of health education materials and through dialogue with

communities [40]. School children are therefore a special target group for health education through the National School Health Programme.

In Tanzania more than 99% of pupils were enrolled in government Primary schools in the period 2002-2006. However, in the same period, the overall contribution of NGOs primary schools has been increasing from 0.4% and 0.3% in 2002 for boys and girls respectively to 1% in 2006 for both girls and boys. The annual average enrolments in 2002-2006 was 21% [3,052,018 in 2002 and 4,051,676 in 2006] for boys and 20% [2,929,320 in 2002 and 3,908, 208] for girls in mainland Tanzania [42], (Figure 2).

Figure 2: Number of pupils enrolled in Government Primary Schools

Note: Years and gender are in the horizontal axis.



Source: Ministry of Education and Culture: Basic Education Statistics in Tanzania (BEST) 2007; 2008 [42]

Prevalence and burden of HPV

Data on the HPV burden in the Tanzanian general population is scarce. However, estimates suggest that about 33.6% of women in the East Africa Region harbour cervical HPV infection [5]. The HP viruses infect skin or mucosal cells. There are more than 100 known HPV genotypes. At least 13 genotypes are known to cause cancer of

the cervix and are called “high-risk” 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59 and 66. The two genotypes most commonly associated with cervical cancer are genotypes 16 and 18 [43-45]. Roughly 69.6% of Cervical Cancer cases in Tanzania are attributed to these two genotypes [5]. Infection with low-risk genotypes very rarely causes cancer, but can cause benign or low-grade changes in cervical cells that are indistinguishable from those caused by high-risk HPV [8]. The most common is genotypes 6 and 11 which can also cause genital warts, a common benign condition of the external genitalia that causes significant morbidity [46].

In Tanzania cervical cancer is the leading cancer in women, followed by breast cancer and then Kaposi’s sarcoma [5]. Currently Tanzania does not have any standard population-based cancer registry; in our study hospital registries were available only at Bugando, KCMC and ORCI [18]. Country representative data are not available and substantial numbers of cases go undetected - underreporting is considerable.

Professional education and training curriculum for health institutes in relation to cervical cancer

Training curricula for various cadres of health workers were reviewed. The following section highlights some key findings, based on in-depth interviews with concerned teachers. The curriculum for the Advanced Diploma of Nurse Midwifery is three years. Cervical cancer is taught during the first year under the topic of Care of the Client with Cancer of the Reproductive Organs – a four hour teaching session. The teaching mainly addresses theoretical aspects of the disease: the natural history of the disease, preventive methods, clinical features, nursing diagnosis, based on symptoms and nursing care during treatment (curative and palliative). Furthermore, the curricula are revised every 3 years and the last revision was in 2006. Teachers in collaboration with Ministry of Health and Social Welfare are responsible for the revisions.

The curriculum for medical doctors (MDs) is five years. Cervical cancer is taught in the third year in pathology in conjunction with other malignancies. It is taught in the second year in microbiology as part of infectious disease and during the fourth year as part of the clinical aspects in obstetrics and gynaecology. The syllabus covers issues such as

natural history of the disease, counselling, preventive methods (for example, condom use, screening for early detection by Pap smear and treatment, especially palliative care of advanced disease). The curriculum is supposed to undergo a revision every year, to be undertaken by the Dean, the academic board and teachers of that subject every year. According to the interviewed teacher, the curriculum will soon include the issue of the HPV vaccine, as a primary preventive intervention, to increase knowledge of the vaccine as now it is available in Tanzania. Further, the subject of HPV is also introduced to fourth year medical students during their two week clinical rotation at Ocean Road hospital when learning how to manage cancer patients; this lends a practical perspective to their theoretical approach. The review of the curriculum for MD is ongoing for 2010 following the need for it to comply with updated medical knowledge establishment.

The nursing curriculum is for four years. The interviewed tutor reported that cervical cancer is taught during the second year in microbiology as part of infectious diseases and in the third year during a pathology session on malignancies for approximate two hours in total. The syllabus is focused on the theoretical aspects of the disease in terms of the natural history of the disease, counselling, preventive methods, and clinical features. The syllabus also includes nursing diagnosis, based on symptoms; and in the clinical part care for patient with cervical cancer and treatment modalities (curative and palliative). The training also includes a prevention component – same as for sexually transmitted infections i.e. promoting condom use and care for cervical cancer patients. The curriculum is revised by the Dean of nursing, the academic board and teachers of that subject only when there is a need and it was last revised in 2003. The tutor also said that they contribute to the promotion of prevention and improvement in mortality due to cervical cancer by training the students to provide prevention through educating women. It was pointed out by the tutor that ‘since this is the same as a sexually transmitted infectious disease, the same preventive methods like condom use and care for cervical cancer’ are emphasized. In this year 2010 curriculum review is ongoing.

The curriculum for the Advanced Diploma in Medicine (Assistant Medical Officers-AMO) is stretched over three years. Cervical cancer is taught in the first year as one of the gynaecological malignancies and it is done in two sessions of 2 hours each. Once again, it was reported further that the syllabus covers mostly theoretical aspects of the disease in terms of the natural history of the disease, clinical features, investigations and treatment modalities (curative and palliative), counselling, preventive methods and early detection including the use of Pap smear. The practical part is usually verbal on how to do a pap smear; there is no real patient-doctor contact. The AMO curriculum is supposed to be revised by the Ministry of Health and Social Welfare in collaboration with the tutors from the respective schools every 3 years. There has been a lag in the review process as the last review was done in 2000 due to a shortage of funds. However in 2010 funds have been obtained and the initial arrangements for reviewing the curriculum have started.

There is no strategic plan for training students on the HPV vaccine yet. With increasing recognition given by the MoHSW to the benefits of the vaccine, one is likely to be developed.

B. Cervical cancer and the broad policy context

Health and development in Tanzania

Health has always been a priority in Tanzania's development agenda. One of the priorities in Vision 2025 is a high quality livelihood including access to quality primary health care as well as reproductive health services for all Tanzanians. Quality health is also part of cluster two of The National Strategy for Growth and Reduction of Poverty (NSGRP) also known in Kiswahili as "Mkakati wa Kukuza Uchumi na Kuondoa Umaskini Tanzania - (MKUKUTA 2005-2010)" which feeds into Vision 2025. The national health policy emphasizes the need to improve the health and well-being of all Tanzanians, while focusing on those most at risk, and to encourage the health system to be more responsive to the needs of the people. The Health Sector Strategic plan of 2007-2010 aims at enabling the Ministry of Health and Social Welfare to focus on priority areas that are in line with MKUKUTA and other national policy frameworks.

The health sector is also going through policy reforms and institutional re-arrangement whereby major changes have been made in the areas of management and the financing of health care. The role of the Ministry has shifted from direct running of health facilities to facilitative policy making and districts have emerged as active managers of health facilities and services under the policy of decentralization by devolution (D by D). Under the health sector and local government reforms, primary health services are managed and administered by the Local Government Authorities (LGAs). Cost sharing in various forms has been the major feature of health sector reforms over the last two decades. The ruling party "Chama cha Mapinduzi" (CCM) also includes health priorities in its election manifesto showing a commitment to improving the health of newborns, under-fives, maternal health, HIV/AIDS and general improvement of health facilities. Recently the Primary Health Service Development Programme (PHSDP) or in Kiswahili, "Mpango wa Maendeleo ya Afya ya Msingi-(MMAM) 2007-2012 has been developed to accelerate the access to health care services to all by 2012 [47]. The strategy focuses

on strengthening health systems, through human resource development, increased health sector financing and improved provision of medicines, equipment and supplies.

Cancer and health policy in Tanzania

Health priorities in Tanzania have traditionally focused on prevention and cure of communicable diseases especially those under the essential health intervention package. However, non communicable diseases including cancer have received little attention in health related policies. The first national health policy in Tanzania was formulated in 1990 and reviewed in 2002 in which cancer was not specifically mentioned. The 2007 health policy recognized the rapid increase in chronic and non-communicable diseases, including cancer [47]. The policy identified ORCI as a key organization responsible for the prevention and treatment of cancers. The institute was assigned the task to establish cancer treatment units in regional hospitals across the country with financial support from the government. During 2006-09 training sessions on cancer screening have taken place in 13 health facilities (Personal communication with resource person from ORCI). The HSSP III also highlights cancer as a health priority and requires that health facilities take a more active role in the management of chronic conditions including cancer.

National strategy for Non-Communicable diseases

The national strategy for Non-Communicable Diseases (NCD) (2009-2015) was introduced in 2008 to feed into the broader development agenda such as the Health Sector Strategic Plan III (2009-2015) and Vision 2025, MKUKUTA, the National Health Policy 2007, and the MMAM. The activities related to NCD strategy have a budget and the activities are done in the MoHSW under the Department of Hospital Services. All these policies and strategies emphasize an integrated approach to address poverty, gender and equity challenges. The strategy promotes an evidence-based approach to ensure implementation of high standard and cost effective NCD interventions. The goal is to reduce the burden of NCDs on the Tanzanian people and empower the health system to undertake integrated action against NCDs for the well being of the nation. Non communicable diseases include cancer (e.g. breast and cervical cancer), hypertension, stroke, diabetes, mental health and substance abuse, asthma, sickle cell

disease, trauma and injuries. These are priorities in Tanzania due to their contribution to morbidity and mortality.

National Cancer Control Strategy (in progress since 2008)

The draft National Cancer Control Strategy (NCCS) of 2008 aims at accelerating the transfer of cancer knowledge into public health action. It focuses on integrating cancer control activities into the health system with an intention of reducing incidence and improving the lives of patients and their families as well as reducing inequalities with respect to access to cancer care. The document names 8 objectives focusing on expanding and improving primary prevention; early detection, screening and diagnosis; treatment, palliative care; cancer registration and surveillance, research and education; human resource development; establishing a Tanzania cancer society as well as integration and coordination of cancer control into existing health services [18]. The NCCS aims at uniting previous though uncoordinated cancer fighting policies and activities. The document points out that the predominant cancers with respect to high incidence and mortality for women in Tanzania are carcinoma of the cervix, Kaposi's sarcoma and breast cancer. The strategy recognizes the fact that breast and cervical cancer can be screened and detected at an early stage if effective affordable cancer control programs are put in place [47]. The NCCS is highlighted as an opportunity for real impact on the cancer burden in Tanzania. It is imperative that the draft strategy be officially approved with a budget line, for it to have the expected important impact.

