Addressing the cervical cancer burden in developing countries: Vietnam as a case study

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Abstract: Like most global diseases, the burden of the cervical cancer is borne primarily by women in less developed nations. In Vietnam, the government and certain private players are attempting to address the high mortality and morbidity rates of the disease. Vietnam promises to be an example of a relatively effective government approach for tackling cervical cancer that other similarly situated nations should consider in establishing their own cervical cancer interventions. As a developing nation, Vietnam’s government must balance many, competing interests in implementing a public health intervention and encourage collaboration among various stakeholders, while also acknowledging and harmonising their individual interests.

Keywords: Vietnam; human papillomavirus; HPV; cancer; patent; vaccine; pap; cervical cancer; health disparity; intellectual property; developing country.


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1 Introduction

If current trends can be used as a barometer, it is apparent that all diseases are not created equal in the eyes of the medical technology industry. The allure of finding a cure or treatment for a disease is based less on factors such as the disease prevalence or the global burden of a disease, and more on economic realities such as profitability. For instance, the pharmaceutical industry neglects the vast majority of tropical diseases afflicting developing nations despite the overwhelming burden of these diseases globally. In stark contrast, the same firms constantly compete to innovate and to fine-tune treatments for diseases and even minor disorders affecting the populations of wealthy, industrialised nations.

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Global diseases, like HIV/AIDS and cancer, are a subset of diseases that developing and industrialised nations share in common. Unlike the situation with neglected diseases where no treatment exists, pharmaceutical companies and biotechnology firms have both the incentive and the ability to develop innovative treatments for global diseases. The primary intention of such firms is to access the profitable markets of industrialised nations, which leads to a unique moral and philosophical predicament. More often than not, an appropriate treatment for a global disease is available, but those in the greatest need, such as the populations in developing countries, cannot access the treatment due to financial barriers.

As the World Health Organization (WHO) has acknowledged, cervical cancer poses such a dilemma. Cervical cancer may strike women in developing and developed nations equally, but, like most global diseases, the burden of the disease is borne primarily by women in developing and least developed nations. Because cervical cancer is a relatively easy disease to prevent, the inability of women in the developing world, who are hardest hit by the disease, to access appropriate treatment is glaring example of global health disparities.

This paper will address the issues surrounding cervical cancer in one developing country, Vietnam, and the recent efforts of the government and certain private players to address the high mortality and morbidity rates related to the disease. Although the aggregate effect of the existing projects may not be quantifiable for years, Vietnam promises to be an example of a relatively effective government approach for tackling cervical cancer that other similarly-situated nations should consider in establishing their own cervical cancer interventions. Notably, the release of new treatment options for cervical cancer has occurred at an opportune time, when awareness of the burden of the disease is growing globally. As a result, resource-poor nations have a unique window of opportunity to capitalise on efforts to develop programmes and resources to eliminate cervical cancer within their own borders.

Vietnam’s government, like those of most developing nations, must balance many competing interests in implementing a public health intervention. Economic growth and attracting foreign investment may be equally or more important to many policy makers than tackling public health issues. This paper seeks to highlight Vietnam’s approach to encouraging collaboration among various stakeholders, while also acknowledging and harmonising their individual interests.

Section 2 will provide some context in regard to the burden of disease from cervical cancer in Vietnam. The characteristics of the disease and its impact in Vietnam will be discussed to illustrate the potential and the barriers for prevention and treatment in a nation with scarce resources and limited healthcare infrastructure.

Section 3 will outline three potentially effective strategies for addressing cervical cancer in Vietnam. The firms and organisations, including public-private partnerships, currently working on issues of cervical cancer in Vietnam will be reviewed. The success of other public health initiatives will be also be discussed, as potential measures for sustaining cervical cancer programmes in Vietnam in the future.

Section 4 will specifically outline the recent efforts by the government to create an environment which fosters its relationships with foreign and international firms within the framework of Vietnamese culture and history. Specifically, Vietnam’s recent revisions to its patent law system will be addressed in context of the government’s contemporaneous public health policies. Specifically, Vietnam has chosen to develop a
mechanism for foreign technology transfer in order to facilitate the development of its own biotechnology industry without scaring off foreign commercial interests, who are understandably wary of inadequate Intellectual Property (IP) protection in the developing world. This section highlights the need for developing nations to consider using IP policy as a tool to augment access to innovative technologies.

Section 5 will conclude the paper with a discussion of Vietnam’s long-term potential for reducing the burden of cervical cancer on its women. Although this paper may be limited to addressing Vietnam’s efforts, the overarching goal is to provide a basic framework that similar, developing nations may use in developing potential measures to confront their own problems with cervical cancer.

2 Cervical cancer: the burden of disease and Vietnam

Cervical cancer is the quintessential example of a global disease whose burden is disproportionately borne by the women of developing countries. At the same time, certain factors unique to cervical cancer merit its consideration as a top health priority for developing nations. Notably, cervical cancer is an almost entirely preventable disease for which multiple treatments are available. These treatments vary from Pap smear tests which have been available on a large-scale basis since the 1960s to Human Papillomavirus (HPV) vaccines, which were only recently released in limited markets.

As a result, the potential players who may be involved in addressing the cervical cancer burden reflect a broad range of interests, from women’s health advocates to public policy makers to pharmaceutical companies. An effective collaboration among such diverse stakeholders may wield great power in addressing the cervical cancer burden. To explain the background for the diverse stakeholder interests, this section will first provide information on the morbidity and mortality from cervical cancer worldwide and then discuss the specific issues regarding the disease in Vietnam.

2.1 The global burden of disease from cervical cancer

Cervical cancer is the second most common cancer in women worldwide, affecting an estimated 1.4 million women with almost 500,000 new cases reported each year. As a testament to the disparate impact of most global diseases in the developing world, studies estimate that 80% to 90% of all new cases occur in developing countries, where cervical cancer is the primary cause of cancer-related deaths in women. The death toll from cervical cancer is also unequally weighted towards women from resource-poor nations, varying anywhere from 239,000 to 270,000 world-wide annually.¹

Women, regardless of nation-state, have a similar cumulative risk for cervical cancer, but dying from cervical cancer is uniquely a hazard of poverty. The cumulative risk for developing cervical cancer before age 65 is a mere 0.7% greater in developing countries compared to industrialised countries, but, over the past 40 years, the cervical cancer incidence in industrialised nations has rapidly declined.² Notably, prior to 1960s, the incidence of cervical cancer in industrialised nations was comparable to the current rates seen in developing countries.³
The current predominance of cervical cancer cases in developing nations in comparison to industrialised nations has been primarily attributed to the differential in resources for screening and treatment. Secondary prevention measures for cervical cancer have been widely available for almost half a century at a relatively low cost. These various types of cancer screenings, using conventional cytology methods, allow for the early detection and treatment of pre-cancerous lesions which might otherwise develop into cancer. In fact, before the Papanicolaou (Pap) smear test was introduced in the 1960s to 1970s, cervical cancer was the leading cause of death among women in the USA. The US Centers for Disease Control and Prevention (CDC) indicates that approximately 12,000 cases and around 400 deaths are attributed annually to cervical cancer in the USA today. Furthermore, more than half of the cases of cervical cancers among women in the USA occur in women who have never obtained a Pap smear or who have failed to get a Pap smear for five years or more.

