2016

Perceptions of Cameroonian Women Regarding Cervical Cancer Prevention

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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Women in Cameroon as well as those residing in the Maryland-Washington Metropolitan area and the Diasporas suffer a disproportionate rate of cervical cancer morbidity and mortality due to the vast disproportion in the distribution of healthcare services. The widespread human papillomavirus (HPV) vaccination holds promise for helping to attenuate the disproportion in cervical cancer screening and prevention services. Literature from other countries including Cameroon suggests that barriers to the uptake of cervical cancer screening include: culture, religion, the psychological impact of embarrassment, the influence of husbands, cost, discomfort, and vulnerability. The purpose of this study was to gain an understanding of the perceptions of the Cameroonian women regarding cervical cancer prevention, taking into consideration parental attitudes, their knowledge, and their beliefs about the acceptance and usage of the HPV vaccines and other screening services. A survey was designed from a combination of 2 separate instruments as developed, tested, and validated by Kahn et al. (2008) and Griffioen et al. (2012) for this qualitative study. The open-ended survey questions were completed by women who volunteered to participate. Data were collected between April and May, 2015. Eighty women volunteered to participate but only 30 were able to return the completed survey. Using the NVivo software version 10, data were inductively coded, analyzed, and major themes were derived. Results showed that although the women knew about HPV, the vaccines, and Pap test, there was still a need for more education. The results of this study will be provided to law makers in Cameroon to reconsider the educational needs and distribution of healthcare services for women in Cameroon.

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Dedication

I dedicate my dissertation work to my family and many friends. A supernatural force from my late husband Gandhi stood firm besides me through all the difficult times. Although in spirit, his impact was greatly felt. A special feeling of gratitude to my precious children Lovette M, Edna A, and Asanji C, as well as my nephew Blaise N who have been through all sorts of trials and tribulations with me after the passing of my husband and their father. My children have been the center of my life and my stronghold. Thank you for your understanding, consolation, inspiration, words of encouragement. Your push for tenacity rings in my ears. A special gratitude goes to my son Asanji C for the tremendous effort to edit and format this paper using his computer skills and talents.

Special regards to my younger sister Rita who kept pushing that I complete this program before I celebrate my 50th birthday and to my big sister Esther A, who helped to proofread some of my essays, cooked for me, and assisted in many ways so I could have time to study. I also dedicate this dissertation to my friends and classmates who supported me throughout the process.

I will always appreciate the faculty of Gandhi Health Career Services, especially Mr. Joseph, Mr. Ekiko S, Ms. Lisa B, Ms. Karen M, Ms. Elaine H, Mr. Obinna, Mr. Elvis T, Mr. Divine K and Dr. Clark for their words of encouragements and motivation. I dedicate this work and give special thanks to my very good friends Valentine A and Clement G for the many hours you spent proof reading my essays reminding me of due dates and for being there for me through this doctoral journey. Thank you very much.

Acknowledgments

First and foremost, my gratitude to the one above all of us, divine intervention from the omnipresent God, for answering my prayers for giving me the strength to plod on despite my established precedents of wanting to give up and throw in the towel. This dissertation would have remained a dream had it not been for the almighty. Thank you so much, Dear Lord.

I would like to express the deepest appreciation to my committee chair Dr. Raymond Panas, for his countless hours of reflection, reading, encouragement, and most of all patience throughout the entire process. Dr. Panas has shown the attitude and the substance of a genius: he continually and persuasively conveyed a spirit of adventure in regard to research and scholarship as well as the excitement of accomplishing my ultimate goal of walking on the stage to receive the doctorate degree. Without his supervision, inspiration, motivation, and constant help this dissertation would not have been possible.

A special thanks to Dr. Kimberly Dixon-Lawson and Dr. Rosemary Walker for accepting to serve on my committee and for sharing their expertise and precious time in reviewing my work. I cannot find words to express my gratitude to all my committee members. It gives me great pleasure in acknowledging all your help. Please accept my immense gratitude for everything.

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Chapter 1: Introduction to the Study

Introduction

Women in Cameroon as well as those residing in the Maryland-Washington Metropolitan area and the Diasporas, suffer a disproportionate rate of cervical cancer morbidity and mortality. Cervical cancer is the second leading cause of cancer-related deaths amongst Cameroonian women in West Africa. Human Papillomavirus (HPV) leads to cervical cancer. Particularly the strains HPV 16 and 18 have been especially known to be at high risk. There is a vast disproportion in the distribution of healthcare services. Cervical cancer screening services and testing for HPV are mostly available at private health clinics and some government hospitals in the urban areas. In Cameroon most cases of cervical cancer are diagnosed at later and more serious stages. Majority of the cervical cancer victims are poor rural women who are particularly unable to access screening and testing services. Those who screen are unable to return for follow-up or complete treatment due to: inadequate medical advice, lack of awareness of the significance of their symptoms, cultural and religious factors as well as the lack of finances to pay for the services. When Cameroonian women migrate to the United States of America it is expected that they would have access to information and healthcare services to improve their health status and subsequently reduce the mortality rate of those in Cameroon by sharing the information and helping the government to change the healthcare approaches.

According to Baussano, Lazzarato, Ronco, Dillner, and Franceschi (2013), the World Health Organization (WHO) recommended that girls between the ages of 9-13 years be vaccinated against HPV. In this study, Baussano et al. asked whether vaccinating older girls (12-15 years) as well, in a one-time "catch up" cohort, would provide enough additional benefit to be worthwhile. Baussano et al. found that this strategy brought forward the 50% reduction of HPV16/18 prevalence by as much as five years, in both a low-income and a medium-income country. As the cost of HPV vaccine decreases, this strategy may thus become desirable especially in low-income countries.

Cervical cancer is not a problem within the Cameroonian community only but a public health problem affecting women worldwide. Wilson et al. (2013) examined HPV vaccine knowledge and acceptability among ethnically diverse Black women. When findings were compared across groups, Wilson et al. (2013) and Kobetz et al. (2011) noted a varied but limited knowledge and confusion across ethnic groups about the HPV infection and vaccine. Overall, women from various ethnic groups were generally receptive towards the HPV vaccine for girls but unclear about the need to vaccinate boys although the African and Haitian women had the least knowledge. According to Wilson et al. (2013) and Kobetz et al. (2011) concerns about the HPV vaccine were mainly related to side effects/safety and vaccinating children at a young age. Wilson et al. (2013) then concluded that healthcare provider's recommendation of the vaccination was important for decision making and that educational interventions with black women about HPV vaccination should recognize cultural beliefs that vary by ethnic group.

To confirm the fact that HPV is a public health problem, according to WHO (2013), cervical cancer is a worldwide health issue and one of the most preventable of all cancers. Australia adopted an organized approach to cervical screening and encouraged the women to participate in cervical screening to detect abnormal cell changes in the cervix, which if left undetected and untreated may progress to cervical cancer (National Cervical Screening Program [NCSP], 2011). In Australia, 631 new cases of cervical cancer were diagnosed in 2009 and 152 women died from the disease in 2010 (Australian Institute of Health and Welfare [AIHW], 2013). Throughout Australia in 2011, eight out of every 1,000 women screened had a histologically confirmed high-grade cervical abnormality, providing an opportunity to treat women before possible progression to cancer (AIHW, 2013). In the Maryland-Washington Metropolitan Area, there was a large influx of women from Cameroon, many of whom had recently migrated to the large ethnic enclave in this metropolitan area. While in the process of adjusting their immigration status they had no health insurance coverage and consequently no access to healthcare services, including regular Pap screening, the best method available for prevention and early detection of the disease. The Cameroonian immigrant woman faces multiple barriers to routine access of the formal healthcare system, which makes examinations and testing at the intervals recommended by the cancer preventive guidelines highly problematic. For these reasons, greater availability of the HPV vaccines against the HPV infection that is the principal cause of cervical cancer may offer an effective strategy for preventing the disease in this population. Currently there are two

vaccines approved by the FDA to protect against HPV infections. Gardasil, approved in 2006, protects against four types of infections, and Cervarix, approved in 2009. protects against two types of HPV. They were manufactured by Merck & Co., Inc. and GlaxoSmithKline respectively. Gardasil is recommended for use with girls 9 to 26 years of age, and Cervarix for girls and women 10 to 25 years old. These age ranges are based on safety and efficacy studies as well as the best time for the vaccines to provide maximum benefits. They are administered in a series of three doses via injection. The Centers for Disease Control and Prevention (2011) recommends that for girls aged 11 to 12 years, the second dose should be administered eight weeks after the first dose, and the third and final dose should be given 6 months following the first injection. For greater efficacy, all three doses should be completed prior to the initiation of sexual intercourse.

Despite all its benefits for reducing cervical cancer, the vaccines remain controversial in the United States, with barriers particularly linked to parental concerns about promiscuity, safety, and the cost of the vaccines. To my knowledge this will be the first study to examine the perception of the Cameroonian women residing in the Maryland-Washington Metropolitan Area regarding cervical cancer screening and vaccination with HPV vaccines, although there exist studies revealing that the knowledge, awareness, and acceptability vary with diverse ancestry. It is hoped that this study will help to address the gap and serve to initiate an ongoing Cameroon community-based cervical cancer control program in the Maryland-Washington Metropolitan Area. Through the leaders of the traditional and cultural associations, a series of focus groups

discussions were conducted with the immigrant women in the area to understand the factors that may impede or enable vaccine uptake. The findings of this study will be used to develop culturally responsive intervention to promote vaccination use within the Cameroonian community enclaves in the diasporas and in Cameroon.

Background of the Study

Five main types of cancer that affect a woman's reproductive organs are known as gynecologic cancer: cervical, ovarian, uterine, vaginal, and vulvar (Centers for Disease Control and Prevention [CDC], 2010). According to CDC, 28,770 of the 83,745 women diagnosed with gynecologic cancer in the United States died from the disease. CDC further stated that cervical cancer used to be the leading cause of cancer death for women in the United States. However, in the past 40 years, the number of cases of cervical cancer and the number of deaths from cervical cancer have decreased significantly because of the availability of regular Pap tests, which can locate cervical precancerous lesions before they turn into cancer.

According to CDC (2010), United States cancer statistics for the years 1999-2010 show that out of the 11,818 women diagnosed with cervical cancer, 3,939 of them died from the disease. CDC (2010) quoted infection with HPV as the most important risk factor for cervical cancer while listing the following as other risk factors: smoking, weakened immune system, chlamydia infection, diet, being overweight, use of birth control pills, use of intrauterine devices, multiple pregnancies, young age at the time of first full-term pregnancy, low income, use of the synthetic estrogen diethylstilbestrol

(DES), family history, and having several sexual partners. According to CDC (2010), cervical cancer can be prevented using: the HPV vaccines, the Pap test (or Pap smear) looking for pre-cancers, and the HPV test that looks for viruses that can cause cellular changes. Regular screening beginning at the age of 21 is the most important preventive measure. Other preventive measures include: the use of condoms during sexual contacts, limiting the number of sexual partners and avoid smoking. Considering the origin of gynecological cancers; the cervical cancer begins in the cervix; ovarian cancer begins in the ovaries; uterine cancer begins in the uterus; vaginal cancer begins in the vagina; and cancer of the vulva begins in the vulva as illustrated in Figure 1.

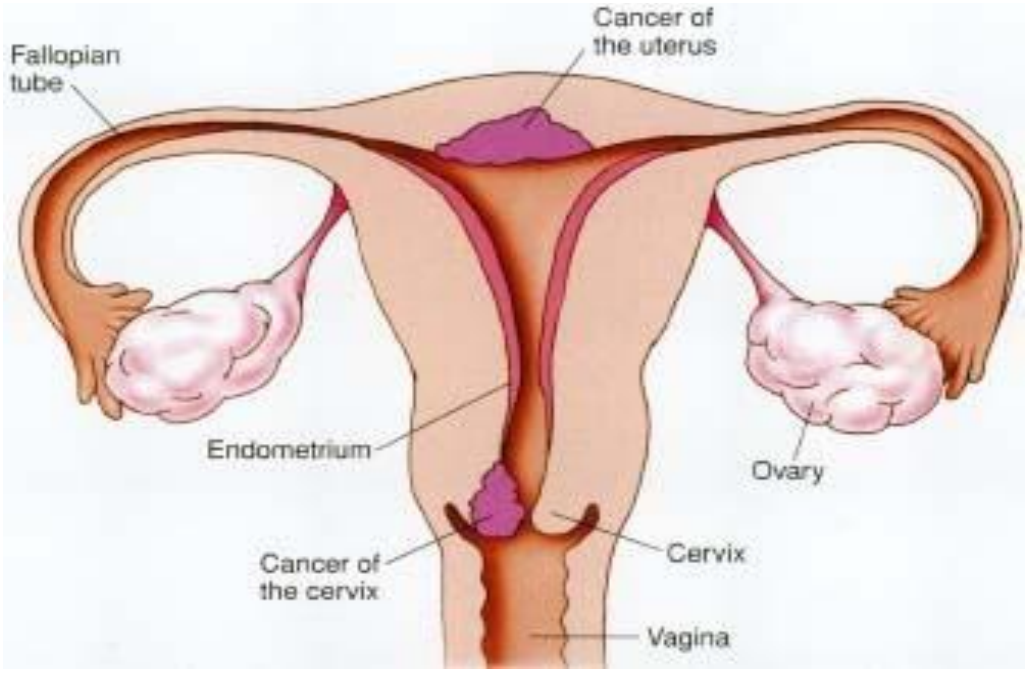
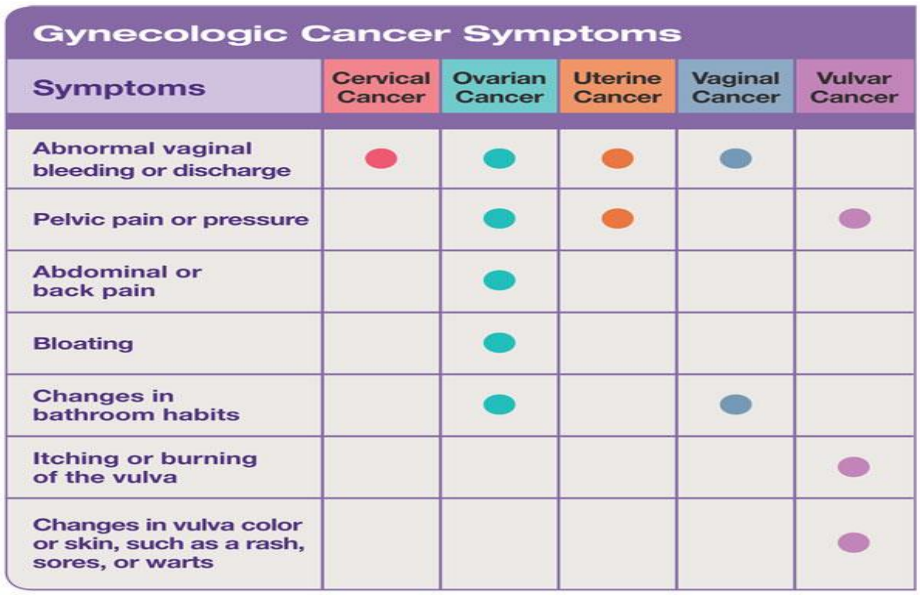


Figure 1. Gynecological cancer type by structure of the female reproductive organ. From "United States Cancer Statistics: 1999–2010 United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2013. Retrieved from http://www.cdc.gov/uscs.

Figure 2. Illustrates how the cancerous tissues of gynecological cancer grow and protrude outside the body through the vulva.

Figure 2. Gynecological cancer showing tissues of the vaginal wall, cervix and vulva protruding outside.
From "United States Cancer Statistics: 1999–2010. United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2013. Retrieved from http://www.cdc.gov/uscs.

Figure 3 Illustrates how specific symptoms of gynecological cancer manifest based on the origin of the cancer cells as well as statistics on cancers resulting from HPV for both males and females.



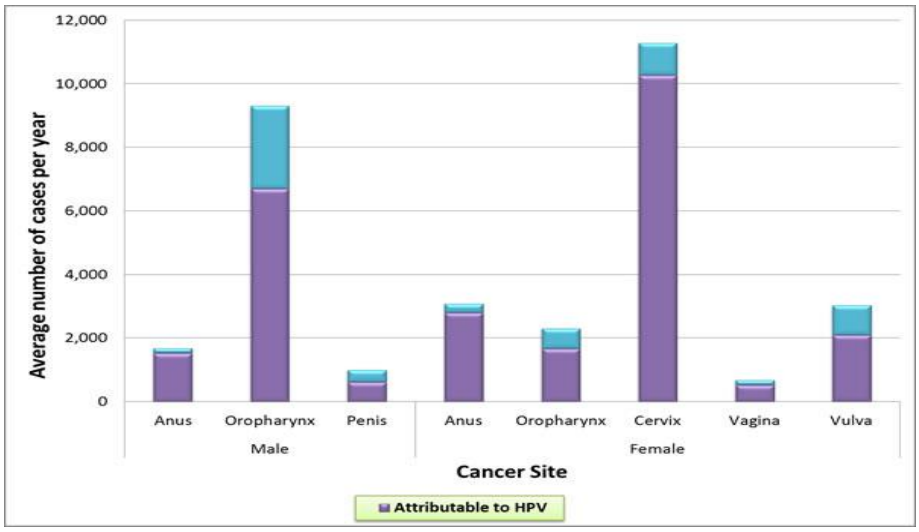


Figure 3. Gynecological cancer symptoms by type.
From "United States Cancer Statistics: 1999–2010: United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from http://www.cdc.gov/uscs.

Figure 4 illustrates how cervical precancerous lesions eventually turn into cancer cells.

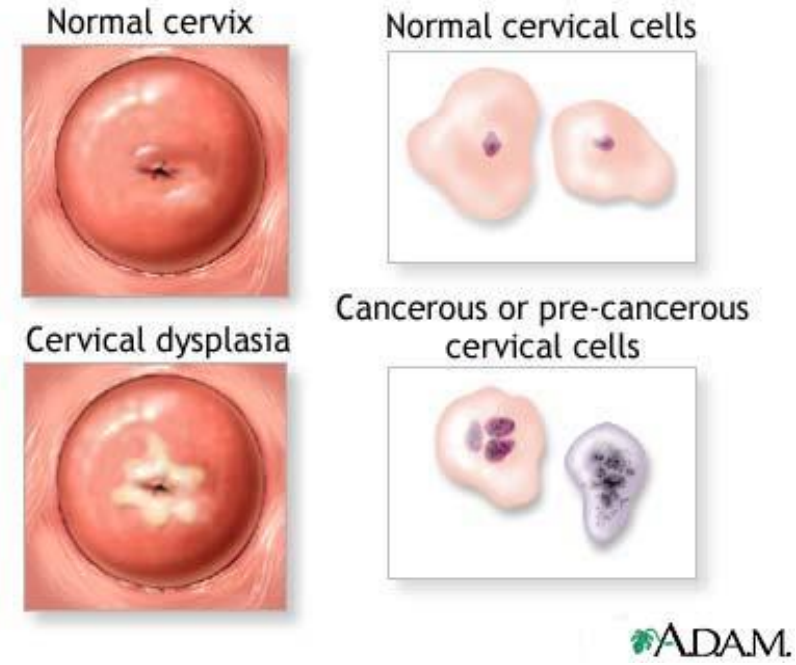


Figure 4. Comparison of the normal cervix vs. cervical dysplasia and cancerous cervix. From "United States Cancer Statistics Working Group: 1999-2010 Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Center for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from http://www.cdc.gov/uscs

According to CDC (2011), early-stage cervical cancers usually don't present with symptoms, but when the cancer grows larger it develops through several stages as illustrated on Figures 5 and 6.

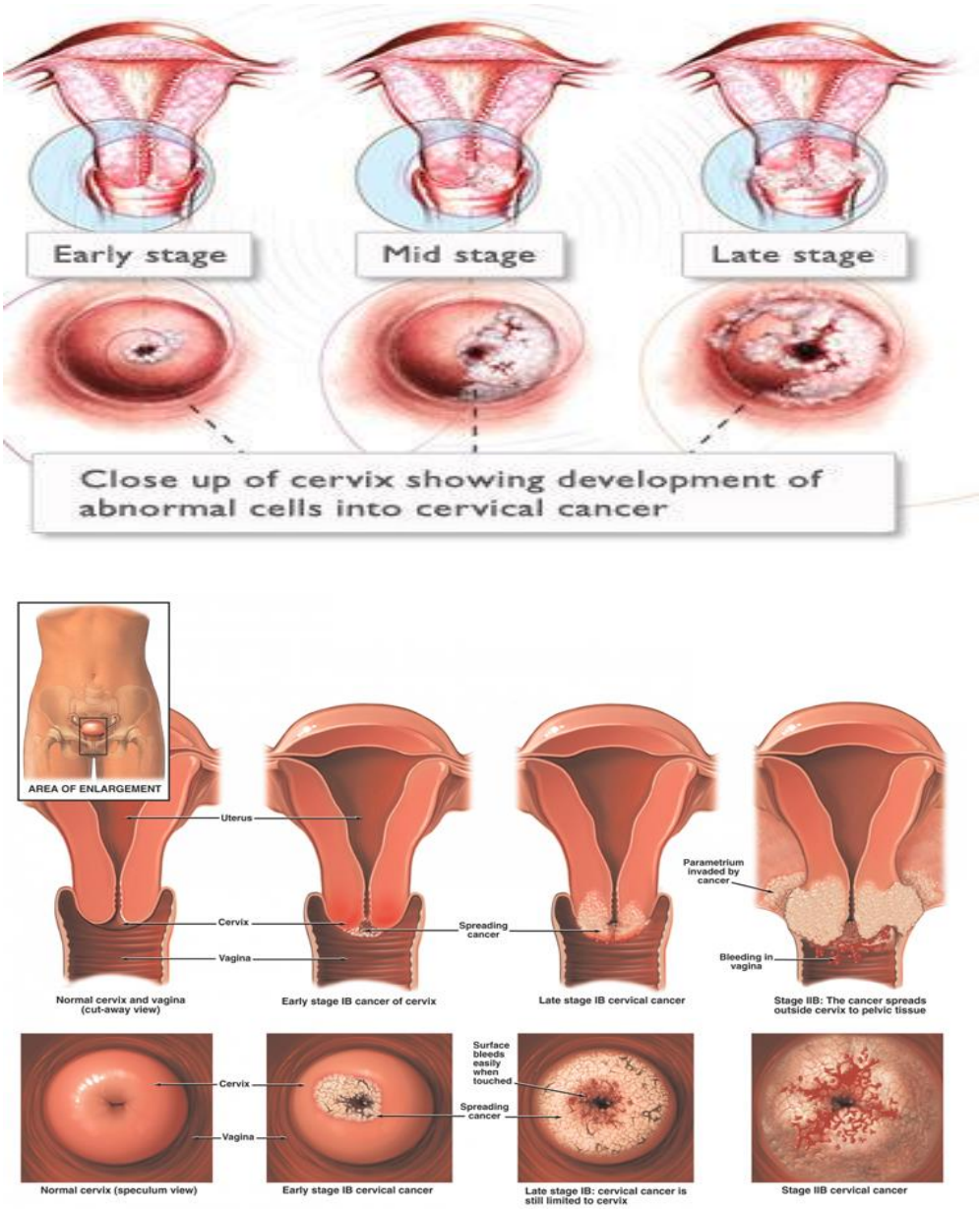


Figure 5. Stages of cervical cancer.
From "United States Cancer Statistics Working Group: 1999-2010 Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Center for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from: http://www.cdc.gov/uscs

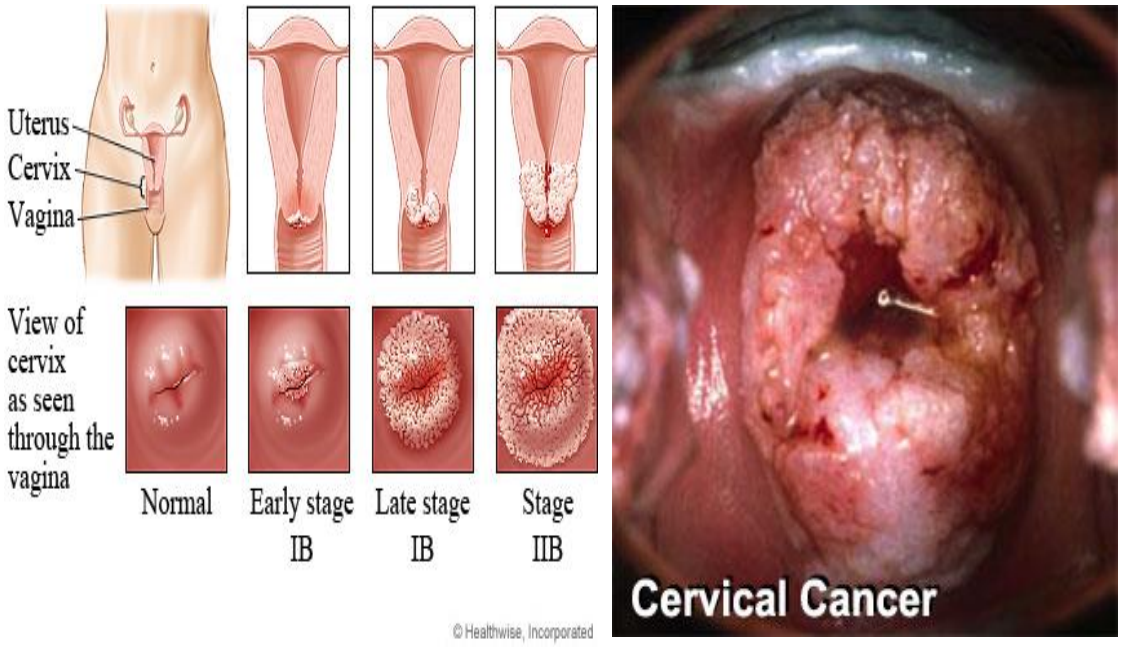


Figure 6. Stages of cervical cancer.
From "United States Cancer Statistics Working Group: 1999-2010 Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Center for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from: http://www.cdc.gov/uscs

Symptoms that will manifest includes: bleeding that occurs between regular menstrual periods; bleeding after sexual intercourse, douching, or a pelvic exam; menstrual periods that last longer and are heavier than before; bleeding after going through menopause; increased vaginal discharge; pelvic pain; and pain during menstruation, urination, and sexual intercourse. Any heavy, sudden onset of abnormal vaginal bleeding is the most commonly experienced cervical cancer symptom. This may occur after sex or douching, or it may manifest as particularly heavy periods, heavy spotting between periods, or an additional period during the monthly cycle.