Remarks on MoHSW policy review

Apart from policy space, HPV vaccination and cervical cancer control activities in general need a 'physical' space in the structure of the Tanzanian health system and health service delivery. Given the newly created unit of reproductive cancers within MoHSW that is responsible for cervical cancer, HPV immunization has found a host within the Ministry's structure with clear responsibility and accountability for service delivery. Contributions from other stakeholders (individuals and departments) need to be integrated in this core programme to avoid duplication of efforts and maximise resource use.

The delays in curriculum review for various cadres have implication on the quality of professionals generated. Up to date curriculum can be made available through proper planning and budgeting for that specific activity. This is important for timely updating of materials needed to generate highly trained health professionals.

C. *Cancer services provision*

The following section synthesises information obtained from a survey undertaken in selected referral hospitals in Tanzania. The organogram of various hospitals is vertical in nature (Annexes F). Despite the allocation of data and information unit in some structures of organogram from two health facilities where organ-graphic information were available in our study, position in higher hierarchy are custodian of valuable data related to cancer control activities. It is for this reason that in cases where the higher level personnel in the hierarchy was very cooperative, most data were made available for this study, otherwise full coverage of data was not readily available for this study in some facilities.

Ocean Road Cancer Institute

As noted earlier, ORCI is the lead organization for the prevention and care of cancer (including cervical cancer) in the country. Data from ORCI show that about 80% of all patients admitted to the hospital are cervical cancer patients. Only 10% of all cancer patients reach ORCI, most of them at stage 3 or 4, too late for effective treatment. According to a senior staff member of ORCI, since 2006 the Institute has been training health providers from the regional and district level to carry out cervical cancer screening using Visual Inspection with Acetic Acid (VIA). Despite being the lead cancer hospital in the country, ORCI has limited number of specialists for the prevention and management of all types of cancer. Compared to the recommended staff to be involved in planning and implementing cervical screening services [16], the study did not find pathologist, gynecologist or anaesthetist at ORCI. This could be explained by the linkage in operations with Muhimbili National hospital where patients are referred for related diagnoses and then sent to ORCI for further management.

ORCI currently does not have an HPV vaccination service. Screening services employ visual tests with VIA / Visual Inspection with Lugol's Iodine (VILI) offered as a routine method for screening pre cancerous lesions (Annex A1). Women coming for screening

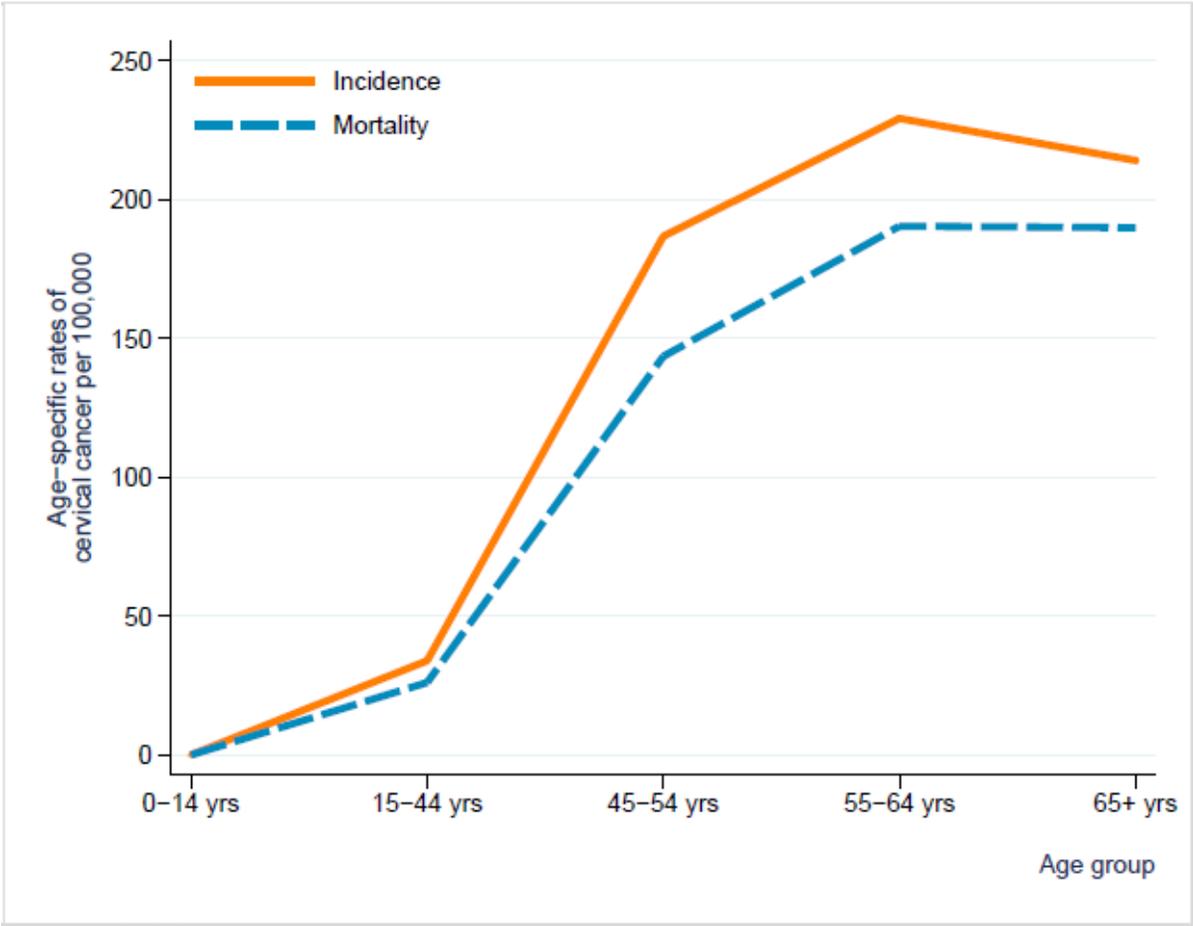
requesting pap smear instead of VIA/VILI will be given a pap smear free of charge. The ORCI does not provide biopsy services however it does receive patients with biopsy results from other hospitals who are referred to the ORCI for management (Annex A2 (i) & (ii)). Although investigation with colposcopy is conducted at the Institute, data is not readily available and therefore was not retrieved for this study. HPV DNA testing is not a routine test but it has been used in an ongoing study - *Primary and secondary prevention of cervical cancer in Tanzania project: Implication for HPV and visual inspection interventions*- that has begun in 2008 to 2010 (Personal communication with resource person in ORCI).

ORCI reported to conduct tailored training on cervical cancer screening in different health facilities countrywide funded by the government. Between 2006 and 2009 ORCI provided in-service training to health personnel in almost all the important areas related to cervical cancer prevention and management. The training covers issues on background information on cancer related to the situation in the country and worldwide and on the causes, prevention and management. A total of 162 providers from 13 regions (6 from regional hospital and 7 district hospitals) were trained to screen cervical cancer using VIA/VILI method between 2006 and 2009. The institute decided to train certain cadre of health workers - Assistant Medical Officers (AMOs), Clinical Officers (COs) and Nursing Officers (NOs) – primarily because they are the ones serving most peripheral districts and health facilities; but also because they are relatively more retainable compared to medical officers. Cancer screening in these facilities has been integrated into routine health care services such as family planning and gynaecological services. Follow-up after training by ORCI facilitators indicated that nearly 70% of the trainees were conducting cervical screening in their facilities. A major challenge is lack of treatment equipment (e.g. Cryotherapy) which is neither provided by ORCI nor part of the national procurement system (under Medical Store Department). Women with suspicious lesions are referred directly to ORCI for further examination and treatment (personal communication with resource person at ORCI).

ORCI intermittently conducts outreach cancer screening programmes in different facilities in the country. Between 2006 and 2008, about 6500 women were screened during the outreach programme by ORCI in Morogoro, Mwanza, Lindi Coast (Pwani), Tanga (Muheza) and Kilimanjaro (Mwanga). The prevalence of screen-positive ranged between 2% and 5%.

In 2007-8, a total of 3480 patients presented at the ORCI outpatients department. Females accounted for nearly 71.9% (n=2505) of all cases. In the same year, the leading cancer at ORCI was cervical cancer, more than 37% of all cancers. In 2007, the institute provided care for 1006 patients (Annex A3) with cervical cancer, equivalent to 32.1% of the total annual new cancer cases. This study did not manage to aggregate mortality due to invasive cervical cancer for at least consecutive five years up to 2009 as this data was not readily available. The data were in its raw form and hence manual counting from the registration book was done to make summaries and some data were missing. The cervical cancer case fatality rate of 36.8 per 1,000 was observed, both in 2007 and 2008 at the institute. According to the 2010 report on HPV and Cervical Cancer in the World [5], in Tanzania annually there are estimated 7515 new cases of cervical cancer and nearly 6009 of them die from the disease. The age-standardized rate per 100,000 women of new cases and mortality due to cervical cancer is 68.6 and 55.6 respectively (See Table 1 (a & b)). The trend show that there is a classical increase in crude age-specific incidence and mortality rates of cervical cancer with age, especially between 15 and 54 year age interval, peaking at around 55-64, and declining thereafter (see fig 3). Tanzania's rates are slightly higher as compared to the estimated rates of other countries in the African region and are nearly twice as much of the rates in Kenya and Uganda [5].

