

“Reducing Cervical Cancer in the Sololá Department of Guatemala”

Introduction

The Bates Foundation is seeking to fund a proposal for a comprehensive cervical cancer demonstration project in Guatemala’s Sololá Department. The Bates Foundation will be investing a total of \$1,500,000 over three years to examine the most effective ways to deliver comprehensive cervical cancer prevention and control strategies, including the vaccination of young adolescent girls and screening of adult women to reduce the burden of cervical cancer in the Sololá Department of Guatemala.

You are a member of a proposal writing team at a large global health organization based in the United States. A partner organization in Guatemala has just contacted you in regards to the proposal and would like to apply jointly for the award. Unfortunately, the deadline to present your proposal to the Bates Foundation is only a week away. You and the rest of the team are now rushing to incorporate the following components into the proposal:

1. Who is your target population(s)? How will you reach them?
2. How will you address gender and cultural barriers around vaccination, screening, and treatment?
3. Who are your other stakeholders and how will you engage them?
4. Do you have all of the needed resources to carry out your program: staffing, infrastructure (labs), supplies, information systems for data collection, and follow up care?
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7. How can the proposal also serve to strengthen the overall health system for girls and women?

Overview of Guatemala

| | |
|--|-------------------------------------|
| <u>Government structure:</u> | Divided into 22 departments |
| <u>Population:</u> | 14,361,666 |
| <u>Population density:</u> | 117 inhabitants per km ² |
| <u>Gross National Income per capita:</u> | \$4,800 |

A Brief History

Guatemala gained independence in 1821 which was followed by a succession of dictatorships and guerilla uprisings, ultimately culminating in a 36 year long civil war that ended in 1996 with the signing of the Peace Accords. During the civil war over 200,000 citizens were murdered, of which 80% were estimated to

be Mayan or of Mayan descent. Mistrust of the government is still present in many parts of the country, and it has left a profound impact on the health and welfare of the indigenous population.¹

Public Health Challenges in Guatemala²

- High rates of inequality
- Weak infrastructure
- Variety of traditions, languages, and cultures
- Internal displacement of populations has impacted the stability and quality of the healthcare system
- Under-utilization of health services
- High fertility rates

Background

Cervical cancer, which is preventable and treatable, is the second most common cancer of women worldwide and a leading cause of cancer deaths among women in developing countries. Almost all cases of cervical cancer (99%) are linked to the human papillomavirus (HPV), an easily transmissible and highly prevalent DNA virus. It is estimated that between 50-80% of sexually active women will be infected with HPV at least once during their lifetime, usually between late teenage years and the early thirties. For most women with HPV, infections spontaneously clear after 6 to 18 months, but in a small percentage of cases infections persist and can eventually progress to cancer (See Appendix A for natural history model of HPV and cervical cancer)³.

In terms of prevention, there are two vaccines currently available to protect girls and women from the 16 and 18 HPV strains: Merck & Co.'s Gardasil® and GlaxoSmithKline's Cervarix®. While there are more than 100 strains of the virus, strains 16 and 18 are responsible for approximately 70% of cervical cancers worldwide.⁴ However, the cost, logistics, and other competing health priorities limit availability for many low to middle income countries.

Cervical cancer can take up to 10 to 20 years to develop, during which time screening and early treatment is highly effective in preventing the onset of the disease. If cervical cancer is not prevented, it can be treated with combinations of surgery, chemotherapy and radiotherapy. However, access to treatment is dependent upon an accurate diagnosis, adequately equipped facilities and skilled health professionals, services that are unavailable to most women in developing countries.⁵

¹ (PAHO, Health in the Americas, 2007. Volume II- Countries, 2007)

² (Cagley, 2008)

³ (Spitzer, 2006)

⁴ (RHO, 2013)

⁵ (Action, 2012)

Risk Factors⁶

Acquisition of HPV

- Age at sexual debut: earlier age of sexual initiation increases number of lifetime sexual partners
- Acquisition of HPV infection is associated with increased number of lifetime sexual partners
- Sexual behavior of male partner

Progression from Infection to Cancer

- High parity
- Co-infection with HIV and other STIs
- Smoking
- Use of oral contraceptives