Figure 7 illustrates how cervical bleeding occurs.

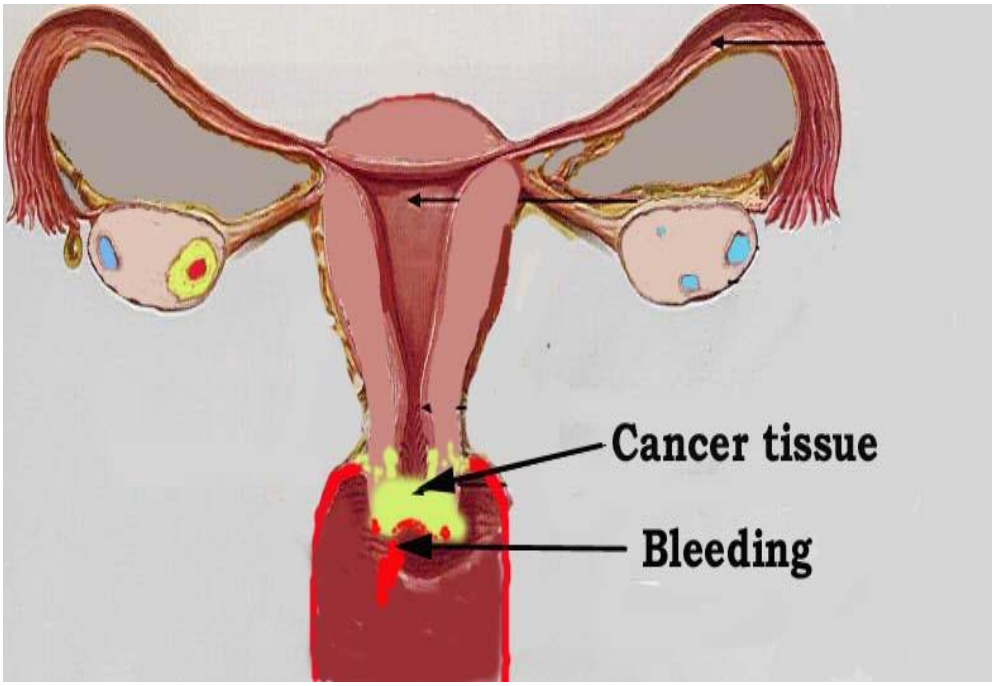


Figure 7. An Illustration of cervical bleeding.
Retrieved from "United States Cancer Statistics: 1999–2010: United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from http://www.cdc.gov/uscs.

According to WHO (2013), visual inspection with acetic acid (VIA) involves naked-eye examination of the uterine cervix under bright light (such as a halogen focus lamp, if available, or a bright halogen flashlight) one minute after application of 3–5% diluted acetic acid. When diluted acetic acid is applied to abnormal cervical tissue, it temporarily turns white (acetowhite), allowing the provider to make an immediate assessment of a positive (abnormal) or negative (normal) result. WHO (2013) also noted that while the use of magnification does not improve its performance, VIA has many advantages, including that it is, safe, affordable, and easy to perform. With the use VIA,

results are available immediately, enabling clinical diagnosis, which can lead to treatment for screen-positive women to be carried out at the same visit or immediate referral for treatment if it is not available on site. According to WHO (2013), VIA can be provided by a wide range of health professionals including doctors, nurses, midwives, and primary healthcare workers after a short period of training. The equipment required to conduct these tests is minimal, and the consumables are universally available. All these characteristics make VIA an attractive screening option for low-resource settings and countries.

McCarey et al. (2011) studied the level of knowledge and awareness of cervical cancer prevention among Cameroonian healthcare workers. Results revealed several gaps in the knowledge of cervical cancer and prevention by screening as well as important misconceptions regarding screening methods. According to their conclusion, creating awareness among healthcare workers on risk factors and current methods for cervical cancer screening is a necessary step towards implementing effective prevention programs in Cameroon.

WHO (2010a) examined cervical cancer incidence rate and found an estimated 8,000 new cases of cervical cancer diagnosed in several African countries including Uganda, Malawi, Ethiopia, and Kenya, with 25 per 100,000 women in Nigeria.

WHO (2010b) associated the lack of awareness of cervical cancer and the role of screening, inappropriate health maintenance behavior by women, poor organization of health services, the low priority accorded to women's health by policymakers, and the

high cost of the vaccine as part of the low acceptance of secondary prevention services for cervical cancer in Africa.

As a confirmation to the findings of WHO (2012a; 2012b), Wheeler (2011) examined the new cases of cervical cancer development throughout the world, estimating that 80% or more occurred in developing countries. In addition, developing countries also accounted for 80% of annual cervical cancer deaths and 95 % of women who had never experienced any cancer-related prevention care, such as Pap smear, or cancer treatment in their lifetimes.

Williams, Patrick, Kenya, Mati, and David (1994) and Gatune and Nyamongo (2005) studied the high risk factors contributing to cervical cancer in Kenyan women and identified the following: the initiation of sexual intercourse at a very early age, smoking, multiple pregnancies, HIV infection, and hormonal contraceptives. In addition to the factors cited by Gatune and Nyamongo (2005), Wheeler (2011) also suggested the barriers to screening for cervical cancer as ignorance, accessibility, and cost as well as lack of finances and fear of abnormal results.

Yamada et al. (2008) studied the impact of HIV on HPV infection stating that HPV could more quickly develop into cervical cancer for a woman who was HIV positive. According to Yamada et al. (2008) the role of the cellular immune response to clearance of HPV infection is shown clearly in HIV-positive women in whom latent HPV infection, persistent infection, mixed infections, SIL, and SIL progression are more frequent than in immune-competent women.

Kolawole (2012) studied the main risk factors contributory to HPV in Nigeria, identifying the following: being unmarried, illiteracy, being positive for anti-Herpes Simplex Virus (HSV) antibodies, tobacco use, parity, multiple sex partners, and extramarital affairs by both parties. These findings confirm those of Gatune and Nyamongo (2005) as well as Wheeler (2011) and Chukwu (2011), who related the high mortality associated with cervical cancer in Nigeria to lack of awareness of the disease, late presentation of patients to the hospital, and cultural beliefs contrary to early treatment interventions.

Mogtomo et al. (2010) analysed the viability of a community-tailored sensitization strategy to increase awareness among the targeted audience such as parents or guardians who are critical decision makers for vaccine delivery to children. Mogtomo et al. suggested that parental education levels, parental awareness of the disadvantages of early engagement in sexual intercourse by the teenagers, community promotion of condom use, family income level, and perceived health risks were additional factors influencing parents' decisions to vaccinate girls.

Consistent with the findings of Gatune and Nyamongo (2005), Desruisseau, Schmidt-Grimminger, and Welty (2009) noted that high risk sexual behaviour such as unprotected sex with multiple sexual partners was in part the result of the inability of women to negotiate the use of condoms with their partners. That led to inconsistent condom use, which increased the risk of both HIV and HPV infections. This placed greater emphasis on condoms as a means for both protection against pregnancy and

protection against diseases such as HPV in Cameroon. The Food and Drug Administration (FDA) licensed two HPV vaccines, the bivalent (Cervarix) and the quadrivalent (Gardasil). The bivalent HPV vaccine prevents two HPV types, (16 and 18) that causes 70% of cervical cancers meanwhile the quadrivalent HPV vaccine prevents four HPV types (6, 11, 16 and 18), which cause 90% of genital warts.

CDC (2011) examined the effectiveness of Cervarix and Gardasil in the prevention of HPV and the type of infection they target and found that Cervarix prevents HPV types 16 and 18 for 6.4 years and Gardasil for 5 years with women not infected at the time of immunization who received all three doses of both vaccines, as illustrated in Figure 8.

Figure 8. An illustration of the recommended ages for Pap tests, its frequency and the HPV vaccinations.
From "United States Cancer Statistics: 1999–2010: United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from http://www.cdc.gov/uscs.

Figure 9 shows the two vaccines approved by FDA that are currently being used.

Figure 9. Types of HPV vaccines approved by FDA and the types of HPV they prevent. From "United States Cancer Statistics: 1999–2010: United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from http://www.cdc.gov/uscs.

Podolsky et al. (2009) studied controversies surrounding the use of HPV vaccine, citing parental concerns that it encouraged sexual activity. In addition, some parents expressed fear over whether the vaccines were safe as one of the reasons they hesitated in approving vaccination. Watts et al. (2009) argued that a conservative religious point of view, general mistrust of outside influences, and cost of the vaccines affected women's decisions whether to accept vaccination and complete the three doses of the HPV vaccines. Kolawole (2012) studied the cervical cancer preventive measures used in Nigeria and came up with explanations that although the quadrivalent and bivalent HPV vaccines continued to be the major tools for primary prevention, HPV vaccination

remains an attractive, cost-effective option. These vaccines will remain inaccessible to many Nigerian adolescents and youths if there is no international assistance with funding. Kolawole (2012) affirmed the urgent need for nationwide baseline studies to determine the pattern of prevalent HPV serotypes distribution in a vast and diverse country like Nigeria. Bair, Mays, Sturm and Zimet (2008) suggested that a mother's attitude is a key factor that influences the teenager's ability to use the vaccines because their mother is the gateway to the adoption of the vaccine. Going to the doctor's office and taking all three doses as well as paying for the vaccines depends on how much value the mother has for the vaccines.

Benard et al. (2012) studied the treatment for cervical cancer explaining that the treatment depended on the type of cervical cancer and how far it had spread. The ways to treat it included surgery, chemotherapy, and/or radiation therapy. According to Benard et al. (2012), chemotherapy involves the use of drugs given in several forms, including pills or through IV (intravenous) injection, to stop or slow the growth of cancer cells. Chemotherapy may cause side effects, but these often improve or resolve when chemotherapy ends. Radiation therapy uses high-energy rays similar to X-rays aimed at the part of the body where the cancer is present in order to kill the cancer cells and stop them from spreading.

Bratu, et al (2011), Kim et al. (2011), and Ye, et al (2012), listed the following seven treatment types and how they work: (a) targeted therapy, a newer type of cancer treatment that uses drugs or other substances to more precisely identify and attack cancer

cells, usually while minimizing damage to normal cells; (b) immunotherapy, also known as biological therapy, which uses the body's own immune system to help control side effects from other cancer treatments such as chemotherapy as well as make it easier for the immune system to halt or slow the growth and spread of cancer cells; (c) Hyperthermia, which uses heat to treat many types of cancer; (d) stem cell transplant (peripheral blood, bone marrow, and cord blood transplants), to replace healthy cells destroyed by cancer or other cancer treatments; (e) photodynamic therapy, a treatment that uses special drugs called photosensitizing agents that are activated by certain kinds of light to kill cancer cells; (f) lasers, which are powerful, precise beams of light used instead of blades (scalpels) for microsurgical work, including with the treatment of some cancers; and (g) blood product donation and transfusion, which temporarily replaces parts of the blood when the body no longer manufacture its own or due to excessive blood loss.

Horneber et al. (2012) studied the use of complementary and alternative medicine (CAM), stating that the National Center for Complementary and Alternative Medicine (NCCAM) defined this method of treatment as a group of different medical and healthcare systems, practices, and products that are not presently considered to be part of conventional medicine but are also used as a treatment approach for cancer. According to Horneber et al. (2012), complementary medicine can be used together with conventional medicine, a combination known as integrative medicine that has been reported to be safe and effective after being studied in patients. CAM includes a wide variety of therapies

such as botanicals, nutritional products, prayer and spiritual practice, relaxation, faith and spiritual healing, and nutritional supplements and vitamins.

Problem Statement

Mogtomo et al. (2010) found cervical cancer to be the second most common type of cancer among women around the world. Although largely preventable, HPV continues to be the most common cause of cervical cancer mortality among women in countries with low-resources. Mogtomo et al. (2010) further stated that West African countries including Cameroon suffers a high burden and mortality could be associated to the fact that policy makers accord a low priority to women's health, poor health care seeking behavior by women, cultural beliefs, poor organization of healthcare services, lack of healthcare services, lack of trained cytotechnicians and gynecologist, lack of awareness of cervical cancer and cancer screening by women. Cervical cancer was found to be the second most frequent cancer among Cameroonian women affecting women 15 - 44 years old (Mogtomo et al. 2010).

McCarey et al. (2011) evaluated the knowledge level of the healthcare workers in Cameroon as regards cervical cancer prevention, and HPV vaccines as well as other cancer screening measures. McCarey et al. (2011) also suggested that healthcare workers in Cameroon needed to be well-informed of the risk factors for cervical cancer, the importance of using the HPV vaccines and continuous screening after taking the HPV vaccines as a measure to ensure the prevention of cervical cancer thus reducing the morbidity and mortality rate of women.

Purpose of the Study

The purpose of this study was to gain an understanding of the perception of the Cameroonian women as regards cervical cancer prevention, taking into consideration parental attitudes, their knowledge, and beliefs about the acceptance and usage of the HPV vaccines and other screening services among the Cameroonian women 18 years and above residing in the Maryland- Washington Metropolitan area.

Nature of the Study

This was a qualitative descriptive research of cervical cancer prevention focused on HPV vaccines acceptability and decision-making amongst Cameroonian women and parents of teenagers eligible for vaccinations living within the Maryland –Washington Metropolitan area. This was a qualitative survey of individual participants as seen in Appendix D, aimed at understanding how the Cameroonian woman perceived the prevention of cervical cancer. The main focus was on the factors that influence the woman's decision to accept and use the available screening services as well as HPV vaccines and/or allow their teenagers to be immunized with the three doses of the vaccines. Data was coded and analyzed using the Nvivo software version 10 according to Bazeley (2007). The survey was recorded and then transcribed into thematic matrixes. Each thematic matrix was considered in relation to the others to develop an integrated idea of the conditions and factors that dealt with the parents' acceptance and non-acceptance of the screening services and HPV vaccine. The data was analyzed separately identifying those data that supported acceptance of the vaccine and the decision-making

process as well as the data related to non-acceptance and other cervical cancer screening services. A summary of the main findings and recommendations were made.

Research Questions

Cervical cancer is a significant public health problem because of its incidence and mortality rate. The following research questions for this project were guided by objectives that explored the level of understanding of cervical cancer screening and prevention as well as the rate of HPV immunizations amongst the Cameroonian women in the Maryland-Washington Metropolitan area:

1. What is the knowledge level of the Cameroonian woman residing in the Maryland-Washington Metropolitan Area in reference to cervical cancer, cervical cancer screening and cervical immunization with HPV vaccines?
2. What are the effects of the knowledge, beliefs, and attitudes on the acceptance of HPV vaccines and cervical cancer screening amongst the Cameroonian women 18 years and above living in the Maryland - Washington Metropolitan Area?
3. What are the social & cultural factors that influence the Cameroonian women's response to cervical cancer screening and prevention using the HPV vaccines?
4. What are the various approaches that could be used to improve the acceptance rate of HPV vaccines and other cervical cancer screening measures amongst the Cameroonian women?

Theoretical Base and Conceptual Framework

Two conceptual frameworks were used to guide the data collection and presentation of this research study as well as the review and summary of previous studies on cervical cancer prevention (Creswell, 2009). Some of the studies found during the literature review were not grounded in theory or discussed within the context of the article. Those that were found to be grounded in theory used an integration of the social cognitive theory, the health belief model or the theory of planned behavior. It was easier to use more than one theory to explain the woman's decision making ability because of the complexity and the multilevel of the factors involved in the process. Two different theories; the theory of planned behavior (TPB) and the health belief model (HBM) were integrated and used for this study to improve the knowledge and understanding as well as the beliefs and attitudes that influences the acceptance of the HPV vaccines and other cervical cancer prevention services amongst the Cameroonian women.

The TPB is useful when evaluating a person's decision making ability to act in response to information obtained as regards accepting and taking the three doses of the HPV vaccines. TPB makes a prediction of the person's behavior to act in a given situation. Combining an intention with a perceived behavior can be used to make a prediction of a change in behavior such as deciding to accept and use the three doses of the HPV vaccines and other cervical cancer prevention services (Ajzen, 1985).

The Health Belief Model

Using the HBM the individual makes a determination of the potential benefits of the cervical prevention services including immunization to the physical, psychological, and financial costs of the vaccines to make a decision as regards accepting and using the proposed vaccines. Having a stronger perception of how susceptible and severe the disease is, compared to the benefits it is more likely they will accept and use the vaccines. The HBM was used to make a determination of the women's decision to accept the HPV vaccine, relating to their HPV level of awareness as illustrated on Figure 3, 4a, 4b, 6, and 7. The HBM is one of the most commonly-used models of health behavior change and is probably the most frequently-taught model in outreach intervention programs (Janz & Becker, 1984; Rosenstock, 1974). Janz and Becker (1984) stated that the HBM has five factors; (a) perceived barriers to performing the recommended response; (b) perceived benefits of performing the recommended response; (c) perceived susceptibility to a health threat; (d) perceived severity of a health threat; and (e) cues to action, with a suggestion that the individual bases his or her decision to accept the vaccine on these factors to change their behaviors. A continues Pap test screenings are required even for those vaccinated to determine the effectiveness of the vaccines. The HBM helps to guide the development of interventional strategies and effective evaluation methods that could effectively promote HPV immunization. The motivation for action could be achieved by combining perceived susceptibility and severity, compared to the perceived benefits to decide what action to take. Thus, the stronger the perceptions of severity, susceptibility,

and benefits, and the weaker the perception of barriers, the greater the likelihood that health-protective actions would be taken (Rosenstock 1974) as illustrated in Table 1 and Figure 10.

Table 1

The Health Belief Model Applied to Cervical Cancer Prevention

Concept	HPV Vaccination Education	Cervical cancer screening & HPV Testing
1. Perceived Susceptibility	The women believe they can get HPV and cervical cancer.	Women's believe they may have been exposed to HPV and cervical cancer.
2. Perceived Severity	The women believe that the consequences of getting HPV and cervical cancer are significant enough to try to avoid.	Women believe the consequences of having HPV and cervical cancer without knowledge or treatment is significant enough to try to avoid.
3. Perceived Benefits	The women believe that the recommended action of using HPV vaccination and screening services would protect them from getting HPV and cervical cancer	The women believe that the recommended action of getting tested for HPV and cervical cancer would benefit them — possibly by allowing them to get early treatment or preventing them from infecting others or dying from cervical cancer.
4. Perceived Barriers	The women identify their personal barriers to using condoms, cost of the screening services, and HPV vaccines, personal and religious beliefs about the vaccines, cultural practices and norms about women's health, husband decision making about the woman's health that may prevent actions.	The women identify their personal barriers to getting tested and explore ways to eliminate or reduce these barriers.
5. Cues to Action	The women receive reminder cues for action in the form of incentives, information that will prompt them to actions by receiving HPV vaccines or cervical cancer screening services.	The women receive reminder cues for action in the form of incentives (such as a key chain that says, "Got HPV? Get tested!") or reminder messages (such as posters that say, "25% of sexually active teens contract an HPV and cervical cancer. Are you one of them? Find out now").
6. Self-Efficacy	The woman's confident in using a condom correctly in all circumstances, completing all three doses of HPV vaccines and yearly Pap test.	The women receive guidance (such as information on where to get Pap tested) or training (such as practice in making an appointment).

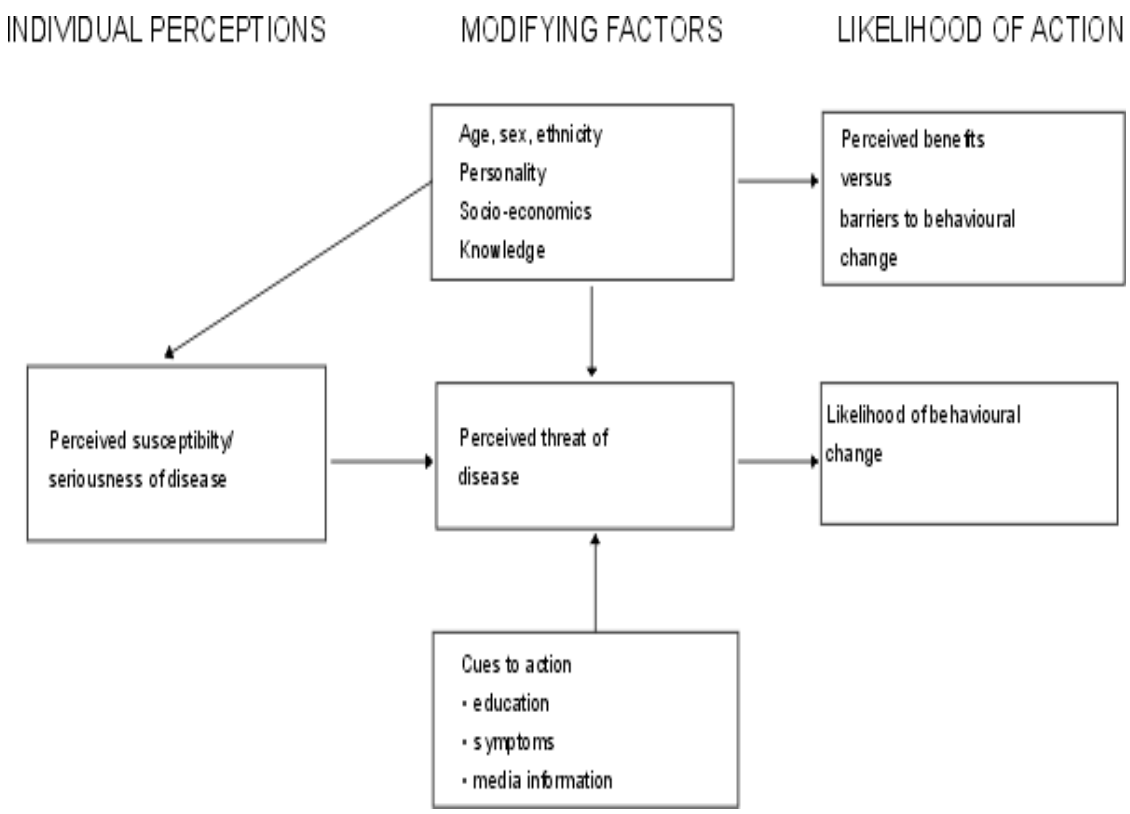


Figure 10. An illustration of the health belief model

Theory of Planned Behavior

The TPB can be used to predict and explain health behaviors and intentions such as cervical cancer prevention and HPV vaccination. According to Ajzen (1991**)** behavioral achievement depends on both motivation (intention), and ability (behavioral control). TPB is comprised of six constructs that collectively represent a person's actual control over the behavior and distinguishes between three types of beliefs, behavioral, normative, and control. According to Ajzen (1991) TPB has six constructs: attitudes

which is the degree to which a person has a favorable or unfavorable evaluation of the behavior of interest; it entails a consideration of the outcomes of performing the behavior; behavioral intention which refers to the motivational factors that influence a given behavior where the stronger the intention to perform the behavior, the more likely the behavior will be performed; subjective norms which refers to the belief about whether most people approve or disapprove of the behavior; social norms which refers to the customary codes of behavior in a group or people or larger cultural context; perceived power which refers to the perceived presence of factors that may facilitate or impede performance of a behavior; and perceived behavioral control which refers to a person's perception of the ease or difficulty of performing the behavior of interest. According to Ajzen (1985) TPB is effective in describing individually controlled health behaviors which is useful when evaluating a person's decision making ability to act in response to information obtained as regards accepting and taking the three doses of the HPV vaccines as well as cervical cancer prevention services.

TPB makes a prediction of the person's behavior to act in a given situation. The woman's intention and decision to accept and use the vaccines and other cervical cancer prevention services will depend on her attitude and how she perceives the importance of changing her behavior which will then be demonstrated by her acceptance and usage of the three doses of the vaccines as explained by (Ajzen 1991). A combination of behavioral intention and perceived behavioral control can be used to predict behavior

change whether or not a woman chooses to be vaccinated against HPV and other cervical cancer prevention services as illustrated in Figure 11.