Figure: 3. Age-specific incidence and mortality of cervical cancer in Tanzania



Source: Copied from WHO/ICO, *Information Centre on HPV and Cervical Cancer 2010*, page 16 [5]

Burden of cervical cancer in Tanzania

Table 1a: Incidence of cervical cancer

Indicator	Tanzania	Eastern Africa	World
Crude incidence rate ¹	40.6	25.7	16.0
Age-standardized incidence rate ¹	68.6	42.7	16.2
Cumulative risk (%) ages 0-64 years ¹	5.1	3.2	1.3
Standardized incidence ratio (SIR) ¹	399.0	250.0	100.0
Annual number of new cancer cases	7515	33903	493243

Source: WHO/ICO, *Information Centre on HPV and Cervical Cancer 2010*. Page 6

Table 1b: Mortality due to Cervical cancer

Indicator	Tanzania	Eastern Africa	World
Crude mortality rate ¹	32.5	20.6	8.9
Age-standardized mortality rate ¹	55.6	34.6	9.0
Cumulative risk (%) ages 0-64 years ¹	4.0	2.6	0.7
Standardized mortality ratio (SMR) ¹	629.0	391.0	100.0
Annual number of deaths	6009	27147	273505

Source: WHO/ICO, *Information Centre on HPV and Cervical Cancer 2010*. Page 12

Kilimanjaro Christian Medical Centre (KCMC)

KCMC hospital has a robust health information system. There is good capacity for data management and personnel are readily able to retrieve, translate and process data when required. The facility reviews/analyses records on a monthly basis. Gynaecologists at KCMC provide cervical cancer control services. The in-service training on screening by visual methods and management of pre cancerous lesions of the cervix was conducted in 2008 (Annex A4). Although there was no record on post training appraisal assessment, there is acknowledgement that was realised through discussion with focal person that this has reduced the time spent on screening process. There is a plan to train 17 personnel for cervical cancer management in the year 2010 although HPV vaccine training is not currently included. The services provided for cancer control includes screening by both Pap smear test (Annex A5) and Visual tests (VIA/VILI) (Annex A1. HPV DNA testing and HPV vaccination are currently not provided. The overall number of women screened using (VIA/VILI) from the past five year (2004-2008) was 4778 and about 553 (11.6%) were VIA/VILI (Annex I). The hospital also provides investigation using colposcopy and biopsy (Annex A2).

KCMC reports that the number of confirmed cancer of cervix in 2004-2008 diagnosed was 359 (24.2%) out of 1482 (Annex A6). The hospital provides treatment for precancerous lesion using LEEP and Cryotherapy (Annex A7). Early invasive carcinomas are treated through surgery. The mortality due to cervical cancer for the past five years (2004-2008) is reported to be 112 women (29.2%) out of 384 women diagnosed to have invasive cancer, (Annex A3&A6). KCMC reported that it provides training for health workers in form of capacity building of health facilities in the Northern zone. This programme was implemented beginning 2007 in Arusha region (Selian and Mount Meru hospital) and Kilimanjaro region (at district hospitals i.e. Hai, Mwanga, Same, Rombo and Mawenzi). Under this training programme regular quarterly supervision is performed by a cervical cancer coordinator and ensures availability of supplies for screening of cervical cancer. Details of how many people have been trained to date were not readily available for this study.

Peramiho

Peramiho has neither an attendance register for referral patients nor a cancer register. Usually data is collected on a daily basis but compiled once at the end of the year and there is no regular review or analysis of records. The hospital does not have an oncologist and pathologist, but does have 2 gynaecologists and 4 lab technicians. The in-service training on screening by visual methods and management of pre cancer of cervix was conducted in 2008 (Annex A4). Screening is done by using visual tests with VIA /VILI and pap smear, whereas VIA/VILI is the routine method (Annex A1). HPV DNA test is not provided at Peramiho hospital. Screening with VIA began in February 2007; hence data for a complete year is only available for 2008. During 2008 a total of 104 biopsies of suspicious lesions were taken for analysis in Germany and 69 (66.4%) of biopsies were cases of invasive carcinoma of the cervix.

Peramiho provides treatment of pre-cancerous lesions but the hospital does not have the capacity for providing treatment of invasive cancer of the cervix including surgery, chemotherapy and radiotherapy (Annex A7). Patients with these needs are referred to Muhimbili National Hospital and Ocean Road Cancer Institute. The hospital reported a

need for cancer and cervical cancer management guidelines, and more specifically a need for amenities for cervical cancer screening and managements (Annex A7).

Bugando Medical Centre

The information system at BMC is underdeveloped and data is incomplete. The registers do not collect data on treatment provided and outcome of treatment. There are no regular reviews or analysis of records hence it was very difficult to acquire data from available registers. BMC has two pathologists; two gynaecologists and two nursing officers which is the basic number needed for the current level of cervical cancer control services by a consultant hospital.

Screening using Visual tests with VIA /VILI is used as the method of choice for screening pre- cancerous lesions and was introduced as a routine service in January 2009 and data on this was not available during our study. Therefore there are no data prior to 2009. Data have been collected since January but no report is available as yet. Pap smear tests are performed but not as a routine and there are no data. All diagnostic procedures including colposcopy and biopsy, (Annex A2), treatment with LEEP and Cryotherapy for pre-cancerous lesion and treatment of invasive cancer using chemotherapy and surgery is provided but there is no systematic documentation of patients' data, (Annex A7). Although Bugando provides treatment in the form of chemotherapy it was indicated that the hospital lacks drug supplies such as [Paclitaxel](#), [Carboplatin](#) and Ifosfamide.

Anecdotal evidence from a number of private hospitals in Dar es Salaam indicated the presence HPV vaccine (cervarix® produced by GSK) which is provided at a price of nearly 60\$ per dose and is readily available.

Cost of services

At ORCI the interviewed person said that all running costs (this included drugs, reagents, equipment, screening reagents etc) are covered by the Ministry of Health and Social Welfare. At Peramiho screening services were reported to be funded by WHO through a demonstration project. Bugando Medical Centre reported to have an overall

budget of US\$740,741 for cervical cancer and US\$26,667 for Cervical Cancer screening alone; the screening budget was covered by DANIDA. KCMC did not provide any information about available budget or constraints nor did they report budget gaps or source of funding for cervical cancer screening, let alone cervical cancer in general. Overall, apart from ORCI, available information suggests that all the remaining hospitals were dependent on external support and this has a bearing on sustainability especially as coverage increases.

Equipments, supplies and drugs

Based on the facility case load, survey findings suggest that none of the facilities have all the required equipment (See Annex 2) and supplies (See Annex 7) for prevention and control of cervical cancer in place; with frequent stock out of essential drugs (i.e. for pain management, blood transfusion, VIA/VILI, Anaesthesia and Emergency Management).

HPV vaccination experience; time and motion assessment

There is currently some experience of HPV vaccine delivery (phase IIIb) from a GSK study ongoing in Mwanza, Tanzania using schools as the platforms including primary and secondary schools and the teachers college. The title of the study is "A phase IIIb double blind, randomised, controlled, multicentre study to assess the immunogenicity and safety of GlaxoSmithKline Biological's HPV 16/18 L1 SO4". The vaccine is administered intramuscularly. An interview with the coordinator of the study revealed that the target group were females between the ages of 10 and 25 years. Three doses of the vaccine (*Cervarix*®) are given at month 0, 1, 6¹. Study subjects were identified from their schools and then given specific appointments to come at Seketure hospital where the vaccine is administered. Other inclusion criteria include; none pregnant women and those that do not plan to be pregnant during the study period; those who are HIV negative; women who have not had immunoglobulin administered to them within three months of enrolment; and those who have not been already vaccinated against HPV. The team of workers comprises a Medical Doctor (1), Assistant Medical Officer 1, Clinical Officer (1), Pharmaceutical Technicians (2), Nurses counsellors (3), drivers (2), registration clerks (2), Community Officer (1), field coordinator (1), interviewer (1), nurses field workers (4). The main challenges faced were related to the misconception that the vaccine causes infertility and that people are being injected with the HIV virus. Also women are not being able to make the decision on their own; they have to ask permission from their husband or their families. These challenges are being tackled using community mobilization through village executive officers. The approximate time to administer the vaccine is as follows: registration 3 minutes, counselling 15-20 minutes, clinical review 10 minutes and vaccination 3 minutes. There was also a supplementary study undertaken to establish the prevalence and incidence of genital HPV infection using HPV-DNA test for period 2008-10.

¹ Name: Phase IIIb double blind placebo control multicentre study to assess immunogenicity and safety of cervarix vaccine which is a multicentre including Tanzania and Senegal with a sample size of 333 from each country.

Time and motion study

A time and motion study was conducted in three referral hospitals, ORCI, KCMC and Bugando where health workers were followed on a clinic day when screening with VIA/VILI for cervical and breast examination were done. Medical doctors and nurses were interviewed about their weekly time use and then followed on a real working day to document their time use.

Most of the health workers reported to be working from 8:00am to 2:00pm and sometimes up to 3:30pm everyday from Monday to Friday. An hour for health education and morning reports, from 8:00am to 9:00am is followed by screening and treatment services. However the observational study showed that daily patients' attendances by health care provider were ending at 12.00 noon. These included activities like screening for cervical and breast cancer and biopsy taking. Post noon, nurses would clean and attend to any late comers (though this was rare). The specialists would be teaching or following up on administrative activities. On the average, 25-27 patients per day were seen in the three visited hospitals. There were 2 clinic rooms in each of the hospitals and therefore the average number per clinical personnel was 10.5-13.5 patients per day. Although the clinic room had a specialist and some nurses, nurses were seen doing most of the screening activities while specialists were seeing patients who needed further treatment like Cryotherapy and LEEP.

On average screening for cervical cancer took an average of 11.21 minutes with range of 6-20 minutes per patient. That included activities like entering the examination room, consultation, undress, seating on the examination bed, examination and recording of the findings. In this study the time spent on examining cervix might have been underestimated because we approximated the average time spent for both screening the cervix and the breast. However, the procedure for doing cervical cancer screening takes longer if the time spent preparing equipment such as the speculum or the material e.g. acetic acid for visualizing the cervix with colposcopy is included. Breast examination was done only by the use of hands. The study could not get a screened positive with VIA/VILI i.e. patients with pre cancerous lesions, but based on ORCI nurse's experience, treatment for precancerous lesions

with Cryotherapy takes around 11 minutes (3minutes freeze, 5minutes defreeze and again 3mins freeze) for treatment using Cryotherapy.

Overall, the time and motion study established that nurses were doing most of the screen activities and sometimes treatment using colposcopy and Cryotherapy; only LEEP requires a specialist. The time required to screen-treat could average 29 minutes for the 2-5% patients that might be screened positive.