Cervical Cancer Distribution and Trends

Worldwide

Over 500,000 women develop cervical cancer and approximately 275,000 women die from the disease each year. The vast majority (88%) of these deaths occur in developing countries. In high income countries, cervical cancer rates have steadily declined due to effective early screening and treatment programs that are assisted by health education, clinician training, improved cancer treatment and functioning health information systems. However, in low and middle income countries, poor performance of the Papanicolaou test, limited health systems, plus costs and other challenges prevent many women from traveling repeatedly for more screening and/or follow-up care.⁷

Latin America and Caribbean Region (LAC)⁸

- One of the highest incidence and mortality rates of cervical cancer in the world.
- Women from lower socioeconomic status are often unaware of cervical cancer screening or lack access.
- Absence of country-tailored guidelines for best practice of cervical cancer prevention and control contribute to high rates.
- Cervical cancer contributes more years of life lost than any other cancer, tuberculosis, maternal conditions, or AIDS in the Latin America and Caribbean region.

Cervical Cancer in Guatemala ⁹

- Cervical cancer is the most common cancer among women in Guatemala.
- Approximately 33.2% of women in the general population are estimated to harbor cervical HPV infection at a given time.

⁶ (Almonte, 2008)

⁷ (Action, 2012)

⁸ (PAHO, Cervical Cancer Prevention and Control Programs: A rapid assessment in 12 countries of Latin America., 2010)

⁹ (Ferlay, 2008)

- There are 3.8 million women in Guatemala at risk of developing cervical cancer.
- Guatemala's cervical cancer incidence and mortality are among the highest in the Americas, ranking 10th out of 33 countries.
- The Instituto Nacional de Cancerologia (National Cancer Institute, INCAN) is the primary referral site for cancer diagnosis and treatment in Guatemala, and the repository for the country's cancer data which relies primarily on paper records.
- Screening rates vary by region, but 49% of women (ages 25-64) have never had a pelvic exam in Guatemala, and only 40% are considered to have effective screening coverage.¹⁰
- Comodronas (midwives) play an important role, especially in rural areas of Guatemala where they often serve as facilitators for healthcare services in the area of women's health.¹¹

Sololá Department¹²

- Located in the Western Highlands
- Indigenous peoples comprise 96% of the population in Sololá
- Approximately 11,000 girls (ages 9-12)
- Approximately 50,000 women (ages 30-59)
- Illiteracy among Mayan women is particularly high, with an average of only 4.4 years of schooling

Cervical Cancer Control Strategies in Low Resource Settings

Low income countries have struggled for decades to initiate and maintain cervical screening using cytology, but now there is a combination of new and cost effective tools in order to help prevent and reduce the burden of cervical cancer. Each of the available methods has its own strengths and limitations so the critical issue is to select what is most appropriate for the context. Following screening, effective treatment must also be available to prevent disease progression and mortality.¹³

HPV Vaccines

Governments in Latin America and the Caribbean are now able to purchase the vaccines at a heavily discounted price through the Pan American Health Organization's EPI Revolving Fund.¹⁴ The World Health Organization recommends that routine HPV vaccination be included in national immunization programs based on the following key considerations:¹⁵

- Prevention of cervical cancer or other HPV-related diseases, or both, constitutes a public health priority
- Vaccine introduction is programmatically feasible

¹⁰ (Siteman, 2012)

¹¹ (Cagley, 2008)

¹² (PAHO, 2007)

¹³ (Maine, 2011)

¹⁴ (Action, 2012)

¹⁵ (WHO, 2009)

- Sustainable financing can be secured
- The cost-effectiveness of vaccination strategies in the country or region is considered
- HPV vaccination is targeted to adolescent girls prior to sexual debut

HPV Vaccine Challenges

- Levels of provider and community understanding of the need for vaccine, or even of the burden of cervical cancer that occurs in their communities
- Convincing communities and families to support the vaccine.
- Ideal age for HPV vaccine (9-13) range outside of typical vaccination campaigns
- Competing demands for the introduction of other new vaccines
- Have a known duration of protection of at least 5 years; clinical trials are still in progress to show the full duration of protection.
- Loss to follow up: both are administered in a series of 3 injections over 6 months¹⁶