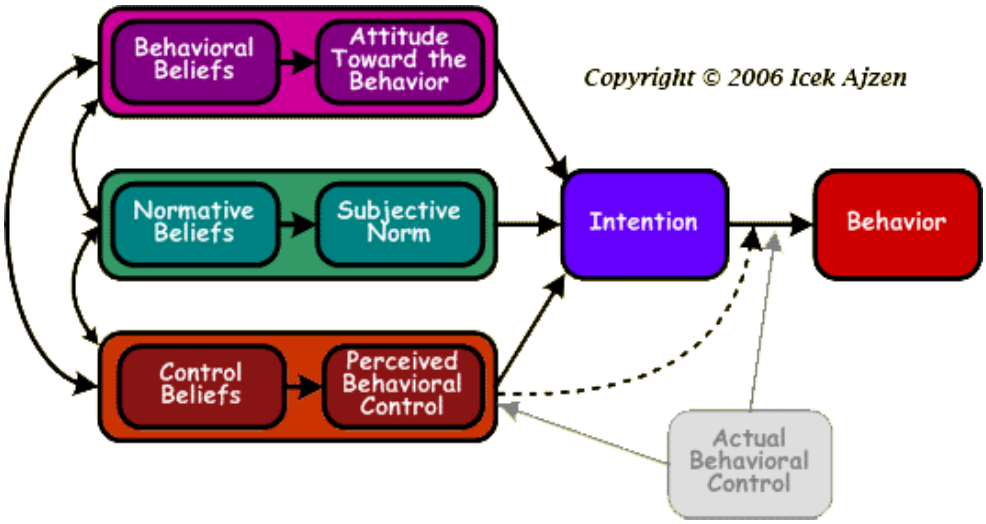


Figure 11. The theory of planned behavior.

An Integration of the HBM and TPB

An assessment of her perceived behavioral control and her intention to change must be the same from the first assessment and the last obtained after the change has occurred because this will be used to predict the validity of the project in explaining the attitude, belief and perception of the women towards the HPV vaccination (Ajzen 1991). Integrating the two models (HBM and TPB) suggests that the woman's' beliefs, attitudes, knowledge, experiences, and perceptions influence the decision to accept or refuse the vaccine as seen in Figure 12.

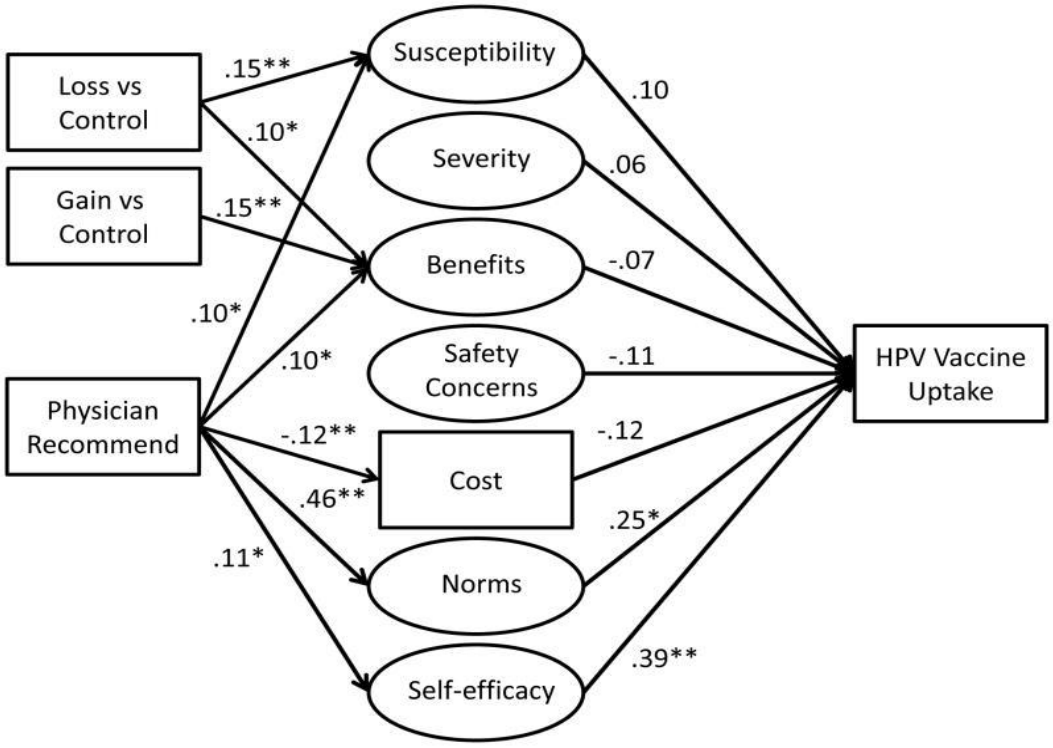


Figure 12. The health belief model (HBM) and theory of planned behavior (TPB) constructs.
This is a combined illustration of the Prediction of HPV vaccine uptake from HBM and TPB constructs that were assessed immediately after exposure to the message framing intervention. HPV vaccine uptake was assessed approximately 10 months later. Retrieved from *Brewer N.T, Gilkey M.B* (2012). Comparing theories of health behavior using data from longitudinal studies: a comment on Gerend and Shepherd. *Ann Behavioral Medicine 44(2):147-8.*

Framework Summary

In summary, Dempsey, Zimet, Davis, and Koutsky (2010) suggested that parents should have authority for making most decisions about HPV vaccination because it is recommended for young under aged adolescent girls. Therefore, the success of programs designed to maximize vaccine uptake will largely depend upon parental decision-making. And that it is important to examine parental willingness to vaccinate their daughters and

provide educational services to improve the uptake of HPV vaccines and other cervical cancer prevention services. Conditions of vaccine acceptability were to be considered collectively, the themes comprising these five domains may serve as indicators of HPV vaccine acceptability among participants. The themes cluster into broader categories that reflect the conditions under, which participants deem the vaccine either acceptable or unacceptable.

Other important factors that may warrant vaccination will be assessed such as safety, efficacy and affordability. Women were also be asked to describe conditions of HPV vaccination and other cervical cancer risk factors in relation to sexual activity. The vaccines' suitability for use by younger, pre-adolescent girls, who presumably are not sexually active, were also be evaluated. The TPB has shown more utility in public health than the HBM, but it is still limiting in its inability to consider environmental and economic influences. Using a combination of these two models is preferable as illustrated in Figure 10.

Operational Definitions of Terms

The following definition of terms were adapted from Alberts, Bray, Lewis, Raff, Roberts, and Watson (1989) and copied directly from the AACR website's dictionary of cancer terms retrieved from www.cancer.gov/dictionary, and www.meds.com/glossary.html:

Attitude: a feeling or way of thinking that affects a person's behavior. Attitude is also measurable and changeable as well as influencing the person's emotion and behavior.

Cervical cancer: Cancer of the entrance to the womb (uterus). The cervix is the lower, narrow part of the uterus (womb).

Cancer: An abnormal growth of cells which tend to proliferate in an uncontrolled way

Cancer symptoms: Abnormal sensations or conditions that persons can notice that are a result of a cancer.

Colposcope: A lighted magnifying instrument used by a gynecologist to examine the tissues of the vagina and the cervix. The procedure is called colposcopy.

Colposcopy: A procedure in which a lighted magnifying instrument called a colposcope (or vaginoscope) is used to examine the vagina and cervix.

Cervical intraepithelial neoplasia: The growth of abnormal precancerous cells on the surface of the cervix. Grades from one to three (least to most) may be used to describe the degree of involvement.

Human papillomavirus: HPV. A family of over 100 viruses including those that cause warts and are transmitted by sexual contact. Some types of human papillomavirus are associated with tumors of the genital tract including, notably, cancer of the cervix.

Invasive cervical cancer: Cancer that has spread from the surface of the cervix to tissue deeper in the cervix or to other parts of the body.

Lesion: An area of abnormal tissue change. Lesions vary in severity from harmless to serious.

Pap smear: A screening test for cervical cancer based on the examination of cells under the microscope. The cells are collected from the cervix, smeared on a slide and specially stained to reveal premalignant (before cancer) and malignant (cancer) changes as well as changes due to noncancerous conditions such as inflammation from infections.

Pap test: A screening test for cervical cancer that involves the microscopic examination of cells collected from the cervix, smeared on a slide, and specially stained. A Pap test can reveal premalignant and malignant changes in the cells, as well as changes that are due to noncancerous conditions, such as inflammation. Named after the physician George Papanicolaou, who developed the test, also known as Pap smear.

Perception: is the organization, identification, and interpretation of sensory information in order to represent and understand the environment; the way you think about or understand someone or something or the ability to understand or notice something easily.

Precancerous: Pertaining to something that is not yet overtly cancerous, but appears to be on its way to becoming a cancer. Synonymous with premalignant

Prognosis: The forecast of the probable outcome or course of a disease; the patient's chance of 'recovery.

Risk factor: Something that increases a person's chances of developing a disease. For example, cigarette smoking is a risk factor for lung cancer.

Sexually transmitted disease: Any disease transmitted by sexual contact; caused by microorganisms that survive on the skin or mucus membranes of the genital area; or transmitted via semen, vaginal secretions, or blood during intercourse.

Squamous intraepithelial lesion (SIL): A general term for the abnormal growth of squamous cells on the surface of the cervix. The changes in the cells are described as low grade or high grade, depending on how much of the cervix is affected and how abnormal the cells are.

Stage: As regards cancer, the extent of a cancer, especially whether the disease has spread from the original site to other parts of the body.

Tumor: An abnormal mass of tissue. Tumors are a classic sign of inflammation, and can be benign or malignant (cancerous).

Vaccines: Microbial preparations of killed or modified microorganisms that can stimulate an immune response in the body to prevent future infection with similar microorganisms.

Vaginal discharge: Vaginal discharge is a fluid produced by glands in the vaginal wall and cervix that drains from the opening of the vagina.

Virus: A microorganism that is smaller than a bacterium that cannot grow or reproduce apart from a living cell. A virus invades living cells and uses their chemical machinery to keep itself alive and to replicate itself.

Vulvar: Pertaining to the vulva, the female external genitalia including the labia majora, labia minora, clitoris, the tiny glands called Bartolin's glands, and the entrance to the vagina (the vestibule of the vagina).

Womb: The womb (uterus) is a hollow, pear-shaped organ located in a woman's lower abdomen between the bladder and the rectum. The narrow, lower portion of the uterus is the cervix.

Assumptions

This study had two primary assumptions. The first assumption was the women's tribal and culturally conservative environment in which the women considers the cultural and traditional views about the vaccine as being culturally and morally wrong because the vaccine was considered to encourage early sexual intercourse or the intent to or engagement in sexual behaviors. The second assumption was that there were differences in HPV vaccine attitudes and acceptance based on differences in tribal, cultural and traditional background of the participants.

Limitation

There were a few foreseen limitations to this study such as:

1. This study did not assess the Cameroonian men's Knowledge, beliefs, attitudes and perception of HPV and the vaccine even though a vaccine was recently developed for both boys and girls and also it takes both parents to make decisions to vaccinate their under aged teenage children with the HPV vaccines.

2. As a qualitative research study, the selection of participants had to utilize a convenience sampling method and had a small number of participants.
3. The researcher was not be able to gain adequate insight in to the women's perception and experiences of cervical cancer screening because some of the participants who volunteered did not return the survey as expected. Some of the questions were left unanswered.
4. Due to financial and time constraints, the researcher was not able examine all the cultural and traditional associations in the Washington Metropolitan area and the diasporas.
5. The prevalence rate of HPV on self-reported information on the topic could have been a weakness if participants did not respond truthfully.
6. The scope of this study and its results were limited to the Cameroonian women in the Maryland-Washington Metropolitan area that did not a representative of the diaspora.
7. Although the results of this research has helped in understanding the knowledge, attitudes, beliefs, perception and predictors of acceptance of the HPV vaccination among Cameroonian women in this area, the results cannot be generalizable to other traditional and culturally diverse Cameroonian women's populations in the U.S.

Delimitations

This study was limited to Cameroonian women 18 years of age and above who reside in the Maryland-Washington Metropolitan area who voluntarily agree to participate in this study. Finally the study eliminated girls less than 18 years old as well as boys and men.

Significance of the Study

This project was crucial because the Cameroonian women residing in Diasporas, including those within the Maryland-Washington Metropolitan area are trusted and highly respected within the Cameroonian Community. These women are surrogates to those in Cameroon where no such studies related to the perception of women about HPV and HPV vaccines had ever been conducted because of the misconceptions and controversies that surrounds the use of HPV vaccines both culturally and politically. Hopefully the findings of this study would be used to design evidence based messages that will reach targeted populations such as teenagers, legal guardians and parents residing both in the Diasporas and in Cameroon as well as the Cameroon government. Hopefully these messages would increase the level of awareness about cervical cancer, HPV infection, its method of transmission, as well as the importance of continuous screening after immunization to reduce the cervical cancer related mortality rate amongst Cameroonian women. Information from this study could aid the Cameroonian government to take closer look at helping the Cameroonian public by providing the education, and healthcare services to every woman in Cameroon especially the cancer

screening services as well the HPV vaccines. Parents play a major role in making healthcare decisions for their under aged children, a well-informed public especially the woman will help them to make better healthcare decisions for her children. Cameroonians in the Diaspora are considered to be well-informed, educated, have the money and are highly respected back in Cameroon. Those in the Diaspora are regarded at very high esteem within the Cameroonian community. So information from this study could be used to first of all educate the Cameroonian in the Diaspora who could then join forces to change the perception of those residing in Cameroon especially those in power who have the abilities to make better healthcare decisions for the citizens of Cameroon.

Implications for Interventions and Effect on Social Change

The goal of this dissertation is to integrate findings from this study after examining the personal, interpersonal, organizational and societal factors that influence cervical cancer screening and HPV vaccine uptake to form a conceptual model for intervention planning and evaluation. This approach would use a multi-component intervention approaches that includes methods and strategies to effect changes at multiple levels to attain the greatest impact on HPV vaccination behavior. It would also use educational interventions and messages for both parents and young women emphasizing on the low rate of serious adverse events associated with vaccination, as well as evidence of durable efficacy. Promoting awareness of the high prevalence of HPV infection and the fact that young women are vulnerable to HPV-associated illnesses, including cervical cancer, would also be needed given the perceptions of low susceptibility among both

women and parents, (Rosenthal et al 2008). Intervention approaches and messages that are effective for low literacy audiences are critical to avoid disparities in vaccine uptake, (Bartholomew et al 2008).

Finally, removing or reducing cost barriers can be achieved by providing information about federal vaccine programs that offer free vaccine for families who qualify, and alerting individuals to the potential for insurance coverage by many carriers. The outcome of my project could help policy makers to come up with decisions that could help sensitize and provide cancer prevention and screening services to more people and improve vaccination rates, such as recall and reminder systems, to ensure they are effective, particularly if these systems are automated. In addition, this result could help clinician reminders about vaccination, as well as chart-auditing with feedback to clinicians, through an effective strategy for changing provider practices, and improving School-based programs. It could also avoid inequities in vaccination and reduce costs for individuals via insurance coverage and through state and federal programs which are very much needed to negotiate cost reductions for the public health system. Zimmerman (2009) stated that policy strategies play a critical role in HPV vaccine uptake while the role of mandates remains controversial, school-entry requirements which have been extremely effective in attaining high rates of vaccination for other diseases.

This study may highlight the importance of understanding the variety, scope and impact of legislative activities at the state and federal level in the United States, and of the driving forces behind policy formation and enactment. This dissertation may also

recommend the importance of determining the optimal cost for the vaccine, making it affordable to ensure that vaccination rates are high enough to achieve herd immunity and to reduce the potential inequities in vaccine uptake and cervical cancer. In conclusion, a multilevel socio-ecological model will be used to organize factors influencing HPV vaccination and other cervical cancer screening measures that can help in the design of interventions and guide future research. Interventions that affect change in parental and personal knowledge and attitudes about the HPV vaccine which may be needed to increase uptake. Multilevel interventions impacting personal, interpersonal, organizational and societal change are likely to be the most effective in increasing HPV vaccination uptake, (Bair et al. 2008). Future research should focus on evidence of the association between behavioral and/or environmental factors and actual vaccination behavior, examine the interrelationships between factors that influence vaccination and cervical cancer screening at various levels, and evaluate the effectiveness of multilevel interventions.

Summary

It is evident that this research was needed after taking a close look at the general information about HPV, cervical cancer, the HPV vaccines knowledge, attitudes and beliefs that young women and parents seem to have. Continuous research studies are needed to see if there has been a change in attitudes, level of awareness, acceptance and usage of the HPV vaccines since its licensed seven years ago. This research has helped to shade some light on the level of awareness, acceptance and usage of the screening

services especially the HPV vaccines given the large proportion of women who migrate into the country from other countries including Cameroon, who fall in the catch up vaccination age range. This has added some information to the existing body of knowledge since the licensed of the HPV vaccines by the FDA. Unlike any other studies reviewed, this study has provided an insight on the rate of acceptance of the HPV vaccination and usage of other cervical cancer screening services given the level of awareness and perception of the Cameroonian women in the Maryland-Washington Metropolitan area.

Chapter 2: Literature Review

Introduction

Few studies have examined the incidence and mortality of cervical cancer in Cameroon. Dollin (2013) noted that over the past 50 years there has been a dramatic decrease in the mortality and morbidity rate because of cervical cancer in developed countries through successful screening programs using cytological examination followed by evaluation and treatment of high-grade precancers of the cervix. In underdeveloped countries, cervical cancer incidence and mortality remain high. However, Echelman, and Feldman (2012) suggested that moving forward, using a combination of the HPV vaccine, new HPV screening capability, and simple see-and-treat techniques may help to decrease the cervical cancer burden in these countries.

Several databases such as Medline, PubMed, and ProQuest Central were searched for important literature to be referenced for this review using the following key words: *cervical cancer, HPV vaccination, HPV vaccines, cervical cancer prevention,* and *human papillomavirus*. These key words were made broad so as to obtain several results giving me an opportunity to select those articles relevant to this study. Using the same key words for a search on the Internet through Google Scholar obtained more results. Additional articles were selected from the reference lists of reviewed articles. The database search included materials dating back to 1985, but most of the articles selected for this review were from 2008 through 2013.

The literature review is presented according to subject matters or themes beginning with general information about cervical cancer and its treatment and preventive measures. Other themes will include the level of cervical cancer awareness, beliefs, attitudes, and practices of sexual behaviors in relation to acceptance and use of the HPV vaccines. Integrated within these discussions will be the conceptual model for this study as well as other methods used in previous studies. The last section will be an assessment of the research studies that have been conducted and published after the HPV vaccines were licensed for use.

General Information on Cervical Cancer and the Human Papillomavirus

Walter (2013) explained that HPV can infect cells on the surface of the skin, genitals, anus, mouth, and throat, stating that although HPV types 6 and 11 cause over 90% of the cases of anogenital warts in both men and women, types 16 and 18 cause 70% of cervical cancer, 30% of vaginal and vulvar cancer, and 80% of anal cancer. According to Walter (2013), HPV has a prevalence rate of 45% in the 20-24 age groups and remains at a rate of 20% for women ages 50-59, suggesting that 80% of sexually active females will contract the virus before the age of 50.

Walter (2013) also estimated that approximately 20 million Americans are currently infected with HPV and that an additional six million people become infected each year. According to Walter (2013), those infected with HPV are often unaware because the body is typically able to clear the infection on its own. However, those infected by high-risk oncogenic HPV types can develop a chronic condition leading to

cervical cancer, which is one of the most common female malignancies in the world as illustrated in figures 2, 3a, 3b, and 3c.

According to CDC (2011), the Food and Drug Administration (FDA) approved a vaccine known as Gardasil manufactured by Merck & Co., Inc. in 2009 that prevents HPV types 6, 11, 16, and 18, and one called Cervarix from GlaxoSmithKline in 2010 that prevents HPV types 16 and 18. Merck and Qiagen (2011) found that these vaccines are most effective for both boys and girls ages 9-26, when administered before the individual becomes sexually active. This quadrivalent vaccine guards against four strains of HPV associated with cervical cancer, precancerous genital lesions, and genital warts. CDC (2011) states that the HPV vaccines approved by FDA are more effective for these age groups because the greatest benefits are obtained when administered before a person become sexually active. According to the Advisory Committee on Immunization Practices of the CDC (2011), teenagers are the recommended target population for routine immunization. CDC (2011) also states that those who are above 26 years of age and have already commenced sexual activity should be given a "catch-up" dose of the vaccination although the efficacy is almost 100% if given to young women before sexual exposure. However, women who are already HPV-infected may still benefit from the vaccine because the vaccine can also prevent other HPV strains not yet contracted. CDC (2011) further states that Gardasil vaccine is most effective when all three doses are injected over a six months period. Prior to the development of HPV vaccines like Gardasil, the Pap test provided the most effective avenue for preventing cervical cancer

and has been widely used as a screening procedure. The Pap test remains critical for early detection even in those who have received the HPV vaccine because it detects changes in the cervix before cancer develops.

Cancers that affect the female reproductive organs are generally called gynecological cancers. These include cancers of the vulva, vagina, uterus, cervix, fallopian tubes, ovaries, and peritoneum. According to Maine, Hurlburt, and Greeson (2011), approximately 77,000 women in the United States are estimated to be diagnosed with gynecological cancers each year and approximately 28,000 die from them. Maine et al. (2011) also stated that 80% of the 400,000 worldwide cervical cancer cases diagnosed yearly were in the developing countries as illustrated in Table 2 and Figure 13. This confirmed the findings of McCormack and Schüz (2012), who stated that cervical cancer is the second most common cancer in women worldwide and the leading cause of deaths in women in Africa between the ages of 30-40. According to McCormack and Schüz (2012), Africa's cancer burden will at least double between 2008 and 2030. Dollin (2013) shares a similar opinion by stating that every year in the U.S, there are 4,000 deaths in approximately 10,000 women from the most common type of cervical cancer known as the squamous cell carcinoma caused by HPV commonly transmitted by sexual contact.

This number is significantly less compared to the findings of McCormack and Schüz (2012).

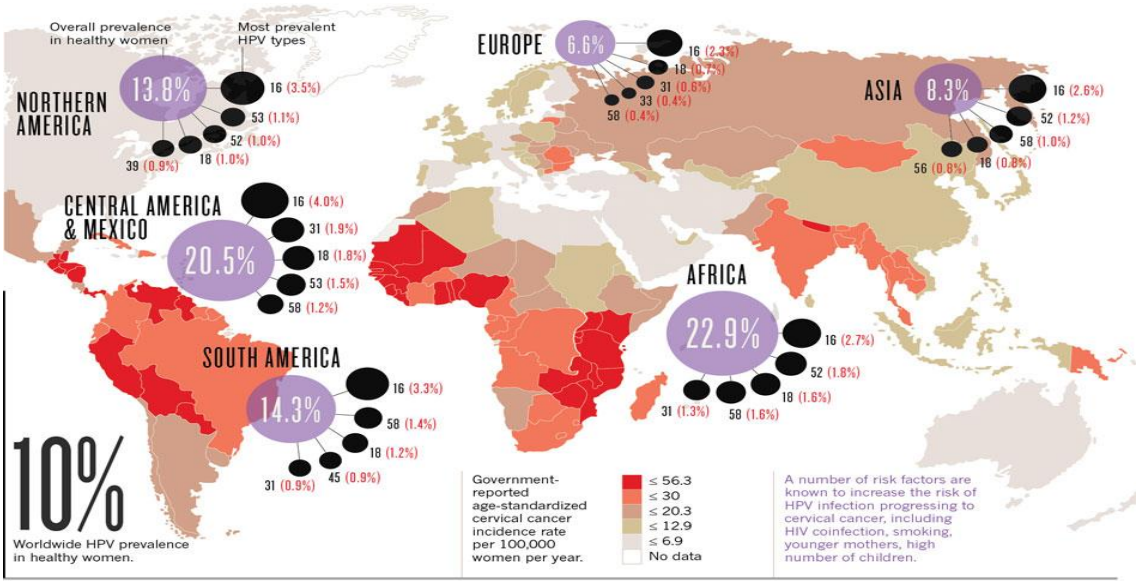


Figure 13. Illustrates the burden of cervical cancer in the world.
From "United States Cancer Statistics: 1999–2010: United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved+ from http://www.cdc.gov/uscs.

Table 2

Global Burden of Human Papillomavirus-Related Cancer.

Site total # of cancers	**Attributable to HPV (cervical cancer)**	**Developed countries total # cancers**	**Developing countries attributable to HPV**
Cervix	100	83,400	83,400
Anus	90	14,500	13,100
Vulva/vagina	40	18,300	7300
Penis	40	5200	2100
Mouth	≥≥3	91,200	2700
Oropharynx	≥≥12	24,400	2900
Other	0	4,779,100	0
All sites	5,016,100	111,500	5,827,500

From "United States Cancer Statistics: 1999–2010: United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from: http://www.cdc.gov/uscs.

According to Dollin (2013), cervical cancer is often detected in its earliest stages and more commonly in its precancerous stages (dysplasia prevention) with appropriate screening. Through a systematic screening, diagnosis, and treatment interventions for racial and ethnic minorities Glick, Clarke, Blanchard, and Whitaker (2012), found that there are HPV vaccines available to selected young women targeting specific strains of the HPV that cause the majority of cervical cancers. According to Glick et al. (2012), women who undergo regular Pap smear testing are unlikely to develop advanced cervical cancer. Stating that Cervical cancer is a matter of prevention than treatment in developed countries, such as the United States, because of widely available cervical cancer screening programs like Pap smears and related tests compared to underdeveloped countries (Glick et al. 2012). Further suggesting that cervical cancer could be completely eradicated in the future with the development and improvement of the HPV vaccines against the most common cancer-causing strains of human papilloma virus, (HPV-16 and HPV-18), with wide usage in young women and children (Glick et al. 2012). However, Fiander (2011) found that women are still suffering from high rates of late stages of cervical cancer in under-developed countries resulting in more deaths than other cancer types in women. According to Fiander (2011) better screening and vaccination programs in these countries are highly recommended that would revolutionize cervical cancer survival worldwide.