C. HPV policy implementation environment

Existing channels of vaccination with potential interface for HPV vaccination

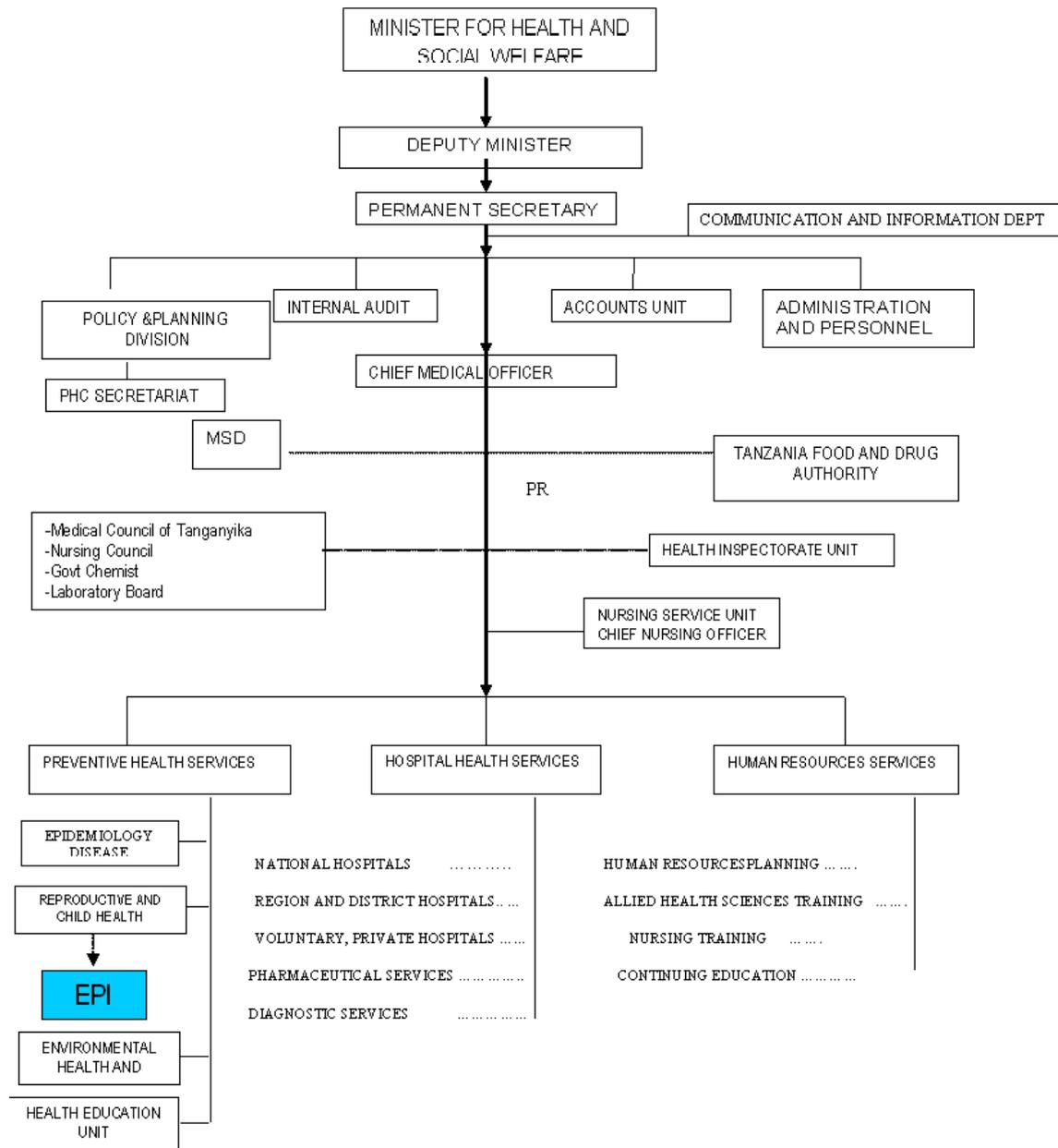
Currently in Tanzania the health policy reform aims to improve the health and well being of all Tanzanians with a focus on those most at risk. Immunization is one of the components in the National Package of Essential Health Interventions (NPEHI) of 2000.

The well established Expanded Programme on Immunization (EPI) is under the Reproductive and Child Health Services in the directorate of Preventive Health Services in the Ministry of Health and Social Welfare (MOHSW) [48]. Immunization services are provided countrywide through a network of health facilities. Out of a total of 5,299 health facilities countrywide, 76.8% (4,072 health facilities) provides immunisation services. The vaccines provided include for prevention of measles, diphtheria, pertussis, tetanus, polio and tuberculosis. EPI has made immunization services accessible to the majority of the population. The main immunisation target groups are infants and to some extent pregnant women at some stage during pregnancy. It is currently planned to increase the number of health facilities providing immunisation services to 85% by 2014.

EPI has an established network top from the ministerial level down to the district. At the village level the administrative infrastructure exists where executive officers are responsible for all matters including social mobilization. At regional and district levels there is Cold Chain Officer (DCCO) and Reproductive and Child Health Coordinator (RCHCO). These personnel are answerable to Medical Officers (Regional or District) and are responsible for management and coordination of immunization activities. Through this network they provide technical support to health workers in immunization services and distribution of vaccines and supplies.

The EPI Programme with its extensive network from central down to the district level presents a real opportunity for the roll out of the EPI HPV vaccination programme. Possibly through EPI facilities and personnel already in place, like the Cold Chain facilities/Officer. And the existing Reproductive and Child Health Coordination at various levels has the potential to interface with HPV vaccination.

Figure: 4 The Ministry of health organogram and EPI positioning



Source: Copied from the United Republic of Tanzania Ministry of Health and Social Welfare– Tanzania mainland. Expanded Programme on Immunization. 2010 - 2014 Comprehensive multiyear plan. Draft. August, 2009. pg9.

Stakeholders views regarding HPV vaccine implementation

Awareness and knowledge of cervical cancer

“Neither women, nor men in the general population in Tanzania know how serious the burden of cervical cancer is. You see a woman coming at terminal stage of the disease. After coming all the way without knowing anything, she falls in the hands of a doctor at the Ocean Road Hospital, waiting to hear the bad news, just imagine”. (MOHSW stakeholder)

Interviews with national level stakeholders provide an indication that awareness is very low amongst Tanzanians with regards to various aspects of cervical cancer such as causes, risk factors, the magnitude and the population at risk. Prevention and treatment options are largely unknown at community level, and by health managers and even health workers. Even less known, is the newly developed vaccine to prevent high risk HPV types linked to cervical cancer, and also the fact that discussions are ongoing on immunizing pre-adolescent girls against HPV. Stakeholders had varied levels of awareness, with those directly dealing with (cervical) cancer having more knowledge and more in favour of action against cancer. Better understanding of cervical cancer was thus associated with support for the introduction of HPV. There was more awareness at national level as was quoted in a stakeholder interview:

“Thanks to MEWATAs campaigns against breast cancer, they have really helped people and the government to wake up ... building awareness on all types of cancer, including cervical cancer” (MOHSW stakeholder)

Medical Women Association of Tanzania (MEWATA) is one of the few professional organizations founded in 1987 in an effort to address some of the issues of women's health, to promote interests of women in the medical profession, to assist the development of promising young women professionals and to advance the health care of women and children. There are two principal organs of the association namely the General Assembly and the Executive Committee. The General Assembly consists of all members and is the supreme organ that makes decisions, which

governs the organization [49]. The Executive Committee comprises of six office bearers; four executive council and two ex-officio members, who are responsible for the overseeing the overall implementation of the planned Associations affairs and in other subcommittees. The board of Directors consists of five members whose task is to monitor and advise the association activities.

Interview with MEWATA leader revealed that it started a community based campaign to create awareness of cancer of the breast in 2005. Several partners joined hands to fund the campaigns with a large percent coming from the community level through media fundraising campaigns. About 90% of the funds used in the campaigns were donated by the public either as cash or material supplies. One of the key players was a private television campaign which gave more air time for education and announcements requesting for funds. The benefits of the campaign included raising awareness about the presence of breast cancer, breast clinical examination, how to perform breast examination, risk factors, symptoms and signs for cervical cancer, and some were also referred for mammography.

There were a number of challenges faced by MEWATA during its campaigns implementation. Although women were generally positive about coming out for examination and treatment, there was a lack of service coordination in the country. There were shortages of resources to cover all districts in the visited regions, and insufficient understanding of the major goal of MEWATAs campaign which resulted in confusion of roles and poor cooperation by some stakeholders within and outside the health system. Table 2 shows the number of women examined by a MEWATA team in seven regions of Tanzania, the number of women found to have a breast problem and those who had developed cancer.

Table: 2 Total women screened during MEWATA campaign

	REGION	YEAR	NUMBER OF WOMEN	WOMEN WITH BREAST PROBLEM (and % of screened)	BREAST CANCER CASES (and % to those with breast problems)
--	--------	------	-----------------	---	--

1	Dar es salaam	2005	7259	751 (10.3)	46 (6.1)
2	Mwanza	2006	11668	871 (7.5)	25 (2.9)
3	Mbeya	2007	23102	513 (2.2)	27 (5.3)
4	Lindi	2008	5005	150 (3.0)	8 (5.3)
5	Mtwara	2008	8028	220 (2.7)	9 (4.1)
6	Dodoma	2008	6797	332 (4.9)	23 (6.9)
7	Manyara	2008	2036	141 (6.9)	9 (6.4)
	Total		63895	2978 (4.7)	147 (4.9)

Source: MEWATA Data

Opinions on HPV vaccine implementation activities

The approach to HPV vaccine implementation is an issue of concern among key stakeholders. From the interviews with stakeholders, it was revealed that involvement of all stakeholders is very important. Some stakeholders had never heard anything about HPV immunization, and of those who heard, most had no idea if there was any government statement. On the other hand, stakeholders were fascinated to learn of the HPV vaccine and that it can protect women against cervical cancer. They welcomed wider use of the vaccine and rationalized this on grounds that women deserve to be protected against cervical cancer with the best available technology.

Stakeholders revealed some challenges that are likely to impact on HPV vaccination activities. Various health system requirements were cited as a prerequisite before the introduction of HPV immunization on a national scale. Some essential preparations need to take place in key departments within the MoHSW and other sectors involved with adolescent activities such as the MoEVT and youth organizations/ centres. Within MoHSW the cold chain system, human resources for health, the supply and distribution and general logistics need to be prepared to welcome the new intervention.