Visual Inspection with Acetic Acid (VIA)

VIA is an effective, low cost test that can be performed after a relatively brief training. VIA involves examining the cervix with the naked eye and a bright light after applying diluted acetic acid (3%-5%). When anomalous cervical and uterine tissue comes into contact with the acetic acid solution, it temporarily takes on a whitish color (“acetowhite”), making it possible for the health provider to know whether the result is positive (abnormal) or negative (normal). Because VIA allows diagnosis of abnormal cells almost immediately, women can be treated in the same visit with cryotherapy which reduces costs and loss to follow-up.¹⁷

Accreditation System

Gynecologists, general practitioners, family doctors, nursing personnel, and midwives are authorized under national regulations in Guatemala to perform VIA, but rules are more restrictive for performing cryotherapy. Providers are accredited by San Carlos National University, Mariano Gálvez University (a private institution), the College of Physicians and Surgeons, and the Guatemala Association of Gynecology and Obstetrics (AGOG).¹⁸

VIA Challenges

- Issues associated with adequate training, supervision, quality control, evaluation, and monitoring
- Limited availability of cryotherapy equipment and the problems associated with maintaining it.¹⁹

¹⁶ (Maine, 2011)

¹⁷ (PAHO, 2012)

¹⁸ (Action, 2012)

¹⁹ (Action, 2012)

HPV DNA Testing

HPV DNA testing is a molecular approach to screening that detects the presence of cancer causing types of HPV. This powerful method identifies more positive cases than the Pap or VIA and could reduce the amount of lifetime screenings needed. Uptake has been slow in low and middle income countries, but the *careHPV* test developed through a private public partnership and will potentially allow for same day testing and treatment in low resource settings.²⁰ However, it is not advised before the age of 30 due to low specificity. If implemented, HPV testing will require a clear triage strategy for diagnostic follow-up.

Treatment

Women who have precancerous lesions on the cervix are usually treated with one of the following methods which prevent abnormal tissue from progressing to invasive cancer in 85% to 89% of cases.

- Cryotherapy—does not require electricity and can be performed safely and effectively by nurses and midwives. Can be done at the same day as screening.
- LEEP (loop electrosurgical excision procedure)—requires heavier and more expensive equipment, reliable electricity, and highly skilled providers. It is associated with a higher risk of severe bleeding.
- Cone biopsy—general or spinal anesthesia is sometimes used, and cone biopsies are often done in a hospital or outpatient surgery clinic.
- Laser ablation—requires highly skilled providers, expensive equipment, and electricity.²¹

Summary of Assignment

Despite having evidence based, cost effective secondary prevention methods, cervical cancer still kills a disproportionate amount of women in developing countries. Hence, the Bates Foundation will be investing a total of \$1,500,000 over three years to examine the most effective ways to deliver comprehensive cervical cancer prevention and control strategies, including the vaccination of young adolescent girls and screening of adult women to reduce the burden of cervical cancer in the Sololá Department of Guatemala.

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²⁰ (Action, 2012)

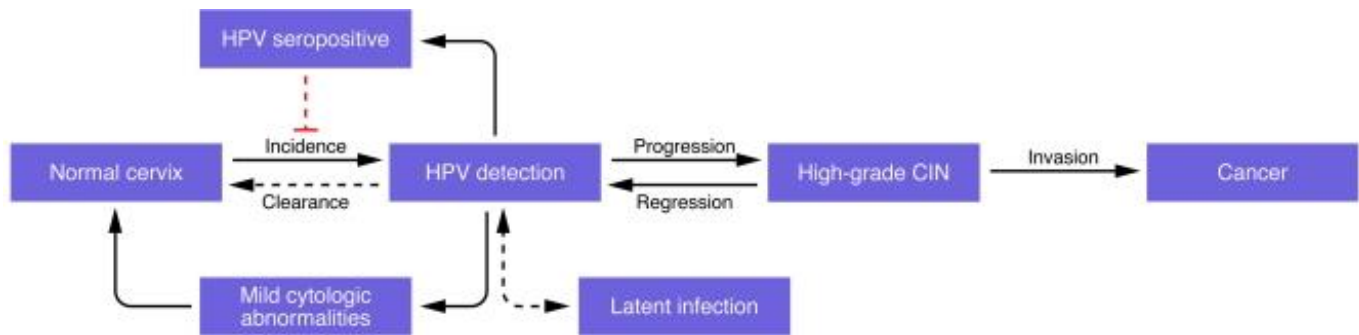
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Appendix A