Bogaards et al. (2011) explained that there is a sex specific difference between the course of an infection and the transmissibility of HPV disease outcomes between males

and females. Bogaards et al. (2011) set out to study the effectiveness of vaccinating both boys and girls as a measure to prevent HPV infections. Their study showed that genital transmission from males to females is relatively inefficient to be considered as a measure to reduce the levels of HPV infection, stating that most of the existing vaccination programs have been efficient although they have targeted only the girls. According to Bogaards et al. (2011) directing and increasing prophylactic immunization at the sex with the highest pre-vaccine prevalence as a rule is a more efficient way of reducing HPV infections rather than, including boys in existing vaccination programs. This idea is in contrast with the findings of Drolet, Boily, Van de Velde, Franco, and Brisson (2013), which carried out a similar study to help decision- makers in considering the vaccination of both girls and boys using different HPV vaccines to benefit from their respective strengths.

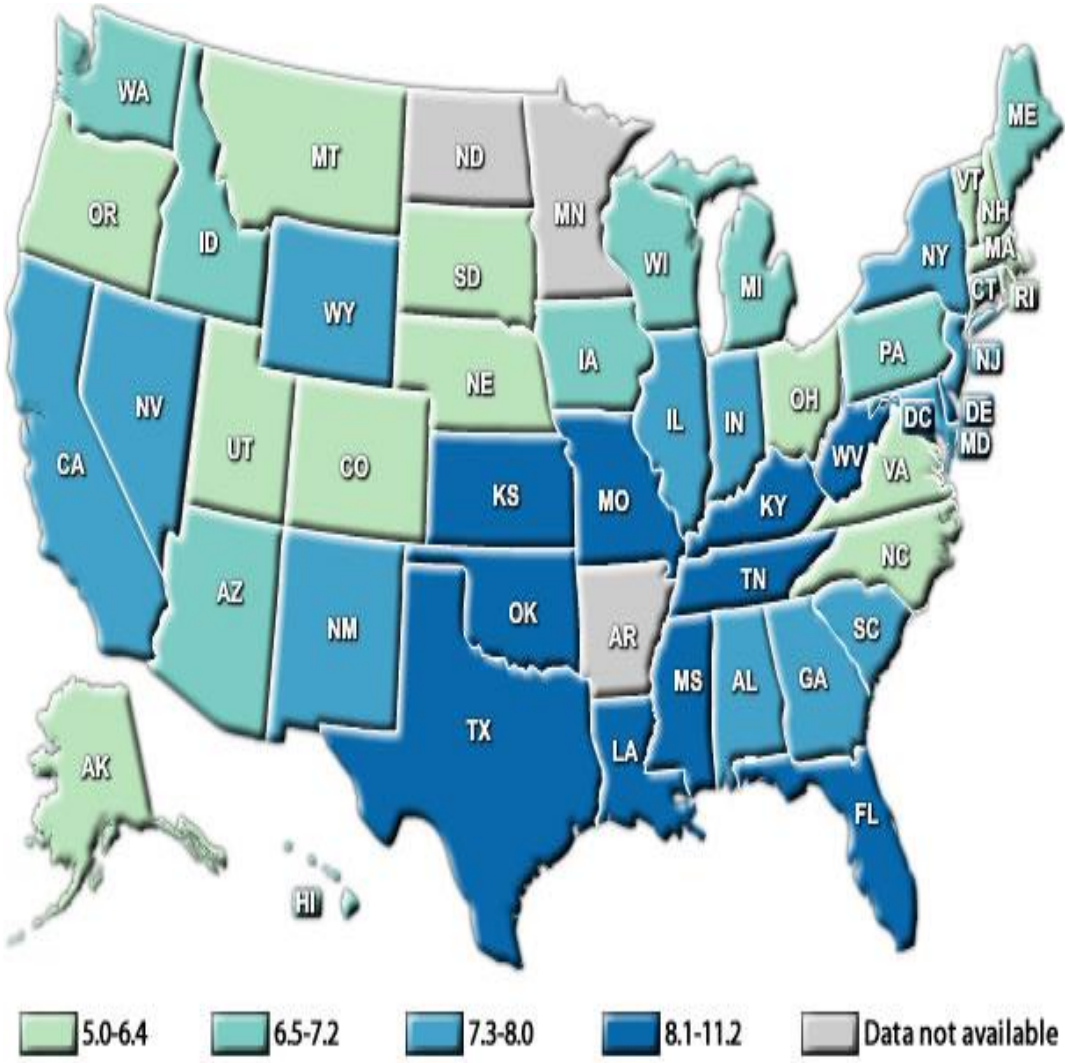
According to Drolet et al. (2013) the bivalent (HPV2) confers greater cross-protection while the quadrivalent (HPV4) prevents anogenital warts (AGW). Drolet et al. (2013) compared the vaccination of both genders with the HPV4 to vaccinating the boys with HPV4 and the girls with HPV2. On an assumption of a 70% vaccination coverage and lifelong cross-protection, findings showed that vaccinating boys has little additional benefit of AGW prevention, irrespective of the vaccine used for girls. A greater incremental reductions in SCC incidence was noted using HPV4 for boys and HPV2 for girls than using HPV4 for both genders (12% vs 7% points).Vaccinating boys produced an incremental reduction in AGW of 17% points on a 50% vaccination coverage if both

sexes were vaccinated with HPV4 while an increases was noted in female incidence by 16% points if girls are switched to HPV2. Drolet et al. (2013) predicted a higher incremental (16% vs12% points) reductions in SCC incidence when vaccinating boys with HPV4 and girls with HPV2 compared to vaccinating both genders with HPV4. Sensitivity to vaccination coverage and the relative duration of protection of the vaccines was noted leading to a conclusion that vaccinating girls with HPV2 and boys with HPV4 can optimize SCC prevention if HPV2 has higher/longer cross-protection but can increase AGW incidence if vaccination coverage is low among boys.

Marty et al. (2013) also challenged the findings of Bogaards et al. (2011) through a similar study in Europe where the incremental benefit of vaccinating boys and girls were compared using the quadrivalent HPV vaccine versus girls-only vaccination in terms of reduction in the incidence of HPV 6, 11, 16, and 18-related diseases: cervical, vaginal, vulvar, anal, penile, head, and neck carcinomas and genital warts. Marty et al. (2013) assumed a70% vaccine coverage for both with sensitivity analyses around vaccine coverage and duration of protection results showed a 61% reduction in males and 84% girls-only reduction in HPV 16/18-related carcinomas in females. While vaccination of girls and boys led to a 90% reduction in HPV 16/18-related carcinomas in females and 86% reduction in males versus screening alone. Relatively Marty et al. (2013) found a 40% and 60% reduction in HPV related carcinomas respectively and a reduction in the incidence of HPV 6/11-related genital warts of 58% for females and 71% for males versus girls-only vaccination. These findings led Marty et al. (2013) to conclude that

there is a substantial additional clinical benefit in terms of reduced incidence of HPV-related genital warts and carcinomas versus girls-only vaccination.

According to CDC (2012), the rate of getting cervical cancer (incidence rate) varies from state to state in the United States as illustrated on Figure 14.

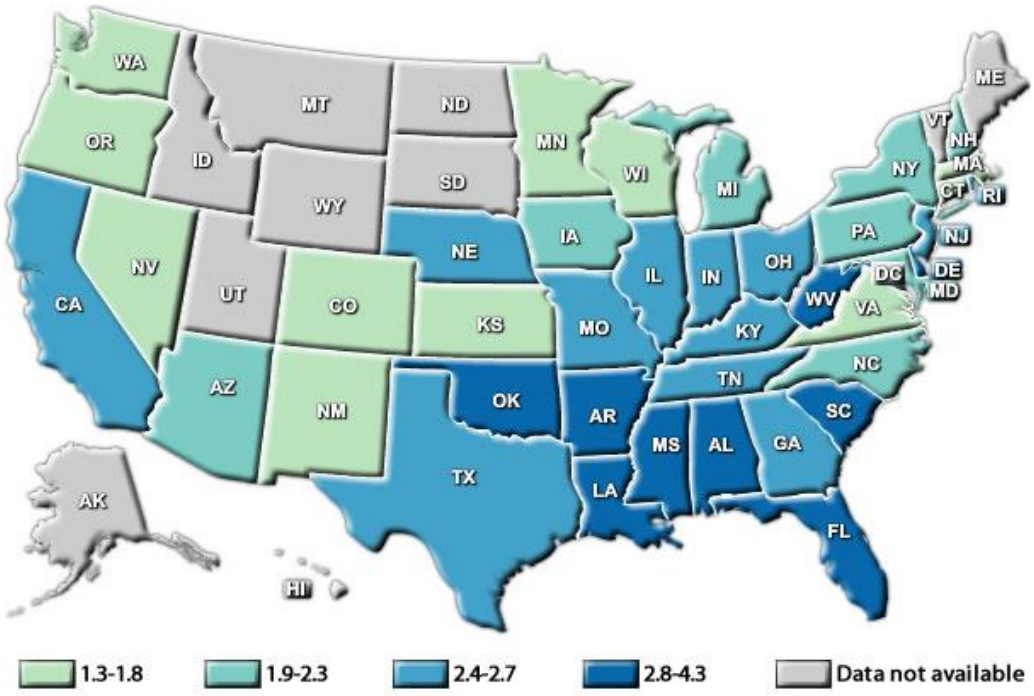


Color on Map	Interval	States
	5.0 to 6.4	Alaska, Colorado, Massachusetts, Montana, Nebraska, New Hampshire, North Carolina, Ohio, Oregon, Rhode Island, South Dakota, Utah, Vermont, and Virginia
	6.5 to 7.2	Arizona, Connecticut, Hawaii, Idaho, Iowa, Maine, Michigan, Pennsylvania, Washington, and Wisconsin
	7.3 to 8.0	Alabama, California, Georgia, Illinois, Indiana, Maryland, Nevada, New Jersey, New Mexico, New York, South Carolina, and Wyoming
	8.1 to 11.2	Delaware, District of Columbia, Florida, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, Texas, and West Virginia
	Data not available‡	Arkansas, Minnesota, and North Dakota

*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.

Figure 14. Rates are not shown if the state did not meet USCS publication criteria or if the state did not submit data to CDC. U.S. Cancer Statistics Working Group. United States Cancer Statistics: 1999–2010 Incidence and Mortality Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2013. Retrieved from: www.cdc.gov/uscs.’’’’

In the United States rates of dying from cervical cancer also varies from state to state as illustrated on Figure 15



Color on Map	Interval	States
	1.3 to 1.8	Colorado, Connecticut, Kansas, Massachusetts, Minnesota, Nevada, New Mexico, Oregon, Virginia, Washington, and Wisconsin
	1.9 to 2.3	Arizona, Iowa, Maryland, Michigan, Missouri, New Hampshire, New York, North Carolina, and Pennsylvania
	2.4 to 2.7	California, Georgia, Illinois, Indiana, Kentucky, Nebraska, New Jersey, Ohio, Rhode Island, Tennessee, and Texas
	2.8 to 4.3	Alabama, Arkansas, Delaware, Florida, Louisiana, Mississippi, Oklahoma, South Carolina, and West Virginia
	Data not available‡	Alaska, District of Columbia, Hawaii, Idaho, Maine, Montana, North Dakota, South Dakota, Utah, Vermont, and Wyoming

Figure 15. Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population. Rates are suppressed if fewer than 16 deaths were reported by a state. Retrieved from: U.S. Cancer Statistics Working Group. United States Cancer Statistics: 1999–2010 Incidence and Mortality Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2013. Retrieved from: www.cdc.gov/uscs.

According to CDC (2012), the number of women who were diagnosed with cervical cancer for every 100,000 women were about 10 black women, 7 white women, 7 American Indian/Alaska Native women, and 7 Asian/Pacific Islander women were diagnosed with cervical cancer per 100,000 women. As illustrated on Figure 16, about 11 Hispanic women were diagnosed with cervical cancer per 100,000 women, compared to 7 non-Hispanic women.

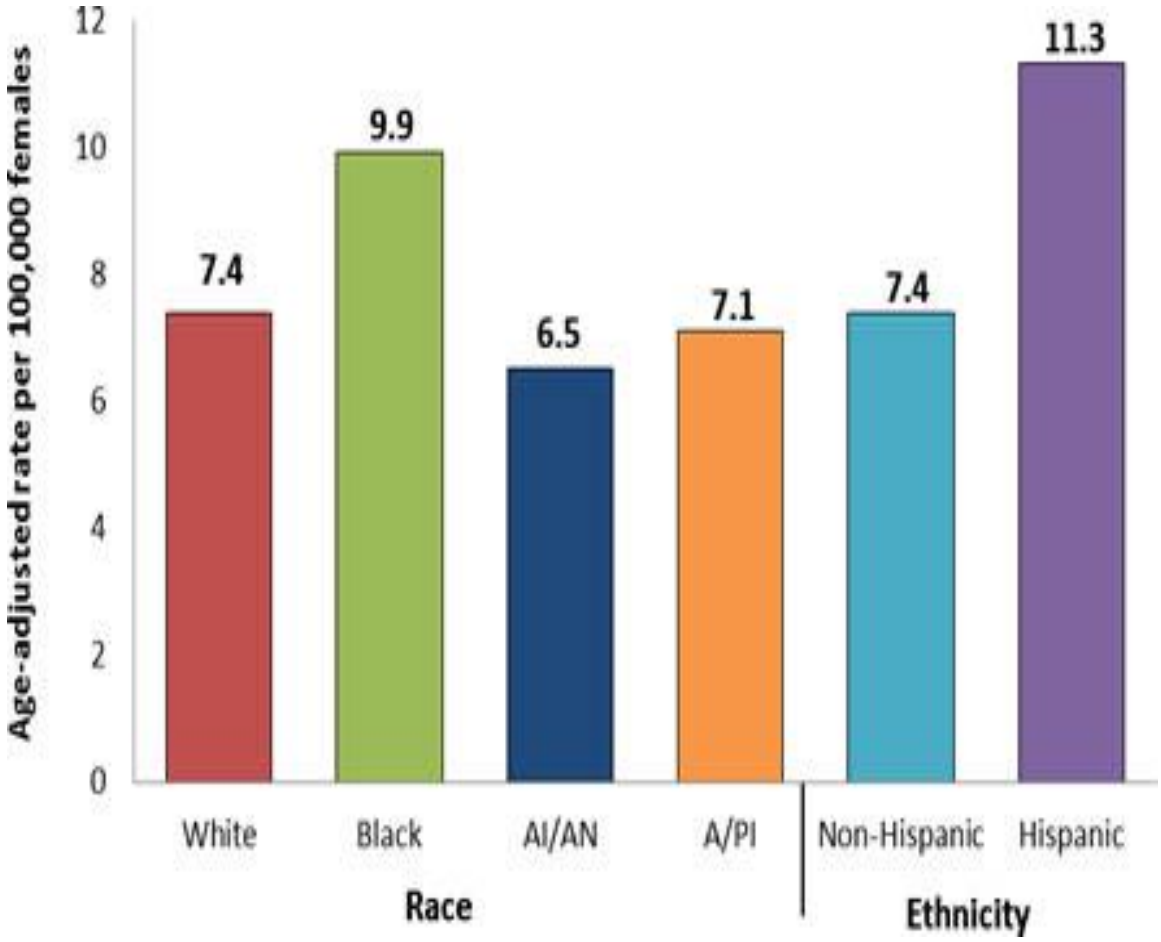


Figure 16. The age-adjusted incidence rates for cervical cancer in the United States during 2004–2008.
Retrieved from Centers for Disease Control and Prevention (CDC). Human papillomavirus–associated cancers—United States, (2012). *MMWR*; 61(15):258–261. "AI/AN" means American Indian/Alaska Native, and "A/PI" means Asian/Pacific Islander.

Some Studies of Cervical Cancer Preventive in Cameroon

Choconta-Piraquive, Alvis-Guzman, and De (2010) noted the unsuccessful effort to reduce the mortality rate using the cytology-based screening since the 1980 in developing countries mainly because of: the lack of trained providers, inadequate material resources, absence of a quality control system, and treatment facilities as well as lack of follow-up services. McCarey et al. (2011) obtained similar findings to those of Choconta-Piraquive et al. (2010) stating that a prime barrier for access to cervical cancer prevention is the lack of knowledge about cervical cancer among health care workers as well as the general Cameroon Community as one of the developing countries. In Cameroon, the epidemiology of cancer is relatively unknown.

Enow-Orock and Doh (2012) stated that although there is no reliable data on its incidence and pattern, with an estimated 15,000 new cases diagnosed annually and a prevalence of about 25, 000 cases throughout the country, cancer was viewed as a public health problem in Cameroon. To confirm these facts Enow-Orock and Doh (2012) collected data from about 20 sources that cover the entire population of Yaoundé the Capital city of Cameroon estimated in 2010 at about 1,299,369 from the Cancer Registry in Yaoundé, a population registry physically located at the General Hospital Yaoundé. Although this registry has been operating since 2004, it is unfortunate that such registries are not available at other cities of the country, which makes it difficult to have a complete picture of the epidemiology of cancer in the entire country.

According to McCarey et al. (2012) the national cervical cancer-screening programs available in Cameroon provide limited services only to some main cities, which probably is responsible for the high cervical cancer incidence and mortality rate. The population of Cameroon is 42% based in the rural area where these services may never get into the hospital registry data. McCarey et al. (2012) further explained that women over 35years of age are most at risk for cervical cancer with a median age of 49 years at diagnosis. At presentation at the clinic these women are already at an advanced and incurable stage of the disease. McCarey et al. (2012) further noted that the Cameroon Ministry of Health launched a mass media educational campaign to raise awareness and distributed information on the available cervical cancer screening that has led to a major development of the Country's cervical cancer prevention programs in recent years.

Overview of the Available Cervical Cancer Screening and Preventive Measures

McCormack and Schüz (2012) found that in Africa there exist difficulties to enforce health standards, use of outdated machinery, lack of personal protective measures and of hazard knowledge, which leads to exposures to high levels of environmental/occupational carcinogenic elements. Sources/settings of exposures include chemical industries, mining, air pollution, chrysotile asbestos use, pesticide-intensive agriculture, and hazardous wastes. The patterns of exposure provide opportunities for research to clarify the role of possibly-carcinogenic agents. As McCormack and Schüz (2012) suggested the use of adequate methods of surveillance and regulation of exposure levels are needed for locally-tailored cancer control plans.

According to Ford, English, Davenport, and Stinnett (2009), there are more than one hundred types of HPV in existence. About forty causes cervical cancer in women and other types of cancer in men. Ford et al. (2009), suggested that sexual intercourse is the main method of transmission and preventable by taking the HPV vaccines given as a series of three doses. Furthermore, Ford et al. (2009) stated that although parental decision are crucial they are the main target audience during a campaign, the HPV vaccine continues to evolve. Many parents were skeptical vaccinating their daughters when the HPV vaccine was first released because they believed it would promote earlier initiation of sexual activity; they also expressed concerns about safety and side effects of the vaccines. According to Healy (2013) 5% of parents in 2008 rejected the vaccines compared to 16% of parents who cited concerns about safety as the main reason they did not have their daughters vaccinated in 2010. Although the disease is preventable, many women still die from cervical cancer. Ford et al. (2009) estimated 11,070 women to be diagnosed with the disease in the United States, and 1/3 to die in 2012.

Chirwa at al. (2010) found that the disparity of this disease had the following influencing factors; parental influence, socio-economic factors, knowledge, socio-demographic characteristics, as well as beliefs and attitudes. According to Chirwa et al. (2010) the wide gap in knowledge in describing the process, outcome, and oncology structure, process and outcome in most developing countries, emphasizing the quality and access to care must be improved so as to gain an efficient economy. Chirwa et al. (2010) strongly recommends the investment in cancer control for developing countries in the

following areas: health policy and planning; national and regional capacity building in health services research; informed investment in higher quality health data sources; more economic evaluations relevant to oncology in developing countries; research into effective and cohesive models of cancer control appropriate to each developing country. Chirwa et al. (2010) recognized the need for regional and international collaboration, and increased national and political leadership. According to Chirwa et al. (2010), detecting cancer as early as possible requires a well-equipped health system that optimally and efficiently relieves the intense suffering caused by cancer, prevent the preventable, and cure the curable because research in Health services is essential for oncology in developing countries.

Dollin (2013) supported the findings of Chirwa et al. (2010) and further suggested that cancer screening be valid, reliable, sensitive, and specific, have good predictive value, and it should be able to detect the condition at an early enough stage to lead to available, acceptable, and safe interventions that work. Dollin (2013) further explained that each of these parameters depends on the baseline prevalence of the disease within a given community. Using the case of Canada as an example the prevalence of the disease varied by uptake of Pap testing, variable access to colposcopy, and people who are at variable levels of risk of cervical cancer as well as variable uptake of HPV vaccination, which complicates the situation (Dollin 2013).

According to Demarteau, Breuer, and Standaert (2012) screening protocols are also changing internationally and the United States Preventive Services Task Force

recommends screening for women aged 21-65 years with a Pap every three years or for women aged 30-65 years who want to lengthen the screening interval, a combination of Pap and HPV testing every five to six years. This is in contrast, to the approach used in some European countries, where HPV testing alone is recommended for screening, beginning at age 30 or 35 years (Demarteau et al. 2012). On a more general term Demarteau et al. (2012) noted that in countries that recommend HPV testing as a screening method, the age at which testing starts is higher, and its frequency lower as well as those countries with highly organized screening programs such as Finland and the Netherlands, have lower rates of cervical cancer.

Wright and Kuhn (2012) said that although cervical cancer is a potentially preventable and curable cancer, there still exists a high mortality among young women residing in low-resource countries largely because of the failure either to initiate or sustain effective cervical-cancer screening programs. Meanwhile, in countries that have had sufficient resources to establish and sustain well-conducted programs, cytology as a screening test, linked with a robust healthcare infrastructure, has affected cervical cancer prevention significantly. Low resource countries have resort into alternative screening tests and approaches to cervical-cancer prevention such as visual inspection with acetic acid and molecular testing for high-risk types of human papillomavirus deoxyribonucleic acid. According to Wright and Kuhn (2012) visual inspection with acetic acid has shown a great deal of promise in cross-sectional studies as well as the so-called “screen and treat” method by linking testing or screening to treatment without the intervention of

colposcopy or the need for sophisticated laboratories may prevent cervical cancer in large numbers of women.

Barriers to Cervical Cancer Screening and Treatment

Ports, Reddy, and Rameshbabu (2013) set out to elucidate potential barriers and facilitators to HPV vaccination in Malawi, a sub-Saharan country where approximately 31 out of every 100,000 women develop cervical cancer annually and 80% of those affected die from this malignancy. According to Ports et al. (2013) HPV vaccination may provide a feasible strategy for cervical cancer prevention in Malawi. Ports et al. (2013) examined the Women's knowledge and beliefs about HPV, cervical cancer, and vaccination, and their social-ecological contexts. Results showed that despite women's limited knowledge, cervical cancer was perceived to be a serious disease and believed that as women, they were responsible for their children's health. According to Ports et al. (2013) the women unanimously reported that they would vaccinate their children against HPV, especially if a health professional recommended it.

Rogers and Cantu (2009) observed that there has been a significant decline in the incidence of cervical cancer over the last 50 years following the implementation of the Pap test. Cancer remains the second most common type of cancer in women worldwide and each year there are approximately 11,000 women in the United States diagnosed with cervical cancer, despite this reduction (Rogers & Cantu, 2009). Infection with oncogenic HPV is necessary for the development of precancerous lesions and the advancement to cervical cancer. For those diagnosed with an HPV infection or cervical cancer, there is

often a considerable personal and financial burden. According to Rogers and Cantu (2009), they estimated that the total direct costs associated with cervical dysplasia and cancers are extensive in addition to adverse effect on a patient's quality of life (social, emotional, and sexual functioning) following a diagnosis with an HPV infection or cervical cancer.

Perkins, Anderson, Gorin, and Schulkin (2013) examined attitudes, practice patterns, and barriers related to HPV vaccination and cervical cancer screening guidelines among United States obstetrician-gynecologists. Perkins et al. (2013) saw that parent and patient refusals were barriers to HPV vaccination as a 92% of obstetrician-gynecologists offered HPV vaccinations to their patients following the guidelines of 21–70 years old or after hysterectomy, and made good use of Pap and HPV co-testing but only 27% patients received vaccination. Although most physicians continued to recommend annual Pap test (74% aged 21-29, and 53% ≥30 years old), physicians felt that patients were uncomfortable with extended screening intervals but had concerns about patients coming for annual exams without concurrent Pap test. These results led Perkins et al. (2013) to recommend Interventions to promote guideline adherence to help improve the quality of cervical cancer prevention amongst obstetrician-gynecologists who demonstrated persistent barriers to the adoption of HPV vaccination and cervical cancer screening guidelines as seen in this study.