Today, even more interventions are available for treating cervical cancer, which suggests that cervical cancer should be a public health priority for developing nations at this time. In addition to traditional secondary prevention methods, options for primary prevention such as vaccines have also been pioneered and introduced in the market since 2006. The two new HPV vaccines, which will be discussed in greater detail below, have the potential to prevent an estimated 70% of cervical cancer cases. Because options for cervical cancer treatment span a wide range in terms of price and pose vastly different challenges, developing countries have the option to tailor programmes based on their needs and their resources.

Current estimates show that developing countries will have an estimated 52.5 million 11-year-old girls by 2010 that could benefit from the HPV vaccine. As a result, vaccinating preadolescent girls prior to their initiation into sexual activity has the potential to reduce the incidence rate of cervical cancer for a massive cohort of women in the future. Although the impact of such a programme may not be visible or, more importantly for most policy makers, quantifiable for 20 to 30 more years, the impact of vaccination on the incidence rate of cervical cancer promises to deliver significant cost-savings when this vaccinated cohort does reach the high-risk age for cervical cancer.

2.2 Cervical cancer in Vietnam

Like many developing nations, the incidence rate of cervical cancer in Vietnam is sizeable at 20 per 100,000 women annually with a mortality rate of 11 per 100,000 women. Due to differences in patterns of sexual behaviour which are attributed to what the Vietnamese call the ‘American War’ in the 1960s and 1970s, incidence rates vary within the country from the South region to the North region. During the war, higher rates of sexual activity in Ho Chi Minh City in the South resulted in greater opportunities for the spread of the HPV virus while North Vietnam remained relatively isolated from the influence of western culture. Not surprisingly, Hanoi in North Vietnam has a relatively low incidence rate for cervical cancer, at 6.8 per 100,000 women, in comparison to the rates seen in Ho Chi Minh City, which have been estimated as high as 26 per 100,000 women.

Until the mid-1990s, participation in secondary prevention methods such as Pap smear tests was limited in Vietnam. A non-profit organisation, the Viet/American Cervical Cancer Prevention Project (VACCP), initiated the development of cancer screening programmes in Vietnam in 1996, fuelled primarily by the efforts of unpaid
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volunteers to provide the necessary resources and training. Vietnamese and American physicians, who compose the core foundation of VACCP, believe that Pap smear tests are the most appropriate and effective tool to tackle the burden of cervical cancer in the country. To establish cancer screening programmes, VACCP collaborated with both the US governmental bodies, like the National Cancer Prevention and Control Program, and the Vietnamese government, specifically the Ministry of Health, to overcome the obstacles to the success of the screening programmes.  

Since its inception, VACCP has made significant progress with reducing the cultural and sociopolitical barriers to cervical cancer treatment in Vietnam. Due to poor public awareness, neither the government nor its people recognised that cervical cancer was a problem at the time that VACCP started. Lack of familiarity with the purpose of health screenings, such as the need for ongoing participation in screenings, resulted in issues with patient compliance and patient loss to follow-up. In addition, VACCP has also acknowledged the additional obstacles for policy makers in broaching public health problems in light of the culturally-sensitive issues related to the disease’s causal link to sexual activity and the war.

Despite these issues, the VACCP website states that official governmental statistics show that the cervical cancer rate in Ho Chi Minh City alone has decreased from 26 per 100,000 women to 16.5 per 100,000 women since the initiation of VACCP’s efforts in 1996. Although the statement is provided with a bold disclaimer regarding the inherent inaccuracy of measuring the cervical cancer rate in a developing nation, the establishment of screening programmes has led to a noteworthy reduction in the incidence rates. Unfortunately, the problem of cervical cancer in Vietnam is far from being solved. Scholars predict that as changing attitudes regarding sex equalise between the South and the North, any decrease in the cancer rate in South Vietnam may be partially counteracted by a potential increase in North Vietnam in the coming years.

It is against this backdrop of limited but growing awareness that current efforts to address the burden of cervical cancer must emerge. As noted above, medical technology has continued to move forward, opening up multiple avenues for tackling the high rates of cervical cancer in developing nations like Vietnam. Innovative treatments like the HPV vaccines generate considerable publicity and excitement, but they also pose new obstacles to overcome for developing nations. For a country like Vietnam with scarce resources and a multitude of other health problems competing for attention, the benefits of using emerging technology must be carefully weighed against its costs. Although the HPV vaccines as a potential solution to cervical cancer has garnered significant interest from powerful stakeholders, like the Bill and Melinda Gates Foundation, the VACCP has roundly criticised such efforts for diverting the attention away from more affordable interventions like Pap smear testing. In fact, the VACCP has aligned itself with Jimmy Carter, who recently suggested that vaccine advocates were “enamored with the promise of scientific and technological innovation at the expense of distributing available preventatives today”. An ideal strategy for addressing cervical cancer in the developing should be aggressive as well as sustainable. The next section will review three potential strategies for addressing cervical cancer in Vietnam at this time, focusing the current efforts of private players in this arena.
3 Innovations and efforts for prevention and treatment

Like the effect of any innovation in medical science, the publicity surrounding the recent introduction of HPV vaccines in the market has renewed interest in the global burden of disease from cervical cancer. Although conventional cytology methods have been available for almost half a century, the availability of the HPV vaccine has generated a significant amount of research and discussion regarding its application in developing nations. As a result, this section will focus in large part on the potential use of the HPV vaccine as a strategy for addressing cervical cancer in Vietnam either alone or in combination with screening.