The provision of vaccines is a multi sectorial issue. All national immunization activities are coordinated by the EPI unit in the MoHSW which is responsible for the cold chain system. Strengthening the cold chain system and providers' skills in delivering the vaccine to young adolescents on a wide scale were identified as key needs for the introduction of HPV vaccine. EPI is mainly responsible for logistics –

quantification, monitoring and evaluation and training of providers in delivering the new vaccine; and Medical Stores Department for the actual delivery of the product. The existing vaccine delivery system is used to dealing with children under five years and pregnant women. EPI will now face the challenge of reaching out to young adolescents, the HPV target group. Experience from other African countries suggests that the school system can be a good entry point in this respect [50]. This should be associated with special strategy to reach for out of school children.

Resources for HPV implementation

The vaccines against HPV are known to be most expensive in history [51]. The cost of purchasing, transportation and distributing vaccines was critical issues raised by all stakeholders. Stakeholders told of their worries that the health system is still struggling with serious epidemics and problems such as HIV/AIDS, malaria and maternal mortality and saw the move towards introduction of HPV vaccine as stretching the already limited resources too far to make a meaningful difference. Stakeholders emphasized on a need for donor support in financing HPV immunization at a national scale. Concerns regarding sustainability of the programme in the long run featured in all the interviews with national and international stakeholders.

Place of HPV vaccination in the Health System

According to the stakeholders interviewed, immunization against HPV has a better chance of being accepted if it is introduced/ integrated within the reproductive health agenda. However they warned of possible conflicts of interest between different departments/sections within the MOHSW, managers at regional and district levels, let alone sponsors, over resource needs and usage. In this regard it is important to first identify and address potential tensions (or conflict of interest) to avoid confusion and abuse of power which can hinder the required cooperation amongst key stakeholders and thus negatively impacting on vaccination coverage and sustainability. The issue of whether HPV should be delivered as vertical or horizontal campaign exercised stakeholders attention. In the main, there was a general feeling that interventions delivered as vertical programmes attract good funding, with clear accountability structures for monitoring and evaluation as well as a sense of sustainability, at least for the entire programme duration. Nevertheless most

stakeholders are aware of the current discourse on horizontal integrated implementation of interventions and actually supported the need to have a rational strategy. They only warned of the need to ensure commitment of resources sufficient for 'full scale' implementation and sustainability through the routine systems.

Defined roles of stakeholders

There needs to be some clarity in the roles and responsibilities of the various parties involved. Medical Store Department, a semi autonomous body is responsible for acquisition, storage and distribution of medical goods in the country [52]. However the Medical Stores Department is not alone in the course because the MoHSW's tender board and UNICEF are sometimes involved in purchasing especially vaccines. Stakeholders called for clearly defined procurement procedures for the HPV vaccine. Strengthening the central cold room as well as proper timing for bringing in the vaccines can reduce overloading the storage system both at national and lower levels. Logistics for clearance of vaccines from the port and transportation from central storage need to be well prepared. There might need to be a phasing of the immunization process starting with some regions/ districts. Vaccine packaging will affect the storage needs considering that single dose vials demand more storage space. Transportation to regions and districts needs to be planned in the sense that it might not coincide with quarterly deliveries for other goods in various districts.

Human resources

Human resources are important for vaccine delivery. Stakeholders called for an assessment of the human resources needed to deliver the vaccine. Injecting vaccines requires medical skills, unlike tablets which can be delivered by non medical personnel. Whether delivered within or outside the health facility context, HPV vaccine has to be administered by trained personnel. EPI has experience of providing tailored trainings on the job to providers and District Cold Chain Coordinators (DCCOs) on issues of vaccine management and delivery when there is a new vaccine. This experience could be applied to HPV. However, as mentioned earlier, given that the focus age group is outside the current EPI target groups of under fives and pregnant women, other appropriate delivery strategies will need to be considered. Any choice of a delivery strategy outside the routine system might impact timely delivery of routine service provision and hence the coverage of existing

routine immunizations. It was pointed out by stakeholders that if HPV immunization is to be done at health facilities it means that health workers in respective facilities e.g. dispensaries and health centres might be too overloaded and will not manage to immunize the target group in their catchment's population in a reasonable time and other services might be paralyzed.

Community responsiveness

Virtually all stakeholders warned of possible suspicion over the effect of the vaccine on fertility that might affect coverage unless deep sensitization is done countrywide.

One of the teachers interviewed said:

“Acceptance by the society will be poor because of cultural beliefs; there are many people who still believe that this disease is caused by witchcraft. Care seeking behaviour in most of our societies is still poor and the condition is worse when it comes to diseases affecting reproductive organs. These problems need to be dealt with during the implementation of an HPV vaccination programme for the prevention of cervical cancer”. (Teacher)

Therefore she emphasized that only wide spread knowledge on the cause of the disease can make people change their views.

Giving an example, one stakeholder had this to say:

“When the campaign against schistosomiasis was being conducted, I was visiting Loliondo. People had heard that some school children fell down in Morogoro after taking the medication. The news spread quickly by word of mouth, and some parents locked their children away to make sure they didn't go to school on vaccination day” (stakeholder, NGO).

NGOs/CBOs dealing with youth at the grassroots can add value in delivering the message by themselves as well as identifying opinion leaders at different settings to maximize acceptability. Mass media campaigns are also important. Providers who are part of the community they serve and share some common worldviews need to be well informed about HPV and the vaccine. Stakeholders also reminded us of the

challenge to complete the 3 doses required. Sensitization needs to continue even after getting the first shot to avoid defaulting, maximize compliance to vaccine requirements and effectiveness.

Choice of delivery channel

Delivery of HPV through school was recommended by most stakeholders with efforts to reach out those out of school. Special days to deliver the vaccine in schools was cited as the most feasible way of reaching youth without having to organize young people independently [50]. In Uganda, a study explored two strategies to deliver HPV vaccine: first was a standalone strategy where girls at schools are vaccinated and second using a child's day plus program which already existed that targeted children 14 years and below in April and October [50]. The second strategy delivered package of preventive services and covered both in and out of schools with vitamin A and catch-up immunization. In Tanzania, the attendance in primary schools is reasonably high. Health providers from several facilities could visit schools, or organize special "immunization day" in pre-agreed site, where the target group has been gathered waiting for immunization and then move on to another site to do the same. However care need to be taken that student did not shy away from coming to school on that day.

Training

Training has been cited by stakeholders as needed to refresh the skills of providers regardless of who they worked for as a strategy to mobilize human resources, save time and to make sure they get the vaccination right. Health providers need to know the specific requirements of the vaccine and to be in a position of dealing with any side effects as well as answering any questions they might encounter in the field. This will cultivate their confidence in and support for the immunization campaign. Teachers should also be involved in advocacy and in bringing pupils into the vaccination sites and their presence during vaccination might make a difference to compliance.

Integration of services for screening

Service integration has high potential to increase screening coverage. Stakeholders pointed out that linking various reproductive and child health services with screening

and testing for cervical cancer could be beneficial. Services like family planning and antenatal care could well be utilized. To attract parents and guardians, whatever decision is taken for the provision of HPV vaccine, this should be linked to screening of women at risk to increase the acceptability of the vaccine.

Sensitization for HPV vaccine and cervical cancer

Health system stakeholders insisted on thorough sensitization before starting to deliver the vaccine. Sensitization needs to focus on two levels. First, is to create awareness about actual problem i.e. cervical cancer and HPV as the main cause of cervical cancer. Second, an opportunity for immunization programme against HPV. The message needs to be targeted at stakeholders including health managers, providers, teachers, youth, parents/guardians, those directly involved in youth (care) activities, and the community at large. The message should focus on the burden of the problem and the importance of preventive measures as well as screening, testing and management. Proper advocacy is important to influence decision making. Experience from within Tanzania has already shown that managers' attitude towards intervention and willingness to prioritize influence patterns of implementation of national interventions. Even scientific knowledge that an intervention is cost effective or is of national importance does not always seem to be sufficient to win managers commitments to sustainable implementation [53-55]. Repackaging of research findings in simple messages could improve communication.

A range of stakeholders were identified as having a potential role to play in a population-wide campaign against HPV. These involve different departments within the MOHSW, civil society organizations/NGOs, politicians, organizations dealing with youth, media, professional bodies, and local community based groups. From within the MOHSW the departments also include those dealing with acquisition of products, logistics and storage and distribution. The message and delivery strategies need to be well shaped to target particular audiences in the most convenient and effective way.

IEC messages targeting adolescents need to be clear to avoid confusion and suspicion that may affect coverage and effectiveness. It is also imperative to build awareness amongst religious leaders and faith healers to avoid conflicting messages

and facilitate proper health seeking for those already HPV positive and with suspected oncogenic strains.

Championship for cervical cancer prevention and control

The main champions for cancer were identified through stakeholders' interviews. ORCI provides most of the services for cervical cancer, tailored training for regional and district staff on routine services integration and is the main referral centre for cervical cancer.

Stakeholders cited women's' health champions to take a lead in advocacy for HPV immunization since they have experience in mobilizing women at community level. MEWATA was cited as a key stakeholder since they are already well known at the community level because of their campaign against breast cancer. Another professional body is Tanzania Media Women's association (TAMWA), women's health NGOs like EngenderHealth, Women's Dignity Project as well as youth centres. The argument was that these bodies/organizations are experienced in sensitization and "are likely to be trusted by the community". Champions need to work with all other stakeholders with an important role to play, such as referral health facilities and providers and medical training institutions.

The key champions need to be complemented by a wide range of stakeholders responsible for overseeing and/or implementation of health interventions at various levels of the health system, (e.g., national, regional, district, health providers), Non Governmental Organizations and Civil Society and Development partners are in this case considered as potential health systems stakeholders. At the national level, relevant institutions, departments, sections and professional bodies under the MOHSW need be truly mobilized.

Community perception of HPV vaccine

In-depth interviews were intended to gain information on both awareness and knowledge of cervical cancer from key stakeholders who are either focal personnel or sometime head of departments or section. FGD however were intended to characterize broader information about awareness and knowledge of cervical cancer; acceptability of a vaccine; delivery options; advocacy and suggestions on how to improve cancer services among community members.