Demarteau et al. (2012), realized that spending the same budget used for screening and treatment of cervical cancer in the pre-vaccination era was same as the

results of the optimization program, which showed the possibility of reducing the number of cases. According to Demarteau et al. (2012), implementing an optimal combination of HPV vaccination (80% coverage) and screening at pre-vaccination coverage (65% UK, 50% Brazil) while extending the screening interval to every six years in the UK and five years in Brazil could have a substantial impact in cervical cancer prevention. Esselen and Feldman (2013) agreed with the findings of Demarteau et al. (2012) suggesting a cost-effectiveness analyses as an important tool for the evaluation and modification of many health care services. According to Esselen and Feldman (2013), the variety of screening tests, prevention, and treatments available for cervical cancer, the differences in resources and settings in which these tests are applied worldwide as well as the costs associated with these options and with their alternatives, a cost-effectiveness analyses evaluation can be very useful to help determine best practices. One barrier to effective prevention is the lack of knowledge amongst nurses who play a prominent role as patient educators in the healthcare field.

McCarey et al. (2011) assessed the level of cervical cancer prevention and HPV awareness of healthcare workers in Cameroon and found the necessity of educating nurses about cervical cancer prevention, the risk factors involved and the impact of HPV based on the gaps noted. McCarey et al. (2011) stated that nurses can be instrumental in raising the level of awareness of the general public about HPV vaccination and cervical cancer prevention. In Pakistan, Ali et al. (2010) had similar result as the knowledge level about cervical cancer was found to be very deficient amongst the healthcare

professionals. According to Ali et al. (2010), 78% knew that infection is the most common cause of cervical cancer, 62% knew the disease was caused by the HPV that was sexually transmitted and preventable by taking the HPV vaccine. Compared to McCarey et al. (2011) where 86% saw cervical cancer as a major public health problem 58% identified the most important etiological factors and 90% believed that cervical cancer could be prevented by screening and 84% by Pap smear.

According to Daley et al. (2011), over the past 50 years in the United States, cervical cancer incidence and mortality have declined because of broad screening efforts. However, some states continue to bear a greater burden because of under-screened and under -treated populations. Daley et al. (2011) listed four levels of barriers to cervical cancer screening and treatment in the state of Florida: institutional level barriers complicate the administration of screening and treatment services; individual beliefs, behaviors, and stressors because of poverty; community level barriers range from cultural differences and fear of deportation, to transportation issues; regulations and funding issues at the policy level are inconsistent between federal, state, and local levels that hinder women's ability to access services. These findings were consistent with those of Lyimo and Beran (2012) who listed the lack of access to care and poverty as factors that prevents women from receiving screening and treatment services for cervical cancer in Tanzania. According to Lyimo and Beran (2012) 22.6% of the participants listed: women's preference for the sex of health provider, husband's approval of cervical cancer screening, women's level of education, women's knowledge of cervical cancer and its

prevention, women's awareness of and distance to cervical cancer screening services and women's concerns about embarrassment, and pain of screening as reasons for the low rate of cervical cancer prevention, and treatment services. Wheeler (2011) also confirmed that the barriers to screening for cervical cancer were as a result of: ignorance, accessibility and cost as well as lack of finances and fear of abnormal results.

The Role of HIV in Cervical Cancer Prevention

In Uganda, Mutyaba, Mirembe, Sandin, and Weiderpass (2010) examined the effect of Human Immunodeficiency Virus (HIV) seropositivity on the outcome of treatment of precancerous cervical lesions using cryotherapy. The visual inspection and cervical lesions diagnosed by colposcopy, according to HIV serostatus was used to study the prevalence of detectable cervical abnormalities and described the outcomes of cryotherapy treatment. From February 2007 to August 2008 trained nurses examined women not previously screened for cervical cancer using visual inspection with acetic acid (VIA) and Lugol's iodine (VILI) in two family planning/post natal clinics in Kampala, Uganda. Women with abnormal visual inspection findings were referred for colposcopic evaluation and HIV testing. Women with precancerous cervical lesions detected at colposcopy were treated mainly by cryotherapy and were evaluated for treatment outcome after three months by a second colposcopy. Mutyaba et al. (2010) found 834 of the 5105 women presented positive and were referred for colposcopy. Of these 75% (625) returned for colposcopic evaluation and were tested for HIV which revealed that 169 women had the cervical lesions, 128 inflammation, 19 with low grade

squamous intraepithelial lesions(LGSIL), 13 with high grade squamous intraepithelial lesions(HGSIL), nine with invasive cervical cancer and two inconclusive. In Conclusions Mutyaba et al. (2010) cited the possibility of a false positive result using only the visual inspection of the cervix uteri with acetic acid (VIA) and Lugol's iodine as a sole method for cervical cancer screening. Mutyaba et al. (2010) further stated that although HIV seropositivity was associated with a higher prevalence of inflammatory cervical lesions the detection rates were higher among older women 41-60 years.

In Cameroon Atashili et al. (2012) also studied the effect of Cervical Cancer prevention on women receiving antiretroviral therapy basing their outcome on the prevalence of the cervical lesions and prevalence of lesions requiring colposcopy. According to Atashili et al. (2012) the potential clinical predictors of lesions were found to be: the Participant's age, marital status, parity, number of lifetime sex partners, age at first sexual intercourse, and history of hormonal contraception, history of exposure to cigarette smoke, CD4 count, and AIDS clinical stage.

Hawes et al. *(*2006) reported a cytological abnormality prevalence of 37% among women with HIV-1 infection attending an outpatient infectious disease clinic in Senegal, Yamada 27.1% in urban patients in Kenya, Moukassa 15.36% among urban dwellers in Congo. As a comparative study to that of Hawes et al. *(*2006), McCarey et al. (2010) studied the socio-demographic and clinical characteristics of cervical cancer using 282 women initiating Highly Active Antiretroviral Therapy (HAART) in Cameroon. McCarey et al. (2010) considered women diagnosed with HIV 0-136 months prior to the

study with a median CD4 count range from100 to 271, 80.9% at the advanced clinical stages of HIV(III/IV) out of whom only 2.1% previously had a Pap smear done. McCarey et al. (2010) found a high prevalence of Squamous Intraepithelial Lesions (SIL) in women initiating antiretroviral therapy in Cameroon. McCarey et al. (2010) concluded that this high prevalence, considering the potential to treat precancerous lesions when detected early and the limited role of HAART on the advancement of lesions, underscores the need for screening in this population. McCarey et al. (2010) further concluded that targeting screening for SIL using clinical and demographic predictors among HIV positive women did not appear feasible.

To confirm the findings of McCarey et al. (2009), McCarey et al. (2010) studied another group of 70 HIV-infected women ages 21-56 (35 under HAART and 35 not initiated with HAART) randomly recruited using systematic random sampling from the outpatients at the day care center of Bonassama hospital in Douala Cameroon for a period of eight months. The results were confirmatory of the previous findings in 2009 as well as those of other studies carried out in other developing countries in the sense that the HIV- infected women were at a significantly higher risk of LSIL and HSIL. The relative prevalence of SILs or cytological abnormalities among HIV positive women is higher.

A similar study was done by Adjorlolo-Johnson et al. (2010) in Ivory Coast, examining the association between HIV infection and invasive cervical cancer taking into account HPV infection and other potential risk factors for cervical cancer. Adjorlolo-Johnson et al. (2010) found a High-risk HPV infection detected in cervical tumor samples

from 89.4% of case-participants and in cervical cytology samples in 31.1% of control-participants. Risk factors for cervical cancer were at a higher risk with HPV infection. These data according to Adjorlolo-Johnson et al. (2010) supports the hypothesis that HIV infection is a cofactor for cervical cancer in women with HPV infection.

Ezechi, Gab-Okafor, Ostergren, and Odberg (2013) suggested the adoption of integrating cervical cancer screening program into HIV care as a standard of care due to its benefits although this is not operational in most HIV clinics in Nigeria. Ezechi et al. (2013) studied the willingness and acceptability of cervical cancer screening among HIV positive women in Nigerian to confirm this hypotheses and found that 56.2% were aware of cervical cancer, 9.4% had had cervical cancer screening, 79.8% accepted to take the test; Cost of the test was an issue to 35.2% and religious 14.0% was their reason for denial. Ezechi et al. (2013) came to a conclusion that HIV positive women were willing to screen for cervical cancer. Ezechi et al. (2013) further suggested that integrating reproductive health services into existing HIV programmers will strengthen the services rather than disrupting.

Desruisseau et al. (2009) stated that HPV types vary by country and HIV status. Although there were no data on the prevalent HPV genotypes from Cameroon Desruisseau et al. (2009) found that 41 out of 61 samples tested (67.2%) had HPV sub-types detected with the most common high risk sub-types noted as 45 (24.6%) and 58 (21.5%). HIV-positive women were more likely to test positive for any HPV and to test positive for the high risk subtypes. Of those with high risk HPV, HIV-positive women

were more likely to have Thin Prep abnormalities than HIV-negative women. Desruisseau et al. (2009) concluded that Oncogenic HPV subtypes 45 and 58 were more prevalent than those subtypes carried in the quadrivalent vaccine.

Awareness of Risk Factors, Symptoms and Screening Methods of Cervical Cancer

Cooper, Polonec, and Gelb (2011) studied the level of knowledge and awareness of women in the United States a well-developed country about gynecologic cancer, their perception of cervical cancer screening and risk factors. Data was obtained from 59 focus groups of women aged 40-60 years in Miami, New York, Chicago, and Los Angeles. Cooper et al. (2011) found most of the women stating that they had heard of cervical, ovarian, and uterine cancers but were unfamiliar with vaginal and vulvar cancers. There was a prevalence noted with the misconception that the Pap test screens for multiple gynecologic cancers engendering a false sense of security in some women. Most women were familiar with an annual Pap screening interval although some mentioned a shorter screening interval for high-risk women while a few mentioned an extended screening interval. Most of the women were unfamiliar with gynecologic cancer symptoms although a few listed abnormal vaginal bleeding as a sign. Cooper et al. (2011) concluded that although the U.S. is a well-developed country rich with higher level of healthcare technologies and accessible healthcare services the women still lacked critical knowledge to understand their gynecologic cancer risk and seek appropriate care. According to Cooper et al. (2011) Pap tests and routine examinations offers ideal opportunities to

educate women about the purpose of the Pap test as well as risk factors and symptoms associated with various gynecologic cancers.

Mogtomo et al. (2010) studied the sexual risk for human papilloma virus (HPV) infection among students at the University of Douala-Cameroon and found that female students 23-24 years who had contracted STIs reported having had one or more sexual partners. Sex related risk attitudes were significantly associated with the non-use or inconsistent use of condoms as students demonstrated a low level of HPV related knowledge. All the students in this study had no knowledge of the relationship between HPV infection and cervical cancer. These findings led Mogtomo et al. (2010) to the conclusion that high sexual risk for HPV and cervical cancer is prevalent among adolescents in Cameroon, which was significantly increased by the lack of condom use because of social stigma, lack of knowledge, made worse by the inability of women to negotiate the use of condoms with their partners. According to Mogtomo et al. (2010) Cameroonians tend to lay more emphasis on the promotion of condoms use as either as a protection measure against pregnancy or diseases like HPV infection.

Maine, Hurlburt, and Greeson (2011) stated that HPV vaccine programs cannot be undermined in both developed and developing countries although the two methods of screening by visual inspection with ascetic acid (VIA) and DNA testing-have received much less attention. These methods can be used to detect cervical lesions and allows for immediate treatment better than the Pap test, minimizing loss to follow-up. According to Maine et al. (2011) the strengths of HPV vaccines may be outweighed by these

advantages, suggesting the improvement of screening coverage with VIA and DNA tests as a priority with a focus on older women 30 years and above as well as the underserved populations. Maine et al. (2011) are hopeful that this approach may end up saving the lives of millions of women in the next 20 years who may have already been exposed to HPV.

McCarey et al. (2011) studied the level of awareness of Cameroonian Healthcare workers about cervical cancer prevention and HPV and found that 36% believed that a competent immune system can clear up HPV infection. This same population was of the opinion that Pap smear was the most popular, consistently, and widely used method of cervical cancer screening. McCarey et al. (2011) were surprised to note that the healthcare workers who worked closely in women's health registered a poor screening uptake as 59% had not had a Pap smear in the last five years; although 75% believed the general lack of information amongst the Cameroonian population about cervical cancer and screening. About 60% of the healthcare workers associated the lack of information to the inconsistent and irregular health campaigns. Cost was listed by 54% as another reason for poor use of screening services. While 75% had doubts about the effectiveness of HPV vaccine, about 44% believed that PHV vaccines could actually prevent cervical cancer and 89% would recommend it for young women aged 10-25 years. The level of knowledge according to McCarey et al. (2011) could be comparable to that in Thailand in 2009 which showed there were 88% of doctors and 82% of nurses who believed that HPV was a public health issue compared to 86% in Cameroon. As of 2011, apart from

the gynecologists who knew of the vaccine, HPV vaccine was considered a new concept among Cameroonian healthcare workers (McCarey et al. 2011). The Cameroonian healthcare workers compared to the Thai cohort, demonstrated a similar level of cervical cancer knowledge and HPV awareness as an importance public health issue. According to McCarey et al. (2011) nurses 88% and doctors 90% said they would recommend HPV vaccines.

Saslow et al. (2012) brought to light the update made to the American Cancer Society (ACS) guideline regarding screening for the early detection of cervical precancerous lesions and cancer, which included: age-appropriate screening strategies; the use of cytology and high-risk HPV testing; follow-up such as the management of screen positives and screening intervals for screen negatives women after screening; the age at which to exit screening; future considerations regarding HPV testing alone as a primary screening approach as well as screening strategies for women vaccinated against HPV16 and HPV18 infections.

Perkins, Langrish, Cotton, and Simon (2011) sort to determine Honduran women's awareness of HPV vaccination and interest in vaccinating their daughters against HPV because cervical cancer is a leading cause of cancer death for women in Latin America in comparison with the findings of Cooper et al. (2011) as well as McCarey et al.(2010). Of the 632 mothers interviewed Perkins et al. (2011) found that only 13% had heard of HPV vaccination before the interview and after education, 91% would accept HPV vaccination for a nine-year-old daughter. Those who had the intention

to vaccinate knew more at baseline about cervical cancer prevention than those who did not endorse vaccination. Perkins et al. (2011) concluded that baseline cervical cancer knowledge was associated with vaccine acceptance because most Honduran mothers would accept HPV vaccination for their daughters after receiving education about the relationship between HPV infection and cervical cancer.

Vesco et al. (2011) set out to answer the question regarding when to begin and end cervical cancer screening despite the reported success of cervical cancer screening programs from other studies. According to Vesco et al. (2011), although screening for cervical cancer in this age group is complicated by lower rates of detection and higher rates of false-positive results than in older women cervical cancer is rare among women younger than 20 years. Knowing that the methods used to diagnose and treat cervical intraepithelial neoplasia have important potential adverse effects, cervical cancer screening in women younger than 20 years may be harmful. Vesco et al. (2011) further explained that women older than 65 years in the U.S who have had a Pap smear within three years have reported a decreased rate of incidence and mortality from cervical cancer since 2000. Vesco et al. (2011), concluded by suggesting a discontinuation of cervical cancer screening among women aged 65 years or older who have had adequate screening and are not otherwise at high risk and focus on screening those who have not been adequately screened.

Whitlock et al. (2011) systematically reviewed the success of using Liquid-based cytology (LBC) and high-risk HPV screening for U.S preventive services task force use

to update recommendations. On the basis of four fair- to good-quality studies, Whitlock et al. (2011) found that LBC had equivalent sensitivity and specificity to conventional cytology. Six fair- to- good quality diagnostic accuracy studies showed that one-time HPV screening was more sensitive than cytology for detecting but was less specific. On the basis of two fair- to- good quality randomized, controlled trials (RCTs), Whitlock et al. (2011) found that primary HPV screening detected more cases of CIN3 or cancer in women older than 30 years. Whitelock et al. (2011) had limited resources, insufficient to gather unpublished data, short-term trial data showed possible ascertainment bias that most RCTs used protocols were different from current U.S. practice. These results led Whitlock et al. (2011) to the conclusion that supports the use of LBC or conventional cytology for cervical cancer screening, although more complete evidence is needed before HPV-enhanced primary screening is widely adopted for women aged 30 years or older.

Attitudes, Beliefs, and Predictors to HPV Vaccines and Cervical Cancer Prevention

Lechuga, Swain, and Weinhardt (2011) investigated the strongest predictors of mothers' intentions to vaccinate their daughters across three cultural groups: the Hispanic, non-Hispanic white, and African American. According to Lechuga et al. (2011) the influence of health beliefs on HPV vaccine acceptability have been extensively documented in past research but studies documenting the generalizability of prior findings to culturally diverse participants are lacking. According to findings from other studies, suggesting that there are disparities in cervical cancer rates across ethnicities

Lechuga et al. (2011) thinks that the theory in cultural psychology, based on beliefs derived from personal expectations may not be the strongest predictors of intentions in individuals socialized in collectivist cultures. Lechuga et al (2011) found that predictors of vaccination intentions varied cross-culturally and culture moderated the influence of norms on intentions. Suggesting that interventions designed for Hispanics may be more effective if norms, rather than attitudes, are targeted (Lechuga et al. 2011).

Montgomery, Bloch, Bhattacharya, and Montgomery (2010) explored the knowledge of HPV and cervical cancer, health beliefs, and preventative practices in women 40 to 70 years using three urban ambulatory Obstetrics and Gynecology offices connected with a teaching hospital's Department of Obstetrics and Gynecology in the Mid-Atlantic section of the United States. A mean knowledge score of 7.39 out of 15 was obtained with more than75% of the women giving the wrong answer to the questions about the relationship of HPV and risks for cervical cancer although most appreciated the seriousness of cervical cancer but believed themselves are not particularly susceptible. Montgomery et al. (2010) confirmed the need for HPV and cervical cancer awareness and education for women older than age 40. Confirming the need for optimum health promotions for all women, through women’s health care professionals are well positioned to act as a catalyst to improve HPV and cervical cancer knowledge, health beliefs, and preventative practices.

France is one of the developed countries with a sophisticated healthcare systems expected to be well-informed about cervical cancer, its causes, and methods of screening and preventive services. However, Haesebaert et al. (2012) noted that although France,

recommends that girls and women aged 14-23 be vaccinated against the HPV, the knowledge level of the French women and their attitude toward the vaccine was not quite known. Haesebaert et al. (2012) found that only 16.9% the 1,478 participant mentioned HPV as the cause of cervical cancer, 76.2% knew of the HPV vaccine, 44.8% knew the target population, 54.3% favored HPV vaccination. The main barrier to acceptance was that the vaccine was fairly new raising concerns about its effectiveness, and possible side effects. Although fewer mothers opposed to HPV vaccination, lack of knowledge about the recommended frequency of Pap testing was an influenced the rate of compliance for Pap test screening and socioeconomic factors had no bearing on their views about HPV vaccination.

Using a door-to-door community-based approach of informing unscreened low income Zambian women, Chirwa et al. (2010) assessed the common myths and misconceptions surrounding the causes of cervical cancer and lack of screening. Within a period of two months, Chirwa et al. (2010) could interview more than 1100 unscreened women with a median age of 33 years, 58% were uneducated beyond primary school, 71% had no monthly incomes above 500,000 Zambian Kwacha (US $100), and 51% were married. Findings showed that about 75% of the women had heard of cervical cancer and the new cervical cancer prevention program in the local clinic. It was concluded that to ensure sustainability and effectiveness it is imperative to consider a societal input when designing and implementing a community based participatory program involving women's reproductive health issues.

Grandahl et al. (2012) used a focus group interview of 50 women to explore immigrant women's experiences and views on the prevention of cervical cancer, screening, HPV vaccination and condom use based on the Health Belief Model (HBM). Grandahl et al. (2012) saw four themes emerged: deprioritization of women's health in home countries; positive attitude towards the availability of women's health care in Sweden; positive and negative attitudes towards HPV vaccination; and communication barriers limit health care access. Grandahl et al. (2012) identified the following barriers: difficulties in contacting health care due to language problems, limited knowledge regarding the relation between sexual transmission of HPV and cervical cancer, culturally determined gender roles and the fact that many of the women were not familiar with regular health check-ups although the women were positive to the prevention of cervical cancer. These findings led Grandahl et al. (2012) to conclude that the women wanted to participate in cervical cancer prevention programs and would accept HPV vaccination for their daughters, but expressed difficulties in understanding information from health-care providers. Grandahl et al. (2012) then suggested the need for information to be translated in different languages and provided through different sources. Grandahl et al. (2012) further recommended that health-care professionals should also consider the difficulties that immigrant women face concerning cultural norms and pay attention to their experiences.

Wald (2013) explained that in countries where HPV vaccine coverage is high, prevalence of genital warts and cervical dysplasia among young women has plummeted.

However, the population-wide impact in the U.S. where only about one third of adolescent girls have received the 3-dose of the vaccine has not been evaluated. According to Wald (2013) CDC investigators compared HPV prevalence in young women age range 14-19 during two periods (2003-2006 and 2007-2010) in the National Health and Nutrition Examination Survey. Findings showed 82% vaccine effectiveness among young women who received at least 1 dose and a prevalence of infection with the HPV types included in the vaccine (types 16, 18, 6, and 11) had fallen significantly, from 11.5% to 5.1%. However no decreases in non-vaccine HPV types were observed in this age group or in vaccine-type HPV in older women. Aragones, Bruno, and Gany (2013) noted that minority populations were disproportionally affected by HPV infection, which reiterates the ideas and findings of Baussano et al. (2011). Aragones et al. (2013) set out to examine the attitudes of primary care providers serving large minority populations towards the implementation of the HPV vaccine for males in their practices. Aragones et al. (2013) found that 62% of all participants reported that they were very likely or will definitely be offering the vaccine to their male patients. According to Aragones et al. (2013) the rate was higher among providers who reported higher numbers of minority patient population and who acknowledged high risk among their patient population. Primary care providers included in the study reported the incorporation of HPV vaccine for males as part of their regular clinical practice.

Blackwell (2013a) stated that some Catholic leaders have objected to the vaccine on the basis that the shots protect against a sexually transmitted virus, while the church

teaches young people to stay abstinent outside of marriage. The chairman of an Alberta Catholic school board also angrily rejected renewed calls to let his students be immunized against HPV in school, suggesting that vaccine advocates were tempting children to defy teachings of the Church's "Magisterial" and the word of Jesus himself. Bynum, Brandt, Friedman, Annang, and Tanner (2011) examined gender differences in HPV knowledge, beliefs, and vaccine acceptance among college students attending three historically black colleges/universities in the Southeast. The findings of Bynum et al. (2011) show that males were significantly less likely to have heard of HPV, scored lower in HPV knowledge. Males were also found less likely to perceive HPV health outcomes as severe and that there was a benefit to vaccinate, reported fewer cues for vaccine acceptance, and perceived more barriers to vaccination compared to females. These findings lead Bynum et al. (2011) to a conclusion that the gender disparities calls for the need to increase HPV-related communication/education to include men and to extend HPV research to a broader segment of the college population.

Tebeu et al. (2008) assessed the knowledge, attitudes, and assumption of cervical cancer by women living in Maroua, the capital of the Far North Province of Cameroon one of the developing countries in West Africa. Tebeu et al. (2008) surveyed 171 women for a one month period as to their socioeconomic status, sexual habits, prior knowledge of cervical cancer, its prevention, and their attitudes toward cervical cancer. Tebeu et al. (2008) found 28% had prior knowledge of cervical cancer while 72% were uninformed about cervical cancer and were mostly single mothers, illiterate, housewives, and had

their first child before the age of 20. Of the 28% of women who had prior knowledge, only a minority of them 8.3% underwent a preventative screening test. Tebeu et al. (2008) concluded that awareness of cervical cancer by women in Cameroon is still inadequate recommending the need of an aggressive campaign to make Cameroonian women aware of cervical cancer and its prevention. In comparison to the results of Tebeu et al. (2008), Marlow (2009) assessed HPV awareness and HPV vaccine acceptability in a sample of women representing the major UK ethnic minority groups. To ensure adequate representation of ethnic minority women: Indian, Pakistani, Bangladeshi, Caribbean, African and Chinese women as well as a comparison sample of white British women were included in the study sample. Marlow (2009) found the level of awareness of HPV were lower 6-18% among ethnic minority women than among white women 39%. Ethnicity and religion were strongly associated with acceptability of HPV vaccination that was highest among white mothers 63% and lowest among South Asians 11-25%, also less accepting of the vaccine (17-34%) was noted with the non-Christian religions. Marlow (2009) emphasized the need for more information; sex-related concerns and concern about side-effects were noted as the most common barriers to giving HPV vaccination suggesting that some cultural barriers could be addressed in tailored information aimed at ethnic minority groups given the importance of recording ethnicity as part of HPV vaccine uptake data. As a follow up to the 2009 findings, Marlow (2011) reviewed the knowledge, acceptability and attitudes about HPV and the HPV vaccine uptake to find out if there has been any improvement in the knowledge

level of the ethnic minorities. According to Marlow (2011) a lower level of awareness of HPV and lower acceptability of the vaccination could greatly affect the HPV vaccine uptake, which coincidentally was seen to have improved from the findings in 2009.