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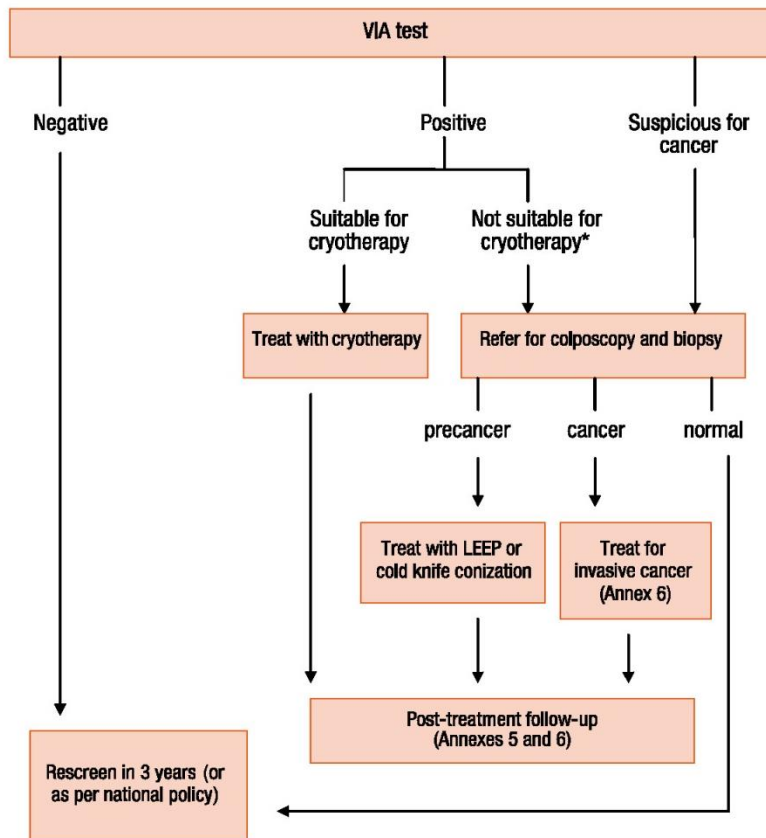
Natural history model of HPV and cervical cancer.

HPV is acquired via sexual intercourse (“incidence”), but the majority of HPV is “cleared” within 2 years in most women. Approximately 60% of women with HPV DNA detected will develop serum antibodies against HPV (HPV seropositive), and if cellular samples are collected during peak viral production, mild cytologic abnormalities may be detected on Pap smears. A minority of HPV infections persists, and individuals with persistent high-risk HPV are at a substantial risk of developing cervical precancer, or CIN3. The CIN3 lesions are the targets of screening, because more than one-third of these will progress to invasive cervical cancer within 10–20 years. The dashed lines reflect the uncertainty in the natural history of HPV. Namely, it is unclear whether anti-HPV antibody developed following natural HPV infection protects against reinfection, and whether loss of HPV detection reflects virologic clearance or establishment of viral latency.

Appendix B

Annex 4: Flowcharts for follow-up and management of patients according to screen results 251

4b. THE "SCREEN-AND-TREAT" APPROACH, BASED ON VISUAL INSPECTION WITH ACETIC ACID AS SCREENING TEST



A4

Annex 4: Flowcharts for follow-up and management of patients according to screen results

*Not suitable for cryotherapy: lesion >75% of cervical surface, extends onto vaginal wall or more than 2 mm beyond cryoprobe, or into the cervical canal beyond the probe tip. Pregnant women should also be referred.

World Health Organization, Department of Reproductive Health and Research and Department of Chronic Diseases and Health Promotion

[Comprehensive Cervical Cancer Control: A guide to essential practice](#)