General information about the two HPV vaccines will be provided first to provide the proper context for the three major strategies discussed as options for reducing cervical cancer in Vietnam. Screening alone will also be discussed, but multiple screening methods are available with varying costs and levels of accuracy. As a result, the secondary prevention method addressed will be limited to one of the most effective, well-established cytology methods available, the Pap smear test. The current efforts to use various preventative strategies in Vietnam will be analysed in regards to effectiveness and sustainability. At the end of this section, other successful programmes to address public health problems in the developing world will be briefly discussed as potential strategies for sustaining future interventions.

3.1 The HPV vaccines

At this time, two HPV vaccines are available on the market: Gardasil® and Cervarix®. Although the HPV vaccines come at a premium price, the potential of vaccines to address cervical cancer effectively is due to the fact that the disease itself can be essentially localised to one organism. Approximately 99% of cervical cancer cases are linked to genital infection, via sexual contact, by a group of related viruses, referred to generally as the HPV. In most people, HPV infection resolves spontaneously without any harm, but, for some women, the virus results in a chronic infection which may eventually lead to cervical cancer. Infection with HPV typically occurs during adolescence or early adulthood, but the development of cervical cancer often does not appear until decades later.20

Although the HPV group includes an estimated 100 virus types, eight types in total are believed to cause 90% of cervical cancer cases. The HPV vaccines, referred to above, protect against infection by HPV-16 and HPV-18, which together account for an estimated 70% of cervical cancer cases.

Gardasil®, which is produced by Merck & Company, Inc. (Merck), has the additional benefit of protecting against HPV type 6 and HPV type 11 as well, which together cause approximately 90% of genital warts. Gardasil® was the first of the two vaccines to obtain approval for marketing in the US and European Union in 2006, and it has subsequently been approved in over 80 nations. Currently, its target group is limited to females aged 9 to 26 years and boys aged 9 to 15 years.21

Cervarix®, a product of GlaxoSmithKline Biologics (GSK), only protects against HPV types 16 and 18, but it has the distinct advantage of being approved for a larger group of females, from ages 10 to 45. As of 2007, the vaccine had only been approved for use in Australia, the European Union, and the Phillipines, but approval for use in the USA was provided recently in October 2009.22
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Both vaccines are administered in a three-dose series, with the current price in industrialised markets for Gardasil® at US$120 per dose (US$360 total). Cervarix® will likely be comparably priced at US$490 for its three-dose series. Both companies have committed to price reductions for developing countries, but even differential pricing cannot overcome the fact that low-income countries spend approximately US$29 per capita on total health expenditures. If Merck’s discounted price of US$97 per dose (US$291 total) for the CDC Vaccine for Children Program is any indication, the chance of a developing nation negotiating a suitable price to establish high coverage rates for the HPV vaccine is tenuous at best.

Vaccine pricing is a major obstacle to the establishment of the HPV vaccine as a singular solution to the problem of cervical cancer in Vietnam. The price of vaccines identified as typically ‘underused’ in developing countries have been procured at prices closer to US$3.50 per dose. Although private financing of the HPV vaccine is another option for augmenting vaccination rates, studies of willingness-to-pay for the typhoid vaccine reflect that private demand for the vaccine peaked at US$4.80 per vaccine. Although the hope is that HPV vaccine prices will decline over time as new suppliers enter and compete in the market, the reality is that the production of these vaccines are essentially patent-protected until at least 2015. Even after the majority of patent protection on the vaccines ends, the willingness of manufacturers to invest in a second generation of HPV vaccines, which are cheaper or easier to deliver in resource-poor settings, still relies primarily on market forces and the promise of profit.

In general, the developing world is not a place for revenue-seeking vaccine manufacturing firms. For instance, the core six vaccines in the Expanded Program on Immunisation (EPI), which are no longer protected by patents, are offered at prices of less than US$0.15 per dose. EPI vaccines, which are used in almost all national immunisation programmes worldwide, represent over 80% of the internationally procured doses of vaccines by volume, but account for less than 15% of revenues in the global market. In sum, an HPV vaccination programme which relies on price reductions from vaccine producers alone will be ineffective in obtaining a price that will allow for widespread coverage for HPV vaccination in a country like Vietnam. Additionally, waiting for patent protection to end in order to implement a cost-effective programme is unreasonable considering the substantial burden of disease from cervical cancer in the developing world today.

In addition to the obvious obstacles posed by price, any widespread introduction of the HPV vaccine must also take current sociopolitical and cultural attitudes into consideration. Although the VACCOP has chipped away at the barriers regarding cancer screenings, general awareness of the causal relationship between HPV and cervical cancer is low. As a result, limited health education may spawn misconceptions about cervical cancer and its relationship to other sexually transmitted diseases. The problem can be as basic as the confusion of HPV with HIV, human immunodeficiency virus, because of the similarity of the acronyms, or as complex as misperceptions that the HPV vaccine will protect against all sexually transmitted diseases.

Although health education on HPV may cure many of these issues, there may be unanticipated consequences to emphasising the relationship of cervical cancer to sexual activity and HPV infection. In a culture that stigmatises women who engage in premarital sex, many women may react by avoiding cancer screenings for fear of appearing sexually promiscuous. In addition, parents or political leaders may perceive that the early
vaccination of young girls may encourage or condone early sexual activity. All these barriers, from financial to cultural, must be considered in the implementation of any strategy for cervical cancer prevention.

3.2 The effectiveness of three strategies for cervical cancer prevention

Three strategies are viable options to address cervical cancer prevention in Vietnam at this time:

1. HPV vaccination alone
2. Cancer screenings alone using the Pap smear test
3. HPV vaccination in combination with cancer screening.

For each option, the population targeted for treatment, the potential to decrease the disease burden of cervical cancer, and the barriers to success will be discussed below.

3.2.1 HPV vaccination alone

In order to obtain the maximum benefit, a cancer prevention programme using HPV vaccination alone would most likely target pre-adolescent girls below the age of 12 to insure vaccination occurred before entry into sexual activity in Vietnam. Any programme relying on vaccination alone must be aggressive from the outset in order to achieve the relatively high vaccination coverage rate needed to merit the costs of the vaccine. Assuming a 70% vaccination coverage rate, the lifetime risk of cancer in Vietnam can be reduced by approximately 50%.