Allen et al. (2012) examined the parents' knowledge, attitudes, and decision-making with regard to obtaining the HPV vaccine for their daughters as a comparison to the results of Tebeu et al. (2008), and Marlow (2009; 2011). Allen et al. (2012) found a variation in preferences for involvement in decision-making; mistrust of medical providers and pharmaceutical companies; insufficient information to make informed decisions; concerns about vaccine safety; and mismatch between actual and preferred sources of information. On the basis of these results Allen et al. (2012) suggested ways of alleviating concerns about vaccine safety, which will help to improve vaccine acceptance through an improvement in communication between providers and caregivers and helping parents to access information necessary for informed decision-making. In comparison with the results of Allen et al. (2012), Gu, Chan, Twinn, and Choi (2012) assessed the knowledge and perceptions of cervical cancer risk and factors influencing utilization of cervical screening adopting the protection motivation theory (PMT) and empirical research to highlight the risk perception of Chinese women. Gu et al. (2012) found no significant association observation between previous screening uptake and PMT variables as all women considered themselves at low risk of cervical cancer. According to Gu et al. (2012) Chinese women demonstrated an unrealistic optimism about their personal risk of cervical cancer although these findings do not support an association between risk

perception and screening uptake. The significance of knowledge and culturally-relevant health behavior and beliefs about cervical screening for Chinese women in determining whether or not they receive screening was highlighted with a revelation of some possible factors influencing women's screening behavior (Gu et al., 2012).

In the United States, Griffioen et al (2012) used a semi structured interview to study the factors that influences mother's decisions to vaccinate their daughters against HPV and the perspectives of both mothers and daughters about HPV about HPV vaccine-related decision making. Griffioen et al (2012) found three primary factors influencing the mother's decisions to vaccinate their daughters against HPV: exposure to media reports/marketing; interactions with clinicians, friends, and family members and the mother's beliefs and experiences.

According to Hoque (2013) cervical cancer is a preventable disease, the primary cancer amongst women in South Africa. Hoque (2013) found 53.3% of the participants had heard about cervical cancer and its method of detection method, only 37.8% knew about HPV and having multiple sexual partners as a risk factor for cervical cancer. According to Hoque (2013) more than half (55.3%) were not aware that cervical cancer is preventable; 76.7% knew that Pap smear test is used for detection of cervical cancer although 79.3% who were sexually active and knew about Pap smear test had not been tested for personal reasons with the main reason being that they were not sick.

As a measure to analyze the factors that determine the use of cervical cancer preventive measures Kuitto et al. (2010) surveyed 760 women aged 14 to 65 in the

German Federal State of Mecklenburg-Western Pomerania and noted that knowledge did not have a significant impact on their behavior. Kuitto et al. (2010) also noted a positive connotation of cancer prevention measures and utility expectations, fear of cancer and high subjective risk perception were conducive to attendance at screening and HPV vaccination. According to Kuitto et al. (2010) women with a low socioeconomic status showed less attendance at the screening services, which was in contrast, as the women with a lower educational attainment and lower social class showed a higher HPV vaccination uptake.

There is evidence indicating that pediatricians and gynecologists are well placed to encourage parents to vaccinate their children Barnack, Reddy, and Swain (2010) surveyed parents to find out their willingness to vaccinate their children for HPV as well as the physicians intentions to encourage parents to vaccinate their children. According to Barnack et al. (2010), religiosity, some parents perceived their children as susceptible to HPV, and the negative consequences of HPV infection were significant predictors of parents' intent to vaccinate. Physician specialty and whether or not physicians would vaccinate their own children were significant predictors of physicians' intent to encourage parents to vaccinate their children. Barnack et al. (2010) suggested campaigns focused on strengthening the intentions of physicians in other specialties who serve children and their parents at increasing HPV vaccination should focus on educating parents about children's susceptibility to and the potential negative consequences of HPV infection. Barnack et al. (2011) did a systematic review of parental, attitudes, and behavior before

and after FDA approval of the quadrivalent HPV vaccine and the bivalent HPV vaccine to confirm their findings of 2010. The electronic database was searched from 2001 to 2011 and findings showed an increase from 60% in 2005 to 93% in 2009 for the percentage of parents who heard about HPV. Barnack et al. (2011) also noted an increase from 70% in 2003 to 91% in 2011 for those parents who had appreciation for the HPV infection and cervical cancer. The percentage of parents whose children received the HPV vaccine was found to peak at 84% in 2010 but dropped to 36% in 2011 so also was the intention to vaccinate that peak at 80% in 2008 but dropped to 41% in 2011. These findings led Barnack et al. (2011) to confirm the safety concerns that parents expressed suggesting the need for physicians to educate their patients providing parents with more information that will build their confidence in making an informed decision to vaccinate their children against HPV.

In Canada, Okoronkwo et al. (2012) examined the role of parental knowledge, and attitude in the decision to vaccinate their daughters with the HPV vaccines. The findings of Okoronkwo et al. (2012) confirmed those of Barnack et al. (2011) indicating that their knowledge had an effect on their negative attitude and decision to give consent to HPV vaccination. Okoronkwo et al. (2012) also recommended a sustained educational campaign designed to increase parent's knowledge about HPV and the HPV vaccine, especially prior to the beginning of school in the fall, as well as engaging family physicians to educate parents to increase the number that consent to have their daughters vaccinated against HPV.

Key Stake Holders Attitudes and Beliefs About Barriers and Facilitating Factors in the Development of a Cervical Cancer Prevention Program

Those who advertised the HPV vaccine strategically created an object market for women only by omitting the sexual themes in the marketing of these vaccines. Mishra and Graham (2012) interviewed vaccine scientists and public health nurses in Canada, as a means of illustrating the clinical, political, and practical complexities of introducing a new and controversial vaccine. The purpose of this study was to challenge the method that the HPV vaccine Gardasil and Cervarix were marketed and introduced to young women and girls with the presumption that they have the autonomy to acquiring the vaccine. According to Mishra and Graham (2012) the public acceptability of the vaccine was promoted by neglecting the clinical and sexual facts of the spread and prevalence of HPV infection and related cancers across genders and sexual orientations, a strategy that generated a blockage in discursion involving individualized risk and pharmaceutical control centered on female bodies.

To complement the work of Mishra and Graham (2012), and Mello et al. (2012) investigated the role played by the Merck & Co Inc. in the state HPV immunization policymaking, using a series of state case studies combining data from key informant interviews with analysis of media reports and materials retrieved from archives to elicit key stakeholders' perceptions of the appropriateness of these activities, and to explore implications for relationships between health policymakers and industry. Key informants from six states that were actively involved in HPV vaccine policy deliberations were

interviewed. Mello et al. (2012) found that Merck promoted school-entry mandate legislation by serving as an information resource, lobbying legislators, drafting legislation, mobilizing female legislators and physician organizations, conducting consumer marketing campaigns, and filling gaps in access to the vaccine.

Mello et al. (2012) also noted that Legislators relied heavily on Merck for scientific information and that most stakeholders found lobbying by vaccine manufacturers acceptable in principle, but perceived that Merck had acted aggressively and non-transparently in this case. These findings led Mello et al. (2012) to conclude that although policymakers acknowledge the utility of manufacturers' involvement in vaccination policymaking, industry lobbying that is overly aggressive, not fully transparent, or not divorced from financial contributions to lawmakers' risks undermining the prospects for legislation to foster uptake of new vaccines.

Herzog, Huh, and Einstein (2010) examined the various approaches used to screen patients for cervical cancer providing some recommendations on how to improve the acceptance and uptake of HPV vaccines in the United States. According to Herzog et al. (2010) setting up guidelines for vaccination are developed by national advisory groups, but successful implementation requires a supportive infrastructure and the cooperation of providers, clinicians, and patients. HPV vaccination has been available in the United States since 2006 and screening practices have been updated to also include HPV genotyping. However, many clinicians fail to adhere to the guidelines for HPV testing and HPV co-testing, as part of cervical cancer screening, and vaccination

coverage has been poor among females aged 11 and 12, the group for which vaccination is recommended by all organizations. Herzog et al. (2010) suggested that policies that influence HPV vaccination and screening should be reassessed at multiple levels in order to achieve more effective implementation and regular use.

As a means of promoting ideas on vaccine uptake, staff's information needs, return of consent forms, and uptake of the vaccine among minority groups Rose, Lanumata, and Lawton (2011) attempted to investigate the knowledge and views of school staff about HPV vaccines knowing that most program utilized the school-based HPV / cervical cancer vaccination programs. Rose et al. (2011) found 58% of the participants knew about the link between HPV and cervical cancer, and that HPV is passed on during sexual contact. 71% disagreed that vaccination would increase sexual activity at a younger age, while 23% were unsure, 6% agreed. According to Rose et al. (2011) majority of staff agreed that vaccine uptake could be improved through provision of information and consent forms in indigenous and Pacific languages; ensuring parents are well-informed and girls educated about the vaccine; involving community groups and by extending availability of the vaccine into community settings as well as school and primary care. In conclusion, Rose et al. (2011) stated that teachers are a very important group of stakeholders and potential health advocates who need to have appropriate information so that they can support girls and their parents in deciding whether to have the vaccine.

Francis, Leser, Esmont, and Griffith (2013) examined the level of knowledge and experience of key stakeholders in Sub-Saharan Africa, South Asia, and Latin America regarding cervical cancer, given the current screening and treatment policies. The aim of this study was to identify the barriers and factors that could facilitate the implementation and uptake of the HPV vaccines. Francis et al. (2013) conducted an in-depth interview of key stakeholders in Cape Town and Johannesburg, which revealed several key findings such as knowledge about HPV and cervical cancer varied across participants, while the knowledge about the relationship between HPV and cervical cancer was low. Francis et al. (2013) found the knowledge about cervical cancer was also mixed amongst the participants. These findings suggested that in addition to the key stakeholders believe that the government, families, and the media need to play a prominent role in prevention efforts they are also concerned about women's health and wellbeing.

Blackwell (2013b) stated that some Catholic leaders have objected to the vaccine on the basis that the shots protect against a sexually transmitted virus, while the church teaches young people to stay abstinent outside of marriage. The chairman of an Alberta Catholic school board angrily rejected renewed calls to let his students be immunized against HPV in school, suggesting vaccine advocates were tempting children to defy teachings of the Church's "Magisterial" and the word of Jesus himself.

Healthcare providers and other stakeholders make efforts to help policy makers in the development of an appropriate health management policy. Using the Yaoundé population, Enow-Orock et al. (2012) studied the incidence and trends of cancer within

the period 2004–2011. Tables 3 and 4 illustrate findings of this study showing a total of 651 new cases who were diagnosed representing 22.4% among female cancers, 13.8% of all cancers. According to Enow-Orock et al. (2012) the Squamous cell carcinoma represented 69.8% histologically verified cases of cervical cancer, while 5.7% were adenocarcinoma with 4% of unspecified cancer unspecified and others 21.5%.

Table 3

Frequency in Percentage by Cancer Types in Cameroon West Africa.

S/N	Cancer	Frequency	%
1	Breast	869	18.5
2	Cervix	651	13.8
3	Non Hodgkin lymphoma	559	11.9
4	Prostate	342	7.3
5	Kaposi Sarcoma	321	6.9
6	Liver	141	2.9
7	Colorectum	135	2.9
8	Soft tissue	133	2.8
9	Ovary	110	2.4
10	Skin	108	2.3

Retrieved from Enow-Orock et al. (2012) who concluded that cancer is a public health problem in Cameroon stressing the important of monitoring the cancer incidence and trends in order to develop an adequate and sustainable plan of care to prevent cancer occurrence in the country.

Table 4

Cervical Cancer Avoidable in Different Countries by Screening Efficacy and Vaccination Coverage

Screening efficacy	**HPV vaccine coverage**
85%	*50%*
85%	95
50%	82
10%	67
0%	64

From "United States Cancer Statistics: 1999–2010 : United States Cancer Statistics Working Group. Incidence and Mortality." Web-based Report. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute, 2013. Retrieved from: http://www.cdc.gov/uscs.

Colgrove, Abiola, and Mello (2011) examines how two defaults policies influences the controversial behaviors of parents towards giving consent to immunizing their sons with the HPV vaccines at school although these defaults may also encourage some health behaviors. Colgrove et al. (2011) found consent was higher in those parents who opted in to their children receiving the vaccines alongside other vaccines compared to those parents who opted out if the HPV was given as a single vaccine. These findings showed that the default policies did not have much effect on the parents that were undecided about the HPV vaccines. Colgrove et al. (2011) found that Parents are very critical to the success of school-located vaccination programs because they must consent to their children receiving vaccines at school in most instances a result that was similar to those of English et al. (2008) and Chapman et al. (2010). Colgrove et al. (2011) concluded that offering additional vaccines may help emphasize the benefits of

adolescent vaccination rather than the controversial nature of the HPV vaccination, a strategy that could be more effective for those parents who are willing to vaccinate their teenager. Meanwhile those parents who are undecided will need an increase in their level of awareness and knowledge about HPV vaccines for males. Colgrove et al. (2011) carried out a similar study for girls in North Carolina and found that approximately half (47%) of parents agreed that laws requiring HPV immunization for school attendance "are a good idea" when opt-out provisions were not mentioned while 84% agreed that "these laws are okay only if parents can opt out if they want to." Most of the parents 95% according to Colgrove et al. (2011) were less likely to agree with vaccine requirements as a good idea if they expressed concerns related to HPV vaccine safety. The conclusion was that parental acceptance of school requirements depended on perceived HPV vaccine safety and efficacy, understanding of the optimal age for vaccine administration, and inclusion of opt-out provisions.

Research Conducted Posticensing of the Vaccine

McKeage and Romanowski (2011) explained how the HPV vaccines and made and how it functions stating that the AS04-adjuvanted HPV 16/18 vaccine (Cervarix) is a noninfectious recombinant vaccine produced using purified virus-like particles (VLPs) that induce a strong immunogenic response eliciting high levels of anti-Ll VLP antibodies that persist at levels markedly greater than those observed with natural infection. According to McKeage and Romanowski (2011) AS04 is composed of monophos-phoryl-lipid A, which enhances cellular and humoral immune response,

adsorbed to aluminum hydroxide. As McKeage and Romanowski (2011) reported, the vaccine is indicated for the prevention of pre- malignant cervical lesions and cervical cancer causally related to certain oncogenic HPV types in females aged 10 years and above. When administered in three doses over a six months period according to McKeage and Romanowski (2011) the AS04-adjuvanted HPV 16/18 elicits a high immunogenic response and is highly protective against cervical intraepithelial neoplasia and infection causally related to high- risk oncogenic HPV types. McKeage and Romanowski (2011) further reported that high levels of immunogenicity and protection were sustained for follow-up periods of up to 8.4 years during a well-designed clinical trials conducted in young women aged 15-25 years who were HPV 16/18 seronegative and DNA negative to 14 HPV high-risk types. According to McKeage and Romanowski (2011) high and persistent immunogenicity against infection with HPV 16/18 was also demonstrated in older and younger females aged 10-55 years who were seronegative for vaccine HPV types. As McKeage and Romanowski (2011) explained the AS04-adjuvanted HPV 16/18 vaccine confers cross protection against certain non-vaccine, high-risk HPV types elicited a greater immunogenic response than the quadrivalent HPV vaccine in women aged 18-45 years who were seronegative and DNA negative for HPV 16/18. As McKeage and Romanowski (2011) stated, the AS04-adjuvanted HPV 16/18 vaccine is generally well tolerated, and pharmacoeconomic analyses have demonstrated the potential for public health benefits and cost effectiveness when vaccination programs are run in conjunction with screening programs. Thus, the AS04- adjuvanted HPV 16/18 vaccine according to

McKeage and Romanowski (2011) prevents cervical disease associated with certain oncogenic HPV types, thereby reducing the burden of premalignant cervical lesions and, very likely, cervical cancer.

Naleway et al. (2012) assessed young women's experiences with their first dose of Gardasil for HPV4 and found a 78% participants reported pain at the injection site while17% bruising, 14% discoloration and pre-syncope or syncope 15%. The results of Naleway et al. (2012) is found to be in contradiction to those of McKeage and Romanowski (2011) who reported that the AS04-adjuvanted HPV 16/18 vaccine is generally well tolerated demonstrating a potential public health benefit and cost effectiveness.

In 2010 Cameroon received a free donation of HPV vaccine (Gardasil) in an effort to increase the immunization of young girls of ages 9-13 in the North West of Cameroon. Wamei (2010) evaluated the effectiveness of the Cameroon Baptist Convention Health Services (CBCHS) campaign program in sensitizing parents/guardians to encourage HPV vaccine uptake. For the purpose of this study, Wamei (2010) examined the factors that influenced the use of cervical cancer screening services among mothers as well as parental decisions to vaccinate their daughters. Wamei (2010) found that 75.5% of the participants understood HPV is sexually transmitted, knew about HPV and other cervical cancer methods of prevention and HPV vaccines 90.3% as a method of prevention. According to Wamei (2010) 31.8% effectiveness of the vaccine was noted and the major barrier for parents to vaccinate their daughters was the

side effects/safety 18.4% and perceived risks. Wamei (2010) also noted that 35.3% reported the use of a cervical cancer screening services, a result that was significantly higher than other parts of sub-Saharan Africa. These findings confirmed the effectiveness of a community-based method of sensitizing targeted populations such as parents/guardians, who are critical decision-makers for vaccine delivery to children as well as the public to increasing awareness.

The Gardasil Access Program (GAP) provides free HPV vaccine to organizations and institutions in lowest income countries. Ladner et al. (2012) studied the effectiveness of this program in seven lowest income countries. According to Ladner et al. (2012), the local institutions are responsible for the development, implementation, and management of these HPV vaccination programs taking into considerations their characteristics, target population, and communication delivery strategies. After completion of the vaccination campaign (three doses), these institutions were made to submit a report showing the data on the doses administered and the vaccination models used. The vaccination coverage and adherence were the two indicators used for the calculation. The training and logistics resources; communication and sensitization; government and community involvement; and challenges were also taken into considerations. Ladner et al. (2012) found that of the eight programs implemented in the seven countries, which targeted a total of 87,580 girls, 76,983 girls were able to complete the full course by receiving all three-doses of the vaccine. A 90.9% rate of mean adherence between the first and third doses of vaccine was noted. The school based delivery model was used by three programs; the health

facility-based models were used by two programs while three programs used both the schools and health facilities considered as the mixed models. The most effective at reaching girls aged 9-13 were the school-based model although the mixed models comprising school and health facility-based vaccination had better overall performance compared with models using just one of the methods. Ladner et al. (2012) saw a positive correlated with the number of vaccination sites with an increased rate of program coverage and adherence. The school based models showed a lower risk of girls being lost to follow-up and vaccinations conducted within the academic year limit the number of girls lost to follow-up and a high level of coordination and logistics to facilitate vaccination administration. In conclusion, Ladner et al. (2012) stated that the mixed models that incorporate both schools and health facilities was seen as the most effective at delivering HPV vaccine, a lesson that could be used for public health programs and policies development going forward

According to Ribassin-Majed, Lounes, and Clémençon (2012) the vaccine coverage is low in France, which caused them to examine the policies affecting the use of HPV vaccination to decrease the incidence of HPV infections and of cervical cancers. Ribassin-Majed et al. (2012) found a 32% and 83% reduction in the incidence of cervical cancers due to HPV 16/18, expected to occur after 20 years and 50 years of vaccine introduction respectively assuming the vaccine coverage and screening rates remain constant. On the other hand, vaccinating the men showed an improved effect on cervical cancer incidence only moderately, compared to strategies in females only. Ribassin-

Majed et al. (2012) concluded that supplemental strategies in females could help to improve cervical incidence although the current vaccination policies may significantly decrease cervical cancer incidence and improve vaccination efficacy.

The Role of Health Care Providers in Cervical Cancer Prevention

Ylitalo, Lee, and Mehta (2013) HPV examined the racial/ethnic differences in the prevalence of healthcare provider recommendations for HPV vaccination and the association between recommendation and vaccination. Ylitalo et al. (2013) found that while 56.9% of female adolescents received a recommendation for the HPV vaccine, 95% adolescents with a recommendation were almost five times as likely to receive a vaccine as those without a recommendation. The association between recommendation and vaccination appeared strong for all racial/ethnic groups although racial/ethnic minorities were less likely to receive a recommendation. Ylitalo et al. (2013) concluded that racial/ethnic minorities and non-Hispanic Whites were equally likely to obtain an HPV vaccine after receiving a recommendation although provider recommendations were strongly associated with HPV vaccination suggesting that vaccine education efforts should target health care providers to increase recommendations, particularly among racial/ethnic minority populations.

Jim et al. (2012) studied the HPV vaccine knowledge, attitude and practices amongst healthcare providers working with American Indians/Alaska Natives because American Indian/Alaska Native women are known to have a higher rate of cervical cancer incidence compared to non-Hispanic white women. Jim et al. (2012) found that

96% of Providers were more likely to administer vaccine to 13-18 year old while 89% recommended the vaccines to 11-12 years old and 64% to 19-26 years old. While funding was the main barrier for 19-26 years old, parental safety and moral/religious concerns were perceived barriers to HPV vaccination for 9-18 year old. On the whole Jim et al. (2012) found that providers were very knowledgeable about HPV, although nearly half of all providers and most obstetricians/gynecologists thought that a pregnancy test should precede vaccination. Jim et al. (2012) also found that 64% of providers of patients receiving the vaccine do not routinely discuss the importance of cervical cancer screening and recommended that provider education efforts should stress that pregnancy testing is not needed before vaccination and the importance of communicating the need for continued cervical cancer screening.

Naki et al. (2010) evaluated the level of awareness, knowledge, and attitudes of healthcare providers working in other specialties than obstetrics and gynecology at the Dr. Lutfi Kirdar Education and Research Hospital towards HPV infection and vaccine. While consent levels for vaccine administration for themselves were similar for physician and non-physician subjects, the frequency of subjects favoring vaccine administration for their offspring was significantly higher among physicians. Naki et al. (2010) also found that cervical cancer, HPV vaccine, and types of HPV vaccine were significantly higher in the physician group. The physician knowledge level in relation to HPV was significantly higher when compared to the non-physician staff. Naki et al. (2010) concluded that physicians were more competent on the relation of HPV infection to cervical cancer and

more aware of the presence and types of HPV vaccines which may lead to higher degree of willingness for vaccination when compared with non-physician healthcare providers.

In comparison with the results of Naki et al. (2010) and Jim et al. (2012), Wong et al. (2013) explored the knowledge, attitude, practice, and barriers to prescribe HPV vaccines among private primary care physicians in Hong Kong. Wong et al. (2013) found that only 27.9% were able to give accurate responses to the questions about the knowledge on the prevalence of cervical HPV and 13.1% genital wart infection among sexually active young women in Hong Kong, and only 44.4% correctly answered the questions on cervical cancers caused by HPV. As regards the attitude, Wong et al. (2013) found 68.3% agreed that HPV vaccination should be fully paid by the government as an important public health strategy while 52.2% that vaccination against HPV was more important than those for genital herpes and 50.1% Chlamydia for adolescent health. Wong et al. (2013) also noted that majority selected adolescents aged 12-14 years as the ideal group for vaccination with 30.9% for Gardasil compared to 28% Cervarix were almost equally preferred. The most significant barriers to prescribe HPV vaccines consisted of parental refusal due to safety concerns (48.2%), and their practice of advising vaccination was mostly affected by local governmental recommendations (78.7%). While the factors that influenced the choice of vaccines were 61.1% the strength of vaccine protection, 56.8% were for long-lasting immunity and 55.6% good antibody response. With respect to recommending the vaccines, Wong et al. (2013) found 83.8% of physicians had recommended HPV vaccines for their female clients/patients aged 18-

26 years for protection of cervical cancer or both cervical cancer and 85.5% genital warts. Wong et al. (2013) came to a conclusion that the knowledge on HPV infection was low among physicians in Hong Kong mean while the prescription of HPV vaccine was hindered by the perceived parental concerns and was mostly relied on governmental recommendations. Wong et al. (2013) further suggested that, educational initiatives be targeted toward both physicians and parents, and that the government should consider full subsidy to enhance vaccine uptake rate.

Theoretical Framework Utilized in Previous Studies

The women's beliefs were seen as a factor that influenced cervical cancer screening using the Pap test. Ackerson (2011) explored inductively African American women's use of Pap smear screening services considering how well the data did or did not affirm the usefulness of the interaction model of client health behavior (IMCHB). Ackerson (2011) used the IMCHB as a guide to exploring the women's social influence and previous health care experience and their influence on the women's cognitive appraisal associated with Pap smears and cervical cancer. Analysis revealed that the IMCHB was useful for framing cervical cancer screening health behavior research because data from both groups fit well onto the framework as well as the routine-use group fit the entire model, with a repeat behavior in cervical cancer screening. Ackerson (2011) also found that the non-routine-use group also fit the model, but their iterative behavior in cervical cancer screening was intermittent due to negative personal influences. Ackerson (2011) concluded that this model can provide a focus to the delivery

of gynecological care based on a client's unique characteristics that can be addressed with individualized nursing interventions designed to promote positive health outcomes.