Knowledge about cancer

People have some knowledge about cancer in general, and a few reported to have heard about cervical cancer. Respondents mentioned that they get information about cervical cancer mainly through radio, television or some having relatives who are suffering or who have because of cervical cancer. There were misconceptions regarding the true course of cervical cancer. People linked cervical cancer to use of cosmetics like facial creams, sunrays, x-rays, industrial processed foods, hormones, chronic fungus disease, bearing many children, ulcers, using contraceptive drugs, the use of fake condoms, early pregnancies, late pregnancies, ectopic pregnancies, abortions, artificial medicine to modify body parts (and these were linked to the use of Chinese drugs), sexual practices with multiple partners, practising sex during menstruation , and the use of unclean pieces of clothes during menstruation. There were other people who reported to have no knowledge on the causation of the cancer and of cervical cancer in particular.

Participants pointed out the misconception that cervical cancer is related to HIV and that it has no cure.

A secondary school teacher from Temeke, Dar es Salaam said:

“...there are those who think that cancer cannot be cured... there should be education that cancer can be cured. Because people say that cancer is like HIV and that it is incurable...”

Participants reported to have no information on where cervical cancer services are provided. It was also reported that services are based far away from people. Likewise, people were not sure where the services were provided and thought it was only at one place in the country. Some reported that no service was available, or if it was available it was very expensive.

Prevention of cervical cancer

The majority of respondents reported that cervical cancer can be prevented if people are well educated about the matter. Moreover, it can also be prevented if the government is ready to combat the problem associated with fake products. Women should be educated on not using products without knowing their side effects. A few respondents explained that cervical cancer can be prevented through medication.

Many suggested that the HPV vaccine should be provided in places where most people meet including in health centres/dispensaries, village government offices, schools, public places and in households. There were contradicting opinions on whether well informed children should seek parents' consent to get HPV vaccine. The first opinion was that a child should seek consent regardless of her knowledge. People lamented that some of the vaccines provided to children have been associated with side effects. The other opinion was that well informed children do not necessarily need parental consent. This was to avoid uninformed parents from stopping their children getting the vaccine. When asked if they were willing for their children to get the HPV vaccine, most replied positively.

In terms of willingness to pay for the HPV vaccine, most respondents were not willing as they are not used to pay for vaccines. Some people reported to have no money to be able to contribute. This will also depend on massive education about cervical cancer and the importance of the vaccine. Few respondents from one FGD session had a view that the vaccine service should not be provided free of charge, as people's perception are that better and important services are not provided free of charge. A man in FGD interviewed at Sotele village in Mkuranga district had this to say.

“Yes, we will be ready to pay, because a better service is obtained by paying, a free service is not valued by people and therefore ignored”.

It was said that parents should be the first to give information to their children about the HPV and other STI.

A parent in FGD in Lindi district revealed:

“Parents should be the first to tell their children at their homes...”

Perception of cervical cancer

Different age groups have been suggested as the best to receive HPV vaccine. These groups include women aged from 15 to 40, or starting with girls who have just started developing breasts as this age group also gets involved in sexual practices and they are potentially at risk of cervical cancer.

A parent in FGD at Mkuranga alerts:

“...the best group are those girls, who are starting to develop breasts (maturity), starting from 12 years, because they are at the risk of getting pregnant...”

The participants reported that the vaccine should be provided to all sexually mature girls, and some participants suggested setting legislations to adopt it as part of the national vaccine programme. This is because the vaccine is important to prevent cervical cancer. There were also suggestions from the respondents that the vaccine should be provided to men as some thought there could be transmission from men to women.

A male teacher interviewed in Dar es Salaam said:-

“It is better that women are vaccinated from 15 years as they mature earlier and get involved in sexual practices at an earlier stage than men...”

Respondents showed willingness to allow their daughters to be vaccinated as a way to avoid cervical cancer. However, there were others who were concerned as to the effectiveness and the side effects of the vaccine.

“... the vaccines need to be well researched to avoid problems on users... for example, there are rumours about the family planning drugs ‘NYOTA ya KIJANI’. Women were advised to use them so as to plan families, but as a result they get tumours and a woman cannot give birth...”

Advocacy and information campaigns

Participants reported that they get information through the radio, television, brochures, and meetings at the village offices, bonanzas, cinemas, public meetings, newspapers and in other public places. It was suggested that education about cervical cancer should be provided through cinemas. In some villages, participants expressed their concerns on the access and use of certain media channels such as newspapers and radios. It was mentioned that there is a need to pay for newspapers and a need for batteries to listen to the radio. Some places like schools and health clinics were also suggested as an appropriate place for receiving information on cervical cancer. Likewise, media that reach many people like TBC and Radio Free Africa have been suggested to be used to educate people. The participants also suggested the use of radio channels that are listened to mostly by young people like Clouds FM and Times FM.

Students Clubs were also suggested to be appropriate places for spreading information on cervical cancer. A Secondary School teacher in Dar es Salaam was quoted as saying:

“...School is also possible, there are teachers for counselling, there are students clubs, there are FEMA clubs that can also be used...”

Religious institutions like churches and mosques have also been cited to be appropriate in sending the right messages.

The suggestions that featured most include the involvement of teachers, parents/guardians, religious leaders, peer groups, health workers and politicians. There was an idea to have a special subject/topic at school on cervical cancer.

With regard to a platform on HPV vaccine provision, respondents suggested the use of health facilities and hospitals, clinics, schools and at the village administrative offices. However there was concern on the use of health facilities as a platform to deliver the HPV vaccine. The congestion in the health facilities is such that it could be an obstacle for adolescents using this platform. More credit was therefore given to the use of schools. Any area that attracts many young people was said to be appropriate for the provision of the HPV vaccine.

In order to increase access to cervical cancer services, respondents suggested that education should be provided to the people on the causes of cervical cancer, how to prevent it and to inform them that treatment is available for patients. There were concerns on the availability of human resources for cervical cancer services. It was suggested that people should be screened to know their status.

Participants in various FGD sessions suggested that HPV vaccine provision should be sustainable, provided free of charge, and there should be a special campaign like the one on breast cancer. A special cancer day was also suggested to provide services related to cancer.

DISCUSSION

In recent years cancer has received increased attention in health policy discussions. Cancer of the cervix is one of the leading types of cancers and the current control efforts have concentrated on management of the final stages of the disease and less on preventive measures. The government is increasingly recognizing the contribution of cervical cancer to overall mortality and its significance in maternal health. This is an important step towards concrete policy implementation. The recently formulated National Strategy for Non-Communicable Diseases was a critical milestone towards a renewed focus – the first draft was released in 2008. In addition there are two other developments. First, a draft of the National Cancer Control Strategy has been released to guide cancer control activities. Second a new unit on reproductive cancers has been created to strengthen control activities specifically related to cervical cancer, breast and prostate cancer.

It is nationally estimated that 69.6% of cervical cancers are due to two HPV genotypes; 16 and 18 [5]. These are global country specific estimates. We have used these estimates due to unavailability of actual data from HPV- DNA tests that are used to establish the most prominent HPV genotypes. This test is not routinely implemented in the current health system and two studies that used the DNA test were not large enough to give representative estimates. In our survey the leading cancer in 2007-8 at the ORCI proved to be cervical cancer and this accounted for more than 37% of all cancers. Control efforts for cervix cancer are currently concentrated in the final stages of the disease; screening activities are not yet available in most parts of the country. It is likely the incidence of cervical cancer recorded at ORCI which is a national referral cancer hospital is underestimated due to the fact that the referral structure currently in place is insufficient to keep track of all cancer cases.

The Tanzanian cancer management information system is not well established as a result the national estimates of new cases and mortality due to cervical cancer was taken from global survey estimates of 2007 [5]. This is due to the fact that there is no population based cancer registry. The follow up system of patients who are newly diagnosed with cancer and who undergo palliative care at home is not yet established. The referral system of cancer patients is not well functioning as a result

some patients die before reaching the national cancer hospital-ORCI. Although the zonal hospital based cancer registry was actively functioning at KCMC and Bugando, the ORCI cancer incidence registry was not fully implemented hence did not adequately capture all referral cases. Data on mortality due to invasive cervical cancer for consecutive five years up to 2009 was not systematically available at ORCI. As the estimates were based on those women coming to the attention of health services, and same for the mortality, many more likely to be suffering from the disease and die unrecorded. Therefore the findings incidence and mortality due to cervical cancer need to be interpreted with caution as it might be underestimated.

The HPV vaccine has not yet been given space in any training curriculum. Teaching on cervical cancer is available in the curriculum, but in a very limited way. Medical students attend 2 weeks practical training but other cadres like nurses and clinical officers who are more widespread countrywide get only theoretical training. VIA/VILI is recommended for countries with limited resources where laboratory services are lacking. Therefore there is a need to provide skills on screening using VIA/VILI as part of Tanzania's cervical cancer control measures.

Co-operation and collaboration in health service provision is very important for effective delivery. In our survey it has been shown that networking to share experiences among the five referral facilities was uncommon. This could be explained by many factors. The facilities were owned differently by government and missions; they lacked common ground to work together in key patients' care skills especially newly developed skills. The ongoing researches in those facilities were sponsored through different channels that contributed to different access to resources and technology and led to the observed heterogeneity in screening and management of cervical cancer. There is therefore a need to establish a platform for networking that could foster a formal framework for sharing experiences and strengthen service delivery.

Cervical cancer is a reproductive issue and a link with reproductive health in terms of policy and practice is likely to be productive. Effective cervical cancer control needs to start at a pre-reproductive age, with immunization of youth before they start engaging in sexual activities in order to prevent them from contracting the cancerous virus (HPV). Vaccination against cervical cancer is closely related to other activities

such as other immunization and youth education. This means that a policy to address cervical cancer needs to be as comprehensive as possible in considering key stakeholders' role, and as specific as possible to avoid confusion of roles, to bring about efficient use of resources and to maximize impact.

The coverage of services for screening and management of cervical cancer across four zonal referral hospitals in the country is not standardized and this service is not provided at all in one of the zonal referral hospitals; Mbeya. In some very few regional and district hospitals routine screening and care of cervical cancer is available. Diagnosis of early and late lesions is routinely done in the zonal referral hospitals except in Mbeya. Chemotherapy is available only at Bugando hospital and ORCI. Anecdotal evidence from a number of private hospitals in Dar es Salaam indicated the presence HPV vaccine which is provided to any women client at a price of nearly 60\$ per dose and is readily available.