Because developing nations must allocate scarce resources to address a variety of urgent needs, effective programme development must take into consideration that one dollar spent on cervical cancer prevention is one dollar less for spending on another equally problematic healthcare issue. Notably, as coverage rates decline, cancer screenings become a more attractive option from cost perspective. Particularly in Vietnam, the impact of any cervical cancer programme depends on whether it is developed as part of a regional or national strategy. If cervical cancer policies can be tailored by region, vaccination only is a feasible option in South Vietnam where the incidence rate is significantly higher. If a unified, national prevention policy is the goal, vaccination alone is not cost-effective as a combination of vaccination and screening even at relatively low vaccine costs of US$10 per vaccinated girl.

On the other hand, cost-effectiveness ratios provide limited insight into the intangible, qualitative benefits of cervical cancer prevention. For instance, the death or illness of a mother has dire consequences on a child’s health, education and nutrition status, which results in related costs throughout that child’s lifetime. An analysis of data aggregated from 72 of the world’s poorest nations, which includes Vietnam, suggests that a ten-year vaccination programme at a 70% coverage rate would affect the lives of 10 million children, who would otherwise lose their mothers. In addition, the full benefits from vaccination may not materialise for a number of years. Even then, the overall benefit to the community from preventing the unnecessary death and illness of an entire generation of mothers, sisters, and friends may be difficult to monetise.
The HPV vaccine must deal with many of the same barriers for screening programmes, but HPV programmes may pose additional challenges because the target population is focused narrowly on young girls. Logistically, the vaccine itself typically requires the administration of three doses in a short time span of six months, and pre-adolescents in Vietnam do not have consistent contact with the healthcare system. They are beyond the age for most childhood immunisations, limiting the ability to provide the HPV vaccine simultaneously with others required vaccinations. Similarly, any school-based immunisation would be limited in a country where up to 20% of females may not be in school at this age.

In a culture that is protective of women, isolating young girls as targets may also elicit apprehension about the vaccine’s purpose. The introduction of the tetanus toxoid vaccine provides one colourful example of the misunderstanding that a vaccine programme can generate. That programme also narrowly focused on vaccinating a small population, women of child-bearing age, which resulted in the development of a conspiracy theory that the vaccine was secretly intended to prevent pregnancy. Vietnam’s history is rife with stories of corrupt bureaucrats, and the country has been isolated from western contact for many years. As a result, the actions of any organisation, whether public or private, may be likely targets for similar rumours.

3.2.2 Cancer screenings alone using the Pap smear test

In the eyes of the VACCPC, cancer screening using the Pap smear test is the most appropriate method for preventing cervical cancer in poor nations with limited financial resources. In contrast to an HPV vaccine programme, a programme involving cytological screening alone would most likely target women at ages of 35 or older for screening at various frequencies. Typical frequencies chosen are either three times per lifetime or screening at five-year intervals. Assuming a screening coverage rate of 70%, the reductions in the lifetime risk of cancer with such a programme in Vietnam would vary from approximately 20% to 32%.

The barriers to the success of a screening programme would typically include loss to follow-up and limited access to critical healthcare resources, such as cytology labs and healthcare facilities. In the past decade, the VACCPC in Vietnam has made significant inroads towards reducing such barriers. Currently, Vietnam has four screening, treatment, and administrative networks in various parts of the country (Ho Chi Minh City, Ha Noi, Hue, and Can Tho). Because of the VACCPC’s prior investments for tackling cervical cancer, the establishment of an effective, large scale cytology-based screening programme is more feasible in Vietnam at this time than in other countries with similar economic and epidemiologic circumstances.

Because of the VACCPC’s past investments in training physicians and improving the healthcare infrastructure in Vietnam, the Pap smear test was identified is the most appropriate choice for cytological screening in Vietnam. Using other cytology screening methods may be an attractive option in many other developing nations who do not have similar infrastructure investments in the Pap smear test. Cytological methods such as HPV-DNA testing offer a higher sensitivity in detecting precancerous lesions of the cervix than the Pap smear test. As a result, the HPV-DNA test has potential benefits when longer intervals between screenings are desired, such as three to five years. A single lifetime screen using HPV-DNA testing of women who were 35 to 40 years of age has the potential to reduce the lifetime cancer risk by approximately 25% in certain
settings, and for resource-poor nations, limiting the frequency of cancer screenings may be a low-cost and desirable option for a developing nation without the appropriate healthcare infrastructure. Overall, the cost of implementing any screening programme promises to be significantly cheaper than instituting a HPV vaccination programme.

3.2.3 Combination of HPV vaccination and cancer screening

Any combination strategy using vaccination and screening would target pre-adolescent girls for vaccination and older women for screening. If adequate vaccination and screening rates can be achieved at 70%, a combination of the two preventative measures yields the largest reductions in the lifetime risk of cancer at approximately 60% to 76%. If cost per vaccinated girl could be maintained at US$10 or below, HPV vaccination combined with screenings every five years was the most cost-effective programme regionally and nationally for Vietnam.

The main benefit of implemented both prevention methods as part of a long-term prevention strategy is the provision of a ‘safety net’ of sorts. Population models fail to reflect that each girl/woman may have different, individual barriers to participation. A female that may be unable to participate in one strategy may have better access to participating in the other strategy. For example, a child who misses the targeted age for vaccination may still, later on in life, participate in cancer screenings. Similarly, girl who is vaccinated at a young age who may not have access to screening facilities later on in life still receives the benefits of reduced risk of cervical cancer from the vaccine.

In corresponding measure, the barriers to success of each strategy still exist in a programme that combines both vaccination and screening. Although parallel efforts to provide health education on cervical cancer may augment each other, the potential for confusion is also greater. For instance, misperceptions may develop regarding the need for women to continue obtaining screenings in older age despite being vaccinated as pre-adolescents. The allocation of scarce resources also becomes a greater issue, and available funding sources may be stretched too thin to cover both strategies adequately, resulting in a drop in coverage rates for both methods. Although Vietnam is in the unique position of having different funding resources to develop the healthcare infrastructure and to obtain the resources needed for both methods simultaneously, few developing countries may be similarly situated. Thus, deciding on which strategy is the most effective still requires a careful assessment of a developing nation’s current resources, needs and healthcare infrastructure.