Guvenc, Akyuz, and Açikel (2011) stated that although the champion HBM scales have been tested extensively for breast cancer and screening for this, evaluation of these scales in explaining the beliefs of women with regard to cervical cancer and the Pap smear test has only received limited attention. According to Guvenc et al. (2011) the actor analysis yielded five factors: Pap smear benefits and health motivation, Pap smear barriers, seriousness, susceptibility and health motivation. These findings led Guvenc et al. (2011) to the conclusion that the HBM scale for cervical cancer and the Pap smear test was a valid and reliable tool in assessing the women's health beliefs and understanding the beliefs of women in respect of cervical cancer and the Pap smear test will help healthcare professionals to develop more effective cervical cancer screening programs. Chania et al. (2013) set out to confirm the findings of Ackerson (2011) which suggested that better Health education programs using the HBM could play a role in modifying the women's belief and motivate them to consider adopting preventive health behaviors as it was the case with African American. A group of 300 women in two prefectures of southern Greece received a health education intervention for cervical cancer prevention. Chania et al. (2013) used the Health Believe model including lectures, discussions and leaflets; a 120-minute health education intervention was given to an experimental group. Chania et al. (2013) developed the following hypotheses which states: "will this brief intervention change women's beliefs (perceived susceptibility to cervical cancer, benefits

and barriers of undergoing the Pap test)? b) will this change in beliefs sustain in six months follow-up period? and c) will women undergo Pap test in six months period?" Chania et al. (2013) found that the health education intervention had significantly modified the women's beliefs and behaviors towards Pap test. According to Chania et al. (2013) the sense of susceptibility towards the disease and the benefits of prevention which were sustained or improved after six months were found to be the greatest changes observed in the women's beliefs. Pain, embarrassment, and worry for the results, which decreased immediately after the program but started relapsing in the six month follow-up period were found to be the Perceived barriers to undergo the Pap test. As Chania et al. (2013) stated with an 88.1% going for a Pap-test during the following six months was a clear indication that the health education intervention modified women's beliefs and behavior about cervical cancer prevention.

Urrutia and Hall (2013) tried to develop and validate a questionnaire that could be used to examine women's beliefs about cervical cancer and the Pap test in Chilean women. Urrutia and Hall (2013) found that after computing six models, the questionnaire was reduced from 53 to 28 items that included six domains: the barriers domain to take a Pap test; the cues to action domain; the severity domain; the need to have a Pap test domain; the susceptibility to cervical cancer domain; and the benefit domain. Urrutia and Hall (2013) concluded that the CPC-28 questionnaire will have important implications on research, education, and administration across disciplines. Suggesting that, Nursing

curricula, and health care providers must stress and reinforce the importance of prevention of cervical cancer and regular Pap test screenings for clinical relevance.

Jalilian and Emdadi (2011) studied the factors that relate to doing regular Pap-smear test based on the theory of planned behavior amongst women aged 20 -70 years in Hamadan County, the west of Iran, during 2009. Findings showed 63.8% of the women had already done Pap smear test at least once, 28.3% had followed a regular Pap smear program. According to Jalilian and Emdadi (2011) a significant correlation was noted between family history of cervical cancer and undergoing regular Pap smear test as well as between age and undergoing regular Pap smear test. Jalilian and Emdadi (2011) concluded that the best predictor for regular Pap smear testing was subjective norms. Over the years the theories of health behavior have guided thousands of studies.

Gerend and Shepherd (2012) did a comparison of two classic theories of health behavior-the HBM and the Theory of Planned Behavior (TPB) in their prediction of HPV vaccination. After watching a gain-framed, loss-framed, or control video, Gerend and Shepherd (2012) led the women ages 18-26 to complete a survey assessing HBM and TPB constructs and HPV vaccine uptake was assessed 10 months later. It was noted that the message framing intervention had no effect on vaccine uptake and that the TPB consistently outperformed the HBM although support was observed for both the TPB and HBM. Subjective norms, self-efficacy and cost of the vaccine were found to be the key predictors of uptake. Gerend and Shepherd (2012) concluded that there was a considerable overlap between the two theories although there was an observed advantage

of the TPB, highlighting the importance of proximal versus distal predictors of health behavior.

Summary of Literature Review

Previous studies shows that parents have reported that physician's recommendations for the HPV vaccine were increasing. Healy (2013) explained that the number of parents who do not think that they would get their daughters vaccinated increased from 40% in 2008 to 44% in 2010 (Healy 2013). Having access to licensed healthcare professionals could be a big challenge in addition to language barrier as well as "cultural stigma" associated with seeking professional help and concerns about confidentiality, lack of knowledge about available services, which may be particularly problematic among immigrant groups because some immigrants may believe that HPV vaccines causes sterilization, and promotes promiscuity (Guion, Kent, & Diehl, 2009). Such a misperception can aggravate the already wide disparity between need for health services, the availability, limited or no insurance coverage or other means of paying for services, reliance on nonprofessional sources of support, especially family members and friends, as well as the use of alternative sources of help such as herbalists and spiritual leaders (Guion et al. 2009).

Chapter 3: Research Method

Introduction

This chapter explains the methodology that was used to study the perceptions of cervical cancer prevention and predictors of acceptance of HPV vaccines among the Cameroonian women residing in the Maryland-Washington Metropolitan Area. The research design and approach is discussed including the population and sample, the qualitative survey instrument, informed consent, data collection and analysis, and the ethical consideration of participants.

Research Design and Approach

A qualitative study design was used to explore the health seeking behavior of Cameroonian women. This study was primarily designed to assess the cervical cancer screening and HPV vaccine acceptability by the Cameroonian women. A qualitative research method was chosen to explore the meanings and perceptions of Cameroonian women regarding cervical cancer prevention, including their awareness and health seeking behavior for cervical cancer, and to understand the factors affecting decision making to seek treatment.

The perception of the Cameroonian women with respect to cervical cancer prevention was obtained at four Cameroonian cultural associations in the Maryland-Washington Metropolitan Area using a qualitative survey. The survey was self-administered and anonymouswith open-ended questions addressed to the women 18 years of age and above. Each participant received a written explanation about the objectives of

the study. I sought permission from the leaders of these cultural associations who had the ability to allocate a slot on their meeting agenda for me to make a presentation of the research purpose to meeting members, clarify any doubts they presented, and convince them to participate in the study. The survey contained open-ended questions covering the following topics: (a) knowledge of epidemiology of cervical cancer; (b) risk factors; (c) HPV infection and link to cervical cancer; and (d) screening methods and practices as well as their perception about using the HPV vaccines as a preventive measure. Some educational and promotional materials and activities also served as methods of learning about the program and providing an opportunity for the women to express opinions about the implementation of the vaccination program as well as factors that influenced acceptance or lack of acceptance of the program, and suggestions for program improvements.

Setting and Sample

I am Cameroonian and personally knew the leaders of the traditional and cultural associations from which the sample was drawn for this study. I wrote official letters to the leaders of each association requesting their permission to obtain data from the members of their association. The participating cultural associations were: the FEDFED cultural association; the UBA cultural association; the AKUNUI BUJANTEH WOMENS association; and the BNCA cultural association.

I met with the leaders of the various traditional and cultural associations to discuss the importance of the study in order to gain their confidence and permission,

because they could to allocate a slot on their meeting agenda for me to make a presentation about the research purpose to their members, clarify any doubts, and convince them to participate in the study. The leaders and the members were informed that those who decided to participate were not to be compensated as they were participating in the study on a voluntary basis.

Sampling Method

The study participants were selected from four traditional and cultural associations by asking women to volunteer and participate in the study. Four cultural and traditional associations were randomly selected from the many different Cameroon tribal conclaves in the Maryland-Washington Metropolitan area that held their cultural and traditional association meetings on a monthly basis.

Invitation letters were sent to the leaders of the four traditional and cultural associations inviting them to meet with me to discuss the research study and the possibility of granting me a slot in their meeting agenda to make a presentation to their members during their meeting session. These leaders then informed their members that they were going to have a guest speaker during their next meeting session. I attended the scheduled association meeting, during which I made a presentation to the entire meeting, answering all questions that they had and clarifying any uncertainties and I was able to convince them to participate in the study. Those who volunteered to participate were given a survey to handwrite their responses. Participants were allowed to take the survey home to complete and return it during the next meeting date or via the U.S. Postal Service

using the self-addressed and stamped envelopes given to them in order to ease the process. I attended the next meeting to collect the completed survey. A locked drop box was also provided for those who brought in their responses when I was not there to collect them. It was estimated that about 20-25 women out of about 200 women who attend the various traditional and cultural associations would volunteer to complete and submit the survey (Creswell 2009).

The open-ended survey questions addressed issues about awareness, attitude toward, and beliefs about the use of HPV vaccines and other cervical cancer screening services. It was noted that Fazekas, Brewer and Smith (2008) as well as Gerend and Magloire (2008) used this type of survey to assess the acceptance of HPV vaccination. This method of gathering information was designed to measure behavior, opinions, and other variables that could be difficult to collect using other methods such as observation and face-to-face interviews as this is a very sensitive issue. Although it could be problematic if the participant was not truthful due to cultural beliefs about sharing their private life experiences, Kahn et al (2008) also used this method to compare HPV status and personal belief. For the purpose of this study, it was advantageous to work with a survey individually designed for this study to ensure that the questions being asked got to the root of and answered the research questions. This qualitative survey research design relied heavily upon the information that was used as a means of collecting verbatim statements from participants. This written open-ended survey allowed participants to offer responses within their own unique context, and the value of the information

provided was very high. Although open-ended responses may be problematic to deal with in large numbers, this qualitative study was based on a small scale.

The members of the cultural and traditional associations convened on a monthly basis for solidarity purposes, practicing their cultural norms and contributing funds to help its members during emergencies situations such as sickness and death, graduation ceremonies, or birth of a child as well as developmental projects in Cameroon. This presented a convenient location to contact Cameroonian women who were willing to participate in this study. These women were of various religious denominations and various levels of education and professional background, factors that could influence their beliefs regarding health practices.

The information obtained was managed, analyzed, and interpreted using the NVivo. The reason for choosing this age group was because in 2006, Gardasil vaccine was approved by FDA for women and children during their teenage years before they became sexually active. According to Sandelowski (1995) determining adequate sample size in qualitative research was ultimately a matter of judgment and experience. Women 18 and above were easier to deal with or convince because of their level of acculturation, understanding, cooperation, and response rate compared to the younger girls less than 18 years of age who were minors, requiring special considerations including parental consent.

Data Collection and Analysis

Data was collected using a survey with open ended questions answered by individuals who volunteered to participate. The survey questions were handed out to the women who volunteered to participate. These women were instructed to write their responses to the questions in the space provided and return to the researcher. Participants were allowed to take the survey home to complete and return during the next meeting date or mail by US postal services as they were given self-addressed and stamped envelopes to ease the process. The researcher was present at the next meeting to collect the completed survey. A locked drop box was also provided for those who brought in their responses when the researcher was not yet there to collect them. A qualitative survey research design relied heavily upon the information that was used as a means of collecting verbatim statements from participants. This written open-ended survey allowed participants to offer responses within their own unique context, and the value of the information provided was very high. Although open-ended responses may be problematic to deal with in large numbers, the NVivo software was used to analyze and modify to gather themes for this study. Major themes were derived from the theoretical frame work of the HBM and TPB. The researcher identified emergent themes, and then coded each theme to delineate individual topics identified from the responses. Statements were grouped by code to the corresponding theme. The findings were then presented in narrative forms by thematic areas using the HBM and TPB as the theoretical framework.

The researcher was able to obtained responses from 30 participants although she handed out as many surveys as possible, with estimation that at least 20 - 25 participants would be able to complete and return the surveys. The NVivo computer software was then used for data coding and analysis, organization and storage. Descriptive statistics was used to describe demographic information about the study participants. As Creswell (2013) recommends qualitative data analysis requires a mixture of steps: summarizing the prevalence of codes, discussing similarities and differences in related codes across distinct original sources/contexts, or comparing the relationship between one or more codes. Creswell (2013) recommends computer software for storing large amount of data to avoid losing and information, easy to retrieve and manage. The NVivo Computer software was ideal for this qualitative study because it has the ability to improve efficiencies in revising the codes, editing, peer reviews, sharing the work and recursive examination of the data. According to Bazeley (2007) NVivo facilitates several aspects of the qualitative research process by recording information, organizing and coding texts, as well as developing systematic links between texts and emerging theoretical concepts, linking codes to concepts, making comments, making notes, exploring various patterns in the data, grouping and conceptualizing their findings, creating documents and organising them in categories.

Instrumentation and Materials

A few questions were selected from previous studies by Kahn et al. (2008) and modified to address the research questions for this study. The topics included: the

perceived susceptibility and severity of the disease, and perceived benefits and barriers of seeking treatment. In addition, items to promote discussion on etiology, mode of transmission, treatment options, attitude of the community towards women affected by cervical cancer, and prevention strategies were also included. The purpose and objectives of the study were explained to the participants, as well as an assurance of the confidentiality of their identities. The meetings with the leaders of these associations were facilitated by the researcher. Each session lasted approximately 30-45 minutes. Participants were encouraged to answer the questions freely, honestly and completely to the best of their abilities.

Survey questions that would meet the study purpose were developed using a proposed modified version of a qualitative survey developed by Kahn et al. (2008). The original survey was tested for validity and reliability in Kahn's "attitudes about HPV vaccines in young women" study published in the International Journal of STD & AIDS in 2008. Kahn et al. (2008) validated the survey in racially and ethnically diverse samples of teenage women and found it to have high internal consistency reliability using a Crombach's coefficient alpha (alpha = 0.82). Dr. Kahn was contacted and she gave written permission to use her tool for this specific research study. A second instrument used for this study was by Griffioen et al. (2012) titled, "Perspectives on decision making about human papillomavirus vaccination among 11- to 12-year-old girls and their mothers". The survey itself covered a range of issues, including (1) demographic and socioeconomic data, (2) cervical screening tests knowledge, (3) beliefs and attitudes

toward cervical screening tests and cervical cancer, (4) reasons for accessing cervical screening, (5) health practices, and (6) perceptions of healthcare services. Some of the structured questions on the original tool were modified to open-ended questions. Those questions that were not useful to this study were deleted and some basic demographic questions retained. The items of this survey focused on cervical cancer and prevention awareness, cervical cancer screening tests knowledge, beliefs and attitudes towards cervical screening tests and cervical cancer, reasons for accessing cervical screening, health practices, perceptions of healthcare services, and behavior about reproductive health matters based on literature review. After collection, the data were coded; analyzed and interpreted using the NVivo software and the results were presented according to (Miles & Huberman, 1994).

Protection of Human Participants and Ethical Consideration

Ethical issues includes: confidentiality, consent, disclosure, competence, conflict of interest, grossly unethical behavior, and the overall ethical stance and actions of the program (Bouman & William, 2010). Creating policies that upholds these standards, paves the way to a successful, respectable and credible project within the community system such as the Cameroon community. Obtaining informed consent could be complicated by differing norms, concerns and expectations across the various cultural groups and associations about signing documents. For the purpose of this project the two ethical issues considered were confidentiality and consent which were considered to be the most familiar ethical issues most probably because they could be easily violated. In

order to protect both the participants and the cultural and traditional associations, it was expected that participants' information and communication be it in the form of a conversation, written answers, and they must be kept confidential. The researcher had respect for each and every participant, provided appropriate responses and maintained confidentiality at all times (Gerrish, 2010).

The researcher adhered to the ethical principles outlined by An Bord Altranais (ABA) 2007. The following are the ethical principles according to Caroll (2011); Respect for persons/autonomy, Beneficence and Non-Maleficence, Justice, Veracity, Fidelity and Confidentiality. The National Advisory Guidelines, according to Bouman and William (2010), stressed the importance of avoiding the use of subjects merely because of their easy availability, low social or economic status or limited capacity to understand the nature of the research. Respect for the person requires meaningful, informed and voluntary consent.

The purpose of this consent was to acknowledge every participant's right to make informed decisions, and respect of their autonomy. The researcher disclosed information on all aspects of the proposed research study, including; aim of study, possible risks and benefits of the study, any discomfort or inconvenience they might experience, methodology used and the participants right to stop the survey at any time and without prejudice (Caroll, 2011).

The researcher clarified all doubts and ensured that the consent was comprehensible and fully understood by each participant and that they are legally and

mentally competent in making their own decisions to participate in the study voluntarily. The researcher ensured that participants were not manipulated or intimidated to participate in the study (Caroll, 2011).

The researcher maintained confidentiality by securely and storing all data gathered from the survey containing any private information (Gerrish, 2010). The consent was clarified once again but their names and identity were not disclosed at any time and they were given copies of the consent form. They were made to understand that the data would be seen by Ethical review committee and would be published in journal and elsewhere without giving their names or disclosing their identity.

Research participants were given copies of the informed consent although they did not sign it. By completing the survey it was accepted as an implied consent or their acknowledgement and willingness to participate in the project.

The participants comfort level was another possible challenge given the sensitive nature of HPV vaccine as people sometimes do not feel comfortable talking about their sex life. According to Lewis et al. (2007), the researcher needed to have a deeper understanding of the background information, know the questions very well and also develop self-confidence to ease the discussions, modified some of the questions as well as those responses that called for more questions and how such questions would be coded for subsequent analysis to overcome the challenge.

Dissemination of Findings

Upon completion of the project the researcher will disseminate or communicate the findings in order to research colleagues and the supervisor of the university. The researcher will make a copy of the research paper available to: the library of Walden University; the leaders of the various traditional and cultural associations in the Maryland-Washington Metropolitan area. One of the major purposes of this research project is to disseminate the findings to the Cameroon government officials as well as other community members and other stake holders in Cameroon who are responsible for making healthcare policies about using the available cervical cancer screening services including HPV vaccinations. Reducing the cervical cancer related mortality and morbidity rate and improving the health status of the women both here in the Diasporas and in Cameroon is the ultimate goal of this research project.

The entire research study will be published on ProQuest, EbscoHost, journals, newspapers, university libraries. Feedback forms will be used to inform community members about cervical cancer risk and preventive measures. Suggestions for reducing cervical cancer risks will be disseminated amongst the Cameroon community through presentations, newsletters, Photo voice projects, community forums and informational meetings with key stakeholders, decision makers, traditional leaders, leaders of the various traditional and cultural associations. The results of this study will be used to develop strategies and write up proposals for policy changes to the Cameroon

government giving suggestions on how to educate the general public about cervical cancer screening, other preventive measures such as the use of HPV vaccinations.

Summary

The methodology chosen for this study was a qualitative research method within a two months period through which the researcher investigated how Cameroonian women make health-seeking decisions regarding cervical cancer screening and prevention. Meeting group discussions were held with the leaders of the various traditional and cultural associations of Cameroonian women residing in the Maryland-Washington Metropolitan area. The survey was used to assess the Cameroonian women's knowledge, beliefs and perception about cervical cancer and HPV vaccine for cervical cancer prevention.

Chapter 4: Results

Introduction

The purpose of this study was to determine the knowledge level, beliefs, and attitudes of Cameroonian women residing in the Maryland-Washington Metropolitan Area about the HPV vaccine as well as the factors that influenced their acceptance and usage of the HPV vaccine. The information in this chapter analyzes and describes the data collected in the survey to answer the research questions. Using a set of survey questions, Cameroonian women were asked to provide information regarding their demographic data, questions on their gynecologic and health history, questions on their level of HPV knowledge in relation to their beliefs, attitudes, and the likelihood to receive the HPV vaccine. The study population is not representative of the entire population of Cameroon women in the diaspora. A total of 210 women were invited to participate in the study; of which 80 women volunteered to participate. Of the 80 surveys given out to women who were willing to participate, 30 were completed and returned for an overall response rate of 37.5%.

Respondent Characteristics

The sociodemographic characteristics of the Cameroonian women are demonstrated in Table 5. Respondents were predominantly employed (41.38%) with an average salary range of $40,000-$59,000. All respondents were educated, with a high school diploma (56.67 %), college degree (30.0%) or post graduate degree (13.33%). Their mean age was 36.8 years, and most (80%) had children.

Table 5

The sociodemographic characteristics of Cameroonian women in the Maryland-Washington Metropolitan area

Respondents Characteristics	Number	%
Ages 26-40	22	73.33
Ages 41-63	8	26.66
Number of Children:		
✓ 0-children	6	20
✓ 1-3 children	20	66.66
✓ 4 and above	4	13.33
Level of Education		
✓ High School / GED	17	56.67
✓ Associate	2	6.67
✓ Bachelors	6	20.00
✓ Graduate	1	3.33
✓ Post Graduate	4	13.33
Yearly Income		
a) ____0-$19,999	12	41.38
b) ____$20,000-$39,999	6	20.69
c) ____$40,000-$59,999	2	6.90
d) ____$60,000-$79,999	2	6.90
e) ____$80,000-$99,999	1	3.45
f) ____$100,000 and above	6	20.69

Knowledge of HPV and Cervical Cancer

Knowledge of HPV and cervical cancer amongst Cameroonian women is outlined in Table 6. Of all the respondents, 76.67% had heard of an HPV or cervical cancer vaccine prior to receiving the survey questions. About 20% of the respondents had heard about it from their doctors, 40% from TV, and 10% from their school of nursing. Most

respondents, 83.33%, stated that HPV is transmitted through unprotected sex, especially with multiple partners.

Table 6

Knowledge of HPV and Cervical Cancer Amongst Cameroonian Women

Have you heard of HPV?	Number	%
Yes	23	76.67
No	7	23.33
What do you know about HPV?		
✓ A disease contracted from unprotected sex with an infected person	25	83.33
✓ HPV can turn into cancer	28	93.33
✓ A deadly disease which can be prevented	23	10
✓ No idea	2	6.66
Age Group at Risk of acquiring HPV?		
0-14	1	3.45
15-24	19	65.52
25-35	7	24.12
36+	2	6.90
Factors that increase the risk and method of spread		
✓ Multiple sex partners	15	50
✓ Unprotected sexual contact with an infected person	26	86.6
✓ No proper health care practices	20	66.66
✓ Smoking, HIV, Chlamydia infection	15	50
✓ I do not know	3	10
Problems HPV might cause		
✓ The virus can cause cancer	26	86.66
✓ Can cause death if not treated in time	20	66
✓ I do not know	3	10

Perception of Cervical Cancer and HPV Prevention

The perceptions of cervical cancer and HPV prevention amongst the Cameroonian women as demonstrated in Table 7 shows 93.33% recommended the use of condoms as a means to prevent exposure to the virus. There were 16.66% of women who felt that they

were too old to take the vaccine whereas 83.33% discouraged multiple sexual partners and thought that they are in a monogamous relationship and their risk of having HPV is reduced. Most of the respondents (90%) said they would like to discuss with their family doctor before deciding if their daughters need the vaccines. Only 16.66% of the respondents expressed concerns about the safety and effectiveness of the vaccines. Half of the respondents (50%) stated that their culture condemns sex before marriage while 83.33% reported that their religion discourages multiple sex partners, condemns sex before marriage, and emphasizes the practice of abstinence. Most participants, 93.33%, stated that their culture condemns sex before marriage, discourages multiple sex partners, and emphasizes the practice of abstinence while 10% reported they do not believe that it exist.

Table 7

Perceptions of Cervical Cancer and HPV Prevention Amongst Cameroonian Women

Perception of Cervical cancer and HPV prevention	**Number**	**%**
Practice abstinence before marriage	15	50
Avoid multiple sex partners	25	83.33
Get immunized and obtain frequent Pap test	22	73.33
Use condoms during sexual contacts if not married	28	93.33
Education of women and the general public about HPV	30	100
Stop smoking and drinking	24	80
How Does your Culture, Family and Religion view cervical cancer		
prevention	12	
My culture encourages traditional medicines and cuts for prevention	28	40
My culture encourages education of women and children	18	93.33
My cultural does not influence me	28	60
My culture supports prevention and condemns sex before marriage	2	93.33
Not aware of any cultural influence	3	6.66
They do not believe that it exist		10

Intention to Accept HPV vaccination

The likelihood of the Cameroonian women accepting the vaccine is demonstrated in Table 8. Although 90% of the respondents said they would likely take the vaccine if recommended by their doctor, it was not a surprise to find that 16.66% of the women expressed concern about the safety and effectiveness of the vaccine. Although 93.33% said they would very likely take the vaccine if they can afford it, about 16.66% of the respondents were not sure if they would take it because of their age.

Table 8

Intention to Accept HPV Vaccine Amongst the Cameroon Women

	Number	%
✓ Unlikely	5	16.66
✓ I would likely if recommended by my doctor	27	90.00
✓ Very likely if I can afford it	28	93.33
✓ I do not know because of my age	5	16.66
✓ I am concerned about the safety and effectiveness	5	16.66

Knowledge of Pap Smear Among Cameroonian women.

The knowledge of Cameroon women of Pap test is illustrated on Table 9. As can be seen, 75.56% have had a Pap test done leaving a 24.14% who have never been tested. Those who have never tested gave the following reasons: I do not have health insurance and I cannot afford to pay. As regards the effectiveness of the test, 90% of the women new that Pap test is done as a routine to diagnose cervical cancer while 86.66% stated the test is very effective. A surprising 6.66% of the women were not aware of the Pap test.

Table 9

What do you know about Pap smear?

	Number	%
✓ A very effective test done to diagnose cervical cancer	26	86.66
✓ A routine test done to diagnose cervical cancer	27	90
✓ A cervical examination and very effective	28	93.33
✓ I do not know	2	6.66

Summary

The demographics of the participants were presented at the beginning of this chapter, followed by the women's health and gynecological history. The last part is presentation of the results addressing each research question individually. Data was analyzed using the NVivo software version 10.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to gain an understanding of the perception of the Cameroonian women regarding cervical cancer prevention, taking into consideration parental attitudes, knowledge, and beliefs about the acceptance and usage of the HPV vaccines and other screening services among the Cameroonian women 18 years and above residing in the Maryland-Washington Metropolitan area. An integration of the health belief model and the theory of planned behavior provided guidelines for this study. From previous studies (Ajzen 1985 and 1991) that integrated these two models (HBM and TPB) it was deduced that women's knowledge, beliefs, attitudes, experiences, and perceptions influenced their decision to accept or refuse the HPV vaccine. This qualitative descriptive study of cervical cancer prevention focused on HPV vaccines acceptability in the decision-making processes of Cameroonian women and parents of teenagers eligible for vaccinations residing within the Maryland-Washington Metropolitan Area.