This study has established that the human resources needed to perform specialized activities related to cervical cancer are lacking. A pathologist needed to make final proper confirmation of diagnoses was not available in KCMC, Peramiho and ORCI. This has a bearing on the quality of services provided. There is a wide heterogeneity of screening approaches among the five referral facilities surveyed. Shortage of human resources and equipment in the main hospitals is likely to be a major contributing factor for this heterogeneity and this was compounded by the unavailability of cadres like pathologists in ORCI, Mbeya, Peramiho and KCMC. Tailored training for screening and management of cervical cancer are organized through ORCI. This has made a difference in cancer screening where a few regional and district hospitals have started to screen for cervical cancer.

Overall, the time and motion study established that nurses were doing most of the screen activities and sometimes treatment using colposcopy and Cryotherapy; only LEEP needed a specialist. This implies midlevel health workers could do most of the activities related to cervical cancer. Already the nurses are responsible for administering the EPI vaccine and they are the likely to be available in most facilities in Tanzania for service provision. In this study it was shown that nurses' activities were ending early on and there were considerable time to do cleanliness and wait for patients. This conforms to what has been observed in the previous studies in the

RCH clinics and elsewhere in Africa that health workers has some unused time to accommodate some more activities [56, 57]. The time required to screen-treat was around 30mins for very few people that might be screened positive that range 2-5% that would not in reality overload the health facilities.

There is limited awareness on cervical cancer in Tanzania at all levels. Knowledge about cervical cancer is limited to those dealing directly in cancer-related activities, and those affected by cancer either as patients or their families. To engage young girls to get vaccinated it is required that permission is sought from their parents who might have misconceptions about this new vaccine. This calls for sensitization of the community. Health workers need to be trained and to understand it well so as to be able to educate the population of the importance of this vaccine in preventing cervical cancer.

Many national and International stakeholders expressed lack of awareness on cervical cancer even though they were supportive of immunization against HPV. They therefore called for concerted efforts in advocacy. Many thought that nation-wide campaign against HPV should be justified by the “facts and figures” on the number of women affected by cervical cancer, the effectiveness of the HPV vaccine, and the experiences from other countries, as well as the cost effectiveness of vaccination and weighing against the burden of maternal mortality in its broad sense. Stakeholders were concerned whether population-wide vaccination is feasible given the current weaknesses in the health system in terms of human resource for health (HRH), the weak distribution system and the potential sustainability of HPV immunization. Caution was expressed in the hope that the government would not compromise immunization levels and that they would consider the global economic crisis and the fact that some donors had shifted their attention to HIV/AIDS. Some stakeholders felt that reducing maternal death was the most important priority compared to HPV immunization and they perceived secondary prevention to be relatively justifiable for low resource systems as more affordable, sustainable to countries like Tanzania. They were thus in favour of screening, early detection and treatment of lesions.

The respondents at community level had only limited knowledge about cervical cancer. Information about cervical cancer is mainly available through radio and television. There were misconceptions regarding the true course of cervical cancer. In addition, the community had no clear information on where services on cervical cancer were provided. The majority had a feeling that cervical cancer services were obtained far away from where they live. When discussing issues related to HPV prevention and vaccination, the majority felt that cervical cancer vaccine can be accepted if people are well informed. With regard to the cervical cancer treatment, there was a perception that it was not treatable. Efforts to increase HPV vaccine uptake should therefore ensure that demand is created through education to the people on the causes of cervical cancer, how to prevent it and treatment options available for patients. In addition, advocacy is imperative to clear misconceptions that the vaccine is useful when is provided to young women and is not aimed at reducing fertility.

The appropriate age for provision of HPV vaccines suggested by the community is based on the period when adolescents start to be sexually active after 15 years of age or sometimes before. This is in conformity with literature from other parts of Africa that explain sexual behaviours among adolescents in Sub-Saharan Africa, including Tanzania. Condom use has been on the increase during the past decade. However, high prevalence of STIs including HIV is recorded among young people and females account for a higher prevalence than males. Nonetheless, TDHS show that 12% of young women and 9% of young men had had sex by age 15. Early sexual debut is several times more likely in Mainland Tanzania than in Zanzibar. Young women with no schooling are significantly more likely than those with at least some secondary education to have had sex by age 15. This behaviour has a bearing on incidence of cervical cancer and provides rationale for provision of HPV vaccines to children below 15 years.

On the HPV vaccine, the majority of community members suggested that the vaccine be provided in places they gather and use most including health facilities, village government offices and schools. There were some contradicting ideas on whether well informed children should seek parents' consent to get HPV vaccine or not.

Some respondents suggested that children should seek consent regardless of their knowledge as a way to ensure that parents are prepared for any possible side effects. But other participants suggested that well informed children do not need parental consent because uninformed parents may stop their children getting the vaccine. The majority were willing for their children to be given the HPV vaccine to protect against cervical cancer. Most respondents suggested vaccinating matured girls against HPV. This age group was reported to be involved in sexual practices and potentially at risk of cervical cancer. There is therefore a need to create awareness for the community acceptance on the ideal age group for the HPV vaccine. In South Africa it has been established that the HPV vaccine could be provided through schools with the involvement of other stakeholders such as sexual and reproductive health providers as well as the advanced programme on immunization (EPI) [58]. However if a decision is taken to use schools, special efforts need to be considered to reach out of school children. With regard to the willingness to pay for the HPV vaccine, the majority of respondents were not willing to pay as they had no experience of paying for vaccines. However a few people showed a willingness to pay if the amount was set at low price equivalent to malaria cost sharing.

Information on cervical cancer was mainly reported to be obtained through radio, television, meetings, cinemas, newspapers and in public places. Respondents from various FGD and in-depth interviews suggested that films on cervical cancer should be used to provide information to community members. Likewise, media such as TBC and Radio Free Africa (RFA) could also be used to educate the community. Local radio such as Clouds FM and Times FM can also be used to provide information because they are mostly listened to by young people. Religious institutions like churches and mosques were also reported to be appropriate place in sending the right messages to the target group. In general the community was positive to the HPV vaccine as long as parents and guardians are well informed

The experience from MEWATAs campaign was highlighted as a lesson for any HPV vaccination national campaigns. Awareness creation could be a starting point but include testing to increase turn-up of women and the community. Sensitization and involvement of all the relevant stakeholders was shown to be important to secure

support in actual implementation. Regional and district authorities need to be made important partners and fully involved in the fight against cervical cancer to incorporate activities in their plans, budgets, supervision and conduct sensitization activities at community level.

There were some limitations associated with this study. Weak data management systems were observed in some hospitals visited. Data were not well organized as a result some data were missing especially on mortality. The issue of cancer is seen as an individual interest and not yet a public health issues, as a result working in some places was difficult and some facilities were excluded from the study. The study limited itself to major hospitals and could not explore in detail experiences in regional and district hospitals. The issue of HPV immunization is a new area of research in Tanzania, and that limited information sharing. However, the triangulation method employed enabled complementarities of approaches that enhanced validity and reliability of findings.

CONCLUSION

HPV vaccination is a new experience in immunization campaigns that has to be given at age 9-13 years, which lies outside the traditional target group for EPI. Despite the inherent challenges for its introduction, it is the view of the authors of this study that it is feasible, if all the barriers that were identified are efficiently addressed. This study established that it is feasible to introduce the vaccine in Tanzania based on:

- The EPI platform is well established for logistical support in terms of cold-chain, well utilized and trusted.
- There is political will whereby a specific policy for cervical cancer has been developed and there is a specific unit “Reproductive cancers” at the MoHSW.
- There is an opportunity of using schools as a platform given high school attendance so long as a special effort was made to track out of school children.
- The community is prepared to take up the new vaccine as long as they get the right message.
- The services related to cervical cancer (screening and testing) have an opportunity to be linked with other services like family planning and antenatal care. There are already established experiences of community sensitization and advocacy that could be utilized for HPV vaccination and reproductive cancers in general.

However, precautions need to be taken when undertaking HPV vaccine policy implementation:

- Strong advocacy and sensitization to create awareness is the most important aspect.
- The political will in the current state is not complete. Real action could be realized when there is a clear plan and a budget line.
- Proper packaging of the messages for various levels is required. Stakeholders need to be identified, and all relevant stakeholders need to be involved to bring about concerted efforts.

-
- Mobilization of financial resources for sustainability is very important.
 - Economic evaluation of cervical cancer control programs (HPV vaccine, screening and prevention and management) should be done to substantiate the use of scarce resources. M&E is also important to be established.
 - Services related to cervical cancer need to be harmonized. Screening procedures in the country should be standardized, providers need to be trained and equipment and drugs need to be available in the referral regional and district hospitals.
 - The HPV vaccination should be included in the curriculum of the health institutes as well as practical training being provided in pre-service training and the referral systems needs to be strengthened.
 - Preparations need to be made in the EPI infrastructure in terms of strengthening the cold chain system.
 - Coordination of referral hospitals need to be encouraged and developed.
 - There is a need to strengthen information systems related to cancers and create a link with the overall Health Management Information system (HMIS).

Political will to support comprehensive cancer prevention and control needs to urgently be translated into a strategic plan and supported by an appropriate budget in order for Tanzanian women and their families to benefit from the different options available in the fight of this ultimately preventable disease.