3.3 The efforts of private players in public health promotion

Recently, a new generation of global players in the arena of public health promotion has spawned interest in cervical cancer programmes focusing on the HPV vaccine. Because of the limited resources available in developing countries, the involvement of private stakeholders is particularly critical for any cancer programme that seeks to include innovative, new technology as a mechanism for prevention. In resource-poor nations, collaboration among players in both the private sector and the public sector enables the pooling of resources and knowledge and improves the potential for success in the long-term. Private-Public Partnerships (PPP) can be a tool for uniting diverse, competing parties in both the private sector and the public sector.
Although collaborations can take many forms, certain stakeholders will be discussed in detail based on their involvement in cervical cancer efforts in the developing world. One PPP in particular, the Program for Appropriate Technology in Health (PATH), will be discussed based on its active role in spearheading the project for HPV Vaccination in Vietnam, but other PPPs promise to be an important resource for other developing countries who want to develop similar cervical cancer programmes in the future. Non-charitable, commercial sources of funding for programmes will also be discussed as a mechanism for developing countries like Vietnam to access new medicines. Vaccine manufacturers often play a large role in supporting PPPs but may also have their own, individual philanthropic efforts. Finally, the success of alliances like the Pan American Health Organization Revolving Fund (PAHO RF) and the potential of new tools such as Advanced Market Commitments (AMCs) suggest other routes for long-term vaccine procurement in developing nations.

3.3.1 Programme for appropriate technology in health: HPV vaccination project

Currently, PATH, a philanthropic organisation funded in large part by a US$27.8 million donation by the Bill and Melinda Gates Foundation, is working in collaboration with the WHO, the International Agency for Research on Cancer, Harvard University, and various agencies in the Vietnamese government to implement HPV vaccination in four developing nations: Vietnam, Uganda, Peru and India. PATH’s primary mission statement is to assure that needy populations have equitable access to new medical technologies. The HPV demonstration project, which will span over the course of five years, seeks to develop the evidence and research necessary to facilitate effective vaccine delivery systems in other developing nations in the future.51

At the outset of the project, PATH worked with key partners in Vietnam to identify the socio-cultural norms, gaps in the healthcare infrastructure, and existing national policies that may pose potential barriers to successful vaccine implementation. The demonstration project itself will involve the implementation of various HPV vaccine delivery strategies, targeting young females ages 11 to 14, to generate data on each strategy’s feasibility and acceptability for long-term vaccine delivery Vietnam. In addition the project will work with the country’s Ministry of Health to bolster existing use of secondary prevention methods, such as cytology screenings and treatment.52

Although the project is currently in its infancy, the resources provided by the PATH project will provide a significant boost in Vietnam’s efforts to achieve widespread vaccination coverage among its young females and to penetrate some of the barriers to long-term success. Notably, the project includes a critical feedback loop to educate high-level policy makers in the government on advocacy strategies to improve the sustainability of the programme.53

3.3.2 Global alliance for vaccination and immunisations

Another PPP, the Global Alliance For Vaccination and Immunizations (GAVI) was created to address specifically the access of developing nations to immunisations and vaccines. The membership of GAVI is diverse and includes governments (developed and industrialised nations alike), philanthropic organisations, normative international organisations (WHO), financial institutions (World Bank), medical technology firms, and
various public health institutions. Since its inception in 2000, GAVI has introduced numerous new and ‘underused’ vaccines into national immunisation programmes, improved the overall safety of vaccine delivery methods, and increased vaccination coverage worldwide.\textsuperscript{54}

Most importantly, GAVI serves as a critical source of external funding for vaccines in the world’s poorest nations.\textsuperscript{55} To be eligible to obtain support for vaccination purchase, a country must have less than US$1,000 per capita annual Gross Domestic Product (GDP). Seventy-two countries, including Vietnam, currently qualify for GAVI support.\textsuperscript{56} As a primary matter, GAVI must first approve a vaccination for funding. Countries submit individual applications, called an investment case, which request funding for a specific vaccine. Because GAVI-funding is intended to be time limited to approximately five years, the applicant country is required to outline a plan for continued funding of its proposed immunisation programme in the investment case in order to be eligible for participation.\textsuperscript{57}

GAVI’s current financing mechanism is based on the concept that countries should actively participate in public health efforts, by co-financing vaccine purchases, albeit at a significant reduced price. Prices are based on a sliding scale according to the applicant country’s financial status. GAVI categorises countries based on wealth in the following ascending order: fragile, poorest, intermediate, and least poor. Vietnam is currently in the intermediate group, and, based on that categorisation, must pay US$0.30 for the first vaccine purchased and US$0.15 for the second and third vaccines purchased.\textsuperscript{58}

Although HPV is not currently eligible for GAVI support, GAVI-eligible countries bear about 54% of the world’s new cases of cervical cancer per year. GAVI funds may be a useful tool to implement HPV vaccination programmes if a country succeeds in getting an investment case approved by GAVI.\textsuperscript{59} Like the PATH vaccination project, GAVI support is intended to provide only an initial boost to a fledging vaccination programmes. The stringent requirements of GAVI applications push developing countries to analyse and to develop realistic plans to finance their immunisation programmes over the long-term.\textsuperscript{60}

\subsection*{3.3.3 Corporate donation programmes}

Undoubtedly the cooperation of vaccine manufacturers is a critical for the success of PPPs such as PATH and GAVI. Merck and GSK have both donated vaccines for use in Vietnam as part of the PATH demonstration projects on HPV vaccination. Through their own private donation programmes, these manufacturers have also taken active steps to accelerate the uptake of the HPV vaccine in developing nations.\textsuperscript{61} Merck has created the Gardasil\textsuperscript{®} Access Program, through which the manufacturer will donate three million doses over five years to vaccinate one million people in GAVI-eligible countries.\textsuperscript{62}

Although none of these direct donation programmes are sustainable mechanisms for long-term HPV vaccination coverage, they do provide additional encouragement for stakeholders interested in investing resources to develop pilot programmes that include vaccines. The initial savings from the donated vaccines allow programmes to run for longer, and have an additional salutary effect of increasing goodwill among major players in the vaccine procurement process. Donation programmes allow the vaccine manufacturer to work with national governments and potential sponsoring PPPs to build confidence in the effectiveness of vaccines as a tool. More importantly, the relationships that are formed may also pave the way for future negotiations for vaccine procurement.
3.3.4 Pan American health organisation revolving fund

For over 30 years, the PAHO RF has succeeded in enabling smaller, developing countries in the Americas to procure necessary vaccines in a sustainable manner. By providing additional assistance to member countries on operational and technical issues, the goal of PAHO RF is to provide developing nations with the tools to support their immunisations programmes both logistically and financially.63