This project was presented to a population of 200 Cameroonian women residing in the Maryland-Washington Metropolitan Area and attending traditional and cultural associations. Only 80 women volunteered to participate in this study. The study I administered the study by handing out a set of 25 survey questions to the 80 women who volunteered to participate. Only 30 participants were able to complete and submit the

survey. Using the results obtained from the 30 participants who responded to the survey questions, a descriptive analysis was made using the NVivo software version 10.

The women were asked to provide information regarding their demographic data, their gynecologic and health history, their level of HPV knowledge in relation to their beliefs, attitudes, and the likelihood to receive the HPV vaccine and other cervical cancer preventive measures. The responses to the survey questions gave an insight as to (a) the extent of knowledge of the Cameroonian women residing in the Maryland-Washington Metropolitan Area regarding HPV and HPV vaccines; (b) their beliefs and perception about HPV and the vaccine; and (c) what factors influence their acceptance and usage of HPV vaccine. Although the study population was not representative of the entire population of Cameroon women in the diaspora, the results were interpreted by the following research questions in order to draw conclusions and make possible recommendations:

Research Question 1

RQ1: What is the knowledge level of the Cameroonian woman residing in the Maryland-Washington Metropolitan Area in reference to cervical cancer, cervical cancer screening, and cervical immunization with HPV vaccines?

I asked if they had heard of HPV. It appeared that some of the participants indeed had accurate knowledge about HPV and the vaccine because vaccine awareness was found to be generally high in women who responded to the survey. About 76.67% of the women heard about HPV prior to receiving this survey leaving 23.33% who said they had

not heard of the virus HPV. Despite the lesser percentage, it was significant that women residing in a Western country such as the United States of America were still ignorant of this preventable disease. This finding is significant because lack of knowledge could be a contributing factor to the high incidence and high mortality rate from cervical cancer in their home country of Cameroon. Cameroonian women who do not know about the existence of cervical cancer cannot be expected to take action to prevent it. Raising awareness should be a priority in this community. Cooper, Polonec, and Gelb (2011) had similar findings when they studied the level of knowledge and awareness of women in the United States a developed country.

A large number of these Cameroonian women reported they did not know the symptoms of cervical cancer. This could be a likely reason why many women in Cameroon did not see the need for screening and consequently failed to seek health care services. If Cameroonian women are made aware of and able to recognize the early symptoms of cervical cancer, they would presumably go to the hospital at an early stage, and more lives will be saved. This suggest the need for massive education of the entire community in regard to preventive services.

A majority of the women reported that they did not know the causes of cervical cancer. This is also significant and a clear indication that cervical cancer is a problem in the Cameroon community. If the women residing in the United States, where they are exposed to advanced healthcare services are ignorant of the causes of cervical cancer,

those residing in Cameroon in West Africa, a third world country, are even more unlikely to know them.

It was impressive to see that these women recognized the fact that having multiple sex partners (83.33%) contributed to the disease spread. They stated that HPV is transmitted through unprotected sex and discouraged the practice of multiple sex partners. Although a small number, it was surprising to find that 10% of the respondents did not know the method of transmission of HPV. Overall the participants had good knowledge about HPV mode of transmission and HPV vaccine as a preventive measure although there were some inaccuracies and misconceptions that needed to be addressed with future education and studies.

With regard to other screening methods, although this was a small number, it was surprising to find that 6.66% of the women were not aware of the Pap test. Cooper et al. (2011) had similar findings which lead to his conclusion that although the United States is a developed country with a high level of healthcare technologies and accessible services, women still lacked critical knowledge to understand their gynecologic cancer risk and how to seek appropriate care. Though 75.56% of the Cameroonian women had had Pap tests, 24.14% still had never been tested. It is significant given the severity of the disease that this number of women are at risk of being infected due to ignorance. Those who had never been tested gave the following reasons: “I do not have health insurance, and I cannot afford to pay.” This indicates they are unaware of affordable and even free healthcare services available to low income people in their community.

With regards to the effectiveness of the test, 90% of the women knew that Pap test was done routinely to diagnose cervical cancer while 86.66% stated “the test is very effective,” and a 6.66% stated “I do not know” To the extent that healthcare providers are trusted by their patients they are in a position to address these issues of patient awareness of HPV. As a recommendation, during a Pap tests and routine examinations, physicians should use the opportunity to educate all women in their care about the purpose of the Pap test and the HPV vaccines, risk factors and symptoms of cervical cancer, methods of transmission of HPV, and the preventive measures associated with various gynecologic cancers especially cervical cancer.

Research Question 2

RQ2: What are the effects of the knowledge, beliefs, and attitudes on the acceptance of HPV vaccines and cervical cancer screening amongst the Cameroonian women 18 years and above living in the Maryland - Washington Metropolitan Area?

I found it amazing to see that a good number of women knew about the HPV and that those who had knowledge of the virus listed a good number of risk factors and suggestions on how to prevent the virus such as: the practice of abstinence before marriage (50%); avoid multiple sex partners (83-33%); getting immunized and obtaining frequent Pap test (73.33%); the use of condoms during sexual contacts if not married (93.33%); education of women and the general public about HPV (100%) as well as to stop smoking and drinking (80%). Religion was found to play a role in the women’s decision regarding their sexuality as some respondents in this study shared similar ideas

with those of Blackwell (2013b) who stated that some Catholic leaders teach young people to stay abstinent outside of marriage.

The results of this study ties in with the suggestions of Chania et al. (2013) and Ackerson (2011) who stated that better health education programs using the HBM could play a role in modifying the women's belief and motivate them to change their attitudes by adopting better preventive health behaviors. Vaccination happens to be one of the ten great public health achievements of the 20th century that has led to the significant decline in the mortality rate of vaccine- preventable diseases such as small pox, tetanus, pertussis, polio, mumps, rubella and other diseases. As a recommendation, active participation of the key stakeholders along with the Cameroon government should be encouraged to make every effort to ensure that these vaccines are available to everywoman residing in all the remote areas and villages in Cameroon, communities, and families, using the mass media in educating the general public.

Research Question 3

RQ3: What are the social & cultural factors that influence the Cameroonian women's response to cervical cancer screening and prevention using the HPV vaccines?

Responses to the question "How Does your Culture, Family and Religion view cervical cancer prevention?" it was surprising to get the following responses: "My culture encourages traditional medicines and cuts for prevention 40%;" "My culture encourages education of women and children 93.33%;" " My culture does not influence me 60%" and "My culture supports prevention and condemns sex before marriage 93.33%." These

results were found to correlate with those of other studies, suggesting that there are disparities in Cervical Cancer rates across ethnicities. Lechuga et al. (2011) stated that the theory in cultural psychology based on beliefs derived from personal expectations may not be the strongest predictors of intentions in individuals socialized in collectivist cultures. On the whole, culture did not seem to have much of an impact on the women's decision making but most importantly, these participants came from a cultural background that beliefs and practices some form of preventive measures most likely because they have an understanding of the importance of disease prevention. Again we see the need for more education to strengthen and improve on their knowledge level and preventive practices as 40% of the women mentioned the use of traditional cuts as a means of prevention which may not have an accurate scientific backing and most probably ineffective in preventing a disease like HPV which so far only has two vaccines approved by FDA (Gardasil in 2006 and Cervarix in 2009). When asked the question "what does being infected with cervical cancer mean to you?"(Perceived susceptibility.) The following responses were given; "I do not know"; "not been using protection and not been vaccinated"; "at risk of cancer"; "death." Some did not even respond to the question which could be interpreted as having no knowledge of what it meant to be infected with HPV. This is significant because raising awareness has been demonstrated by other studies as the best way to increase the use of preventive healthcare services. Women in this community act as surrogates to those in Cameroon who are highly respected and looked up to for support by those in Cameroon. Hopefully this study will

serve as a means to convince the Cameroon government to increase their efforts towards raising public awareness in Cameroon.

Research Question 4

RQ4: What are the various approaches that could be used to improve the acceptance rate of HPV vaccines and other cervical cancer screening measures amongst the Cameroonian women?

When asked the question, "what if anything would you change in relation to using the HPV vaccine and other screening methods to prevent cervical cancer?" the following responses were given; "Practice abstinence before marriage;" "Avoid multiple sex partners:" "Get immunized and obtain frequent Pap test;" "Use condoms during sexual contacts if not married;" "Education of women and the general public about HPV" and "Stop smoking and drinking." These responses were also listed in response to the question," what are your perceptions about cervical cancer and HPV prevention. It can be deduced from these responses that these women see prevention as the best way to be free of cancer and that they are aware of some of the predisposing factors that can lead to cervical cancer. This is significant because some level of awareness exists but requires reinforcement and more enlightenment through sex education.

Doctor recommendation seem to have a big impact on the rate of acceptance and usage of the HPV vaccine as 90% of the respondent said they would likely take the vaccine if recommended by their doctor. Surprisingly 16.66% expressed concern about the safety and effectiveness of the vaccine, and 16.66% not sure if they would take it

because of their age. Once more we see the lack of understanding of some of the participants regarding the effectiveness of the vaccine. Although 93.33% said they will very likely take the vaccine, and 71.45% had already received the HPV vaccine, there was a 28.55% who had not taken the vaccine. McCarey et al. (2011) in Cameroon, a third world country were the women in this study originate from, also found nurses 88% and doctors 90% stating that they would recommend HPV vaccines. These findings place healthcare providers in a better position to educate their patients during routine visits as well as during gynecological examinations. These findings are substantiated by those of Ylitalo et al. (2013), who concluded that racial/ethnic minorities and non-Hispanic Whites were equally likely to obtain an HPV vaccine after receiving a recommendation from their healthcare provider. Jim et al. (2012) and Wong et al. (2013) respectively, showed that 96% and 83.98% of providers were more likely to administer vaccine to 13-18 year old. In conclusion, vaccine education efforts should target health care providers to increase recommendations, particularly among racial/ethnic minority populations.

Cost was identified as one of the reasons for not taking the vaccine as some women stated that they do not have health insurance but would take the vaccine if it is affordable. Lyimo and Beran (2012) had a similar finding as the lack of access to care and poverty were listed as factors that prevented women from receiving screening and treatment services for cervical cancer in Tanzania. Cameroonian Immigrant women to the US may not have health insurance consequently will have limited access to healthcare services which according to this study, is one of the contributing factors to low HPV

vaccination rate. If measures are taken to provide free vaccines and provide free healthcare services to women we most definitely will see a higher acceptance and usage rate of the HPV vaccine.

Amazingly all participants in this study suggested more education which confirms the findings of Chania et al. (2013) and Ackerson (2011) who suggested that better Health education programs using the HBM could play a role in modifying the women's belief and motivate them to consider adopting preventive health behaviors. Only a very small percentage of women were concerned about vaccine safety and effectiveness which again calls for more education.

Study Limitations

Low response rate was one limitation of this study. Only four cultural and traditional associations were willing to give permission for the researcher to present this project to their meeting members. Out of the 200 or more members who attend the meeting, only 80 volunteered to participate. Of these 80 who volunteered and collected survey handouts, only 30 completed and returned the survey.

Following the demographic characteristics presented in table 5, it is possible that this demographic imbalance may have produced bias in the estimation as this is not a true representation of the Cameroonian women in the Maryland Washington Metropolitan area. Only four traditional and cultural associations participated, the results may not be generalizable to Cameroonian women living in the diaspora.

One of the limitations to this study included that fact that teenagers and men were excluded from the study. Men and teenagers are also recipients of the vaccine and it is equally important for them to have the knowledge about the importance of HPV vaccines and other cervical screening methods. An effective healthcare program requires an understanding of the knowledge, beliefs and attitudes of the entire population in question.

Summarily, most of the participants in this study believed that the vaccine prevents HPV and suggested that education of the general public regarding the importance of HPV and cervical cancer screening would be very useful to increase the vaccine uptake and protect women from HPV infection and HPV-related diseases. The majority of women reported they were likely to consider vaccination if the vaccine is recommended for their age group. Most of the women discouraged multiple sex partners and encouraged abstinence, use of condoms and frequent checkups as a means of prevention against HPV infection or HPV-related diseases.

Implication for Social Change

This study is significant because it has widened the level of understanding on the health status and healthcare needs of the Cameroonian women, one of the minority groups in the Maryland-Washington Metropolitan areas in the United States of America. As one of the first studies to explore the perception of the Cameroonian women regarding cervical cancer screening and prevention, this study has increased the level of cervical cancer awareness and the healthcare issues that exist amongst the Cameroonian women residing in the diaspora.

With the availability of the HPV vaccines, social change can be accomplished as more women hopefully will have an increase in their knowledge level and perhaps change of beliefs and attitudes about cervical cancer prevention.

The women in the diasporas are surrogates to those in Cameroon where no such studies related to the perception of women about HPV and HPV vaccines had ever been conducted because of the misconceptions and controversies that surrounds the use of HPV vaccines both culturally and politically. Hopefully the findings of this study will be used to design evidence based messages that will reach targeted populations such as teenagers, legal guardians and parents residing both in the Diasporas and in Cameroon as well as the Cameroon government. An increase in the level of awareness about cervical cancer, HPV infection, its method of transmission, as well as the importance of continuous screening after immunization to reduce the cervical cancer related mortality rate amongst Cameroonian women could be significantly reduced.

Acting as surrogates these women could aid the Cameroonian government to take a closer look at helping the Cameroonian public by providing the education, and healthcare services to every woman in Cameroon especially the cancer screening services as well the HPV vaccines. In addition to Cameroonians in the Diaspora are highly respected and are considered as better-informed, educated, and rich as they send much money to support their love ones in Cameroon. Thus, information from this study could be used to first of all educate the Cameroonian in the Diaspora who could then join forces to change the perception of those residing in Cameroon. With an increase in knowledge

level, the government and public health officials hopefully could take the necessary steps to improve the social and economic status of the Cameroonian women.

Recommendation

This is the first study that has ever been conducted amongst the Cameroonian women in the Maryland-Washington Metropolitan area on the perception of these women on cervical cancer prevention. However, from the results of this study and the literature review, a few areas were identified for some recommendations to be made regarding HPV vaccine programming and health education among the Cameroonian women both in the diaspora and Cameroon.

The first part of this research was focused on finding out the knowledge level of these women and influences their decisions regarding HPV vaccinations. The results of this study will be summarized into main bullet points and distributed to the leaders of the various traditional and cultural groups who participated in the study. These leaders play a key part in health education of the members through their health committees.

Secondly the misconceptions and inaccuracies surrounding the HPV vaccines needs to be cleared up through comprehensive health education programs educating the public with emphasis on safe sex, abstinence and single sexual partners. Directing more educational programs for adults, parent and healthcare workers as this study showed that most of the women relied on their doctor's recommendations to take the vaccines and Pap test.

Future studies on the impact of media coverage of the HPV vaccines on the women's knowledge level especially those in the catch-up vaccination age range are recommended.

A study of the teenage population as well as the men should be conducted to have an understanding of their beliefs and perception about the HPV vaccines and other cervical cancer preventive measures.

In summary, the results of this study will help the Cameroonian leaders realize the need to improve on the existing health education programs and services, create more mass media educational programs that will reach out to many Cameroonians both in the diaspora as well as in Cameroon especially those residing in the remote villages in Cameroon where healthcare services are very poor, hard to reach, inaccessible, unavailable and ignorance is highest.

Conclusion

This qualitative study was conducted to gain an understanding of the perception of the Cameroonian women as regards cervical cancer prevention, taking into consideration parental attitudes, their knowledge, and beliefs about the acceptance and usage of the HPV vaccines and other screening services among the Cameroonian women 18 years and above residing in the Maryland- Washington Metropolitan area. A sample of 30 women participated in the study. A descriptive analysis of the results showed that educational level played a significant role in the participants' acceptance of HPV vaccine as well as other cervical cancer screening. This association was supported by the analysis

that showed education as predictor of cervical cancer screening and HPV vaccine acceptance. All the participants recommended education as a means of increasing the rate of HPV acceptance and other cervical cancer screening which further supports the fact that education has a big role to play. Further studies should continue to explore and shed more light on the barriers to preventive health services as well as the importance of raising awareness of the general public regarding cervical cancer.

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Appendix A: Request for an Authorization

Proposed email to _____ requesting for an authorization to use his research instrument.

Dr. -

I am a PhD student at Walden University School of Health Sciences specializing in Health Care Services. I am writing my dissertation on Cervical Cancer Prevention amongst the Cameroonian women resident in the Maryland- Washington Metropolitan Area. Among other variables, I would like to compare perception of those women who just arrived the U.S from Cameroon with those who have been residing in the U.S for a few years in reference to their level of acculturation, awareness and use of the available cervical cancer prevention services, especially their perception about taking the HPV vaccines which seems to be a gap in the literature.

I have read some of your research work and was very interested in one of the article published in the International Journal of STD & AIDS in 2003 entitled "Attitudes about human papillomavirus vaccine in young women" which seems to be related to my research topic. I was wondering if you would be let me use your survey instrument or any other instruments you think may be helpful to my project.

I am currently examining different survey tools hoping to find an existing tool that has already been tested for validity that would work for my study. I can see from your profile online that you are a very busy person but would be very grateful if you would consider helping me in any way possible. Thank you very much in advance for your understanding and help.

Respectfully submitted,

Anna Nji

RE: Request for an authorization (2)

To Me

Today at 2:01 PM

Hi Anna,

Very sorry for the delay in responding. Attached is a more recent survey which I think is more up to date than the one we used for the study published in 2003. Hope it is helpful. You are welcome to use it; I would just ask that you cite the source in any paper or publication.

Best of luck!, MD MPH

Assistant Chair, Academic Affairs and Faculty Development

Director, Office for Faculty Development

Professor of Pediatrics Division of Adolescent Medicine

To

Today at 6:26 PM

Happy New Year. Thank you very much for letting me use your survey especially providing me with a much more recent version. I greatly appreciate your help. This means alot to me. The almighty will bless you abundantly.

Anna Nji

Appendix B: A Request for an Authorization

Dear Dr.
My name is Anna Nji, a doctoral student at the Walden University School of Health Sciences. I am currently writing my dissertation entitled "the perception of cervical cancer prevention amongst the Cameroonian women in the Maryland-Washington Metropolitan area" a qualitative study. I was interested in using the abbreviated version of the Santa Clara Strength of Religious Faith questionnaire that I came across online and in journal articles to help me answer the question as to whether a woman's degree of religiosity affected cervical cancer screening and HPV vaccine acceptability. I wasn't sure if this questionnaire was considered public domain, but wanted to be sure to gain your permission prior to use.

Sincerely, Anna Nji
Dec 3 at 11:04 PM
To Me
Dec 3 at 11:16 PM

Hi Anna.

Thanks for you email and interest. No problem. Use it as you wish. Details can be found on my web page (www.___.edu/). Go to the bottom of the page for a link for all sorts of information about the scale, references, versions in different languages, etc. best, tp
, Ph.D., ABPP
University Professor
Director, Spirituality & Health Institute
Psychology Department
Alumni Science Hall, Room 203

Appendix C: IRB Approval for Data Collection

Dear Ms. Nji,

This email is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "Perception of Cameroonian Women about Cervical Cancer Prevention," conditional upon the approval of the community research partner, which will need to be documented in a signed letter of cooperation. Walden's IRB approval only goes into effect once the Walden IRB confirms receipt of that letter of cooperation.

Your approval # is 02-26-15-0283682. You will need to reference this number in your dissertation and in any future funding or publication submissions. Also attached to this e-mail is the IRB approved consent form. Please note, if this is already in an on-line format, you will need to update that consent document to include the IRB approval number and expiration date.

Your IRB approval expires on February 25, 2016. One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date.

Please note that this letter indicates that the IRB has approved your research. You may **NOT** begin the research phase of your doctoral study, however, until you have received official notification from the IRB to do so. Once you have received this notification by email, you may begin your data collection. Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application materials that have been submitted as of this date. This includes maintaining your current status with the university. Your IRB approval is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, your IRB approval is suspended. Absolutely NO participant recruitment or data collection may occur while a student is not actively enrolled.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards

in research.

When you submitted your IRB application, you a made commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden website: http://academicguides.waldenu.edu/researchcenter/orec

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Sincerely,

Research Ethics Support Specialist

Office of Research Ethics and Compliance

irb@waldenu.edu

Walden University:

100 Washington Avenue South, Suite 900

Minneapolis, MN 55401

Confirmation of Receipt of Community Partner Approval - Anna Nji

IRB <IRB@waldenu.edu> Mon, Mar 23, 2015 at 6:22 PM
To: Anna Nji <anna.nji@waldenu.edu>
Cc:

Dear Ms. Nji,

This email confirms receipt of the approval notification for the community research partners. As such, you are hereby approved to conduct research with these organizations.

Congratulations!

Research Ethics Support Specialist, Office of Research Ethics and Compliance

IRB Chair, Walden University

Appendix D: Permission for Data Collection.

Today's Date: February 9th 2015
Name: Anna Nkapsah Nji
Association: The Bamenda Cultural Association Washington D.C Chapter

Dear Association leaders

I am currently undertaking a small scale research project for my dissertation as a requirement to complete a PhD in Health Services program with the Walden University. The title of my research project is **"Perception of Cameroonian Women about Cervical Cancer Prevention".** I will be very grateful if you can make up some time o meet with me so I can explain to you the purpose and importance of this study. I would also wish to have the opportunity to come in during your next upcoming meeting in March and explain to the members the objectives of this study, answer any questions and clarify any doubts they may have. There after I will handout hard copy survey questions to members who will volunteer to participate in this study to take home, complete and either return during the April meeting date or mail them through the US postal services using the self-address and stamped envelopes I will give them. The main purpose of this study is to gain an understanding of the Cameroonian women 18 years of age and above residing in the Maryland- Washington Metropolitan area regarding their perception of cervical cancer prevention. Participation will be voluntary and confidential. I wish to assure you of the following:

- The Research Department of the Walden University will give me the permission for this research to be carried out.
- Participants' anonymity will be maintained at all times and no comments will be ascribed to participants by name in any written document.
- Participants will be free to withdraw from the research at any time and/or request that their survey not be used.
- I will write to the association on completion of the research and a copy of my final research report will be made available upon request.

I sincerely hope that the association will be able to help me with my research. If you have any questions concerning the nature of the research or are unclear about the extent of participants involvement, please contact me at **anna.nji@waldenu.edu**.

Finally, I thank you once again for taking the time to consider my request and I look forward to your reply.

Yours sincerely,
ANNA NKAPSAH NJI

Appendix E: Proposed Cervical Cancer Prevention Survey

Thank you for agreeing to answer the questions in this survey. I am asking you these questions so that I can understand your perceptions about cervical cancer prevention, and how you might make the decision to get or not to get the HPV vaccine. Your answers will be confidential. This means that your name will not be written on the survey and no one other than me will have access to your responses. Please read each question carefully and write the answer in the space provided. If you have any questions about the study, ask the researcher. If you do not feel comfortable answering a question, you may leave it blank. Please read the statements on the survey carefully and answer them as best as you can.

Cameroon Women's Perceptions on Cervical Cancer & Human Papilloma Virus (HPV)

1.	What is your date of birth?
2	What is your highest level of education completed? a) _____High school/GED b) _____Associates c) _____Bachelor d) _____Graduate e) _____Post Graduate
3	Do you have children? ____ Yes. ____ No If yes how many children do you have?___
4	What is your yearly income? g) ____$0-$19,999 h) ____$20,000-$39,999 i) ____$40,000-$59,999 j) ____$60,000-$79,999 k) ____$80,000-$99,999

	l) _____$100,000 and above
5	Have you heard of HPV?____Y ____N
6	What kind of problems might HPV infection cause?
7	What age group do you think is at the highest risk of acquiring HPV? a) ____[0-14] b) ____[15-24] c) ____[25-35] d) ____[36 and up]
8	Have you had a Pap smear done before?
9	Can you describe how you first became aware of cervical cancer related to HPV?
10	What do you know about HPV?
11	What factors do you think could increase a woman's risk of cervical cancer & HPV infection?
12	Describe your perception of cervical cancer and hpv prevention?
13	What does being infected with Cervical cancer related to HPV mean to you?
14	Can you describe any particularly difficult or traumatic experiences in your life related to anyone you know with suffering from Cervical Cancer related to HPV?
15	Do you belief HPV is preventable?_____Yes _____No If yes describe how it can be prevented.

16	Can you describe how your culture influences cervical cancer prevention using the HPV vaccine?
17	To what extent do you consider your religious belief related to cervical cancer prevention?
18	What, if anything, would you change in relation to using the HPV vaccine and other screening methods to prevent cervical cancer & HPV?
19	How does your family view cervical cancer prevention screening & using the HPV vaccine?
20	What other methods of hpv and cervical cancer prevention do you know?
21	Have you received the HPV vaccine? ____Yes ____No If NO Please tell us your reason_____
22	Please tell me how likely or unlikely you think it would be for you to get the HPV vaccine?
23	What do you know about Pap smear?
24	How effective do you think the Pap smear is?
25	Have you had a Pap smear done before? _____Yes _____No If No Please tell us your reason_____

STOP! END OF SURVEY

Thank you very much for participating in this study. If you have any questions about the Survey, cervical cancer or about HPV, or if you have any concerns, please contact me. My contact information is listed on your copy of the informed consent.

Appendix F: Some Information to Help You Understand Cervical Cancer