REFERENCES

1. WHO, *Cervical cancer, human papillomavirus (HPV), and HPV vaccines - Key points for policy-makers and health professionals*. Available at: http://www.who.int/reproductivehealth/publications/cancers/RHR_08_14/en/index.html. Accessed on April 6th 2010", 2007.
2. WHO, *Preparing for the introduction of HPV vaccines: policy and programme guidance for countries*. Available at: http://www.who.int/reproductivehealth/publications/cancers/RHR_06.11/en/index.html. Accessed on April 6th 2010", 2006.
3. Koutsky, L., *Epidemiology of genital human papillomavirus infection*. *Am J Med*, 1997. 102(5A): p. 3-8.
4. Crum, C.P., D.W. Abbott, and B.J. Quade, *Cervical cancer screening: from the Papanicolaou smear to the vaccine era*. *J Clin Oncol*, 2003. 21(10 Suppl): p. 224s-230s.
5. WHO/ICO, *Information Centre on HPV and Cervical Cancer (HPV Information Centre)*. *Human Papillomavirus and Related Cancers in Tanzania. Summary Report Tanzania 2010*. Accessed April 11th 2010. Available at www.who.int/hpvcentre. 2010.
6. WHO, *Preparing for the introduction of HPV vaccines: policy and programme guidance for countries*. Available at: http://www.who.int/reproductivehealth/publications/cancers/RHR_06.11/en/index.html. Accessed on April 6th 2010", 2007.
7. Ferlay, J., et al., *Cancer Incidence, mortality and prevalence worldwide*. ARC CancerBase No 5, version 20 IARC Press, Lyon, 2004.
8. WHO, *Human papillomavirus and HPV vaccines: technical information for policy-makers and health professionals*. Available at: http://www.who.int/reproductivehealth/publications/cancers/IVB_07.05/en/index.html. Accessed on April 6th 2010", 2007.
9. WHO/ICO, *Information Centre on HPV and Cervical Cancer (HPV Information Centre)*. *Human Papillomavirus and Related Cancers in Tanzania. Summary Report 2009*. [November 7th, 2009]. Available at www.who.int/hpvcentre. 2009.
10. WHO, *Comprehensive Cervical Cancer Control: A guide to essential practice* (Retrieved <http://www.who.int/reproductivehealth/publications/cancers/9241547006/en/index.html>. Accessed November 18, 2009). 2006.
11. *Gardasil prescribing information (PI) - Version October 2009*. Available at: www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM094042. Accessed April 12th 2010.
12. *Cervarix PI - Version October 2009*. Available at: www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm186957.htm. Accessed April 12th 2010.
13. Kim, J.J., B. Andres-Beck, and S.J. Goldie, *The value of including boys in an HPV vaccination programme: a cost-effectiveness analysis in a low-resource setting*. *Br J Cancer*, 2007. 97(9): p. 1322-8.
14. *Country Profile - The Tanzania national website*. <http://www.tanzania.go.tz/profilef.html>. Accessed 30 April 2010.
15. *Tanzania National Census, 2002* [<http://www.tanzania.go.tz/census/>]. Accessed 30 April, 2010.
16. ACCP, *Planning and Implementing Cervical Cancer Prevention and Control Programs: A Manual for Managers*. Available at: <http://screening.iarc.fr/planningmanual.php>. Accessed on April 6th 2010, 2004.

17. Alexander GA, *Geographical Aspects of Cancer in Tanzania*. J Natl Med Assoc. , 1983. 75 (8): p. 797–804.
18. MoHSW, *The National Cancer Control Strategy, United Republic of Tanzania (draft) 2008*.
19. http://www.eolc-observatory.net/global_analysis/pdf/tanzania_country_report.pdf
20. Burchell, A.N., et al., *Chapter 6: Epidemiology and transmission dynamics of genital HPV infection*. Vaccine, 2006. 24 Suppl 3: p. S3/52-61.
21. Schiffman, M. and S.K. Kjaer, *Chapter 2: Natural history of anogenital human papillomavirus infection and neoplasia*. J Natl Cancer Inst Monogr, 2003(31): p. 14-9.
22. Burd, E.M., *Human papillomavirus and cervical cancer*. Clin Microbiol Rev, 2003. 16(1): p. 1-17.
23. Paul-Ebhohimhen VA; Poobalan A; van Teijlingen ER, *Systematic review of effectiveness of school-based sexual health interventions in sub-Saharan Africa*. BMC Public Health 2008. 8: p. 4.
24. Slaymaker E; Buckner B, *Monitoring trends in sexual behavior in Zambia, 1996-2003*. . Sex Transm Infect 2004. 80 (Suppl 2): p. ii85-90.
25. Ntozi JP; Najjumba IM; Ahimbisibwe F; Ayiga N; Odwee J, *Has the HIV/AIDS epidemic changed sexual behaviour of high risk groups in Uganda?* Afr Health Sci 2003. 3: p. 107-16.
26. Monasch R; Mahy M, *Young people: the centre of the HIV epidemic*. . World Health Organ Tech Rep Ser 2006. 938: p. 15-41.
27. Jaspán HB; Berwick JR; Myer L; Mathews C; Flisher AJ; Wood R; Bekker LG, *Adolescent HIV prevalence, sexual risk, and willingness to participate in HIV vaccine trials*. J Adolesc Health, 2006. 39 (5): p. 642-8.
28. Gavin L; Galavotti C; Dube H; McNaghten AD; Murwirwa M; Khan R; St Louis M, *Factors associated with HIV infection in adolescent females in Zimbabwe*. . J Adolesc Health, 2006. 39 (4): p. E11-8.
29. Rassjo EB; Mirembe FM; Darj E, *Vulnerability and risk factors for sexually transmitted infections and HIV among adolescents in Kampala, Uganda*. AIDS Care 2006. 18(7): p.710-6.
30. Quigley M; Munguti K; Grosskurth H et al, *Sexual behaviours patterns and other risk factors for HIV infection in rural Tanzania: a case-control study*. AIDS Behav, 1997. 11: p. 237-48.
31. Masatu CM; Kazaura MR; Ndeki S; Mwampambe R, *Predictors of Risky sexual Behaviour among adolescents in Tanzania*. . AIDS Behaviour 2009. 13: p. 94-99.
32. Munguti K; Grosskurth H; Newell J. *Patterns of sexual behaviour in a rural population in north-westren Tanzania*. Soc Sci Med, 1997. 44: p. 1553-61.
33. Kazaura MR; Masatu MC, *Sexual practices among unmarried adolescents in Tanzania*. . BMC Public Health 2009. 9: p. 373 doi:10.1186/1471-2458-9-373.
34. National Bureau of Statistics & Macro International Inc, *Tanzania Demographic and Health Survey; Key Findings National Bureau of Statistics Dar es Salaam, Tanzania, United Republic of Tanzania, ORC Macro Calverton, MA*.
http://openlibrary.org/b/OL16299740M/Tanzania_demographic_and_health_survey_2004-2005. Accessed 30th April, 2010, 2005.
35. Trottier, H. and E.L. Franco, *The epidemiology of genital human papillomavirus infection*. Vaccine, 2006. 24 Suppl 1: p. S1-15.
36. Jha P; Chaloupka F, *Tobacco control in developing countries*. New York: Oxford University Press on behalf of The Human Development Network, the World Bank, and the Economics Advisory Service, World Health Organization. Available at:
<http://www.dcp2.org/pubs/DCP/46/Section/6700>. Accessed on April 6th 2010", 1999.
37. Corrao MA; Guindon GE; Cokkinides V; et al, *Building the evidence base for global tobacco control*. Bull WHO, 2000. 78: p. 884–90.
38. Jagoe K; Edwards R; Mugusi F; Whiting D; Unwin N, *Tobacco smoking in Tanzania, East Africa: population based smoking prevalence using expired alveolar carbon monoxide as a validation tool*. . Tobacco Control 2002. 11: p. 210–214.

-
39. Siziya S; Ntata PRT; Rudatsikira E; Makupe CM; Umar E; Muula AS, *Sex differences in prevalence rates and predictors of cigarette smoking among in-school adolescents in Kilimanjaro Tanzania*. Tanzania Health Research Bulletin, 2007. 9(3).
 40. MoHSW, *Neglected Tropical Diseases Country Plan 2009-2014. Draft 1 Ver 30/10/2009*. 2009.
 41. *Millenium development goals* (available at: http://www.tz.undp.org/mdgs_goal2.html)
 42. *Ministry of Education and Culture: Basic Education Statistics in Tanzania (BEST)*. 2007& 2008.
 43. Munoz, N., et al., *Against which human papillomavirus types shall we vaccinate and screen? The international perspective*. Int J Cancer, 2004. 111(2): p. 278-85.
 44. Smith, J.S., et al., *Human papillomavirus type distribution in invasive cervical cancer and high-grade cervical lesions: a meta-analysis update*. Int J Cancer, 2007. 121(3): p. 621-32.
 45. Clifford, G.M., et al., *Human papillomavirus types in invasive cervical cancer worldwide: a meta-analysis*. Br J Cancer, 2003. 88(1): p. 63-73.
 46. Stenzel, A., et al., *"Low-risk" and "high-risk" HPV-infection and K-ras gene point mutations in human cervical cancer: a study of 31 cases*. Pathol Res Pract, 2001. 197(9): p. 597-603.
 47. MoHSW, *Sera ya afya (The National Health policy)*. June 2007.
<http://www.moh.go.tz/documents/sera%20wizarafnlz.pdf>, 2007.
 48. MoHSW. Tanzania. *Expanded Programme on Immunization. 2010 - 2014 Comprehensive multi year plan*. August. Draft: p. 9.
 49. MEWATA website- www.mewata.org. Accessed April 2010
 50. PATH, *Shaping a Strategy to Introduce HPV Vaccines in Uganda: Formative Research Results from the HPV Vaccines: Evidence for Impact project*. PATH, 2009. Available at: <http://heapol.oxfordjournals.org/cgi/reprint/22/2/95>. Accessed on April 6th 2010.
 51. <http://everychild.gavialliance.org/Page.aspx.pdf>; accessed on 20 Feb, 2010.
 52. <http://www.msd.or.tz>; accessed on 20 Feb, 2010.
 53. Kamuzora P; Gilson L, *Factors influencing implementation of the Community Health Fund in Tanzania*. . Health Policy and Planning. 2007. 22.(2): p. 95-102.
 54. Ministry of Health, *HIV/AIDS/STI surveillance. Report Number 19. National AIDS Control Programme, Tanzania, Dar es Salaam*. Report 21 (July 2009). Available at <http://www.moh.go.tz/details.php?value=HIV/AIDS> 2005.
 55. Prosper H; Macha J; Borghi J, *Implementation of Integrated Management of Childhood Illness in Tanzania: Successes and challenges, Consortium for Research on Equitable Health Systems and Ifakara Health Institute*,
http://www.crehs.lshtm.ac.uk/downloads/publications/Implementation_of_IMCI_in_Tanzania.pdf, Dar es Salaam. 2009.
 56. Manzi, F., et al., *Intermittent preventive treatment for malaria and anaemia control in Tanzanian infants; the development and implementation of a public health strategy*. Trans R Soc Trop Med Hyg, 2009. 103(1): p. 79-86.
 57. Adam, T., et al., *Capacity constraints to the adoption of new interventions: consultation time and the Integrated Management of Childhood Illness in Brazil*. Health Policy Plan, 2005. 20 Suppl 1: p. i49-i57.
 58. Harries J; Moodley J; Barone MA; Mall S; Sinanovic E, *Preparing for HPV vaccination in South Africa: Key challenges and opinions*. Vaccine, 2009. 27. p.38-44.