At the present time, almost every country in North and South America participates in the PAHO RF in some capacity to procure vaccines.64 To take part in the PAHO RF, countries must meet certain criteria regarding their vaccination programmes. The country must have an explicit section set aside for vaccine and syringe purchase in its national budget. It must also develop a realistic and appropriate plan of action for vaccination. The relevant plan of action must also allow for the designation of a national programme manager with the authority to develop and to implement the plan.65

Because the PAHO RF serves as the beneficent middleman in the vaccine procurement process, it also charges a minimal fee of 3% which goes towards sustaining the PAHO RF itself. Every year, PAHO RF requests bids from suppliers based on its predictions of regional demand for a vaccine and buys the vaccines on behalf of participating countries. Countries are charged for the vaccines purchased, but the cost per vaccine is based on an average price. As a result, smaller countries may benefit from the economies of scale generated by the bulk purchasing mechanism regardless of the amount of their order.66 It also encourages a culture of accountability in its participating members. Members have to consider their financial obligations first in their plan of action, and again when managing their accounts. Notably, countries may not make purchase orders unless all past invoices are paid.67

Member countries in the programme accrue benefits from taking advantage of economies of scale, market competition between manufacturers, and access to a reliable credit line. On the other side, vaccine manufacturers benefit from the financial security and the supply chain management provided by the PAHO RF. Because the PAHO RF works by soliciting bids from manufacturers to produce the vaccines, participating firms also have the additional security of being able to forecast the demand for their product, which may allow them to offer more competitive prices.68

Because the sustainability of a cervical cancer programme involving vaccination in Vietnam is based on the affordability of the vaccine, PAHO RF may serve as a useful model for stakeholders to consider. The overall success of PAHO RF is reflected in its growth. Since its inception, the PAHO RF’s ability to negotiate the uptake of new vaccines in member countries has increased.

Because of its current relationships with Merck, Vietnam may be uniquely situated to initiate the development of a similar health alliance with neighbouring countries in Asia. By participating in PATH’s HPV Vaccination Program, Vietnam’s governmental leaders and policy makers already have a head start in analysing the necessary factors for establishing a sustainable vaccine programme. Undoubtedly, cervical cancer is a problem for both small and large countries throughout Asia. As a result, a successful purchasing alliance using a common supply chain like the PAHO RF is a feasible option in Asia if appropriate leadership is provided. India, in particular may be a good initial ally, because its large population and its high incidence of cervical cancer may be attractive to vaccine
manufacturers in negotiations. In addition, India’s common involvement in the PATH HPV Vaccination Project may provide it with additional motivation to continue the ongoing efforts started by the PATH programme.

### 3.3.5 Advanced market commitments

As a preliminary matter, ‘push’ and ‘pull’ mechanisms are differing methods for providing producers like vaccine manufacturers with the appropriate incentives to improve upon existing vaccines and to produce enough vaccines to allow for affordable prices. ‘Push’ mechanisms work by targeting research or manufacturing activities to encourage product development. Conversely, ‘pull’ mechanisms assure manufacturers that investments in production capacity to meet the demand for vaccines will result in adequate profit margins.

Although AMCs may work via ‘pull’ or ‘push’ mechanisms, their most common application is as a ‘pull’ mechanism. Typically, third-party donors like GAVI make a financial commitment to the manufacturer to subsidise a developing country’s future purchase of vaccines at an agreed-upon price. Because the vaccine at issue has not yet been produced, manufacturers might otherwise be hesitant to make the capital investments needed to produce the product at an affordable price. Markets in developing countries are notoriously unpredictable, and AMC funding provides manufacturers with the necessary confidence to invest in production.

To assure fairness for all parties involved, AMCs are not binding purchase agreements. Developing countries are not obligated to purchase the vaccine, so manufacturers are not guaranteed a purchase. Notably, the vaccine must be produced appropriately, and the developing country must actually purchase the vaccine for the manufacturer to receive the subsidies from the AMC. Most AMCs also include an independent assessment committee which determines whether the vaccine meets the standards established. Manufacturers only receive some reassurance that the product will generate an adequate return on investment if it is sold to a developing country.

Unlike the PAHO RF which provided a sustainable mechanism for procurement, the primary intent of an AMC is to enable manufacturers to step up production to produce vaccines at a lower price for developing countries. The countries only receive the benefit of subsidised prices from an AMC fund for a limited amount of time, after which they must negotiate ongoing purchase with manufacturers. AMC funds are typically depleted at a point where the manufacturer has recouped the costs of the major investments sought by the AMC. Manufacturers may be required to supply the vaccine the country at a low, predetermined low price to the developing country set in the AMC contract, but the AMC may also set certain exit conditions for the termination of the AMC contract. Thus, the terms of the AMC contract may be negotiated by the parties depending on their interests and objectives in sustaining a long-term vaccination programme.

The HPV vaccine was one of six vaccines considered for a pilot AMC to be launched in 2007. Although the new pneumococcal vaccines were chosen, if the pilot AMC proves to be successful, it may pave the way for the use of AMCs to improve the availability of the HPV vaccine to girls in developing countries. In regards to HPV vaccines, AMCs may be used to encourage the development of second-generation vaccines with more desirable characteristics for use in the developing world. Particularly for a global disease like cervical cancer, HPV manufacturers have an additional incentive of access to a more...
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profitable, industrialised market, to scale up production of vaccines. Thus, it may be easier for developing nations to contract for sustaining lower prices for the HPV vaccine even after depletion of AMC funds.

4 Vietnam: government, laws and culture

The main criticism of the PATH project by advocates of traditional screening methods like the VACCP is that the HPV vaccination programme is driven heavily by the commercial interests of manufacturers. Although resource-poor countries may have interests that conflict with those of profit-seeking firms, the VACCP simplistically assumes that innovative technology has no place in a developing nation’s public health programmes and that competing interests in the commercial and the public sectors cannot be harmonised. In addition, it fails to recognise the need to enable developing nations to implement innovative technologies, which are typically more aggressive than traditional therapies, to address urgent health problems.

Notably, key policy makers and government officials in Vietnam have tailored its national policies to reflect the level of commitment needed to maintain stakeholder confidence in its cervical cancer programmes. Despite aspects of Vietnamese culture that would preclude recognition of IP rights, Vietnam has in recent years made landmark changes in its patent laws. Although it is impossible to tell whether part of the impetus for such changes are related to its current cervical cancer goals, Vietnam’s multi-sectorial approach in promulgating numerous laws will undoubtedly have an effect on the future success of its cervical cancer programmes. Notably, the current policies have placed Vietnam in a good strategic position to develop future collaborations with western, commercial firms like vaccine manufacturers and to foster growth in its own medical technology industry. The most recent regulations and laws involving healthcare, IP, and foreign technology transfer will be discussed in relationship to their impact on Vietnam’s future cervical cancer treatment efforts.

4.1 Vietnamese culture and history

To place the changes Vietnam’s patent system in the appropriate context, it is necessary to acknowledge that introducing the concept of individual rights, much less the type of exclusive rights characterised in western IP regimes, is a slow process in a country like Vietnam. The country’s history is dominated by over ten centuries of occupation by the Chinese, and Confucian ideals provide the foundation for Vietnamese society. In this culture, individual needs are secondary to societal needs. People are typically defined by their relationships, whether those relationships are based on kinship or broader, sociopolitical connections.

For example, an individual may be often called by his/her siblings based on the numerical order of birth instead of a proper name among family and even close friends. Because the parents symbolise the unspoken ‘Number One’ in the family line, the first-born in any family would be called ‘Brother/Sister Two’, the second child, ‘Brother/Sister Three’, and so on. Thus, western IP rights which value individual rights above all are based on a relatively novel idea to traditional Vietnamese concepts of self and society.
Vietnam’s economy has been open to foreigners since 1986, but the Vietnamese view of foreigners may still reflect the relative isolation of most of the nation from western contact. Because western foreigners in particular may be considered overseas experts, the Vietnamese may perceive business dealings with people from abroad as a fair opportunity to obtain education, technology, and innovative ideas. Although large business organisations may have an awareness of the extent of patent laws provided by the Vietnamese government, patent laws which exclude individuals from accessing intangible information may seem selfish and bizarre to the ordinary citizen.

4.2 Recent healthcare policies in Vietnam

In late November of 2000, approximately four years after VACCP initiated its efforts to combat the cervical cancer burden in Vietnam, the Prime Minister of Vietnam issued a decision approving the National Strategy on Reproductive Health Care for the 2001–2010 period (Strategy on RHC). The policy was promulgated based on a proposal issued by the Ministry of Health, the primary governmental body working with the VACCP on its cervical screening programmes. Whether the policy was promulgated at the behest of VACCP to document its interests or whether the Minister of Health merely sought to show his allegiance to VACCP, the Strategy on RHC illustrates the government’s acute awareness of the need to tailor its national policies to reflect its interest in cooperating with foreign organisations.

The Strategy on RHC affirmatively outlines the government’s objectives to “provide better [reproductive healthcare] particularly to older women[, to] provide early diagnosis and treatment of cancers of reproductive tracts[, and] to improve [reproductive health] status, including sexual health, of adolescents through education, counseling and provision of [reproductive health care] services suited to different age groups”. Although VACCP is not specifically mentioned, the Strategy on RHC commits to expanding and improving “bilateral and multi-lateral co-operation with different countries, and international organizations and NGOs in [reproductive health]”. In addition, the key solutions identify the three major obstacles to effective reproductive healthcare: poor health education, limited reproductive healthcare service delivery network, and inadequate training of healthcare personnel. Notably, this list mirrors the primary goals to be addressed by VACCP in the implementation of its cervical cancer screening programme.

Around the same time that World Trade Organization (WTO) members were battling in Doha over the interpretation of Trade-Related Aspects of Intellectual Property Rights (TRIPS) provisions in relationship to the public health needs of developing countries, the Minister of Health also promulgated regulations for the registration of vaccine and medical immuno-biological products. This regulation, issued in July 2003, may be the first shift in Vietnam’s attitudes regarding its capacity to regulate and produce its own medical technology. The regulation has nine different forms for registering different types of products and notably differentiates between locally-produced and foreign-produced products as well. The regulatory structure approaches the complexity of the system used by US Food and Drug Administration system and is a drastic departure from the government’s historical hands-off approach of regarding the regulation of pharmaceutical products and medical processes.
The most recent resolution involving health and healthcare was issued by Vietnam’s Political Bureau in 23 February 2005. The *Resolution of the Political Bureau on the protection, care, and promotion of the people’s health in the new situation* (Health Resolution) is a detailed five page paper discussing the impact of globalisation and the continued need to improve healthcare.\(^8^5\) It reflects the government’s concern about the increasing healthcare costs and health disparities and recognises the country’s unique need to promote the development of the traditional, oriental medicine into a science. The Health Resolution manifestly acknowledges the government’s desire to accelerate the development of a local pharmaceutical and biologics industry.\(^8^6\) As discussed below, the Health Resolution foreshadows the substantial changes that will be made to the IP laws addressing medical technology in the following years.

### 4.3 Intellectual property laws in Vietnam

Because the adoption of TRIPS is requisite for membership in the WTO, the protection of IP rights now plays a key role in any developing nation’s effort to promote economic development. Even though Vietnam has no historic concept of IP rights, or even individual rights, it has aggressively developed a westernised patent law in order to obtain access to the global marketplace and to attract foreign investment within its borders.

Conversely, many public health advocates have opined that the strong IP protection mandated by TRIPS strips developing nations of their ability to promote a key component of economic development, a healthy and able-bodied population. Discussions during the WTO’s Doha Rounds on TRIPS reflect that the access to appropriate medicines and treatment is the subject of much concern and debate for developing nations.\(^8^7\) Not surprisingly, the movement towards harmonising IP law under TRIPS favours producers and inventors in industrialised countries to the detriment of resource-poor, developing nations. Although the core objectives of TRIPS includes the promotion of social and economic development in member countries,\(^8^8\) the minimum floor of IP rights mandated by TRIPS limits the means that most developing nations may use to access the innovative medicines required to address their public health needs.

As expected, the IP legislation in Vietnam has rapidly evolved since the country made its first bid to join the WTO. Vietnam specifically recognised patent rights as a ‘right to exclude’ for the first time in 1989 in its Ordinance on The Industrial Property Protection. ‘Industrial property’ was a term of art, referring to inventions, utility solutions, industrial designs, and appellation of origin.\(^8^9\) In more recent years, Vietnam’s IP legislation has been consolidated into one version, Intellectual Property Law 50/2005, which became effective 1 July 2006. The current authority in the issuance of patents is the National Office of Intellectual Property of Vietnam.\(^9^0\)

Although the IP laws have been characterised by vague guidelines limiting their effective enforcement, the most recent decree implementing the IP laws was issued on 1 November 2007 by the State Council and established clear guidelines for the transfer of foreign technology into Vietnam. The *Ordinance on the Transfer of Foreign Technology into Vietnam* (Ordinance) reflects the government’s intent to encourage foreign firms to transfer rights or knowledge related to ‘industrial property’ to local industries. The Ordinance not only affirms the government’s intent to protect the rights
and interests of foreign firms, but it also provides an additional inducement for the foreign transfer of knowledge to local firms in by expressly giving transferors the right to obtain information on any improvements in the product made by local firms. As discussed above, Vietnam’s health laws expressed a strong interest in developing the local pharmaceutical industry into “a spearhead of technical-economic branch... [to] raise the local capacity of pharmaceutical production, [and to] give priority to forms of high-tech preparations.” The laws concurrently attempt to foster confidence in potential partners from the western world, as the Political Bureau acknowledges the need to “[b]roaden cooperation” in partnering with other countries and international organisations to acquire the necessary education in science, technology, and management.

The Ordinance implements the IP law to support the objectives set out in the Health Resolution by allowing the “transfer of utilization or ownership rights of patents, licences [sic]... industrial property rights... know-how or specialized technical knowledge... technical assistance and consultancy services”. The Ordinance appears to be directed particularly at pharmaceutical and biomedical firms, with express language restricting a transferor’s ability to limit the quantity of production or the export of the products by the transferee, in a contract to transfer technology. Notably, the WTO’s compulsory licensing exception expressly requires participating manufacturers to adhere to limits on production and prohibits export of the product outside the target country. These limitations on production and export in the WTO’s scheme have been criticised for reducing the profit margin for small, manufacturing firms who may be interested in supplying medicines to developing countries. The limited potential for profit acts as a disincentive for firms to participate in the WTO’s compulsory licensing scheme. Although Vietnam’s scheme for technology transfer has not been tested to date, the language in the Ordinance suggests that the government will encourage, if not protect, the efforts of local industry and foreign investors to circumvent the WTO’s compulsory licensing scheme.

5 Conclusion

By considering the characteristics of the disease, the availability of treatment options, and the current socio-economic environment globally and locally, Vietnam is making considerable progress towards reducing the incidence of cervical cancer among its women. As noted above, Vietnam’s approach of establishing a wide range of policies, addressing a range of issues from health to IP rights, will enhance its ability to sustain the current cervical cancer interventions in the long-term. If the cost trends for other such innovative treatment options are any indication, Vietnam is wise not to rely on the promise of patent expiration and market forces to assure access to cheaper HPV vaccines from foreign firms. Particularly for biologics like vaccines, which are produced using complex cellular methods, the emergence of technology that would allow for the development of a more affordable version of the HPV vaccine may not be available for years after patent protection, if ever.

By recognising affordable access to the HPV vaccine will be an issue for many years, Vietnam has taken a multi-sectorial approach to position itself strategically to maintain the involvement of foreign firms in its cervical cancer programme while encouraging greater participation of local firms in producing innovative, medical technology like vaccines. Regardless of whether the impetus for the change in the IP laws reflects the
nation’s desire for economic growth or its concerns about public health, the growth of local biomedical industry may spur on improvements in the HPV vaccine to meet regional needs.

In the healthcare arena, Vietnam has also been careful to adopt policies that reflect the government’s desire and intent to build strong relationships with PPPs and other key players in healthcare. In the IP arena, Vietnam has positioned itself to attract collaborations with foreign commercial entities, with express language that addresses its interest in collaborating with pharmaceutical and biotechnology firms. Although Vietnam may not have the financial resources that would typically be attractive to the vaccine manufacturers, Vietnam has instituted a number of laws and policies that bolster its ability to sustain future cervical cancer programmes. Governmental officials in other countries may benefit from considering the approach taken by Vietnam to develop their own cervical cancer programmes.

References


Notes


2 Saxenian, *supra*, at 4.

3 Id.

4 Id.


8 Id.


10 Id.


13 Id.
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15 *Id.*
16 Suba, *supra.*
17 Available at http://vietnamcervicalcancer.org.
19 Suba, *supra.*
20 See, *Id.* at 5; Saxenian, *supra*, at 5–6.
21 *Id.*
22 *Id.*
23 *Id.* at 8.
24 Batson, *supra*, at 220.
25 Saxenian, *supra*, at 8.
26 *Id.* at 10.
27 *Id.* at 8.
28 *Id.* at 10.
29 Batson, *supra*, at 220.
30 See generally, WHO Report, *supra* (discussing potential misperceptions in attitudes towards HPV vaccines).
31 *Id.*
32 *Id.*
33 Kim, *supra*, at 4022.
34 *Id.* at 4018–4021.
35 *Id.* at 4019.
36 *Id.*
38 *Id.*
39 *Id.*
40 See, *Id.* at 4022; Saxenian, *supra*, at 3.
41 Kim, *supra*, at 4022.
42 Batson, *supra*, at 222.
43 Kim, *supra*, at 4019–4022.
44 To, *supra*, at 197.
45 *Id.* at 198.
46 Goldie, *Cervical Cancer Screening*, *supra*, at 165.
48 *Id.*
49 Kim, *supra*, at 4022.
50 *Id.*
51 See, Saxenian, *supra*, at 7; PATH, *supra*, at 1–2.
52 PATH, *supra*, at 1–2.
53 *Id.*
54 Batson, *supra*, at 222–223.
Saxenian, supra at 18–19.

Id.

Id.

Id.

Id.

Id.

Id. at 21.

Id.


The five countries not participating in the PAHO RF are Canada, Chile, Mexico, the USA, and French Guyana.

Id.

Id.

Id.

Id.

Id. at 90.

Id.

Id.

Id.

Id.

Id.

Saxenian, supra, at 20.

Id.

Id.

Id.

Id.

Batson, supra, at 224.

Id.

Id.

Saxenian, supra, at 20.

Id.

Id.

Id.

Batson, supra, at 224–225.

Suba, supra.


Claire Ellis, Culture Shock! Vietnam 186 (Kuperard Ltd. 1995).


Id.


Id.

The Doha Public Health Declaration, which was unanimously agreed upon by all WTO member countries at the Doha Ministerial Conference, expressly states that TRIPS provisions “should be interpreted and implemented in a manner supportive of WTO Members’ right to protect public health and, in particular, to promote access to medicines for all”.

Id.
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90 See, Id. at 138–141.


92 Resolution of the Political Bureau, supra.

93 Id.

94 Id.